

Samp_Seq

Totally Integrated Automation Portal																																																																																								
<div>Table of contents</div> <table><tr><td>Program blocks</td><td></td></tr><tr><td> Main [OB1]</td><td>3 - 1</td></tr><tr><td> STARTUP [OB100]</td><td>4 - 1</td></tr><tr><td> Duplicate_Ins [FC40]</td><td>5 - 1</td></tr><tr><td> Simulate [FB40]</td><td>6 - 1</td></tr><tr><td> Comms_DB [DB30]</td><td>7 - 1</td></tr><tr><td> Simulate_DB [DB40]</td><td>8 - 1</td></tr><tr><td> Unit1_Export_Data [DB1]</td><td>9 - 1</td></tr><tr><td> Comms [FB30]</td><td>10 - 1</td></tr><tr><td> Unit1_Import_Data [DB2]</td><td>11 - 1</td></tr><tr><td>System blocks</td><td></td></tr><tr><td> Program resources</td><td></td></tr><tr><td> CIP_1_Send_Conn_DB [DB4]</td><td>12 - 1</td></tr><tr><td> CIP_1_Rcv_Conn_DB [DB3]</td><td>13 - 1</td></tr><tr><td> TRCV_C [FB1031]</td><td>14 - 1</td></tr><tr><td> TSEND_C [FB1030]</td><td>15 - 1</td></tr><tr><td> CONT_C_1 [FB0]</td><td>16 - 1</td></tr><tr><td> SCALE [FC105]</td><td>17 - 1</td></tr><tr><td> Unit1</td><td></td></tr><tr><td> Unit1_000Main [FB100]</td><td>18 - 1</td></tr><tr><td> Unit1_Gates [FB121]</td><td>19 - 1</td></tr><tr><td> Unit1_Motors [FB122]</td><td>20 - 1</td></tr><tr><td> Unit1_PIDLoops [FB123]</td><td>21 - 1</td></tr><tr><td> Unit1_Valves [FB124]</td><td>22 - 1</td></tr><tr><td> Unit1_990Misc [FB115]</td><td>23 - 1</td></tr><tr><td> Unit1_991Abnormal [FB116]</td><td>24 - 1</td></tr><tr><td> Unit1_000Sample [FB101]</td><td>25 - 1</td></tr><tr><td> Unit1_040Hold [FB112]</td><td>26 - 1</td></tr><tr><td> Unit1_060Shutdown [FB113]</td><td>27 - 1</td></tr><tr><td> Unit1_080EShutdown [FB114]</td><td>28 - 1</td></tr><tr><td> Unit1_DB [DB100]</td><td>29 - 1</td></tr><tr><td> Unit1 [DB101]</td><td>30 - 1</td></tr><tr><td> Unit1G [DB103]</td><td>31 - 1</td></tr><tr><td> Unit1M [DB104]</td><td>32 - 1</td></tr><tr><td> Unit1S [DB102]</td><td>33 - 1</td></tr><tr><td> Unit1V [DB106]</td><td>34 - 1</td></tr><tr><td> Unit1P [DB105]</td><td>35 - 1</td></tr><tr><td> zzDevice_Control</td><td></td></tr><tr><td> Gate_Flop [FB1099]</td><td>36 - 1</td></tr><tr><td> Gate_Slide [FB1098]</td><td>37 - 1</td></tr><tr><td> Valve_Disc [FB1097]</td><td>38 - 1</td></tr><tr><td> Motor_Std [FB1095]</td><td>39 - 1</td></tr><tr><td> Motor_Conv [FB1096]</td><td>40 - 1</td></tr></table>			Program blocks		Main [OB1]	3 - 1	STARTUP [OB100]	4 - 1	Duplicate_Ins [FC40]	5 - 1	Simulate [FB40]	6 - 1	Comms_DB [DB30]	7 - 1	Simulate_DB [DB40]	8 - 1	Unit1_Export_Data [DB1]	9 - 1	Comms [FB30]	10 - 1	Unit1_Import_Data [DB2]	11 - 1	System blocks		Program resources		CIP_1_Send_Conn_DB [DB4]	12 - 1	CIP_1_Rcv_Conn_DB [DB3]	13 - 1	TRCV_C [FB1031]	14 - 1	TSEND_C [FB1030]	15 - 1	CONT_C_1 [FB0]	16 - 1	SCALE [FC105]	17 - 1	Unit1		Unit1_000Main [FB100]	18 - 1	Unit1_Gates [FB121]	19 - 1	Unit1_Motors [FB122]	20 - 1	Unit1_PIDLoops [FB123]	21 - 1	Unit1_Valves [FB124]	22 - 1	Unit1_990Misc [FB115]	23 - 1	Unit1_991Abnormal [FB116]	24 - 1	Unit1_000Sample [FB101]	25 - 1	Unit1_040Hold [FB112]	26 - 1	Unit1_060Shutdown [FB113]	27 - 1	Unit1_080EShutdown [FB114]	28 - 1	Unit1_DB [DB100]	29 - 1	Unit1 [DB101]	30 - 1	Unit1G [DB103]	31 - 1	Unit1M [DB104]	32 - 1	Unit1S [DB102]	33 - 1	Unit1V [DB106]	34 - 1	Unit1P [DB105]	35 - 1	zzDevice_Control		Gate_Flop [FB1099]	36 - 1	Gate_Slide [FB1098]	37 - 1	Valve_Disc [FB1097]	38 - 1	Motor_Std [FB1095]	39 - 1	Motor_Conv [FB1096]	40 - 1
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Totally Integrated Automation Portal

Program blocks

Main [OB1]

Main Properties

General

Name	Main	Number	1	Type	OB	Language	LAD
Numbering	Manual						

Information

Title	K Process Soda Ash Unit	Author		Comment	SodaAsh Unit Control Copyright (c) 2023 Dog-wood Valley Press, LLC	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value
▼ Temp		
OB1_EV_CLASS	Byte	
OB1_SCAN_1	Byte	
OB1_PRIORITY	Byte	
OB1_OB_NUMBR	Byte	
OB1_RESERVED_1	Byte	
OB1_RESERVED_2	Byte	
OB1_PREV_CYCLE	Int	
OB1_MIN_CYCLE	Int	
OB1_MAX_CYCLE	Int	
OB1_DATE_TIME	Date_And_Time	
Temp1	Bool	
Temp2	Bool	
Constant		

Network 1: Soda Ash Unit

%DB100
"Unit1_DB"

%FB100
"Unit1_000Main"

EN

ENO

Network 2: Communications

%DB30
"Comms_DB"

%FB30
"Comms"

EN

ENO

Network 3: If not simulation, transfer inputs to proper location

%M0.4
"Enab_Simulation"

%FC40
"Duplicate_Ins"

EN

ENO

Network 4:

%M0.4
"Enab_Simulation"

%DB40
"Simulate_DB"

%FB40
"Simulate"

EN

ENO

Network 5: On for first scan of OB1

Reset first scan bit. MUST BE LAST RUNG IN OB1!!

%M1.0
"First_Cycle"

%M1.0
"First_Cycle"

(R)

Program blocks

STARTUP [OB100]

STARTUP Properties							
General							
Name	STARTUP	Number	100	Type	OB	Language	LAD
Numbering	Manual						
Information							
Title	"Complete Restart"	Author		Comment	Copyright (c) 2011, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					

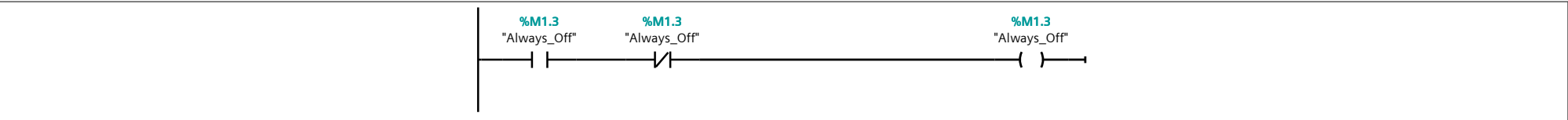
Name	Data type	Default value
▼ Temp		
OB100_EV_CLASS	Byte	
OB100_STRTUP	Byte	
OB100_PRIORITY	Byte	
OB100_OB_NUMBR	Byte	
OB100_RESERVED_1	Byte	
OB100_RESERVED_2	Byte	
OB100_STOP	Word	
OB100_STRT_INFO	DWord	
OB100_DATE_TIME	Date_And_Time	
Constant		

Network 1: On for first scan of OB1

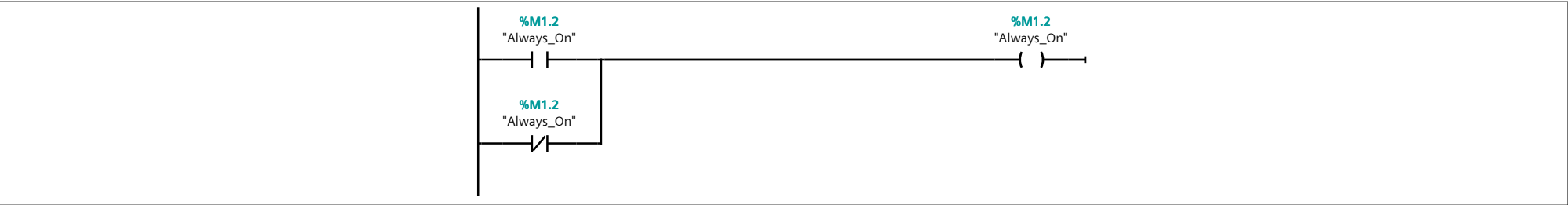
Indicates when program executing for first time



Network 2: Always off



Network 3: Always on



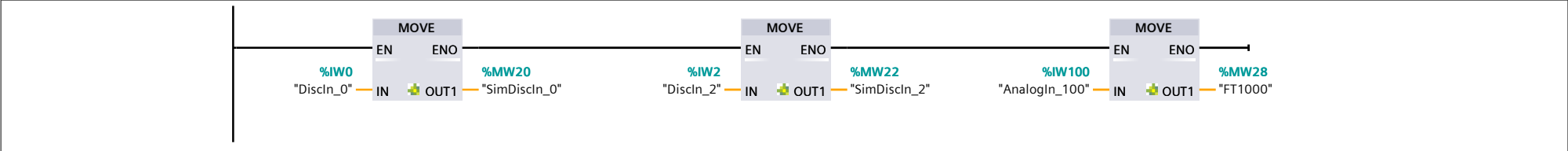
Program blocks

Duplicate_Ins [FC40]

Duplicate_Ins Properties							
General							
Name	Duplicate_Ins	Number	40	Type	FC	Language	LAD
Numbering	Manual						
Information							
Title	Copy inputs from modules into duplicate image	Author		Comment	Copyright (c) 2011, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value
Input		
Output		
InOut		
Temp		
Constant		
▼ Return		
Duplicate_Ins	Void	

Network 1:



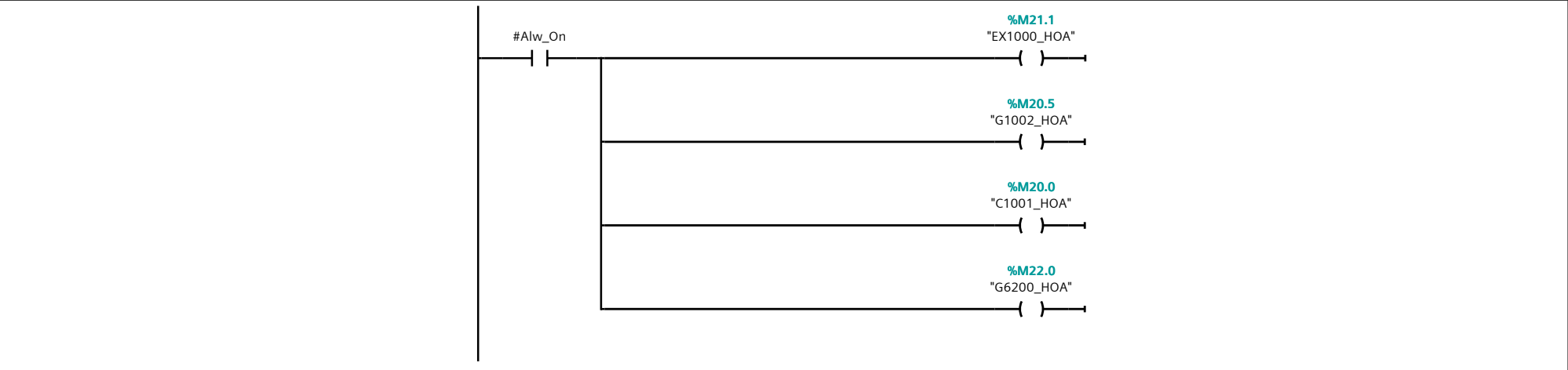
Program blocks

Simulate [FB40]

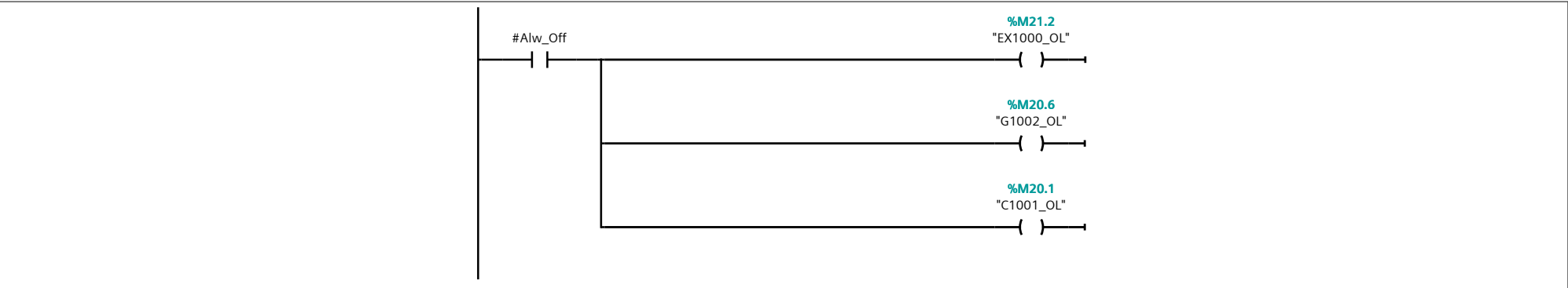
Simulate Properties							
General							
Name	Simulate	Number	40	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Simulation Logic	Author		Comment	Copyright (c) 2023, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value
Input		
Output		
InOut		
▼ Static		
Alw_On	Bool	True
Alw_Off	Bool	false
Sim_Tmr_C6100_Start	TON_TIME	
Sim_Tmr_C6100_Stop	TON_TIME	
Sim_Tmr_L6100_Start	TON_TIME	
Sim_Tmr_L6100_Stop	TON_TIME	
Sim_Tmr_G6000_Open	TON_TIME	
Sim_Tmr_G6000_Close	TON_TIME	
Sim_Tmr_XV6001_Open	TON_TIME	
Sim_Tmr_XV6001_Close	TON_TIME	
Sim_Tmr_G6200_Left	TON_TIME	
Sim_Tmr_G6200_Right	TON_TIME	
Temp		
Constant		

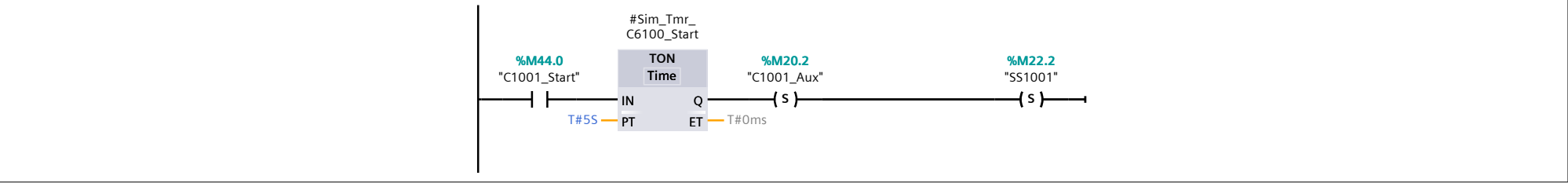
Network 1: Turn all HOA's on



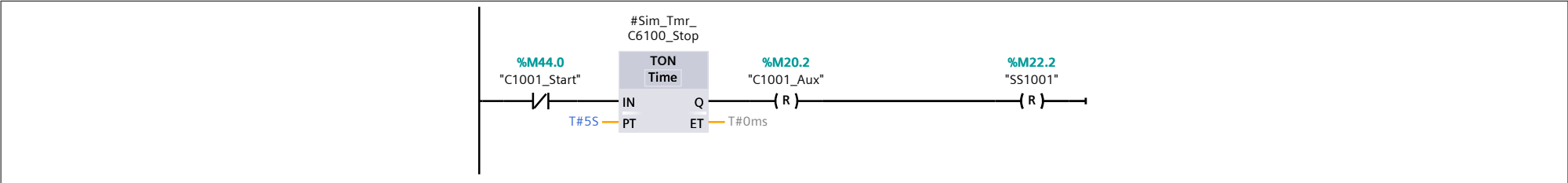
Network 2: Turn all overloads off.



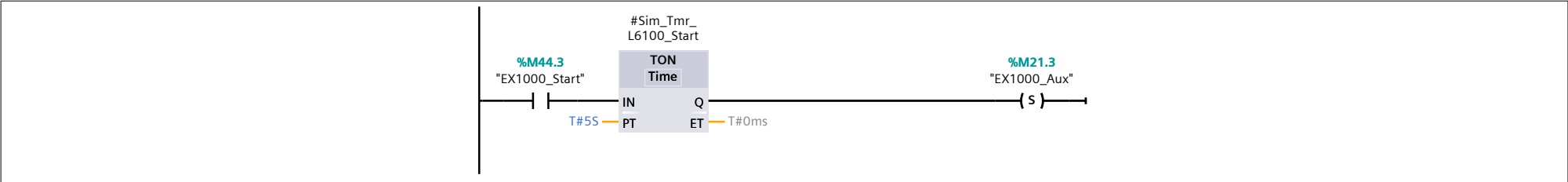
Network 3: Simulate C6100. Also simulate speed switch.



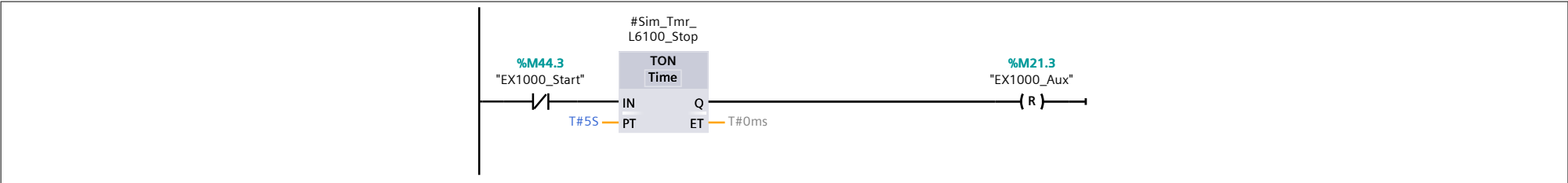
Network 4: When control off, reset aux and speed switch after delay



Network 5: Simulate L-6100

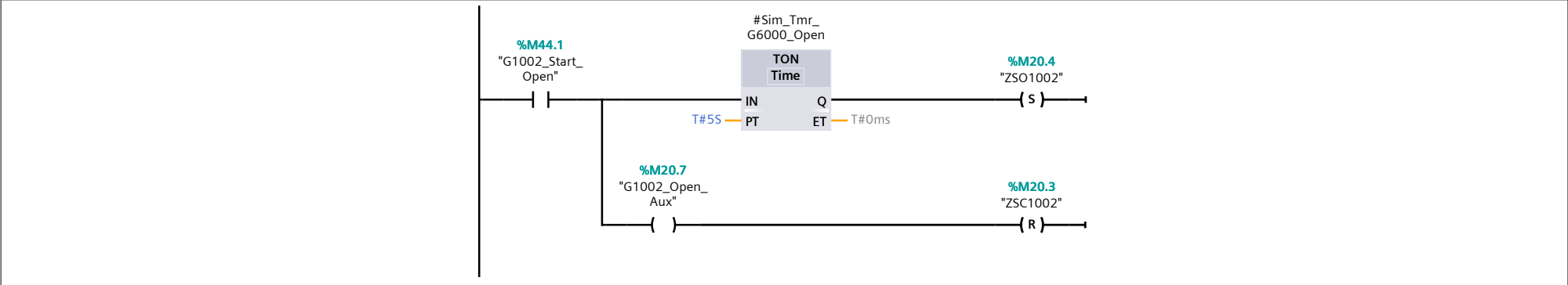


Network 6: When control off, reset aux after delay



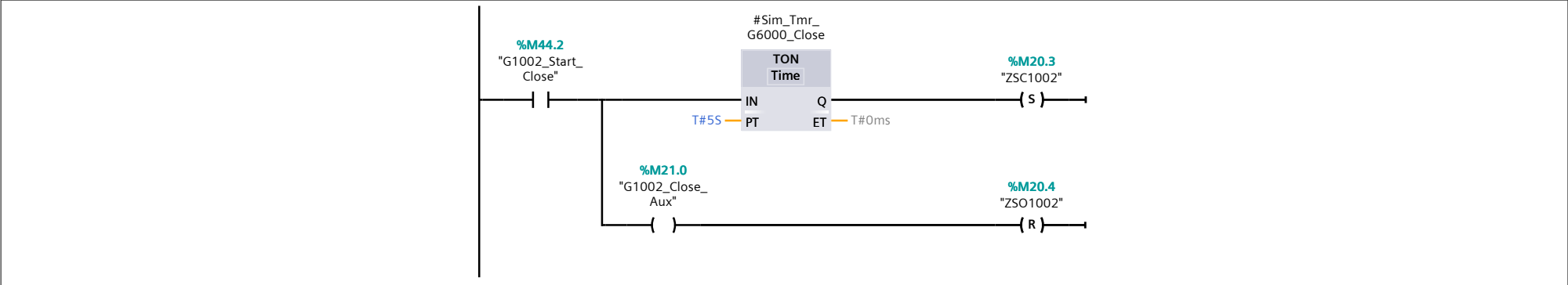
Network 7: Simulate G-6000 slide gate opening.

Also handle limit switches. Aux is on immediately and close LS opened immediately.



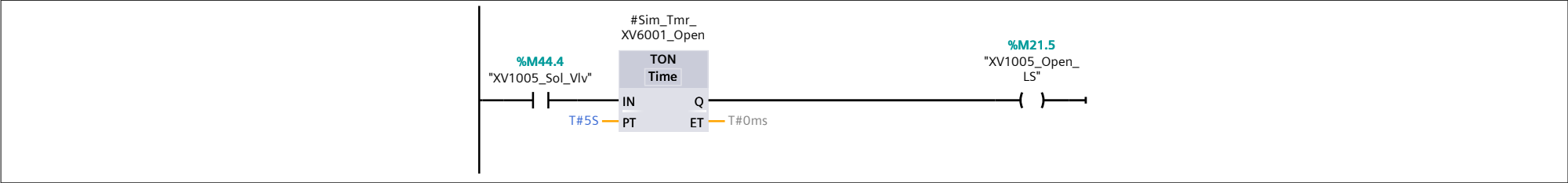
Network 8: G-6000 Soda Ash CIP Slide Gate closing; Close Aux contact

Also handle limit switches. Aux is on immediately and open LS opened immediately.



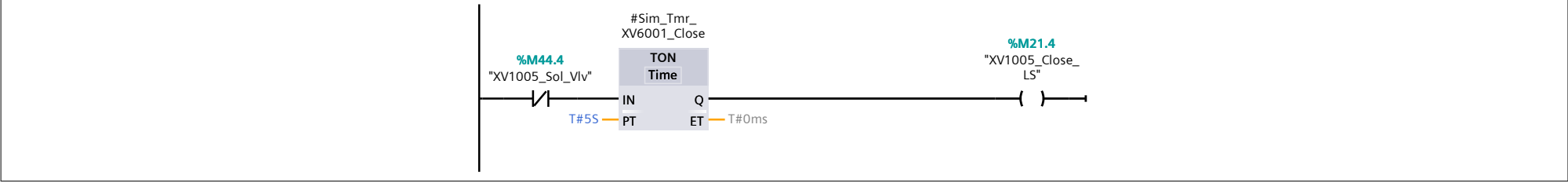
Network 9: XV6001 Soda Ash Sample Valve open

Open Limit Switch after delay



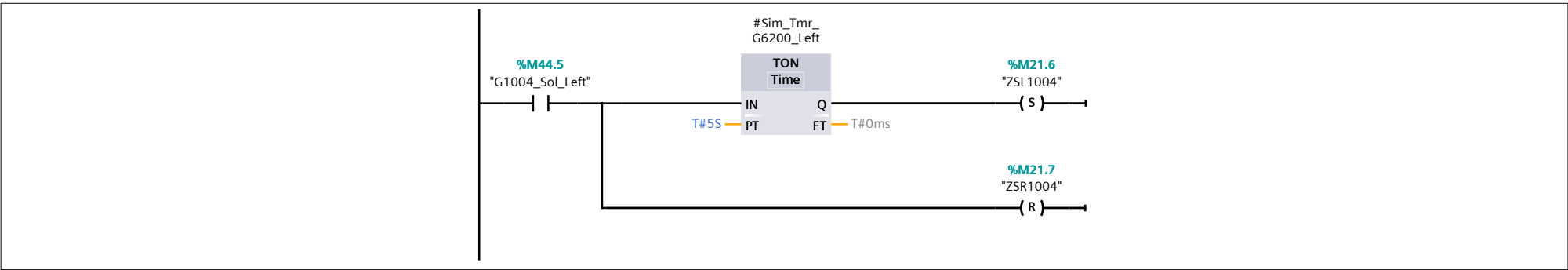
Network 10: XV6001 Soda Ash Sample Valve close

Close Limit Switch after delay



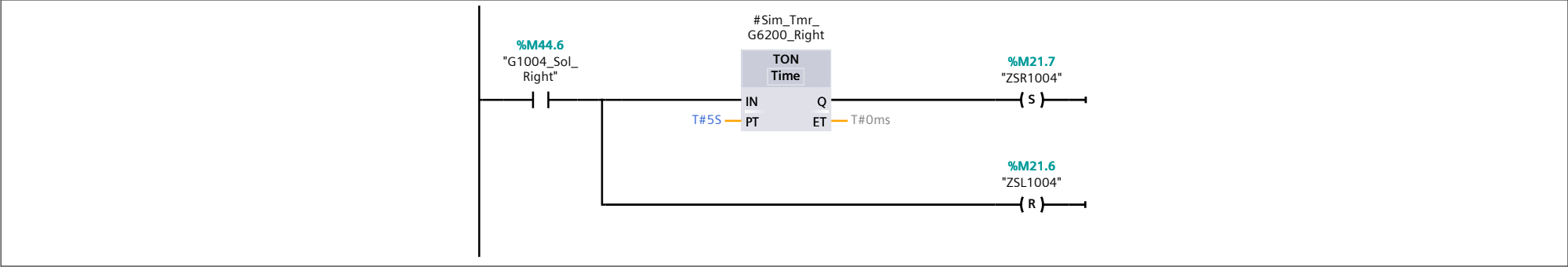
Network 11: Simulate G-6200 Sample flop gate left.

Left LS set after delay. Right LS reset immediately



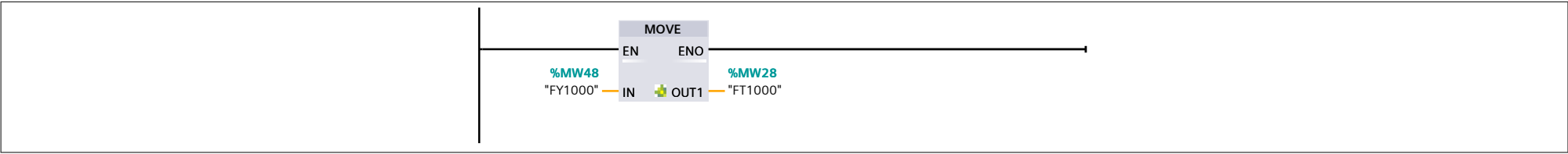
Network 12: Simulate G-6200 Sample flop gate right.

Right LS set after delay. Left LS reset immediately



Network 13: Simulation for flow loop

Copy controller output to PV measurement



Totally Integrated Automation Portal

Program blocks

Comms_DB [DB30]

Comms_DB Properties

General

Name	Comms_DB	Number	30	Type	DB	Language	DB
Numbering	Manual						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
Input			
Output			
InOut			
▼ Static			
Tic_Tmr	TON_TIME		True
Send_Err_Tmr	TON_TIME		True
Act_Send	Bool	false	True
Conn_Error	Bool	false	True
Send_Busy	Bool	false	True
Send_Done	Bool	false	True
Send_Err	Bool	false	True
Recv_NewData	Bool	false	True
Recv_Err	Bool	false	True
Send_Stat	Word	16#0	True
Send_Stat_Save	Word	16#0	True
Recv_Stat	Word	16#0	True
Recv_Stat_Save	Word	16#0	True
Recv_Len	Int	0	True
Recv_Len_Save	Int	0	True
Tic_Tmr_Q	Bool	false	True
Send_Connect_Cmd	Bool	false	True
Send_Conn_Est	Bool	false	True
TSend	TSEND_C		True
Send_Conn_Trans	Bool	false	True
TSend_Stat_Save	Word	16#0	True
Recv_Comm_Est	Bool	false	True
TRcv	TRCV_C		True
TRcv_Stat_Save	Word	16#0	True
TRcv_Len_Save	UDInt	0	True

Totally Integrated Automation Portal

Program blocks

Simulate_DB [DB40]

Simulate_DB Properties

General

Name	Simulate_DB	Number	40	Type	DB	Language	DB
Numbering	Manual						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
Input			
Output			
InOut			
▼ Static			
Alw_On	Bool	True	False
Alw_Off	Bool	false	False
Sim_Tmr_C6100_Start	TON_TIME		False
Sim_Tmr_C6100_Stop	TON_TIME		False
Sim_Tmr_L6100_Start	TON_TIME		False
Sim_Tmr_L6100_Stop	TON_TIME		False
Sim_Tmr_G6000_Open	TON_TIME		False
Sim_Tmr_G6000_Close	TON_TIME		False
Sim_Tmr_XV6001_Open	TON_TIME		False
Sim_Tmr_XV6001_Close	TON_TIME		False
Sim_Tmr_G6200_Left	TON_TIME		False
Sim_Tmr_G6200_Right	TON_TIME		False

Totally Integrated Automation Portal

Program blocks

Unit1_Export_Data [DB1]

Unit1_Export_Data Properties

General

Name	Unit1_Export_Data	Number	1	Type	DB	Language	DB
Numbering	Manual						

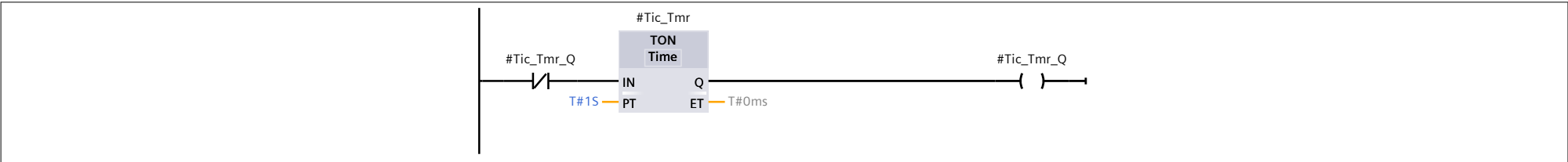
Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
Export_Info	DInt	0	False



Network 4: Timer for send message to CIP

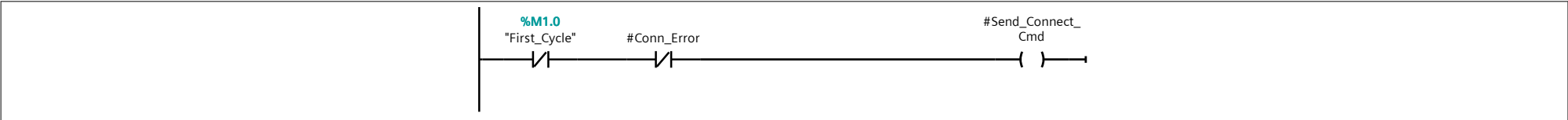


Network 5: Clear Send_Busy bit to start initial communication



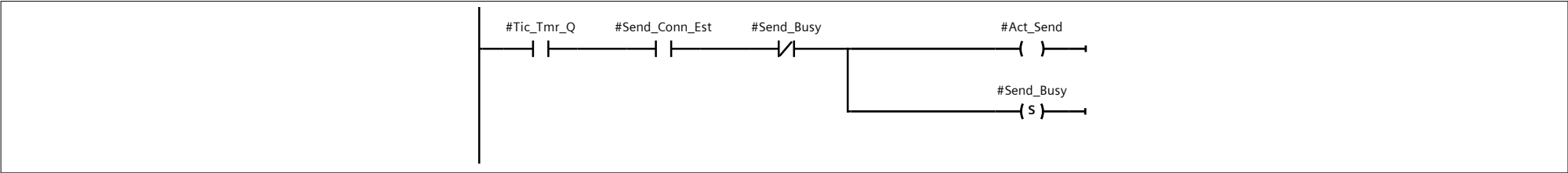
Network 6: Connect comand for TSEND_C

Not during first scan and as long as no connection error

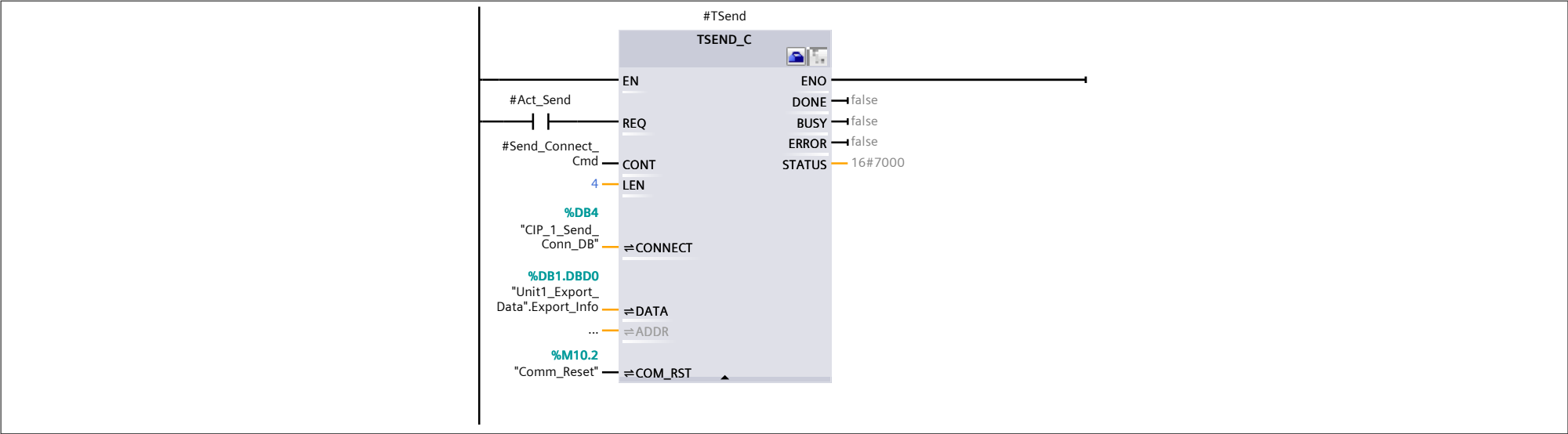


Network 7: Start TSEND_C with communication tic

If connection established and send not in progress. The REQ input of TSEND_C is triggered with a pulse and Send_Busy is set as long as the TSend_C has not completed.

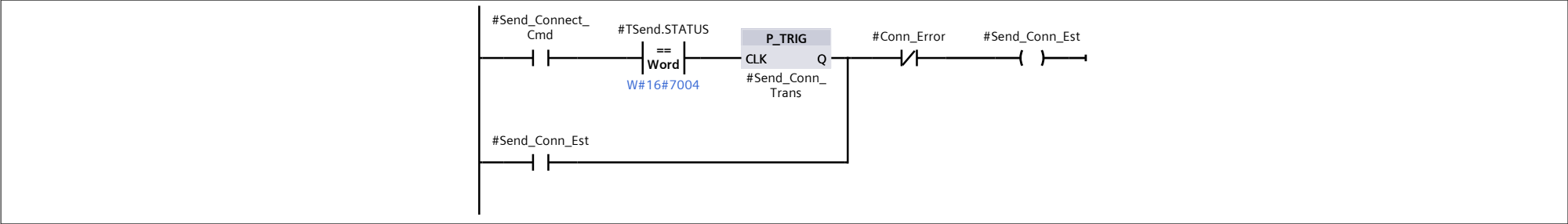


Network 8: Invoke TSEND_C function



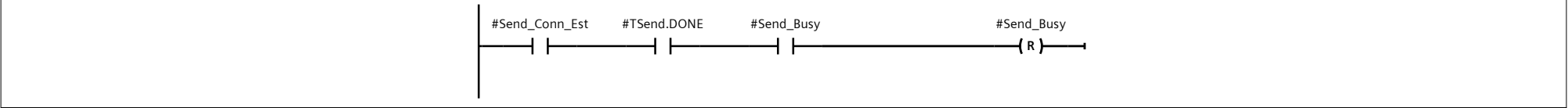
Network 9: Connection established

If status becomes 0x7004, connection is established. Maintain until connection error detected



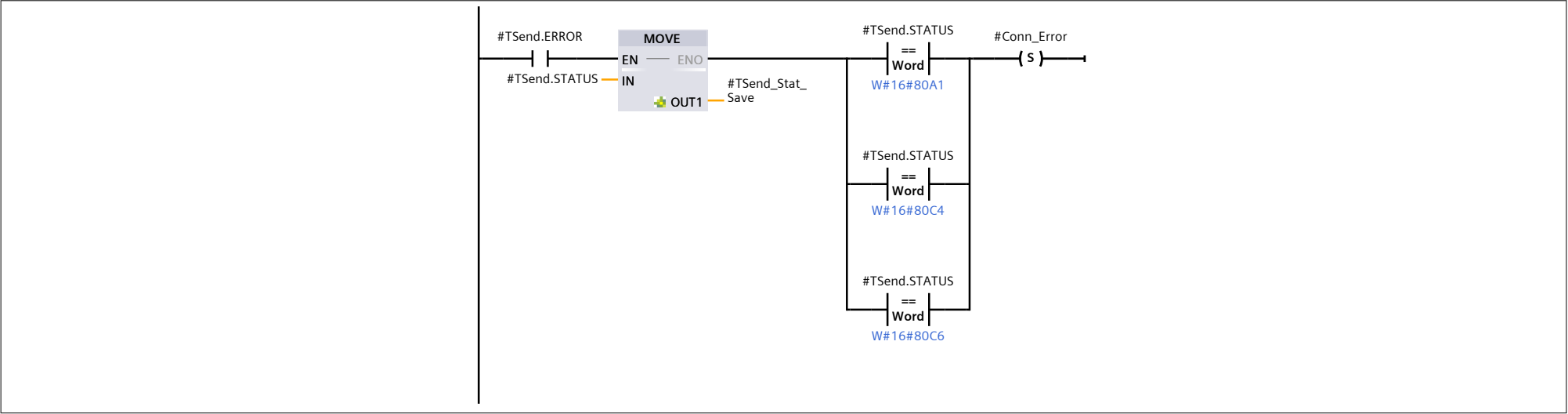
Network 10: Send complete

If connection established, sending complete, and send in progress, reset Send_Busy. TSend_Done on for things other than send complete.



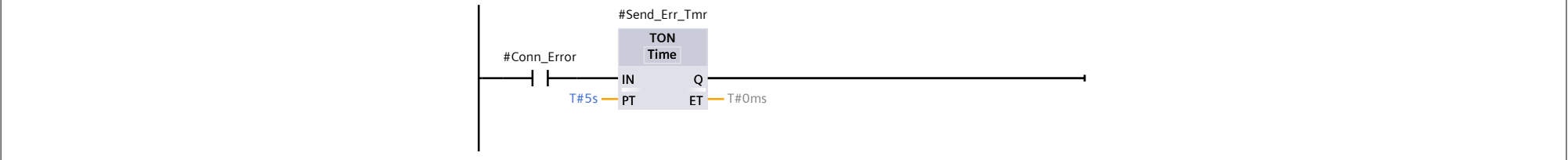
Network 11: Error tracking and check for connection error

Save error status. If connection-related error, set Conn_Error so maintained for timer.



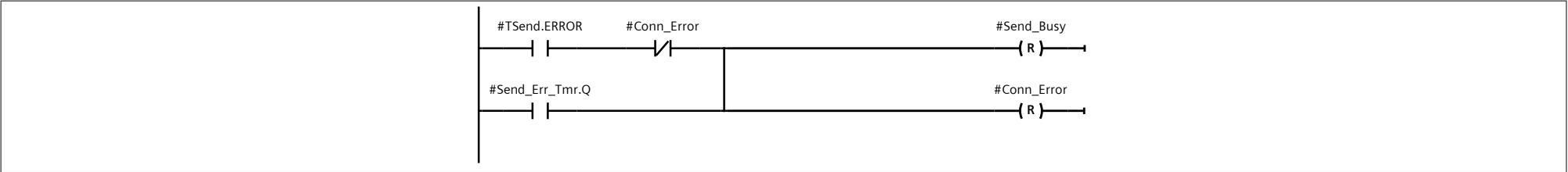
Network 12: Connection error timer

If connection error, wait 5 secs before reinitiating TSEND_C



Network 13: Resets due to error

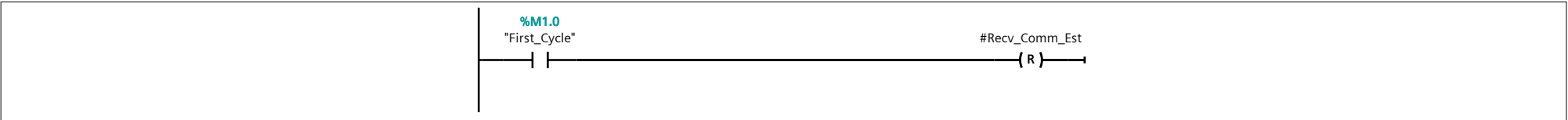
If error and not connection error, reset Send_Busy and Conn_Error immediately. If connection error, reset them after 5 seconds.



Network 14: Receiving CIP Export information

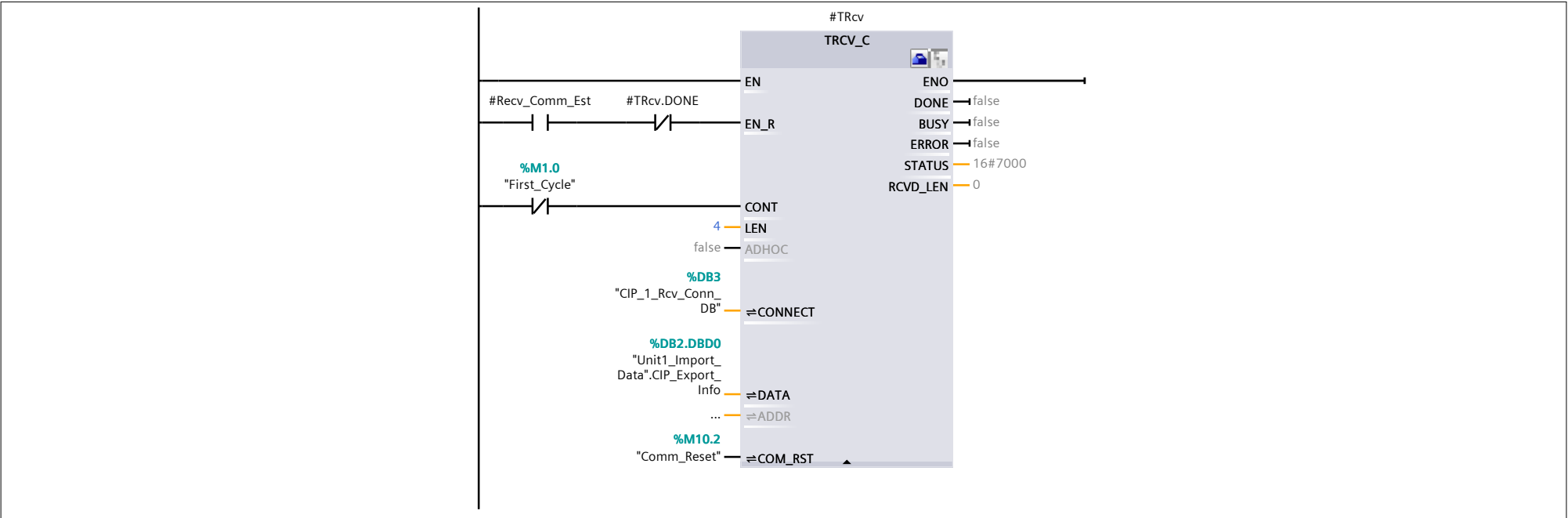
Network 15: First scan initialization

Reset communication established indication



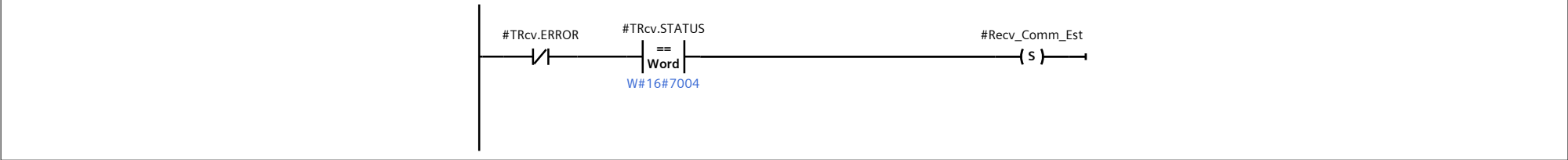
Network 16: Invoke TRCV_C function to receive data from other PLC

Note that CONT must not be on during first scan so that communications will recover after a change to run mode



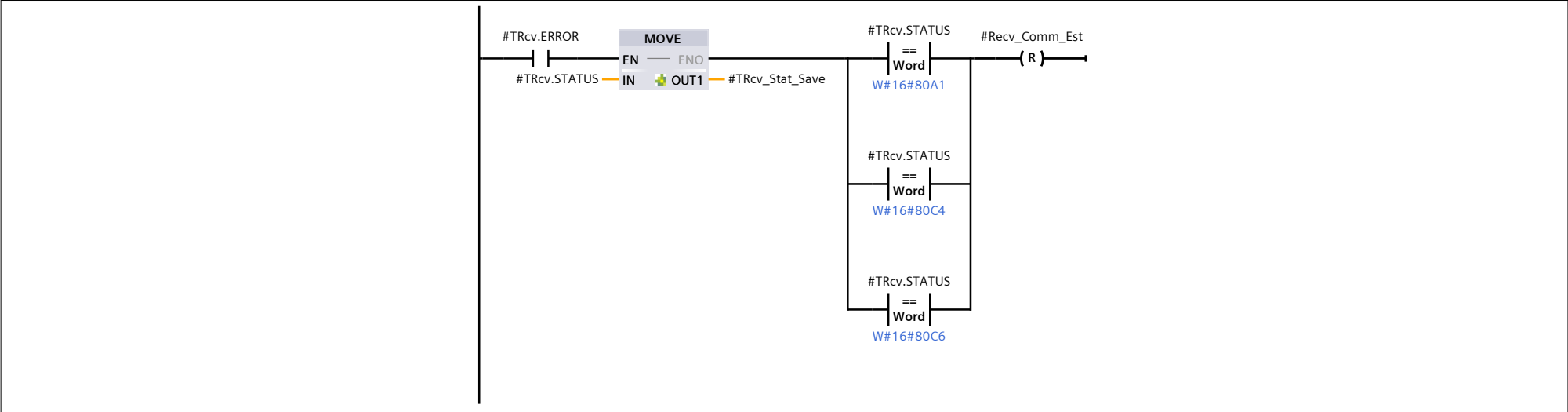
Network 17: Communication established

When no error and status is 0x7004, connection has been established.



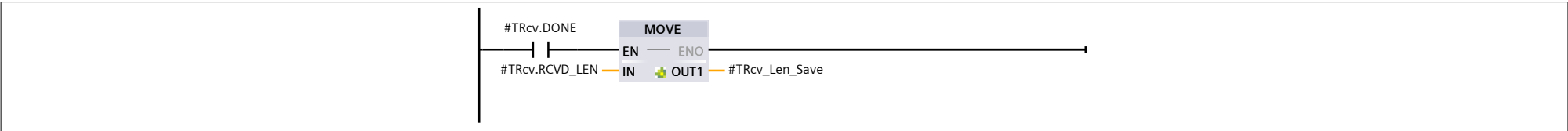
Network 18: Error tracking and check for connection error

Save error status. If connection-related error, reset Comm_Est so will start over.



Network 19: New data received

If new data received, save its length.



Totally Integrated Automation Portal

Program blocks

Unit1_Import_Data [DB2]

Unit1_Import_Data Properties

General

Name	Unit1_Import_Data	Number	2	Type	DB	Language	DB
Numbering	Automatic						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
CIP_Export_Info	DInt	0	False

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

CIP_1_Send_Conn_DB [DB4]

CIP_1_Send_Conn_DB Properties

General

Name	CIP_1_Send_Conn_DB	Number	4	Type	DB	Language	DB
Numbering	Automatic						

Information

Title		Author	SIMATIC	Comment		Family	MC7Plus
Version	1.0	User-defined ID	IP_RFC				

Name	Data type	Start value	Retain
▼ Static			
Interfaceld	HW_ANY	72	False
ID	CONN_OUC	2	False
ConnectionType	Byte	16#0C	False
ActiveEstablished	Bool	true	False
RemoteAddress	IP_V4		False
RemoteTSelector	TSelector		False
LocalTSelector	TSelector		False

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

CIP_1_Rcv_Conn_DB [DB3]

CIP_1_Rcv_Conn_DB Properties

General

Name	CIP_1_Rcv_Conn_DB	Number	3	Type	DB	Language	DB
Numbering	Automatic						

Information

Title		Author	SIMATIC	Comment		Family	MC7Plus
Version	1.0	User-defined ID	TC_IP_v4				

Name	Data type	Start value	Retain
▼ Static			
Interfaceld	HW_ANY	72	False
ID	CONN_OUC	1	False
ConnectionType	Byte	16#0B	False
ActiveEstablished	Bool	true	False
RemoteAddress	IP_V4		False
RemotePort	UInt	2000	False
LocalPort	UInt	0	False

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

TRCV_C [FB1031]

TRCV_C Properties

General

Name	TRCV_C	Number	1031	Type	FB	Language	SCL
Numbering	Automatic						

Information

Title	Reading data over Ethernet (native TCP or UDP)	Author	Simatic	Comment		Family	COMM
Version	2.1	User-defined ID					

Name	Data type	Default value	Retain
▼ Input			
EN_R	Bool	false	Non-retain
CONT	Bool	false	Non-retain
LEN	UDInt	0	Non-retain
ADHOC	Bool	false	Non-retain
▼ Output			
DONE	Bool	false	Non-retain
BUSY	Bool	false	Non-retain
ERROR	Bool	false	Non-retain
STATUS	Word	16#7000	Non-retain
RCVD_LEN	UDInt	0	Non-retain
▼ InOut			
CONNECT	Variant		
DATA	Variant		
ADDR	Variant		
COM_RST	Bool	false	Non-retain
▼ Static			
s_state	Int	0	Non-retain
s_locked	Bool	false	Non-retain
s_udp	Bool	false	Non-retain
s_configured	Bool	false	Non-retain
s_tcon_80A3	Bool	false	Non-retain
s_ConID	CONN_OUC	16#0	Non-retain
s_TCON	TCON		
s_TDIAG	T_DIAG		
s_TDIAG_Status	TDiag_Status		Non-retain
s_TRCV	TRCV		
s_TURCV	TURCV		
s_TDISCON	TDISCON		
s_TRESET	T_RESET		

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

TSEND_C [FB1030]

TSEND_C Properties

General

Name	TSEND_C	Number	1030	Type	FB	Language	SCL
Numbering	Automatic						

Information

Title	Sending data over Ethernet (native TCP or UDT)	Author	Simatic	Comment		Family	COMM
Version	2.2	User-defined ID					

Name	Data type	Default value	Retain
▼ Input			
REQ	Bool	false	Non-retain
CONT	Bool	false	Non-retain
LEN	UDInt	0	Non-retain
▼ Output			
DONE	Bool	false	Non-retain
BUSY	Bool	false	Non-retain
ERROR	Bool	false	Non-retain
STATUS	Word	16#7000	Non-retain
▼ InOut			
CONNECT	Variant		
DATA	Variant		
ADDR	Variant		
COM_RST	Bool	false	Non-retain
▼ Static			
s_state	Int	0	Non-retain
s_locked	Bool	false	Non-retain
s_udp	Bool	false	Non-retain
s_configured	Bool	false	Non-retain
s_tcon_80A3	Bool	false	Non-retain
s_REQ	Bool	false	Non-retain
s_ConID	CONN_OUC	16#0	Non-retain
s_TCON	TCON		
s_TDIAG	T_DIAG		
s_TDIAG_Status	TDiag_Status		Non-retain
s_TDISCON	TDISCON		
s_TSEND	TSEND		
s_TUSEND	TUSEND		
s_TRESET	T_RESET		

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

CONT_C_1 [FB0]

CONT_C_1 Properties

General

Name	CONT_C_1	Number	0	Type	FB	Language	SCL
Numbering	Automatic						

Information

Title	continuous PID controller	Author	SIMATIC	Comment		Family	ICONT
Version	1.5	User-defined ID	CONT_C				

Name	Data type	Default value	Retain
▼ Input			
COM_RST	Bool	false	Retain
MAN_ON	Bool	true	Retain
PVPER_ON	Bool	false	Retain
P_SEL	Bool	true	Retain
I_SEL	Bool	true	Retain
INT_HOLD	Bool	false	Retain
I_ITL_ON	Bool	false	Retain
D_SEL	Bool	false	Retain
CYCLE	Time	T#1S	Retain
SP_INT	Real	0.0	Retain
PV_IN	Real	0.0	Retain
PV_PER	Word	16#0	Retain
MAN	Real	0.0	Retain
GAIN	Real	2.0	Retain
TI	Time	T#20S	Retain
TD	Time	T#10S	Retain
TM_LAG	Time	T#2S	Retain
DEADB_W	Real	0.0	Retain
LMN_HLM	Real	100.0	Retain
LMN_LLM	Real	0.0	Retain
PV_FAC	Real	1.0	Retain
PV_OFF	Real	0.0	Retain
LMN_FAC	Real	1.0	Retain
LMN_OFF	Real	0.0	Retain
I_ITLVAL	Real	0.0	Retain
DISV	Real	0.0	Retain
▼ Output			
LMN	Real	0.0	Retain
LMN_PER	Word	16#0	Retain
QLMN_HLM	Bool	false	Retain
QLMN_LLM	Bool	false	Retain
LMN_P	Real	0.0	Retain
LMN_I	Real	0.0	Retain
LMN_D	Real	0.0	Retain
PV	Real	0.0	Retain
ER	Real	0.0	Retain
InOut			
▼ Static			
sInvAlt	Real	0.0	Retain
slanteilAlt	Real	0.0	Retain
sRestInt	Real	0.0	Retain
sRestDif	Real	0.0	Retain
sRueck	Real	0.0	Retain
sLmn	Real	0.0	Retain
sbArwHLmOn	Bool	false	Retain
sbArwLLmOn	Bool	false	Retain
sbILimOn	Bool	true	Retain

Totally Integrated Automation Portal

Program blocks / System blocks / Program resources

SCALE [FC105]

SCALE Properties

General

Name	SCALE	Number	105	Type	FC	Language	SCL
Numbering	Automatic						

Information

Title		Author	SIMATIC	Comment		Family	CONVERT
Version	1.0	User-defined ID	SCALE				

Name	Data type	Default value
▼ Input		
IN	Int	
HI_LIM	Real	
LO_LIM	Real	
BIPOLAR	Bool	
▼ Output		
OUT	Real	
InOut		
▼ Return		
Ret_Val	Word	

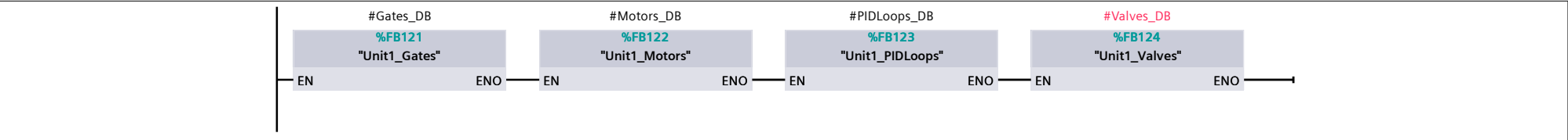
Program blocks / Unit1

Unit1_000Main [FB100]

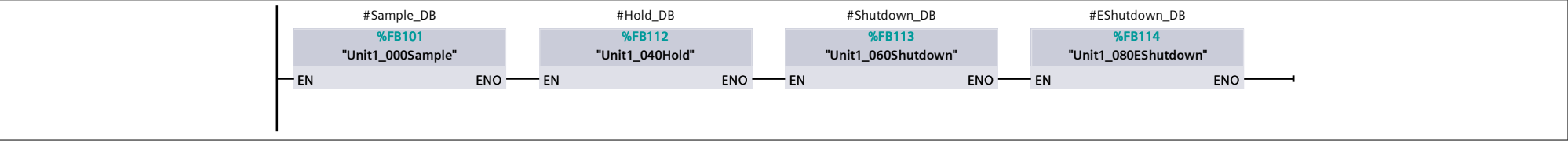
Unit1_000Main Properties							
General							
Name	Unit1_000Main	Number	100	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	SodaAsh Unit Main Block	Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Default value	Retain
Input			
Output			
InOut			
▼ Static			
Gates_DB	"Unit1_Gates"		
Motors_DB	"Unit1_Motors"		
Valves_DB	"Unit1_Valves"		
Sample_DB	"Unit1_000Sample"		
Hold_DB	"Unit1_040Hold"		
Shutdown_DB	"Unit1_060Shutdown"		
EShutdown_DB	"Unit1_080EShutdown"		
PIDLoops_DB	"Unit1_PIDLoops"		
Abnormal_DB	"Unit1_991Abnormal"		
Misc_DB	"Unit1_990Misc"		
Temp			
Constant			

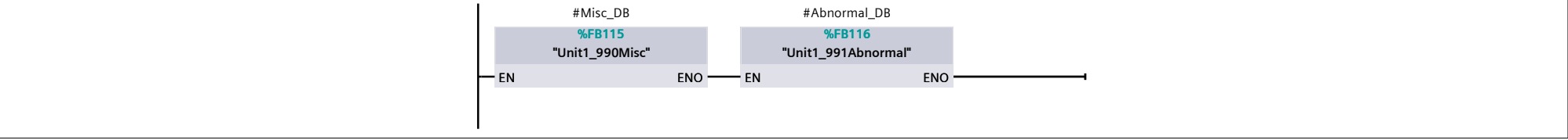
Network 2: Device Controls



Network 3: Sequences



Network 4:

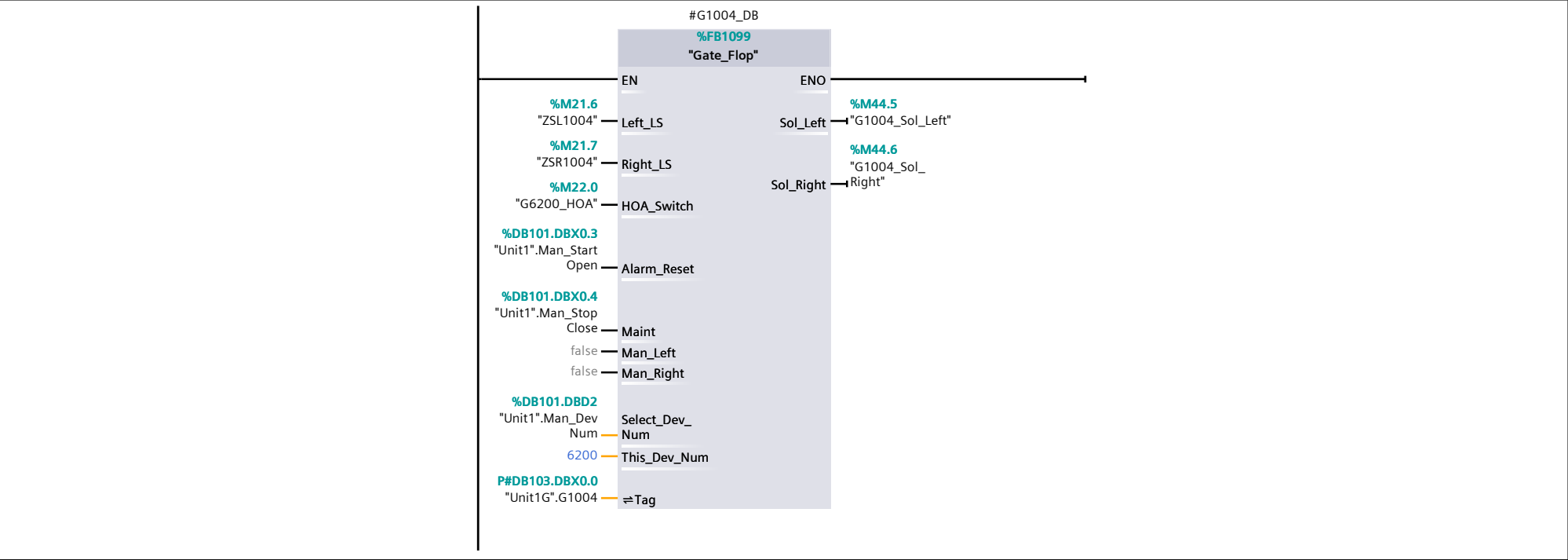


Program blocks / Unit1

Unit1_Gates [FB121]

Unit1_Gates Properties							
General							
Name	Unit1_Gates	Number	121	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Flop Gates	Author		Comment	Copyright (c) 2023, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					
Name		Data type		Default value			
Input							
Output							
InOut							
▼ Static							
G1004_DB		"Gate_Flop"					
Temp							
Constant							

Network 1: G-1004 Sample Flop Gate



%M44.5

"G1004_Sol_Left"

Sol_Left

%M44.6

"G1004_Sol_Right"

Sol_Right

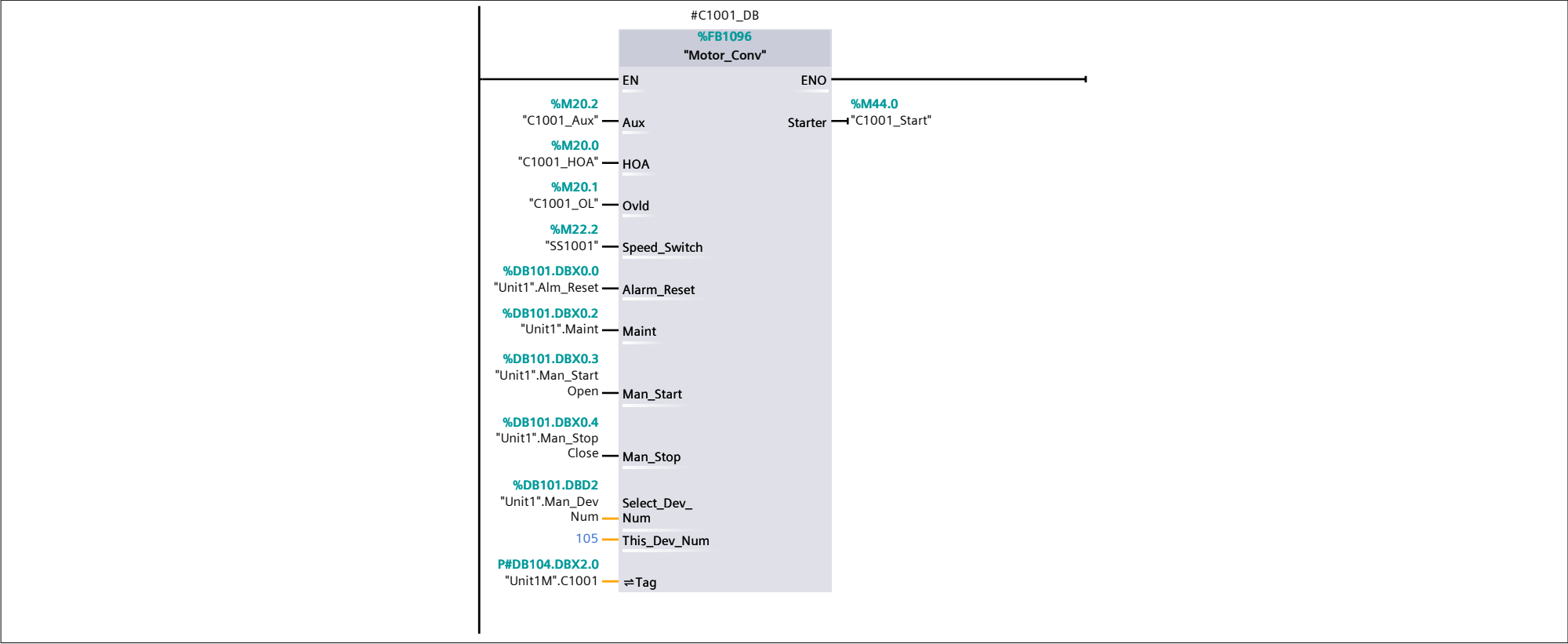
Right

Program blocks / Unit1

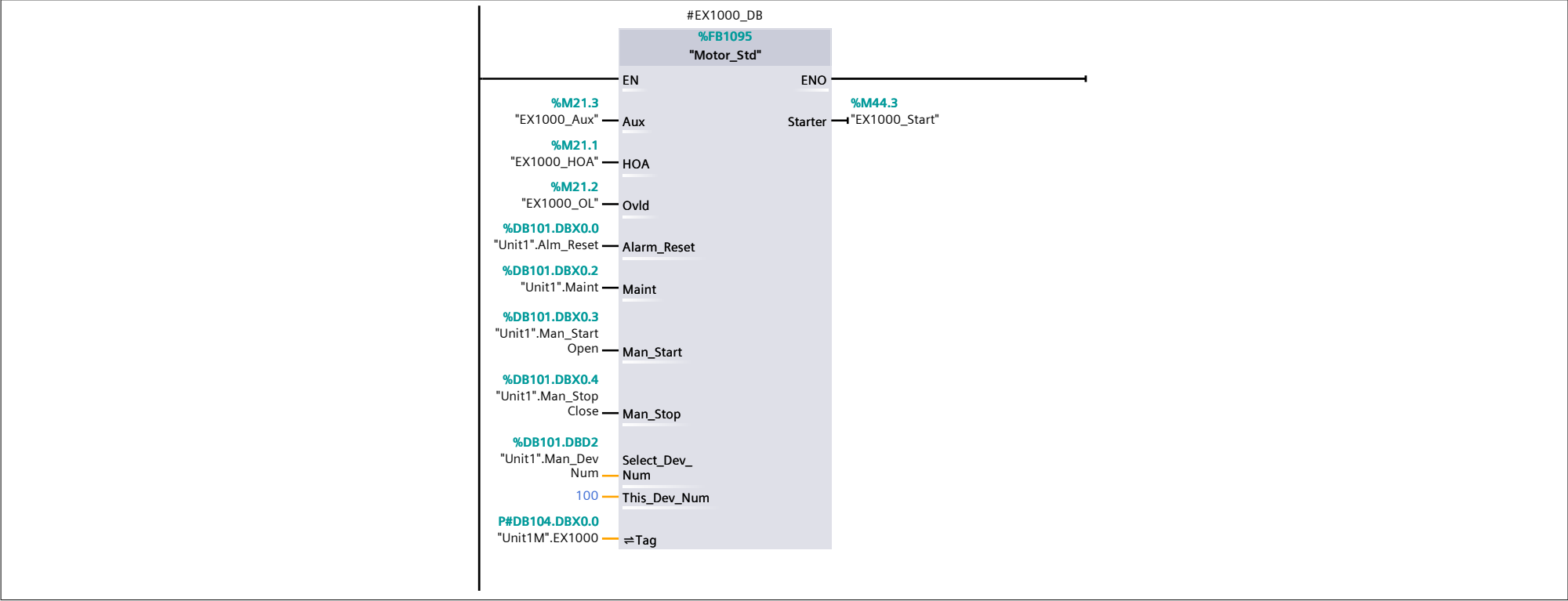
Unit1_Motors [FB122]

Unit1_Motors Properties							
General							
Name	Unit1_Motors	Number	122	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Motor Devices	Author		Comment	Copyright (c) 2023, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					
Name				Data type		Default value	
Input							
Output							
InOut							
▼ Static							
C1001_DB				"Motor_Conv"			
EX1000_DB				"Motor_Std"			
G1002_DB				"Gate_Slide"			
Temp							
Constant							

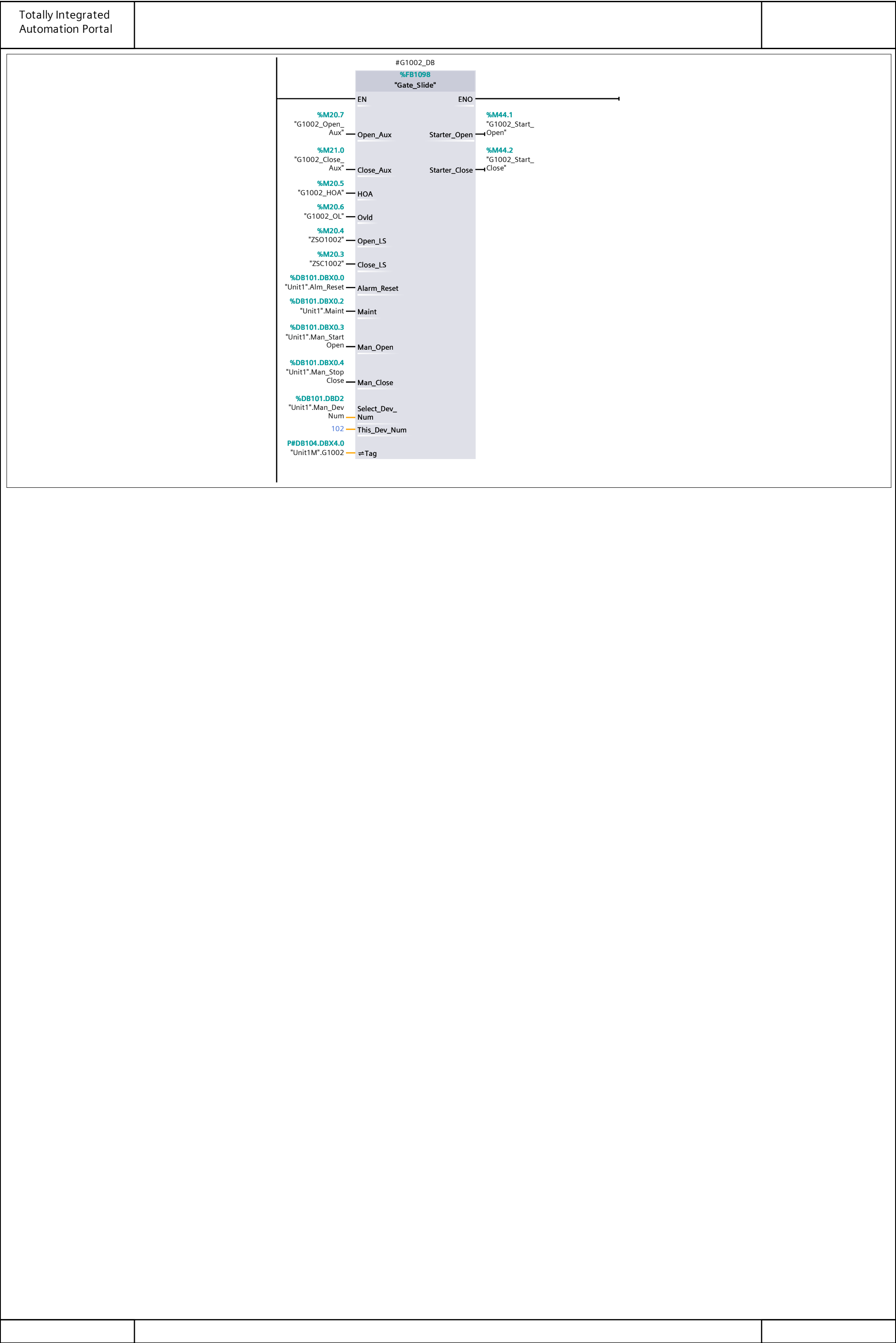
Network 1: C-6100 Conveyor Device Control



Network 2: L6100 Airlock Control



Network 3:



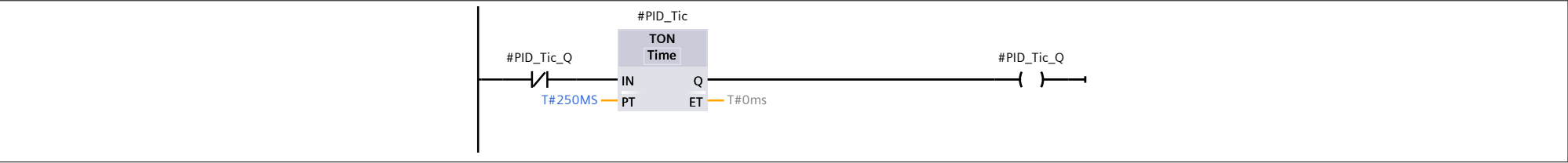
Program blocks / Unit1

Unit1_PIDLoops [FB123]

Unit1_PIDLoops Properties							
General							
Name	Unit1_PIDLoops	Number	123	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	PID Loops	Author		Comment		Family	
Version	0.1	User-defined ID					

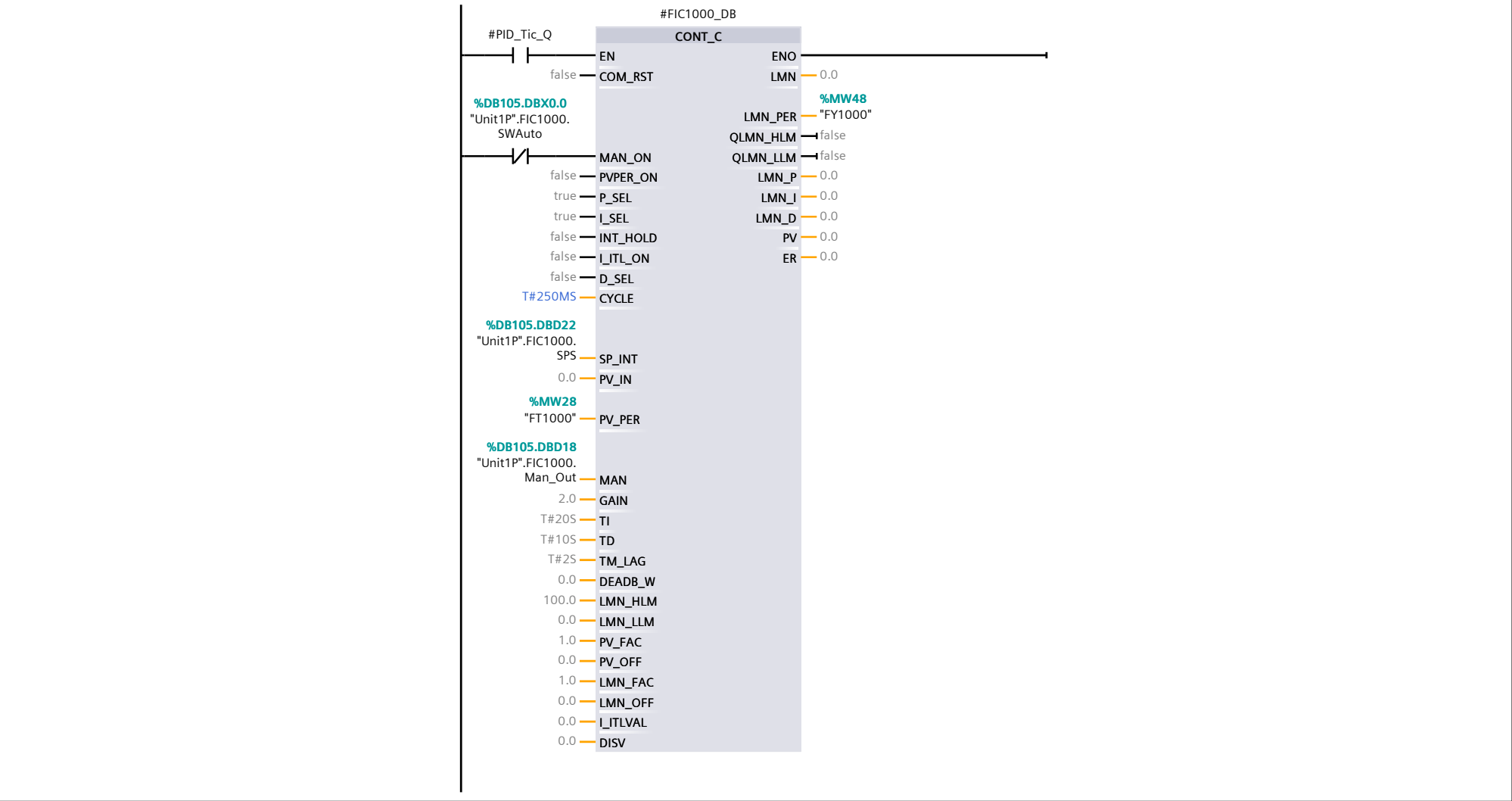
Name	Data type	Default value
Input		
Output		
InOut		
▼ Static		
PID_Tic	TON_TIME	
PID_Tic_Q	Bool	false
Ret_Val	Word	16#0
Tmpl	Int	0
TmpR	Real	0.0
TmpR2	Real	0.0
FIC1000_DB	CONT_C	
FQI6000_Tmr_Q	Bool	false
FQI6000_Tmr	TON_TIME	
Temp		
Constant		

Network 1: Sample time timer



Network 2: FIC1000 Sample Flow loop.

This loop has no operator manual station.



Network 3: Scale FIC1000 measurement for operator interface.

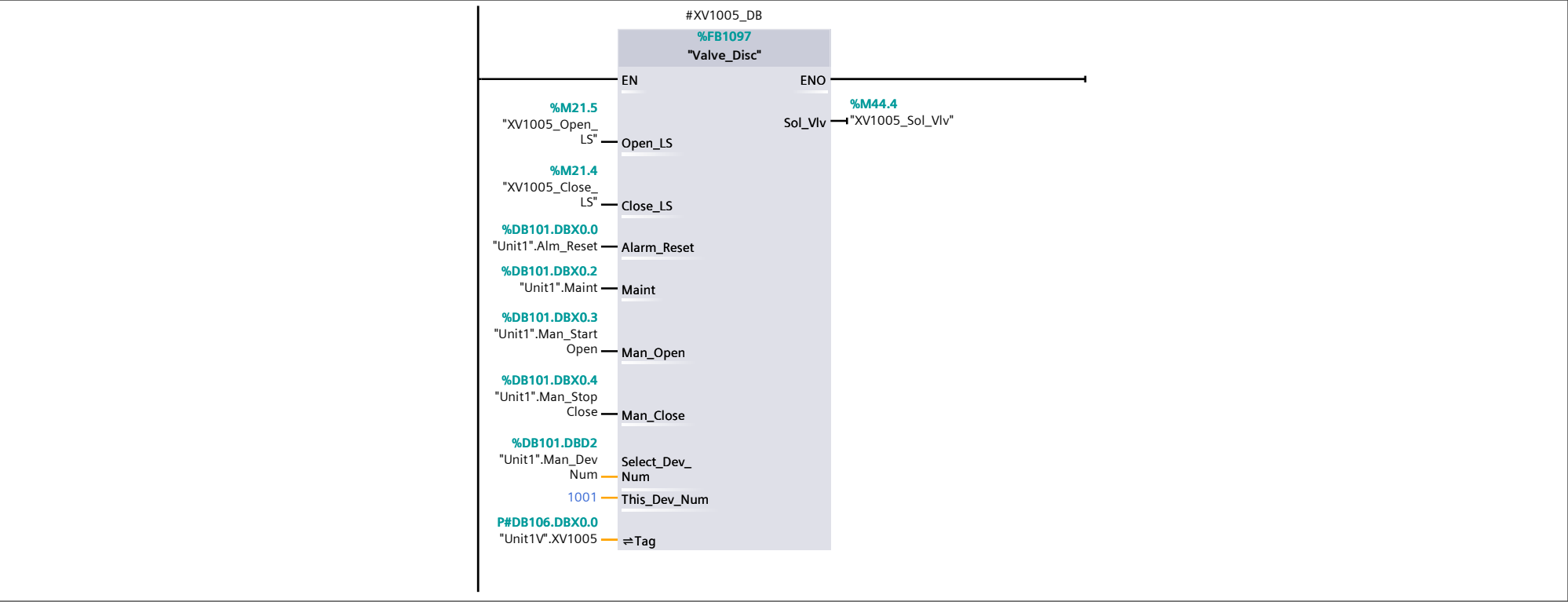
Program blocks / Unit1

Unit1_Valves [FB124]

Unit1_Valves Properties							
General							
Name	Unit1_Valves	Number	124	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Valve Devices	Author		Comment	Copyright (c) 2023, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value
Input		
Output		
InOut		
▼ Static		
XV1005_DB	"Valve_Disc"	
Temp		
Constant		

Network 1: XV1005 Sample Valve



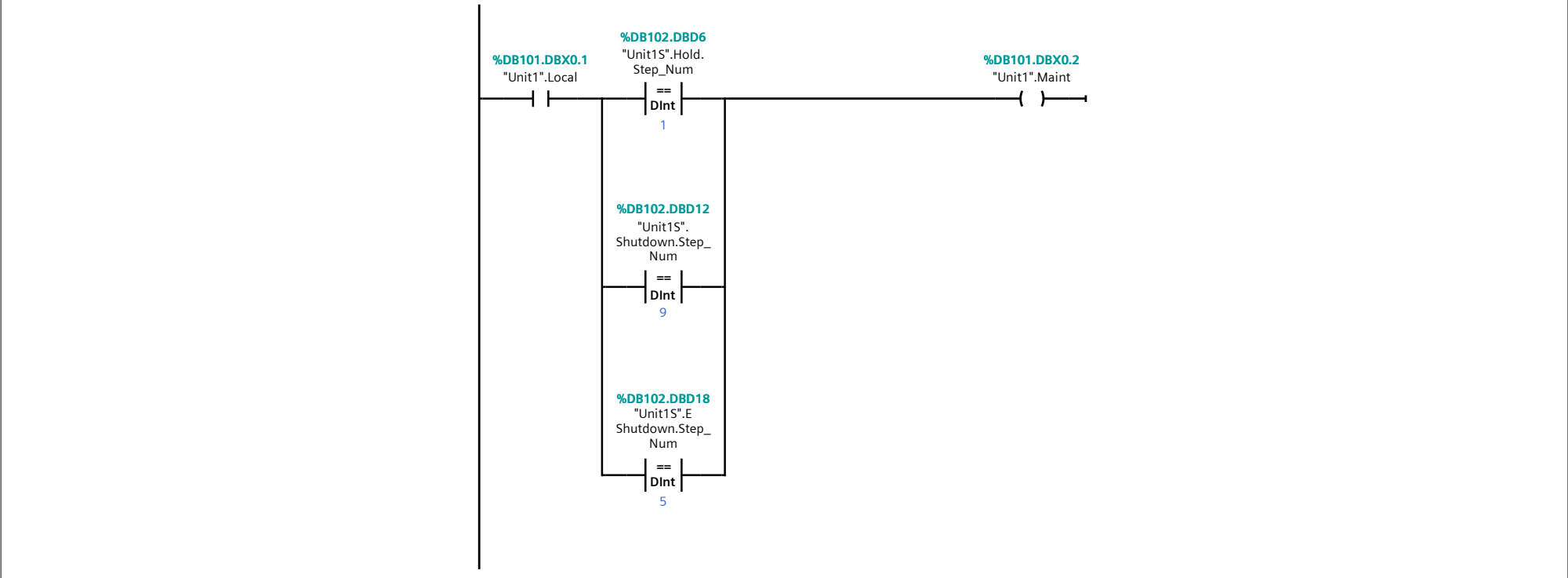
Program blocks / Unit1

Unit1_990Misc [FB115]

Unit1_990Misc Properties							
General							
Name	Unit1_990Misc	Number	115	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Soda Ash Miscellaneous	Author		Comment		Family	
Version	0.1	User-defined ID					
Name			Data type	Default value		Retain	
Input							
Output							
InOut							
▼ Static							
Dummy			Bool	false		Non-retain	
Temp							
Constant							

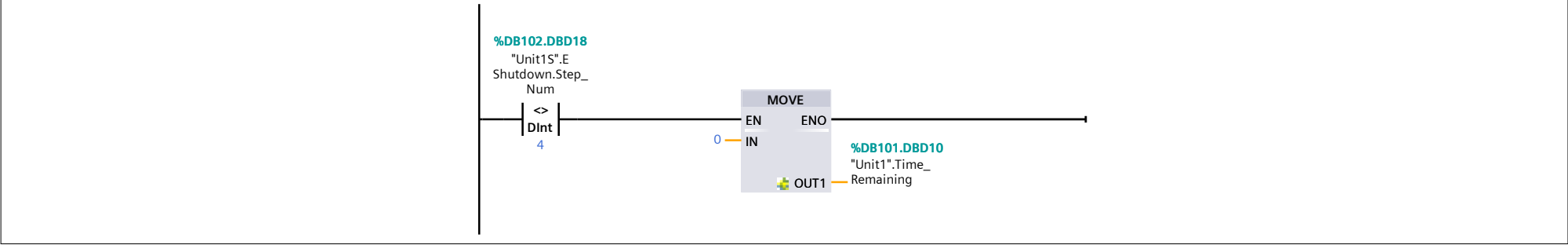
Network 1: Maintenance privilege for device control

Unit device manual control allowed when local control granted and in safe state.



Network 2: Clear time remaining to OI

If not in conveyor cleaning step or next-to-last step in E-shutdown



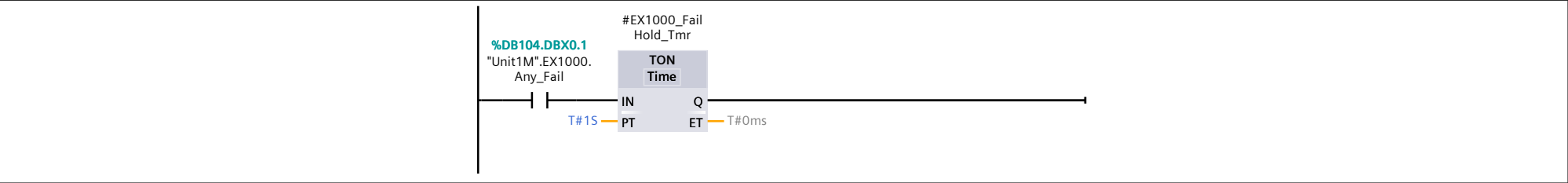
Program blocks / Unit1

Unit1_991Abnormal [FB116]

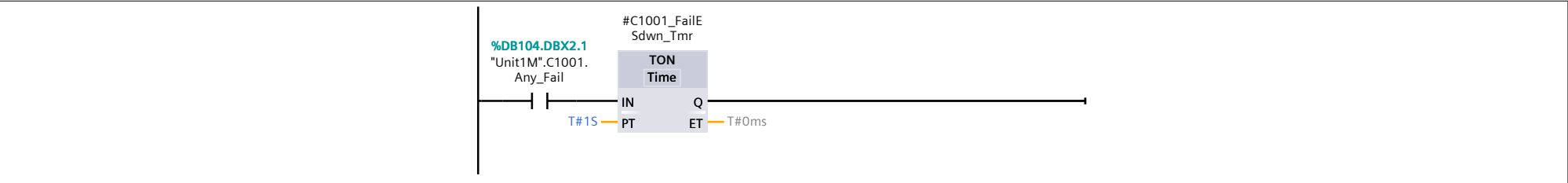
Unit1_991Abnormal Properties							
General							
Name	Unit1_991Abnormal	Number	116	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Sample Abnormal Condi-tions	Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Default value	Retain
Input			
Output			
InOut			
▼ Static			
EX1000_FailHold_Tmr	TON_TIME		Non-retain
C1001_FailESdwn_Tmr	TON_TIME		Non-retain
G1002_FailESdwn_Tmr	TON_TIME		Non-retain
Temp			
Constant			

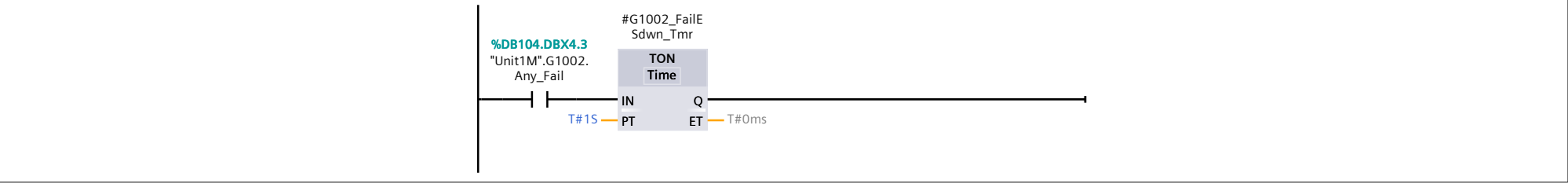
Network 1: EX1000 Fail to Hold

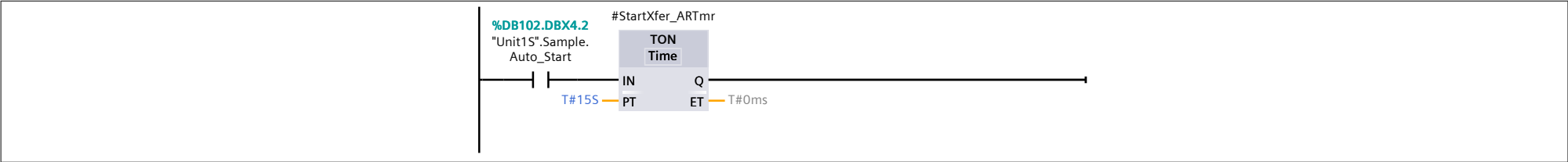


Network 2: C-1001 Fail to E-Shutdown

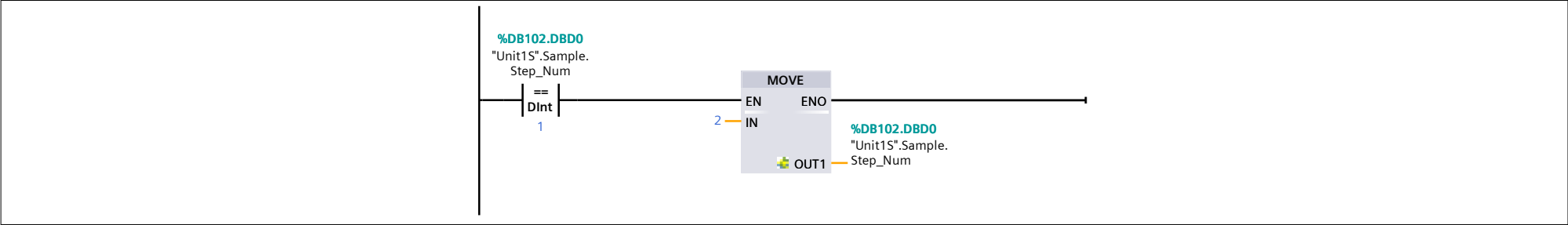


Network 3: G-1002 Fail to E-Shutdown

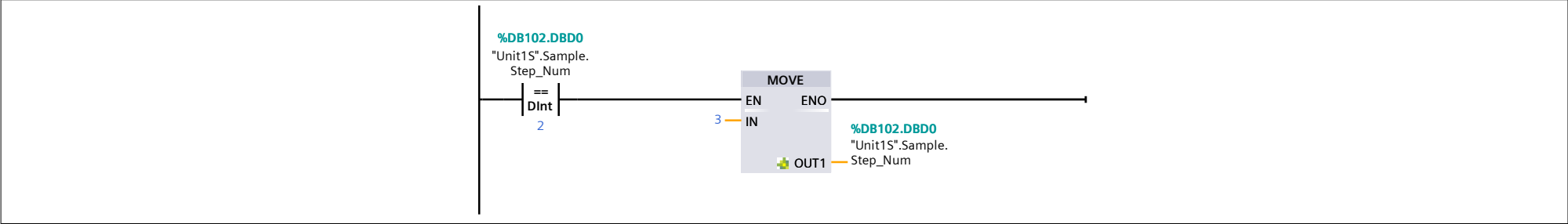




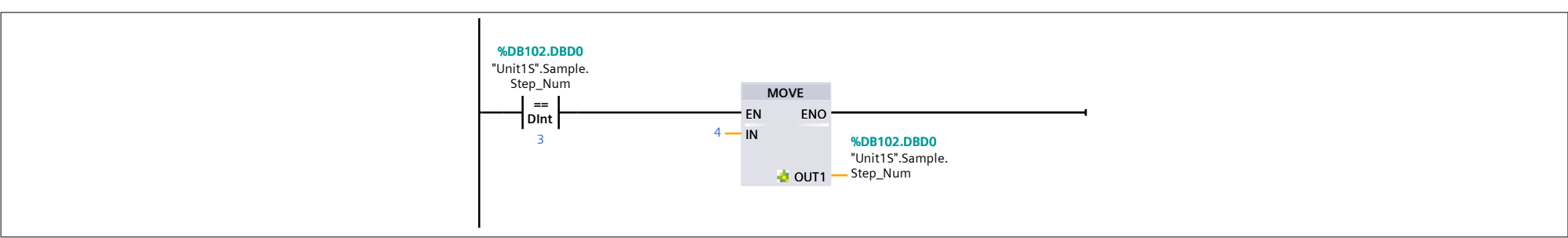
Network 4: Step 1 - Spare



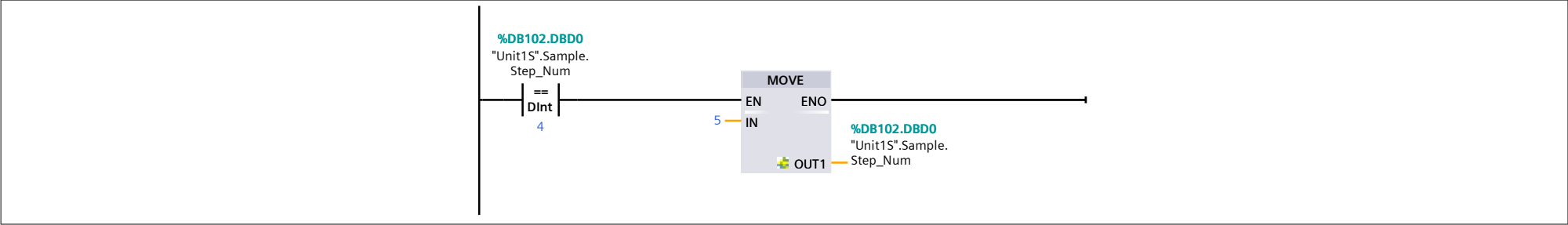
Network 5: Step 2 - Spare



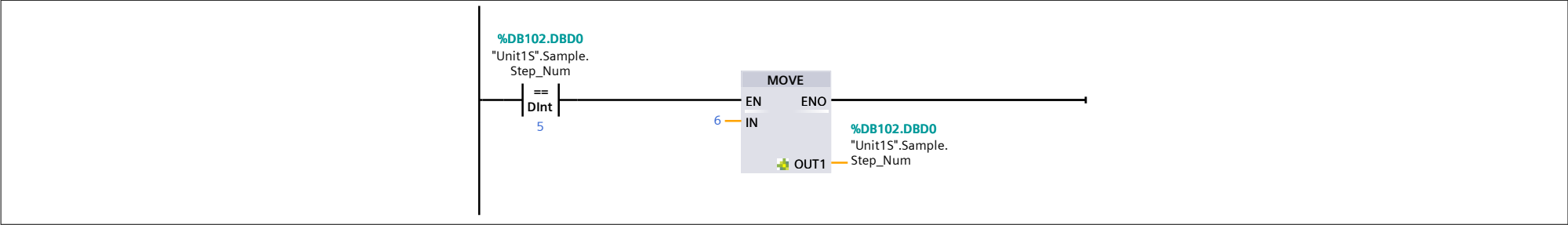
Network 6: Step 3 - Spare



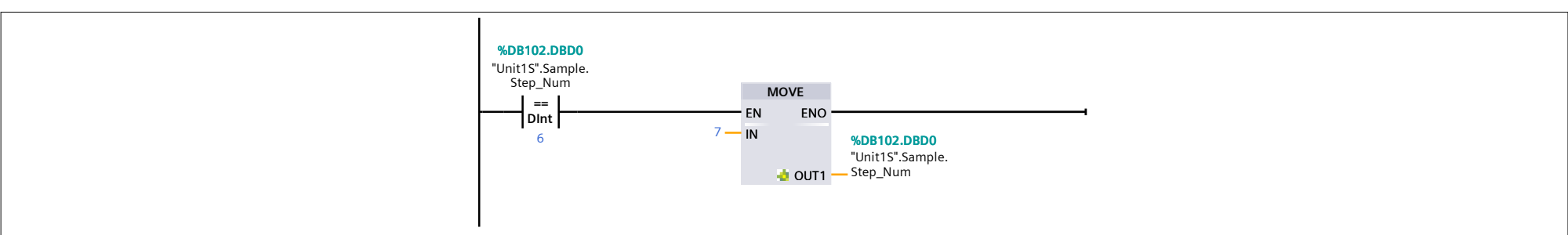
Network 7: Step 4 - Spare



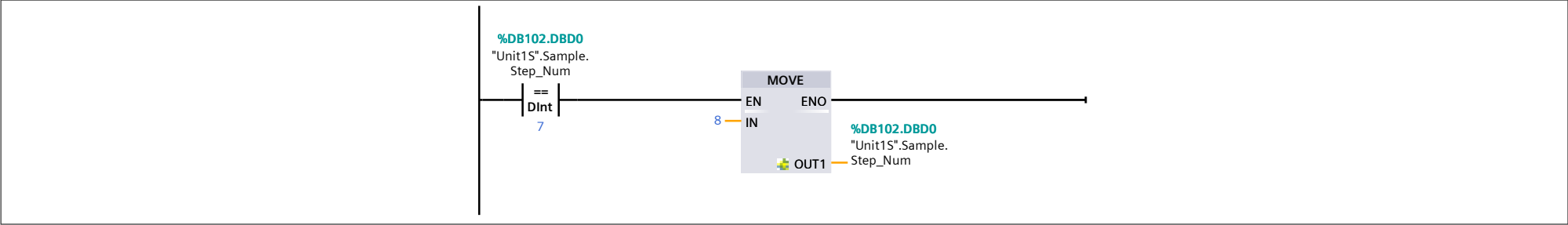
Network 8: Step 5 - Spare



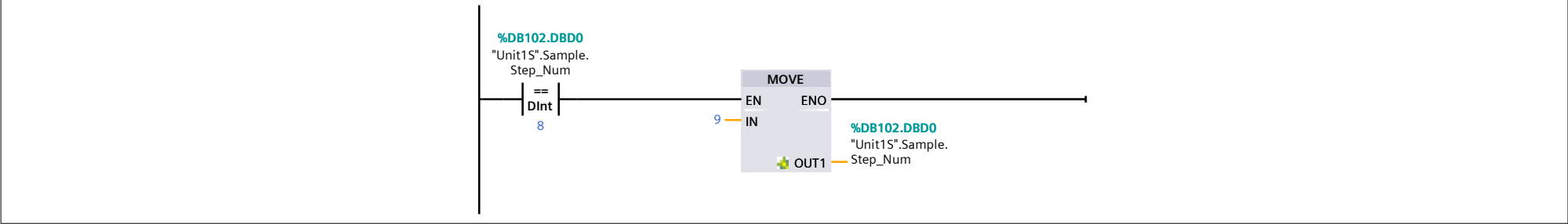
Network 9: Step 6 - Spare



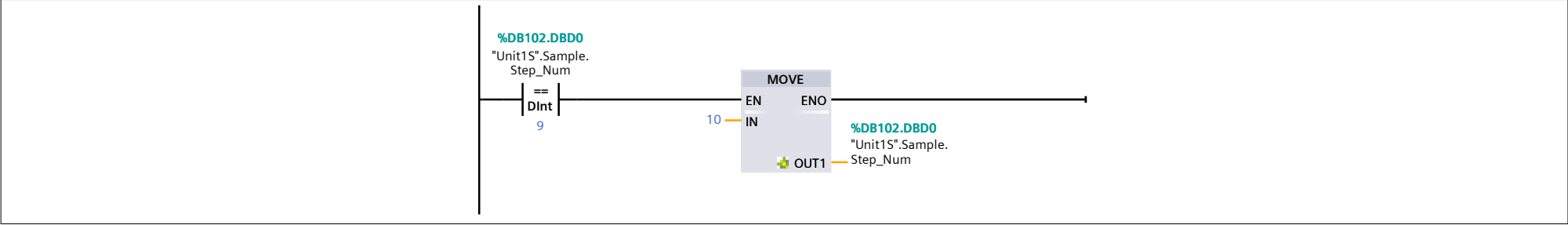
Network 10: Step 7 - Spare



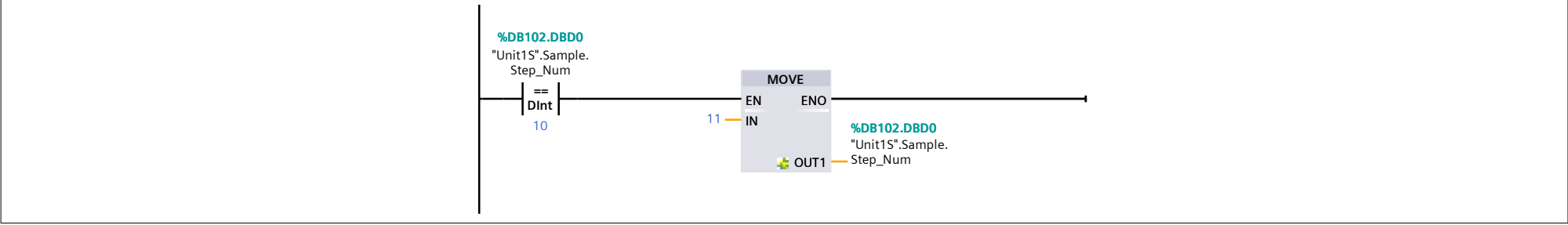
Network 11: Step 8 - Spare



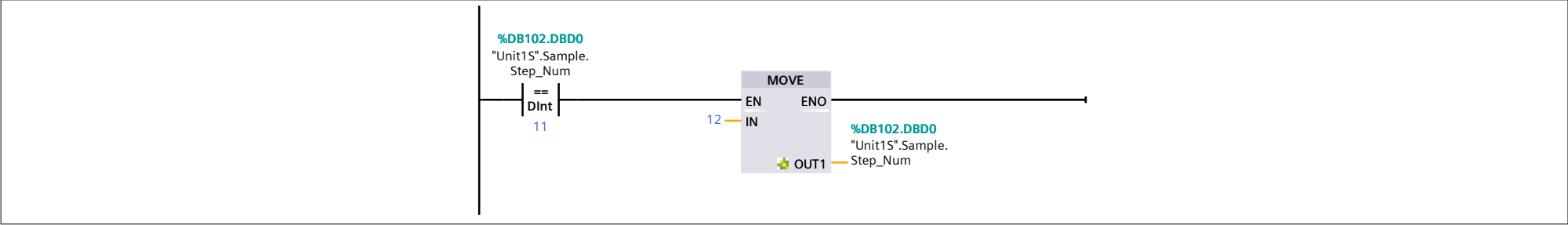
Network 12: Step 9 - Spare



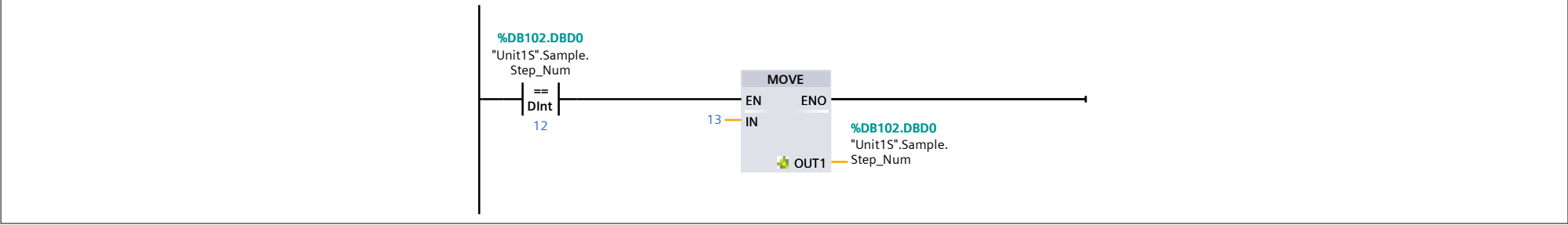
Network 13: Step 10 - Spare



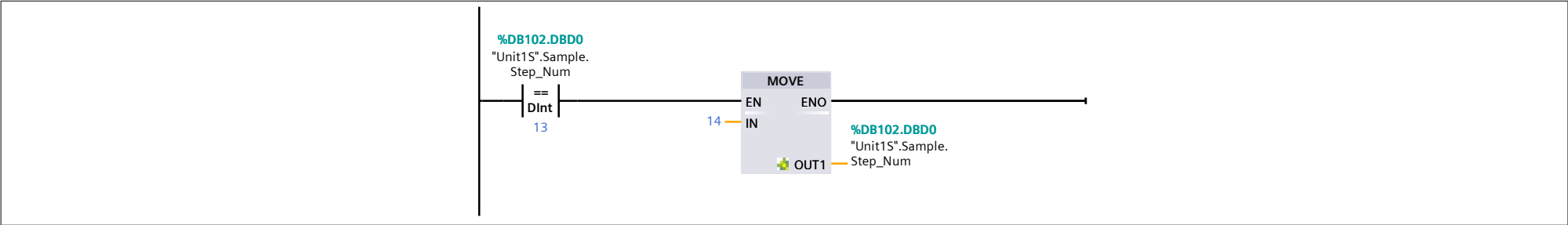
Network 14: Step 11 - Spare



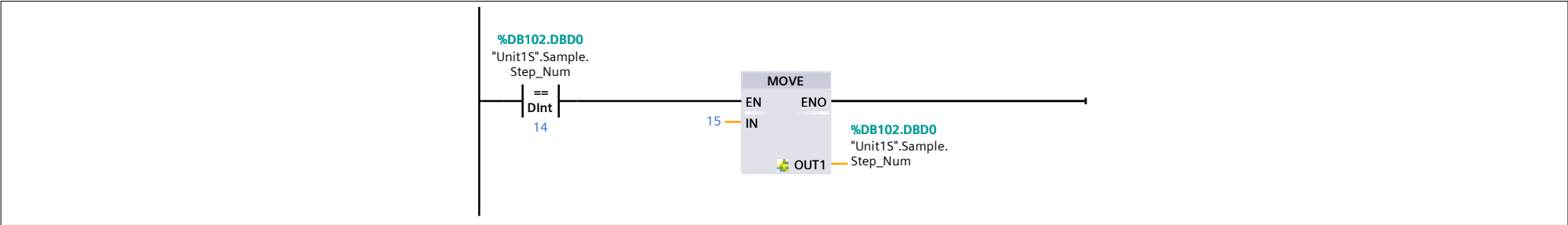
Network 15: Step 12 - Spare



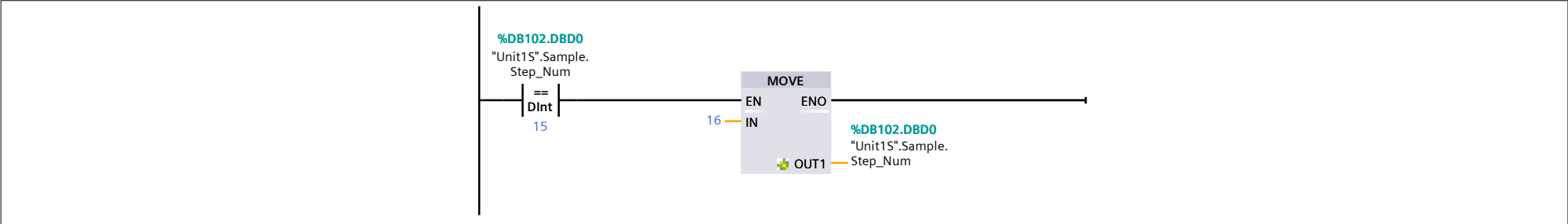
Network 16: Step 13 - Spare



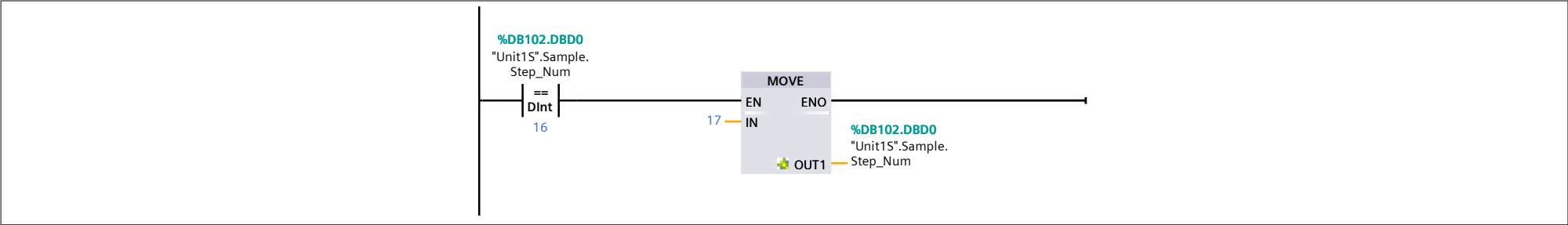
Network 17: Step 14 - Spare



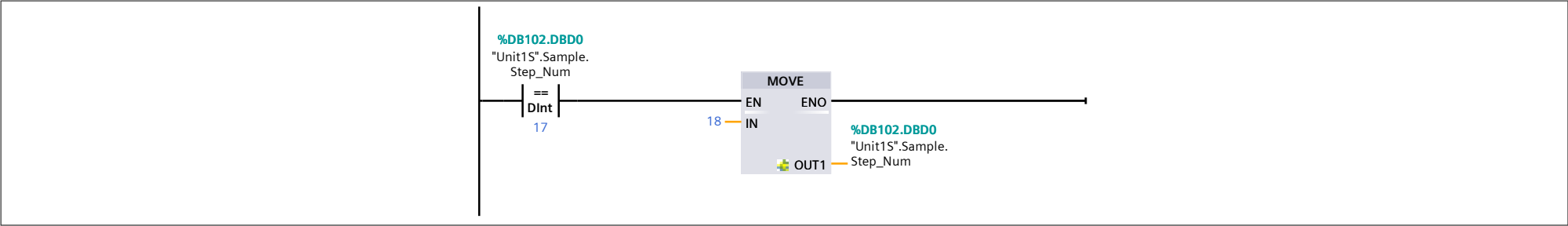
Network 18: Step 15 - Spare



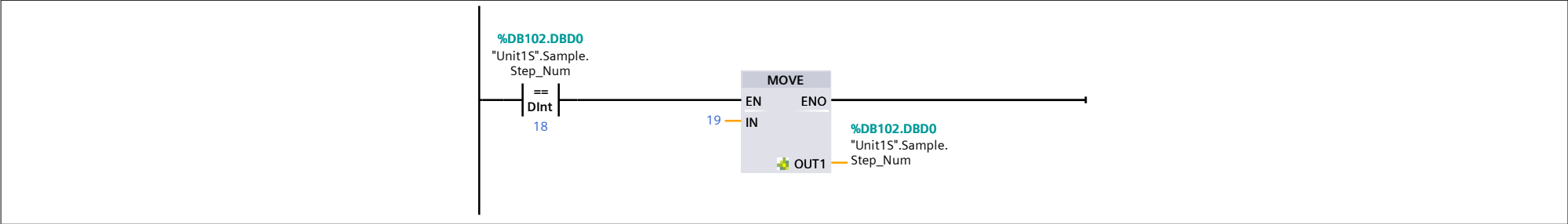
Network 19: Step 16 - Spare



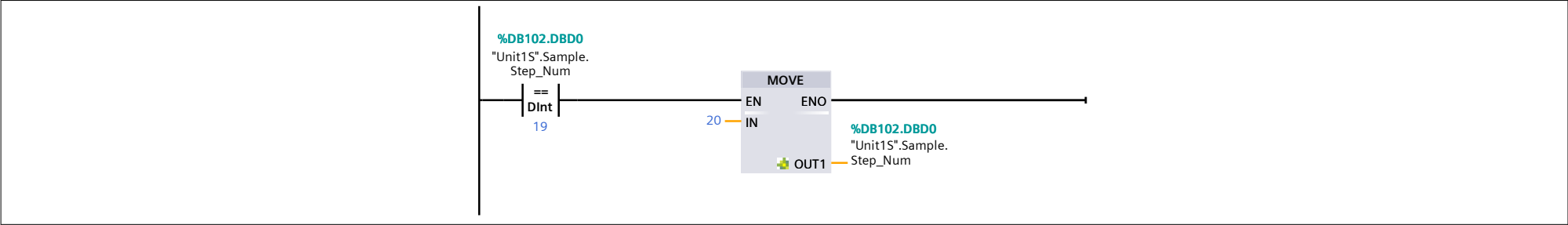
Network 20: Step 17 - Spare



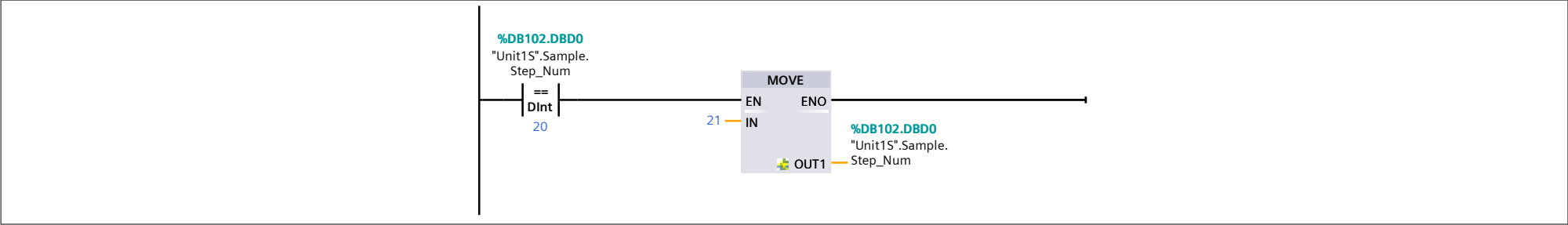
Network 21: Step 18 - Spare



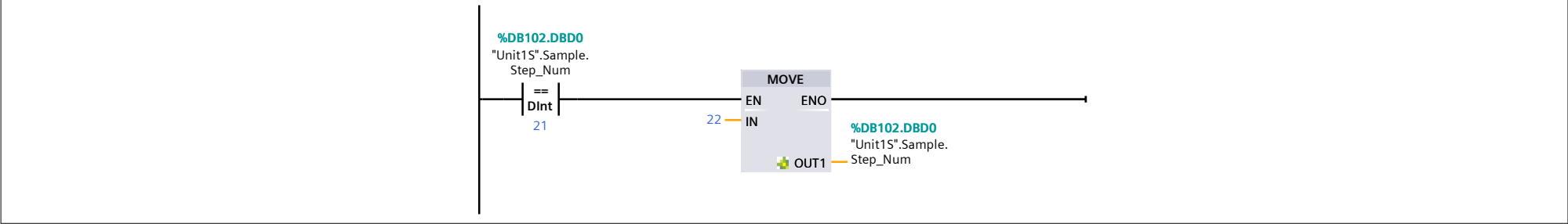
Network 22: Step 19 - Spare



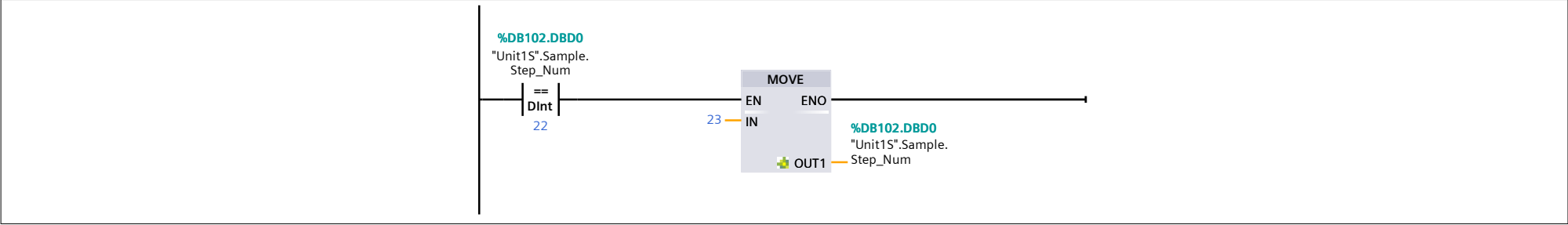
Network 23: Step 20 - Spare



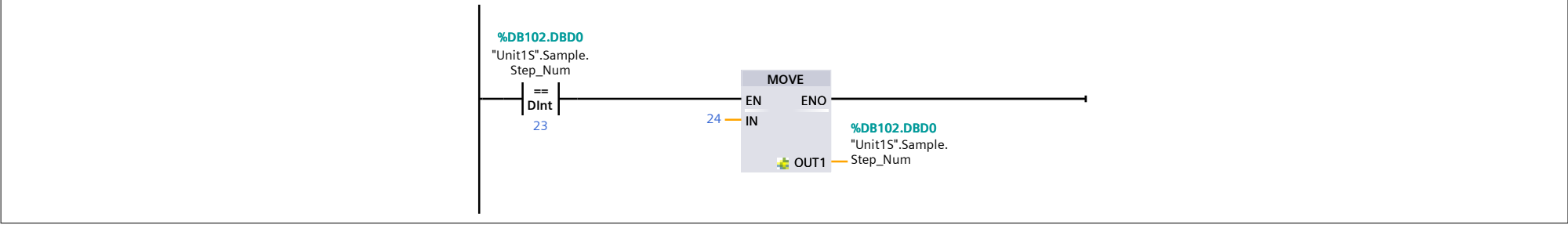
Network 24: Step 21 - Spare



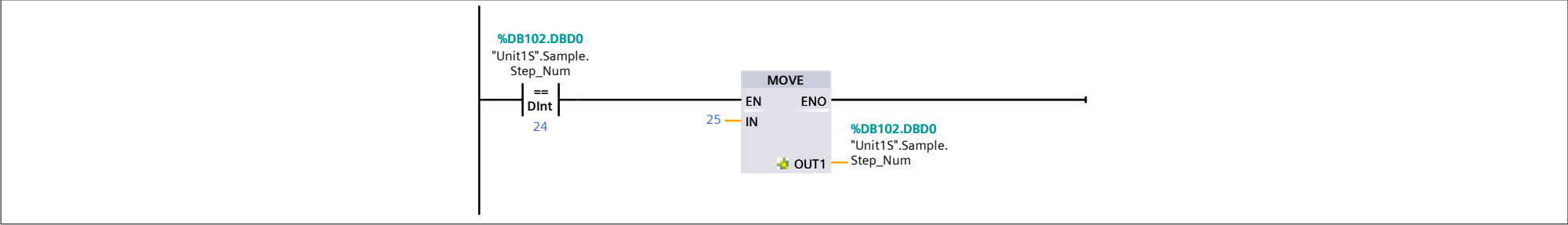
Network 25: Step 22 - Spare



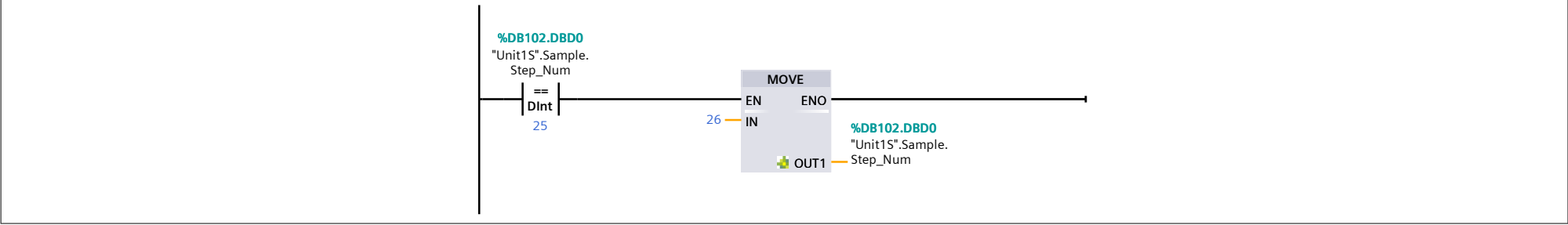
Network 26: Step 23 - Spare



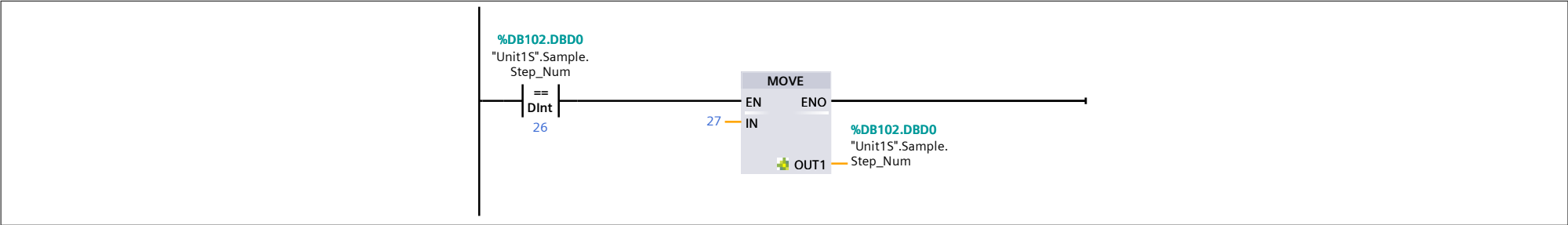
Network 27: Step 24 - Spare



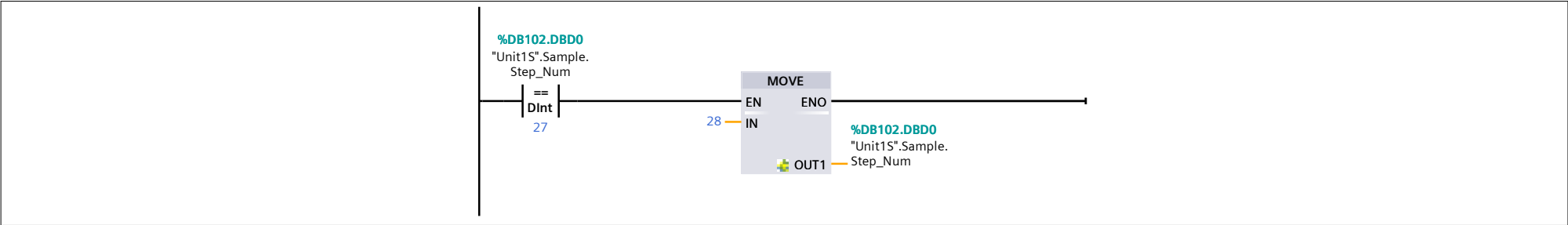
Network 28: Step 25 - Spare



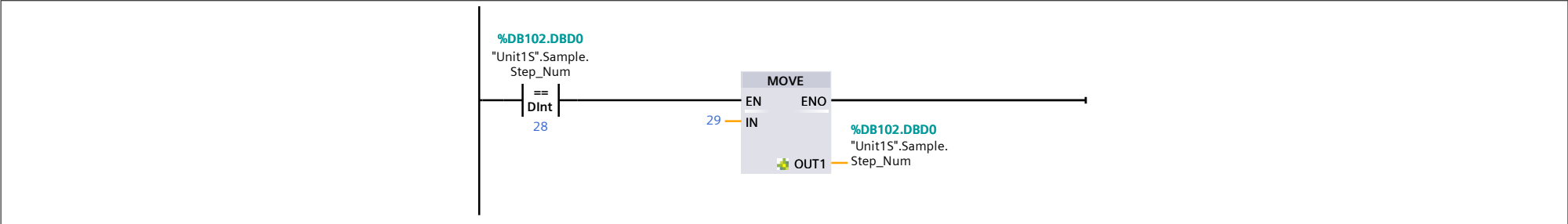
Network 29: Step 26 - Spare



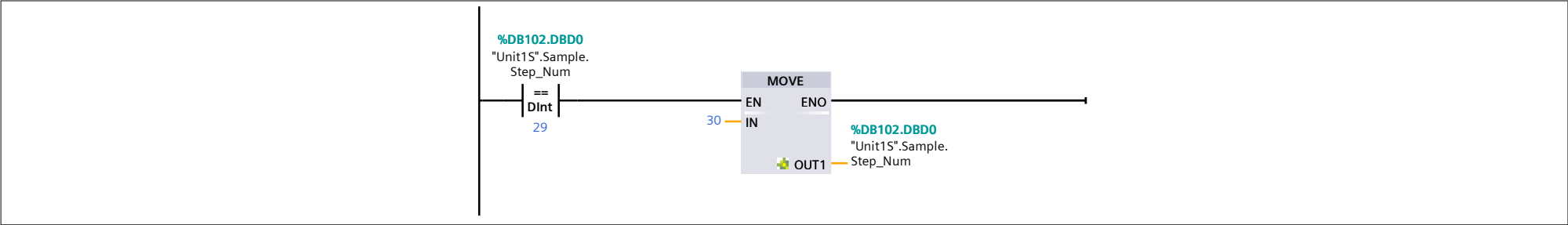
Network 30: Step 27 - Spare



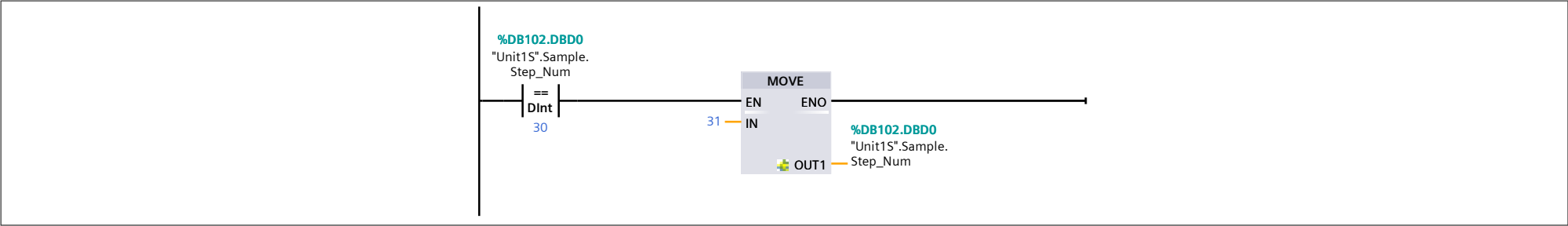
Network 31: Step 28 - Spare



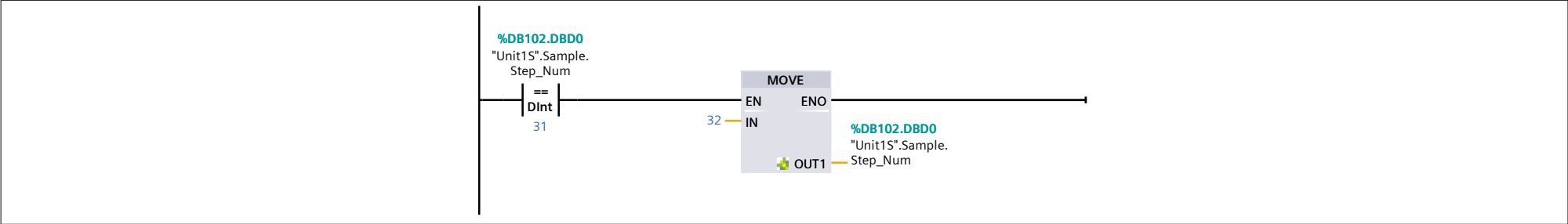
Network 32: Step 29 - Spare



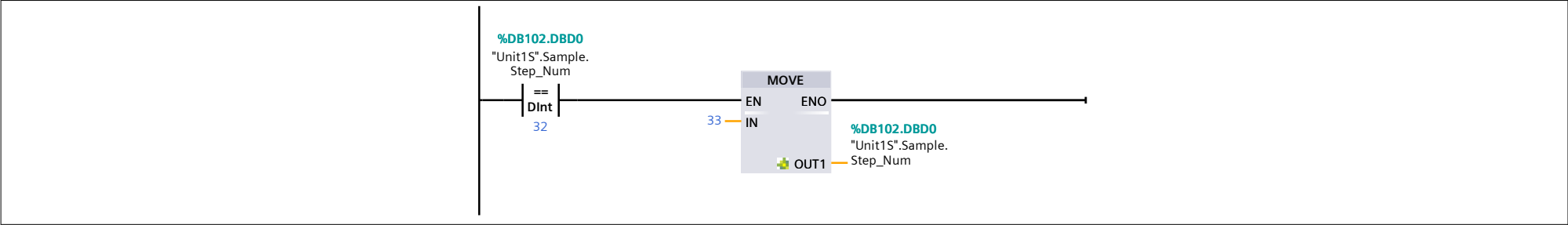
Network 33: Step 30 - Spare



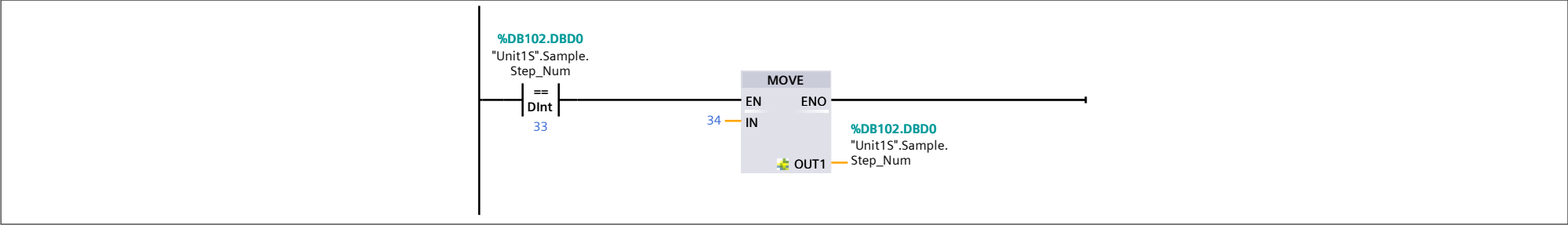
Network 34: Step 31 - Spare



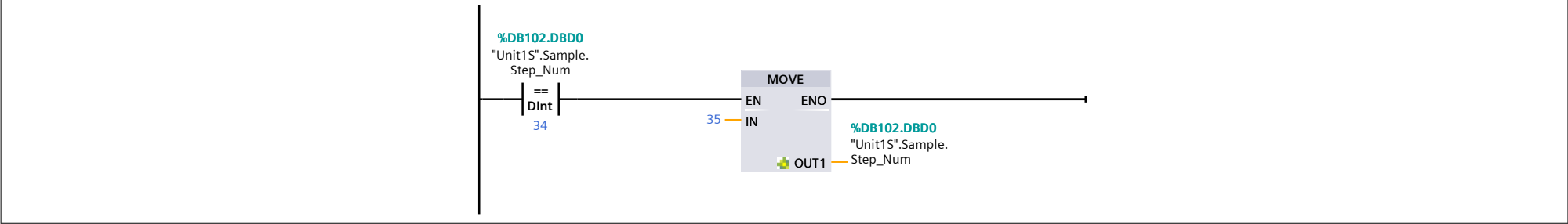
Network 35: Step 32 - Spare



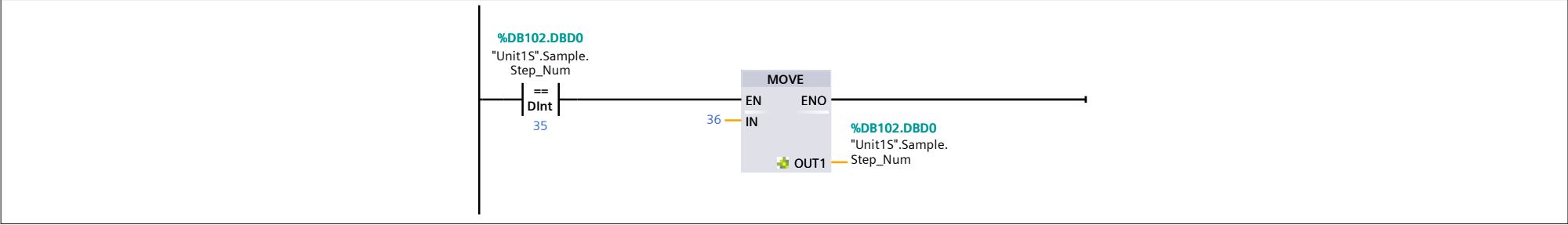
Network 36: Step 33 - Spare



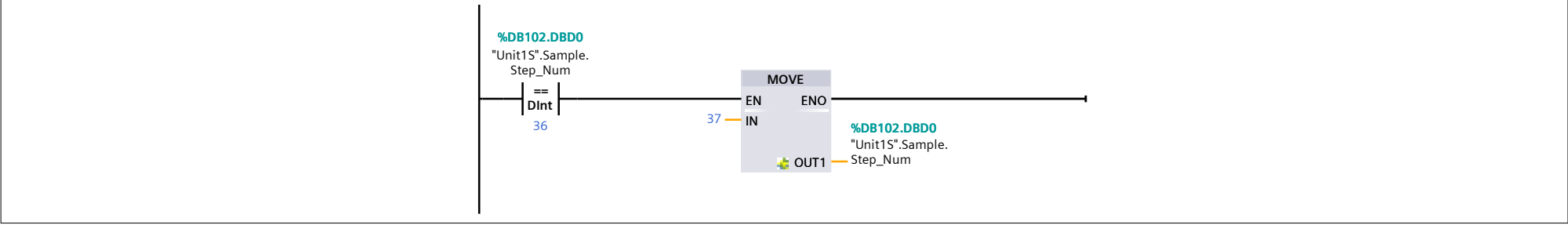
Network 37: Step 34 - Spare



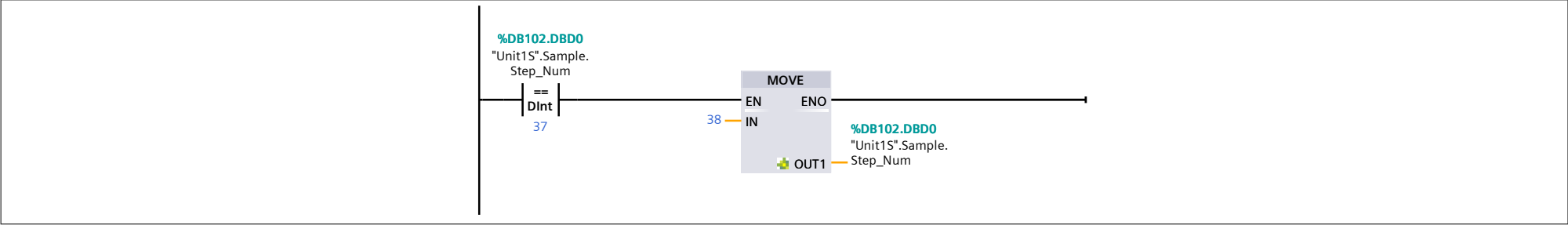
Network 38: Step 35 - Spare



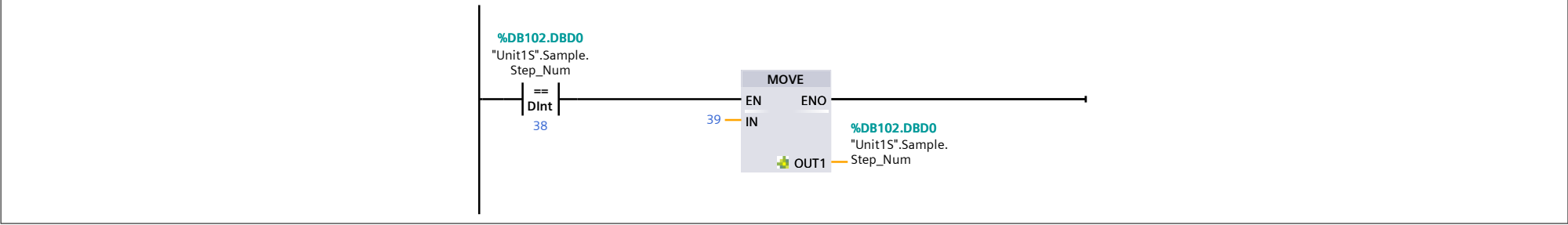
Network 39: Step 36 - Spare



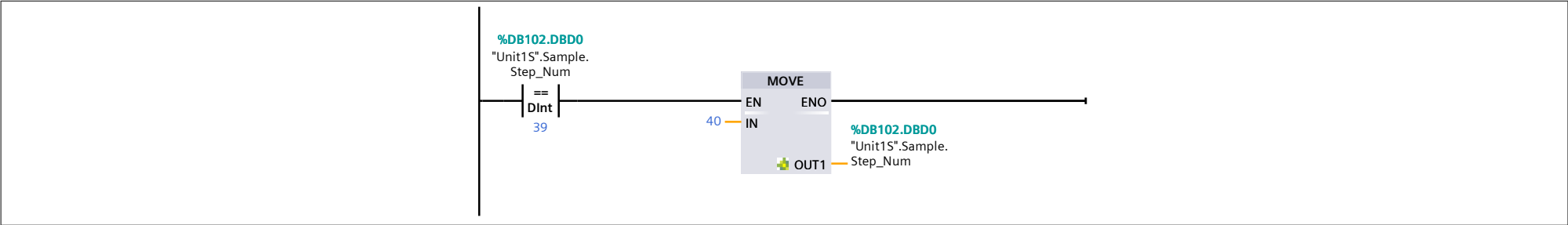
Network 40: Step 37 - Spare



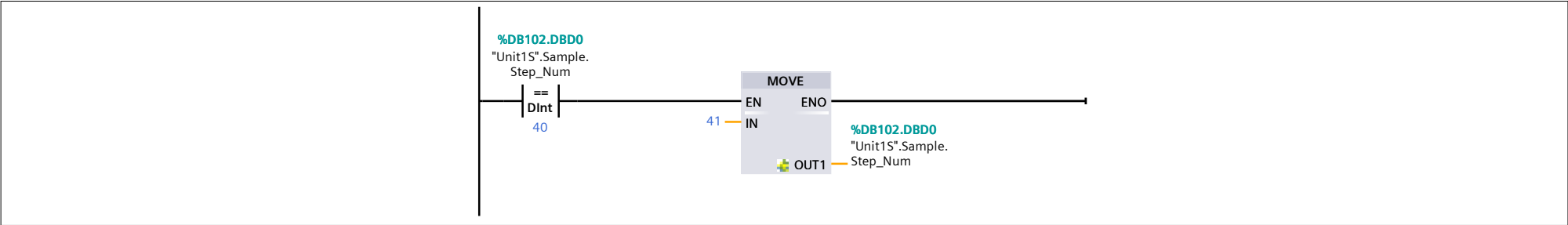
Network 41: Step 38 - Spare

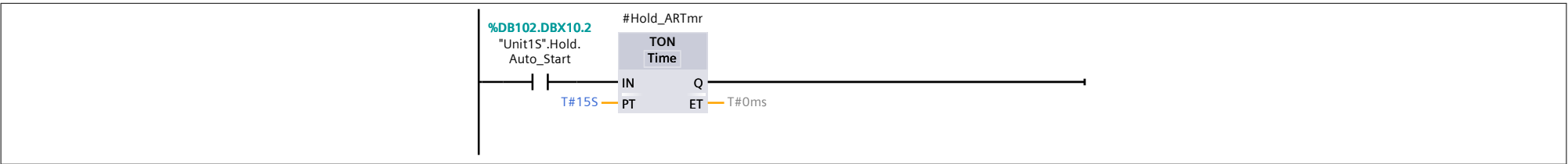


Network 42: Step 39 - Spare



Network 43: Step 40 - Spare





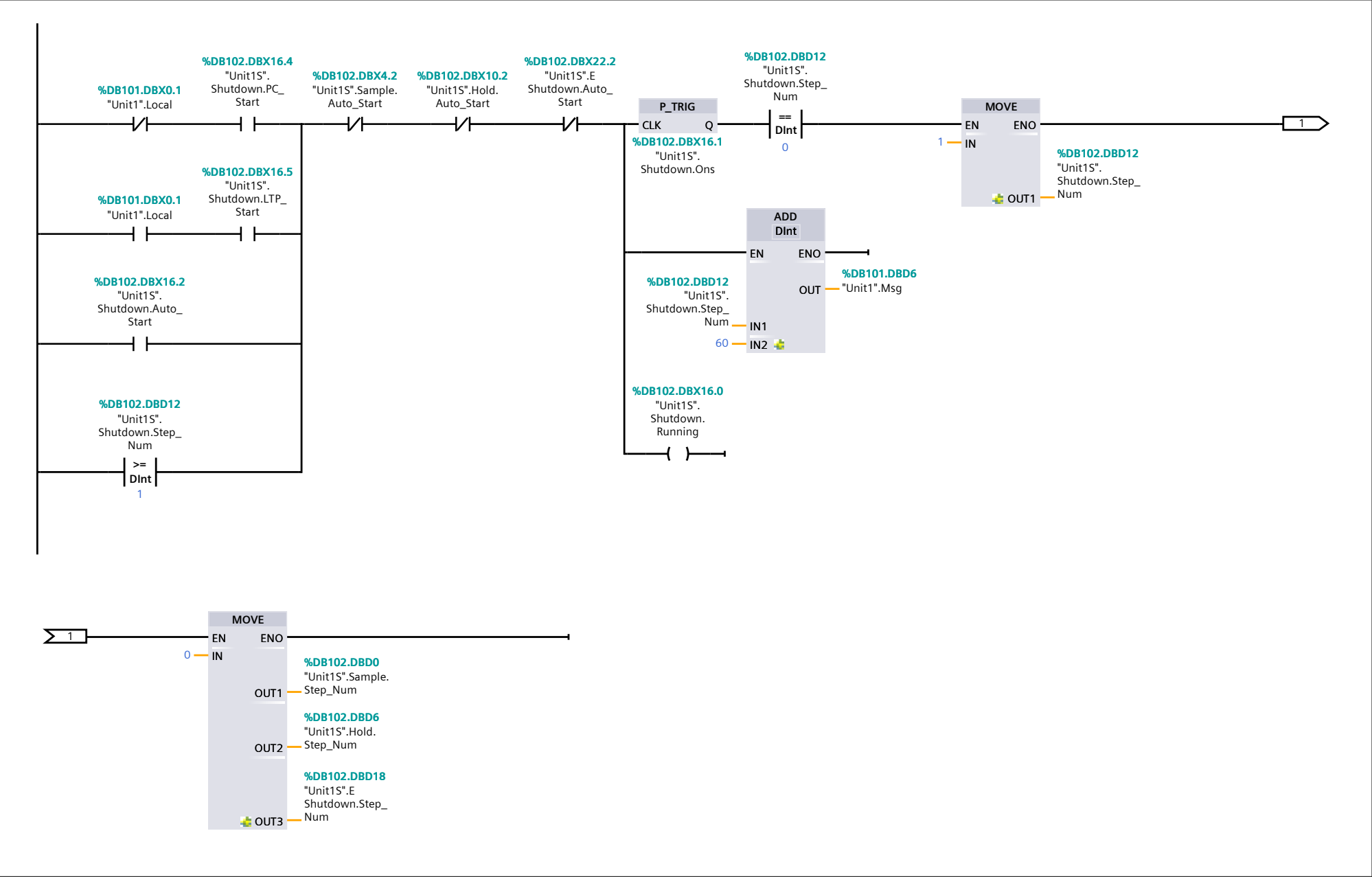
Program blocks / Unit1

Unit1_060Shutdown [FB113]

Unit1_060Shutdown Properties							
General							
Name	Unit1_060Shutdown	Number	113	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Unit1 Shutdown sequence	Author		Comment		Family	
Version	0.1	User-defined ID					
Name			Data type	Default value		Retain	
Input							
Output							
InOut							
▼ Static							
Shutdown_ARTmr			TON_TIME			Non-retain	
ConvCln_Tmr			TON_TIME			Non-retain	
Temp							
Constant							

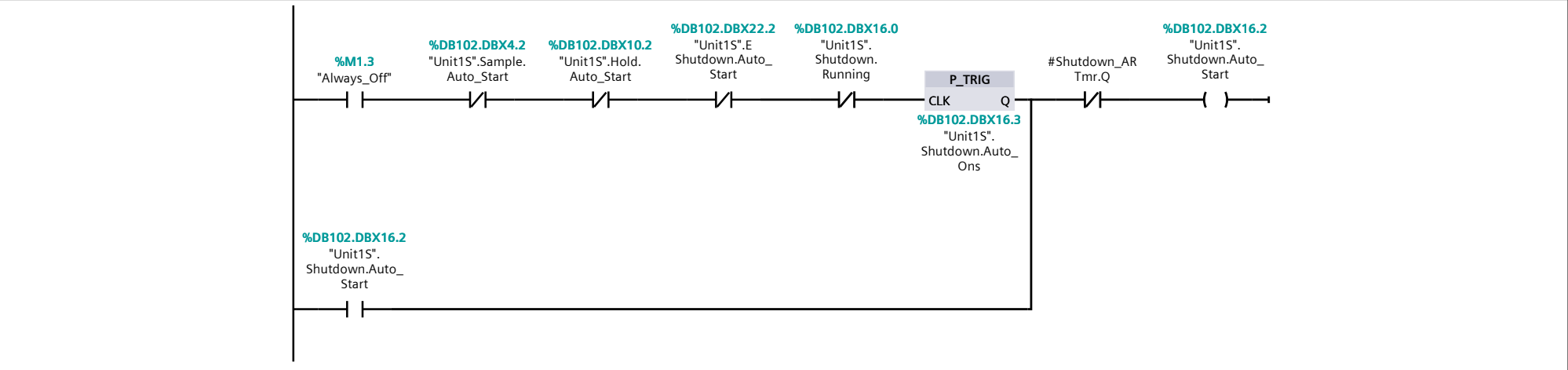
Network 1: Shutdown Sequence

Shutdown - Operator requests and auto sequence starts. Maintain message number for OI

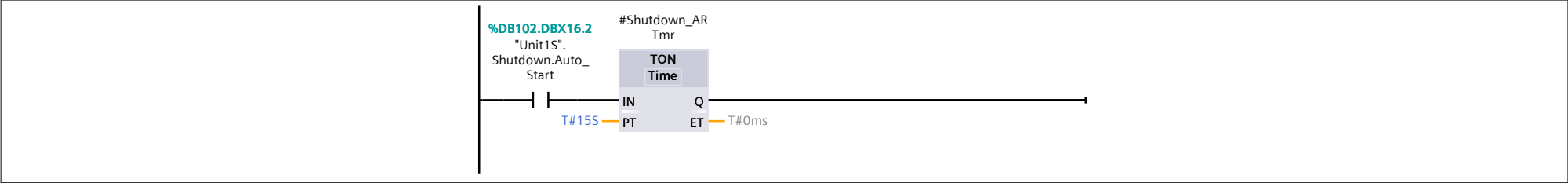


Network 2: Auto start request

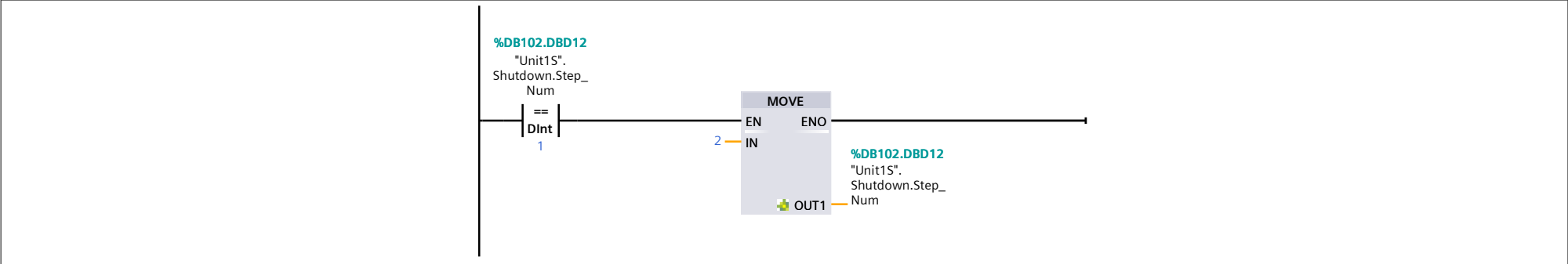
Auto-start for Shutdown



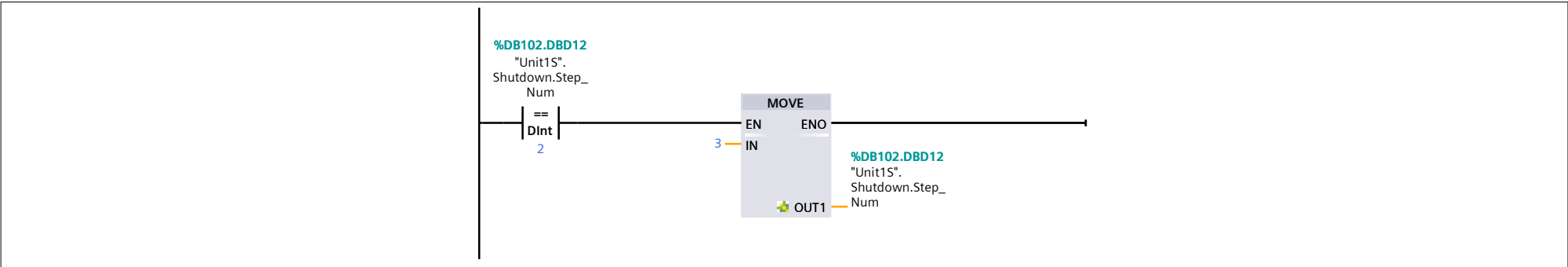
Network 3: Auto Start Timer



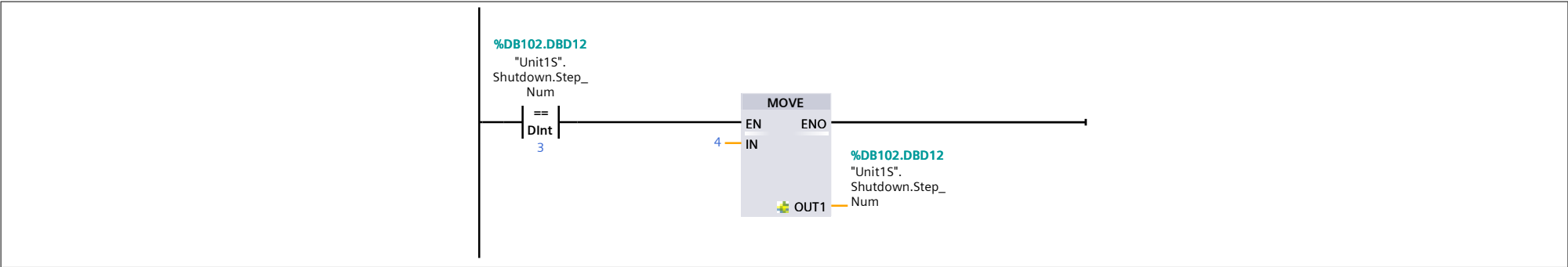
Network 4: Step 1 - Spare



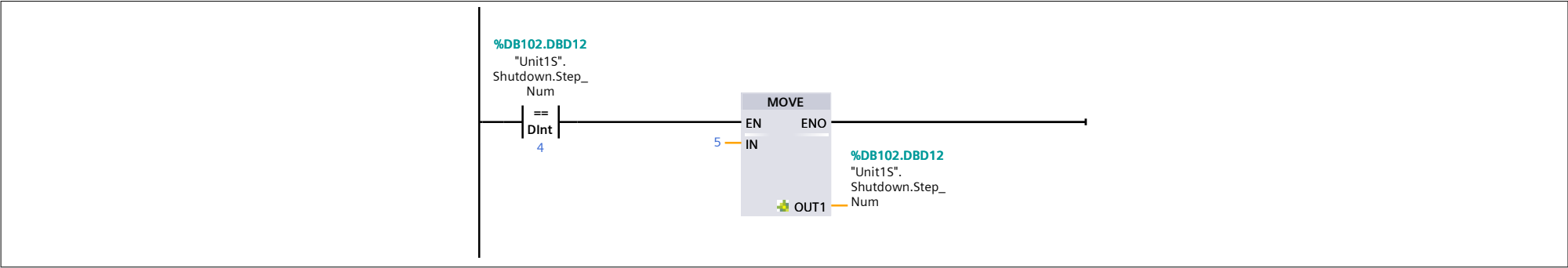
Network 5: Step 2 - Spare



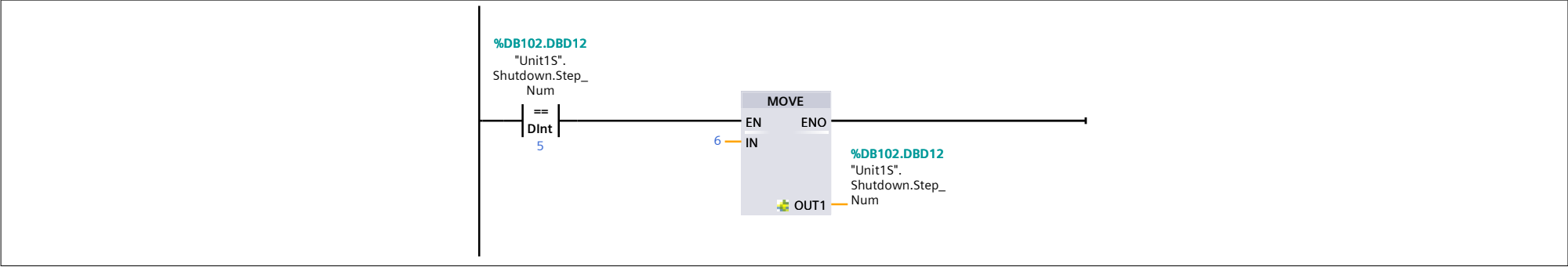
Network 6: Step 3 - Spare



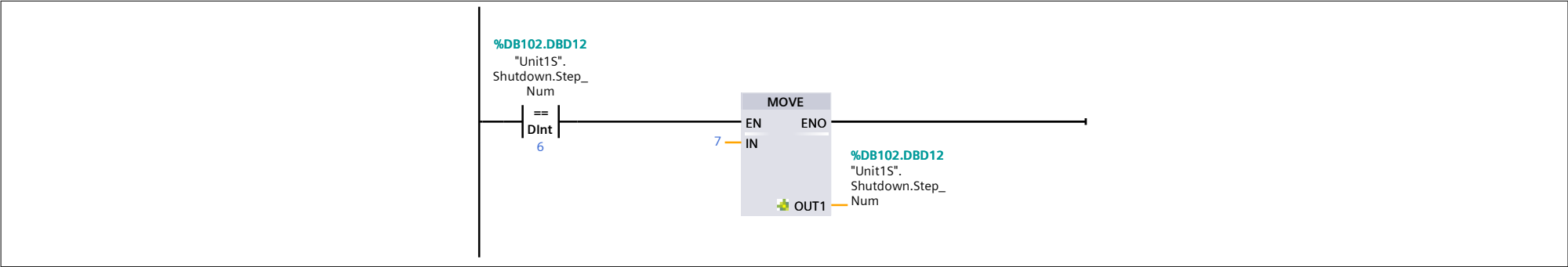
Network 7: Step 4 - Spare



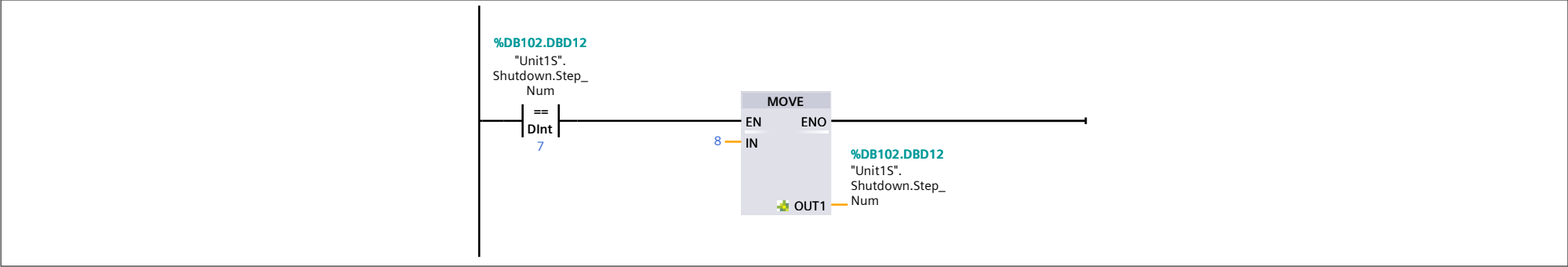
Network 8: Step 5 - Spare



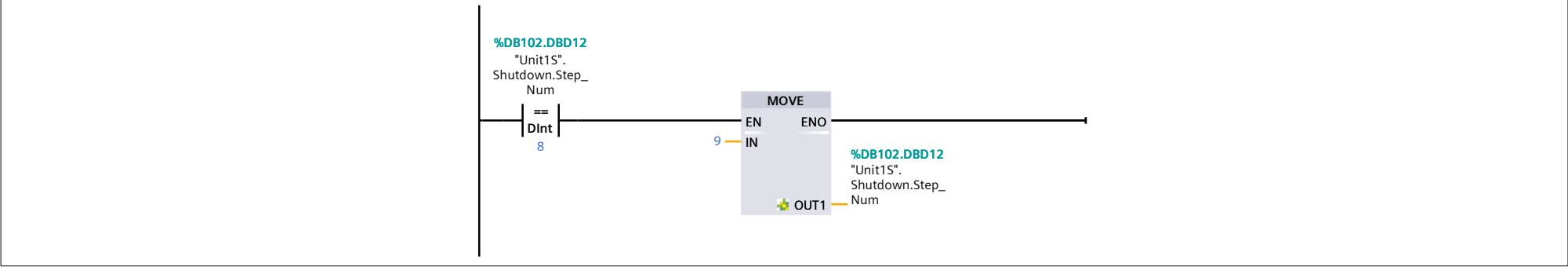
Network 9: Step 6 - Spare



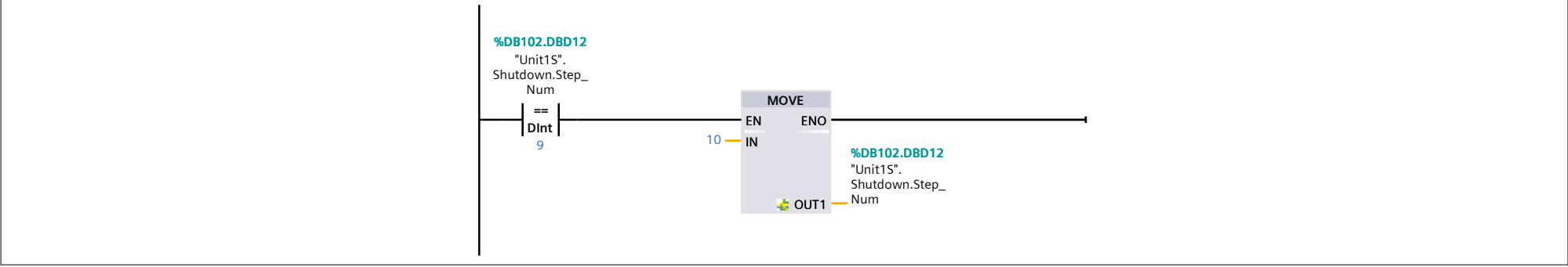
Network 10: Step 7 - Spare



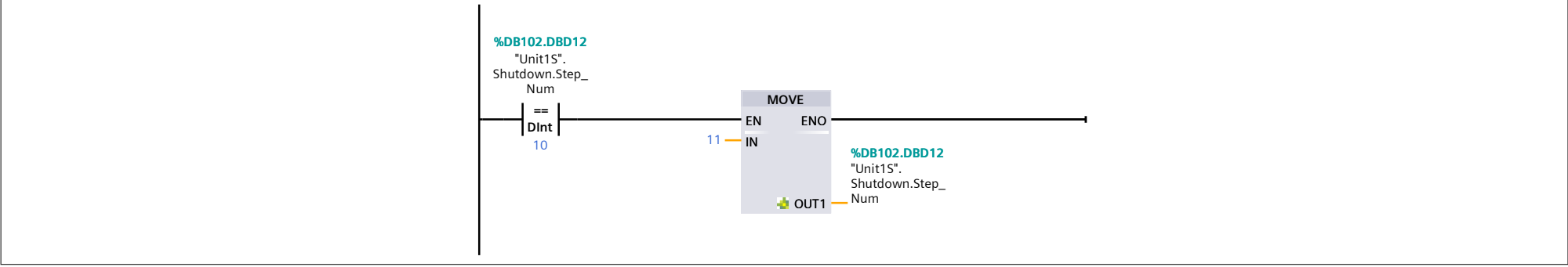
Network 11: Step 8 - Spare



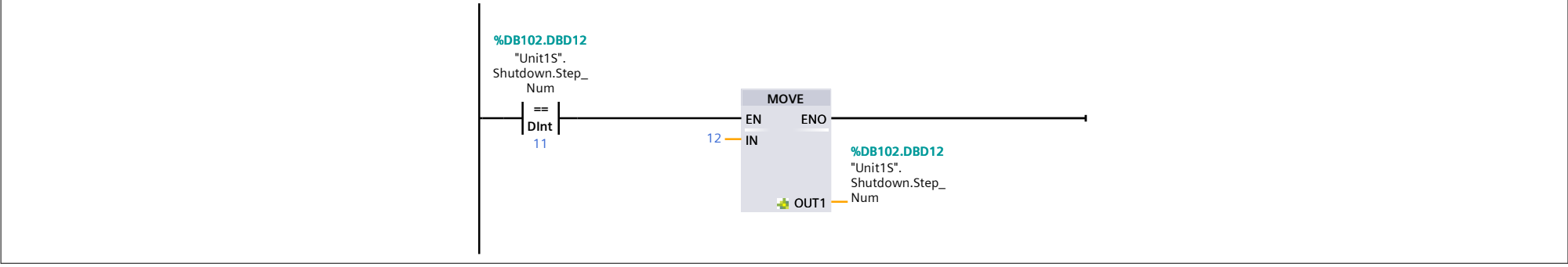
Network 12: Step 9 - Spare



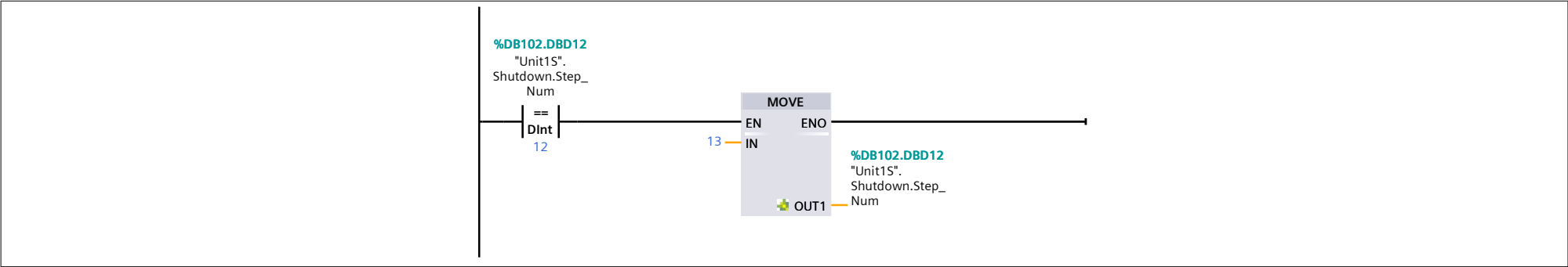
Network 13: Step 10 - Spare



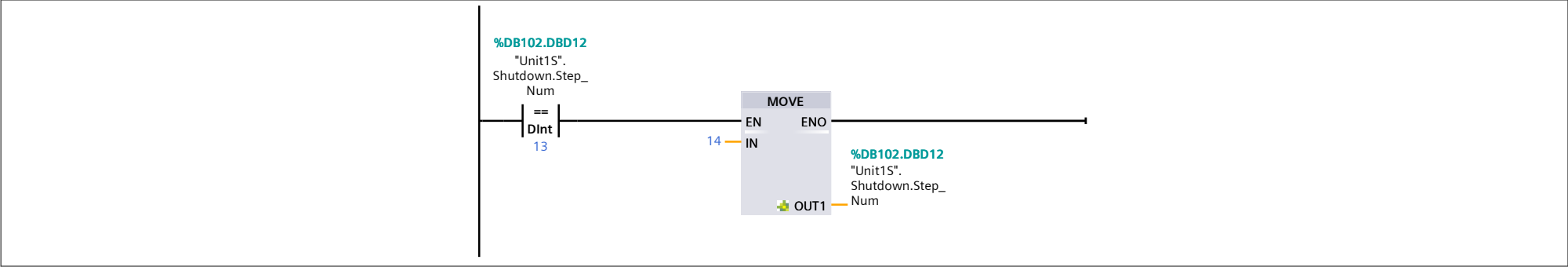
Network 14: Step 11 - Spare



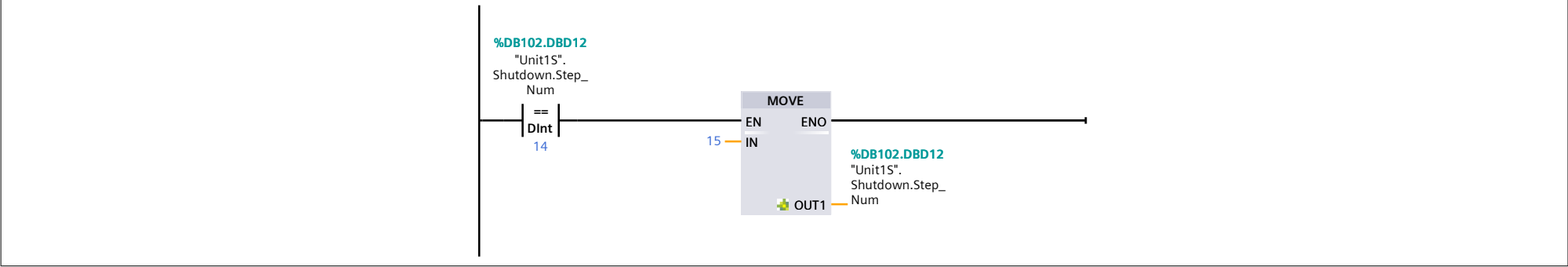
Network 15: Step 12 - Spare



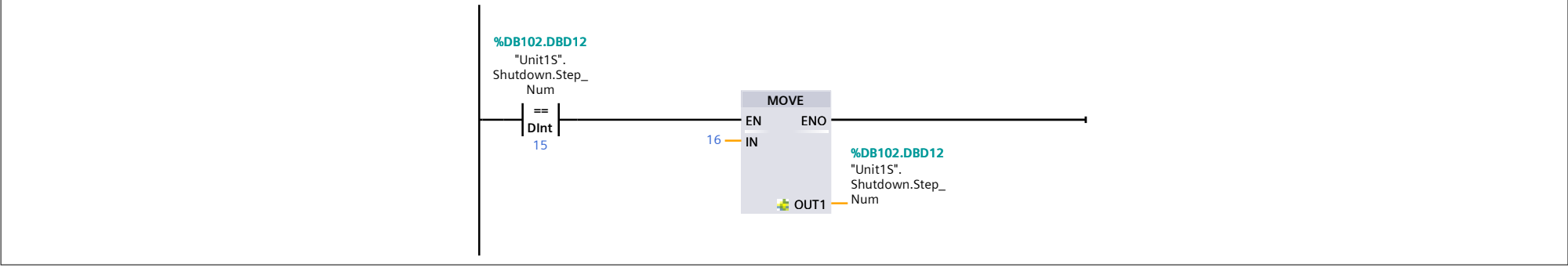
Network 16: Step 13 - Spare



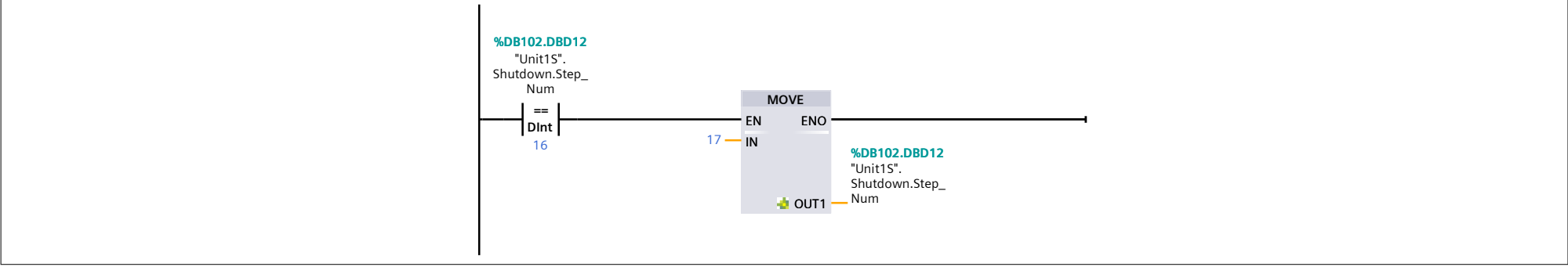
Network 17: Step 14 - Spare



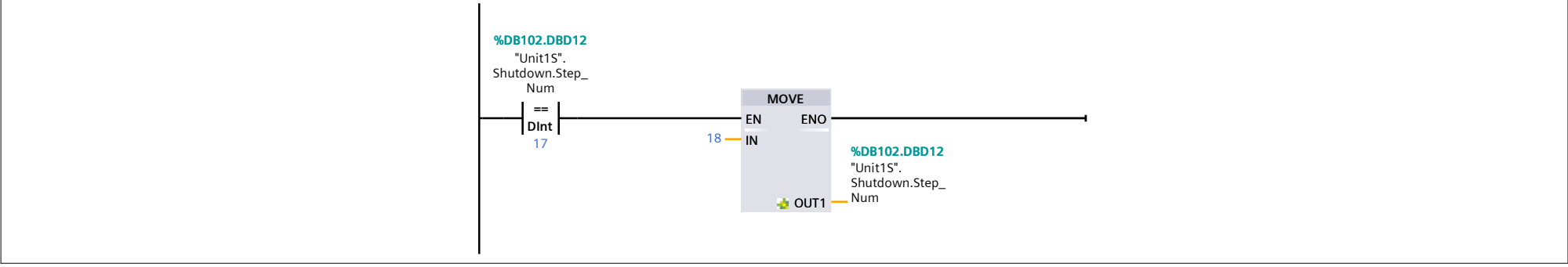
Network 18: Step 15 - Spare



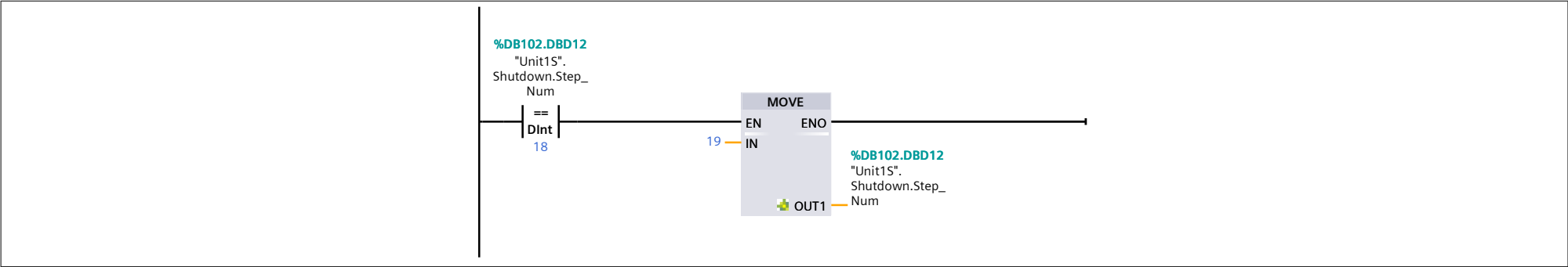
Network 19: Step 16 - Spare



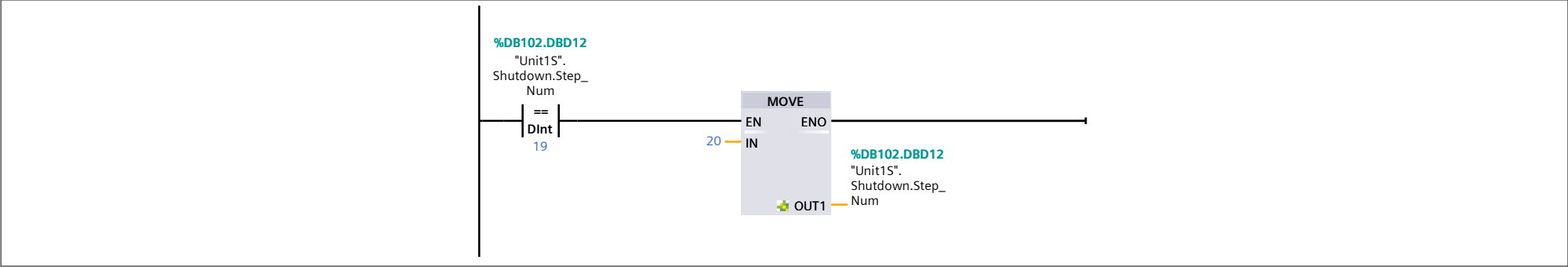
Network 20: Step 17 - Spare



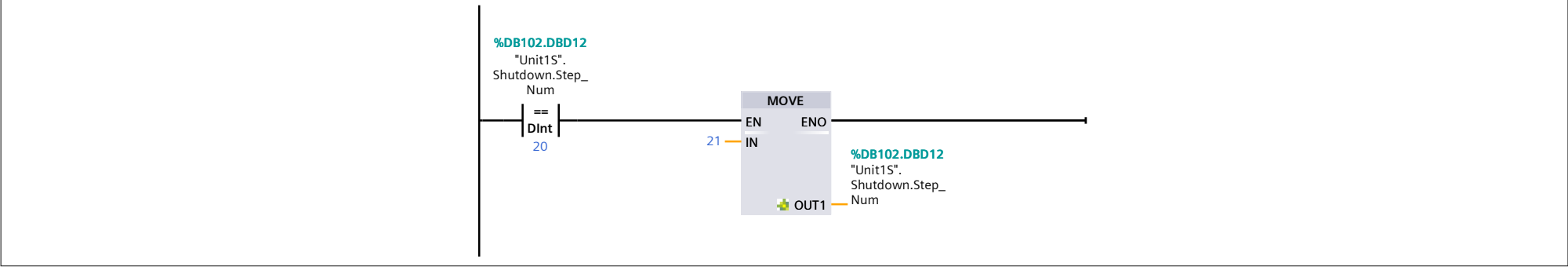
Network 21: Step 18 - Spare



Network 22: Step 19 - Spare



Network 23: Step 20 - Spare



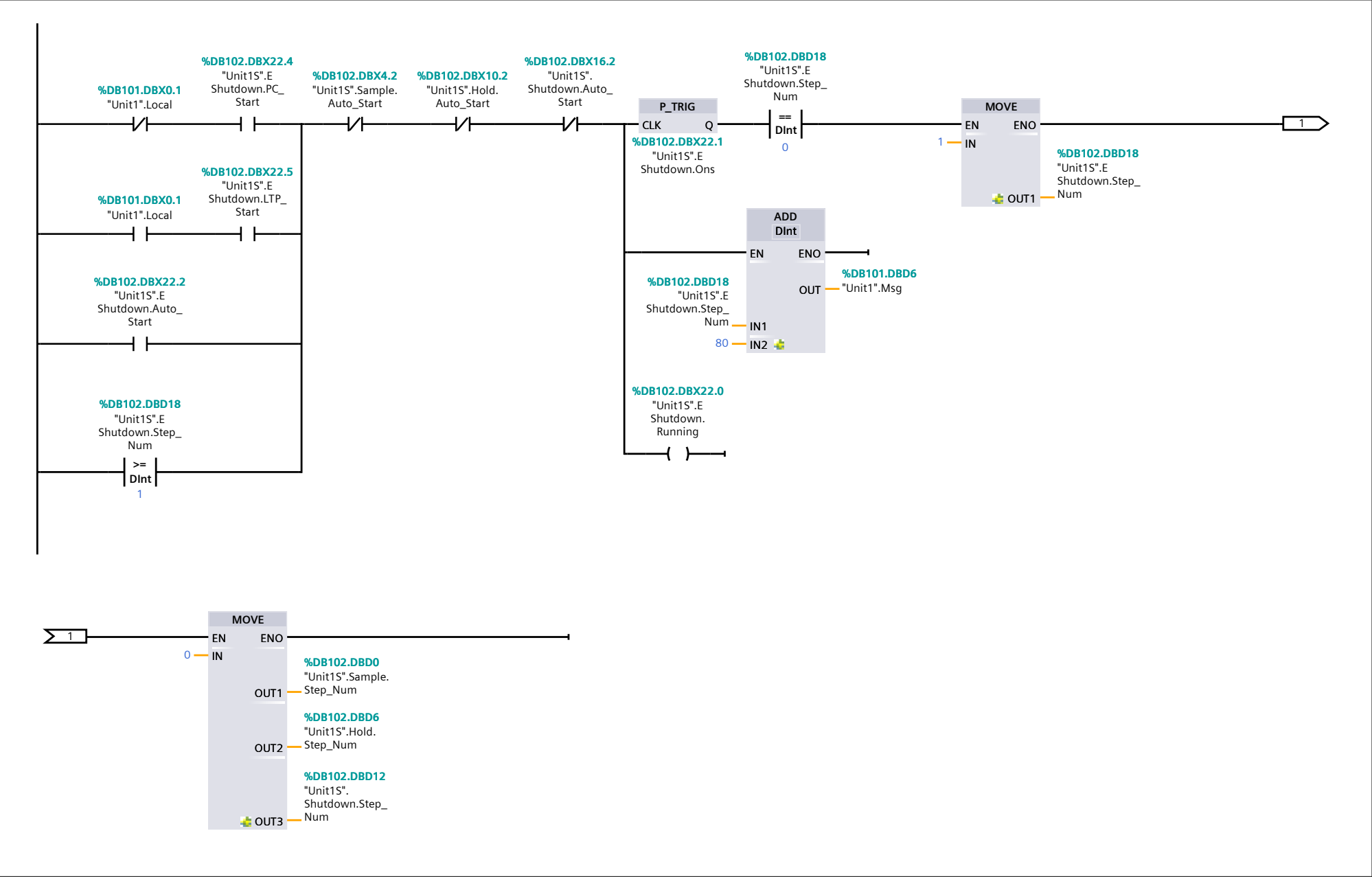
Program blocks / Unit1

Unit1_080EShutdown [FB114]

Unit1_080EShutdown Properties							
General							
Name	Unit1_080EShutdown	Number	114	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Unit1 E-Shutdown Sequence	Author		Comment		Family	
Version	0.1	User-defined ID					
Name			Data type	Default value		Retain	
Input							
Output							
InOut							
▼ Static							
EShutdown_ARTmr			TON_TIME			Non-retain	
EShutdown_Tmr			TON_TIME			Non-retain	
Temp							
Constant							

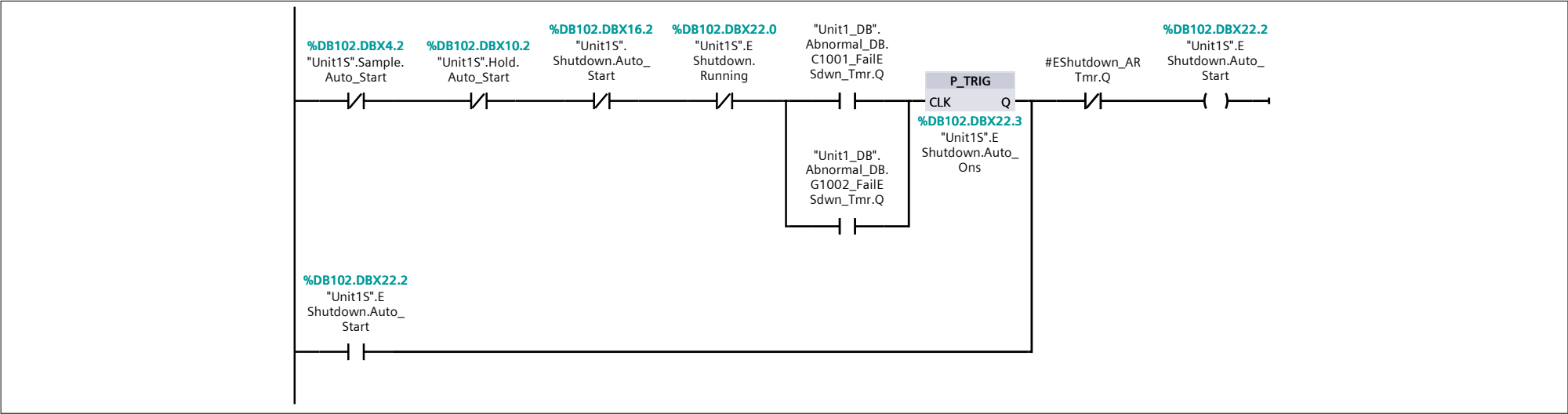
Network 1: E-Shutdown Sequence

EShutdown - Operator requests and auto sequence starts. Maintain message number for OI

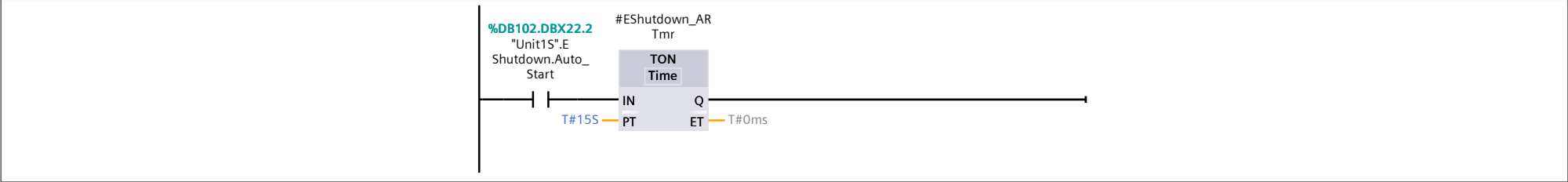


Network 2: Auto start request

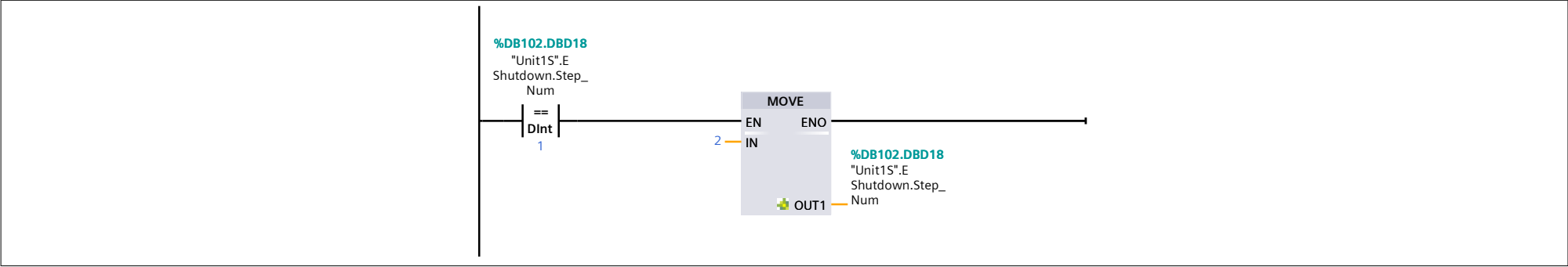
Auto-start for E-Shutdown



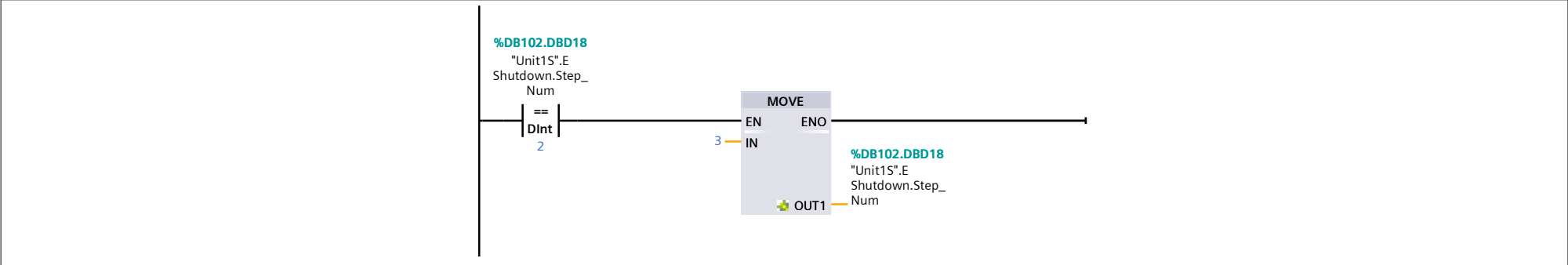
Network 3: Auto Start Timer



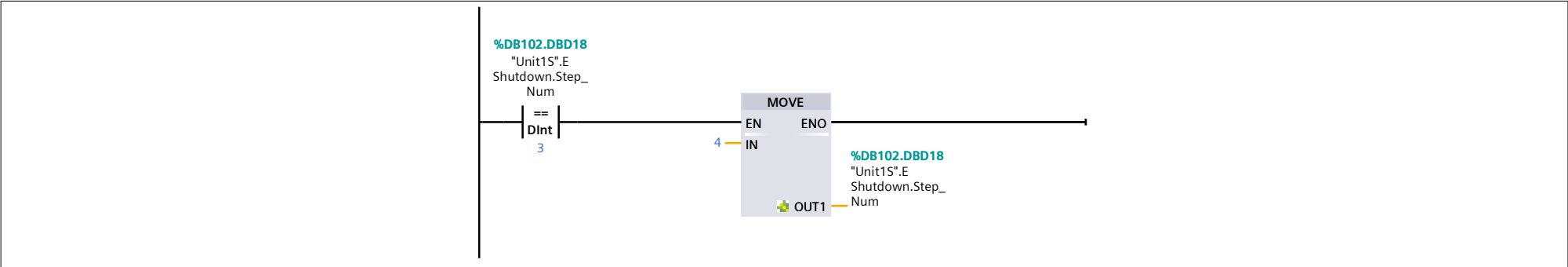
Network 4: Step 1 - Spare



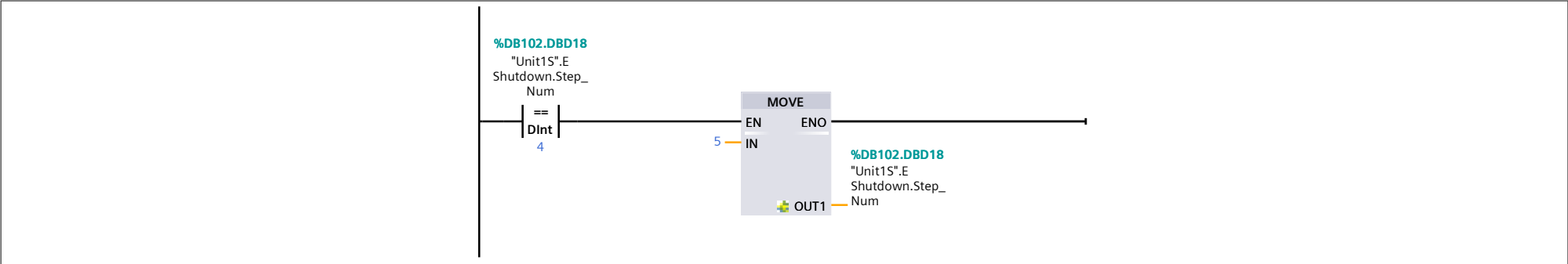
Network 5: Step 2 - Spare



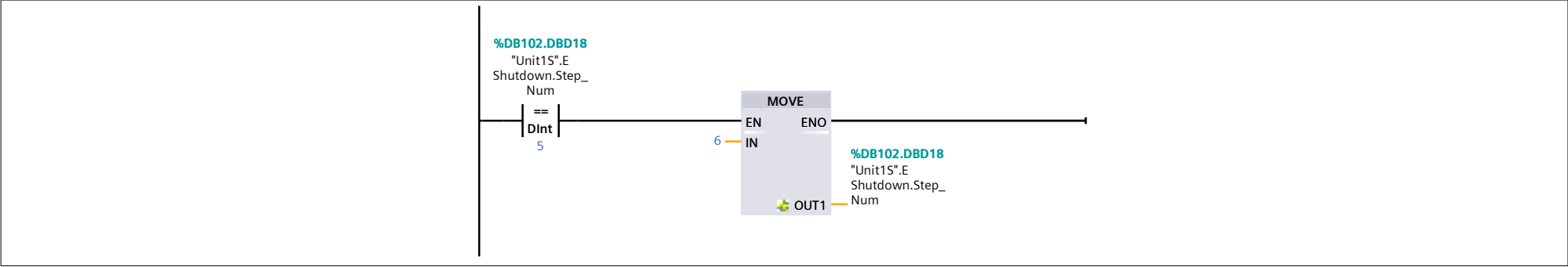
Network 6: Step 3 - Spare



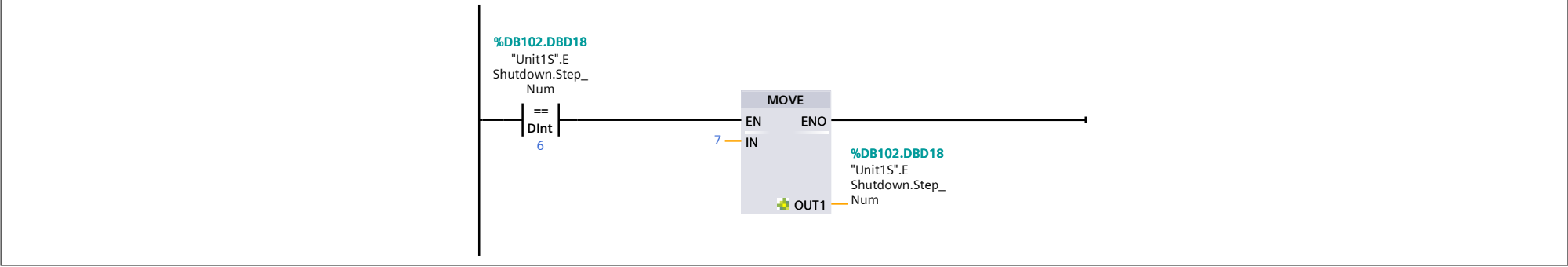
Network 7: Step 4 - Spare



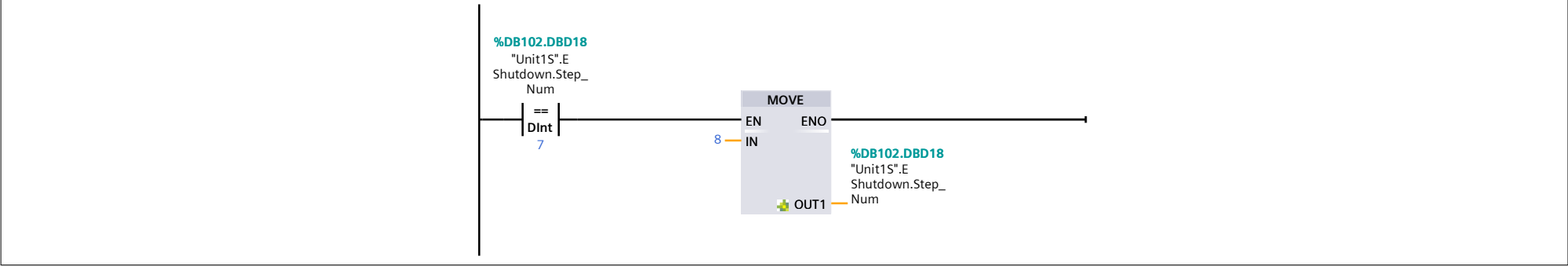
Network 8: Step 5 - Spare



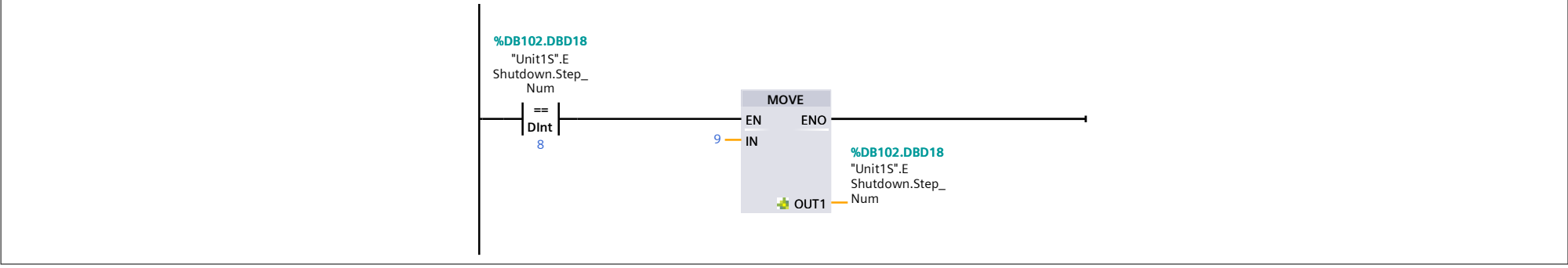
Network 9: Step 6 - Spare



Network 10: Step 7 - Spare

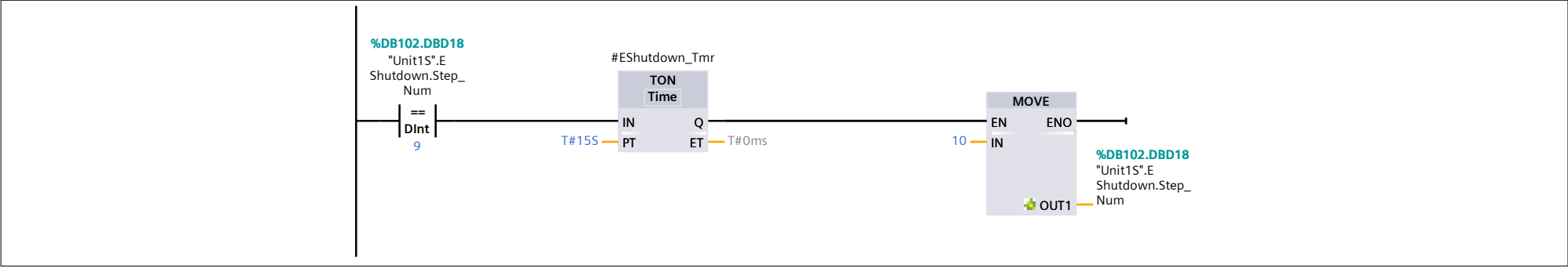


Network 11: Step 8 - Spare



Network 12: Step 9 - Wait 15 seconds

for equipment to shut down before allowing maintenance mode.



Network 13: Calculation of time remaining for step 9

```
0001 IF "Unit1S".EShutdown.Step_Num = 9 THEN
0002     "Unit1".Time_Remaining := ((#EShutdown_Tmr.PT - #EShutdown_Tmr.ET) / 1000);
0003 END_IF;
0004
```

Totally Integrated Automation Portal

Program blocks / Unit1

Unit1_DB [DB100]

Unit1_DB Properties

General

Name	Unit1_DB	Number	100	Type	DB	Language	DB
Numbering	Manual						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
Input			
Output			
InOut			
▼ Static			
Gates_DB	"Unit1_Gates"		False
Motors_DB	"Unit1_Motors"		False
Valves_DB	"Unit1_Valves"		False
Sample_DB	"Unit1_000Sample"		False
Hold_DB	"Unit1_040Hold"		False
Shutdown_DB	"Unit1_060Shutdown"		False
EShutdown_DB	"Unit1_080EShutdown"		False
PIDLoops_DB	"Unit1_PIDLoops"		False
Abnormal_DB	"Unit1_991Abnormal"		False
Misc_DB	"Unit1_990Misc"		False

Totally Integrated Automation Portal

Program blocks / Unit1

Unit1 [DB101]

Unit1 Properties

General

Name	Unit1	Number	101	Type	DB	Language	DB
Numbering	Manual						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
Alm_Reset	Bool	false	False
Local	Bool	false	False
Maint	Bool	false	False
Man_StartOpen	Bool	false	False
Man_StopClose	Bool	false	False
Man_DevNum	DInt	0	False
Msg	DInt	0	False
Time_Remaining	DInt	0	False

Totally Integrated Automation Portal

Program blocks / Unit1

Unit1G [DB103]

Unit1G Properties

General

Name	Unit1G	Number	103	Type	DB	Language	DB
Numbering	Manual						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
G1004	"Gate_Flop_Type"		False

Totally Integrated Automation Portal

Program blocks / Unit1

Unit1M [DB104]

Unit1M Properties

General

Name	Unit1M	Number	104	Type	DB	Language	DB
Numbering	Manual						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
EX1000	"Motor_Std_Type"		False
C1001	"Motor_Conv_Type"		False
G1002	"Gate_Slide_Type"		False

Totally Integrated Automation Portal

Program blocks / Unit1

Unit1S [DB102]

Unit1S Properties

General

Name	Unit1S	Number	102	Type	DB	Language	DB
Numbering	Manual						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
Sample	"Seq_Type"		False
Hold	"Seq_Type"		False
Shutdown	"Seq_Type"		False
EShutdown	"Seq_Type"		False

Totally Integrated Automation Portal

Program blocks / Unit1

Unit1V [DB106]

Unit1V Properties

General

Name	Unit1V	Number	106	Type	DB	Language	DB
Numbering	Manual						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
XV1005	"Valve_Disc_Type"		False

Totally Integrated Automation Portal

Program blocks / Unit1

Unit1P [DB105]

Unit1P Properties

General

Name	Unit1P	Number	105	Type	DB	Language	DB
Numbering	Manual						

Information

Title		Author		Comment		Family	
Version	0.1	User-defined ID					

Name	Data type	Start value	Retain
▼ Static			
FIC1000	"PIDData_Type"		False

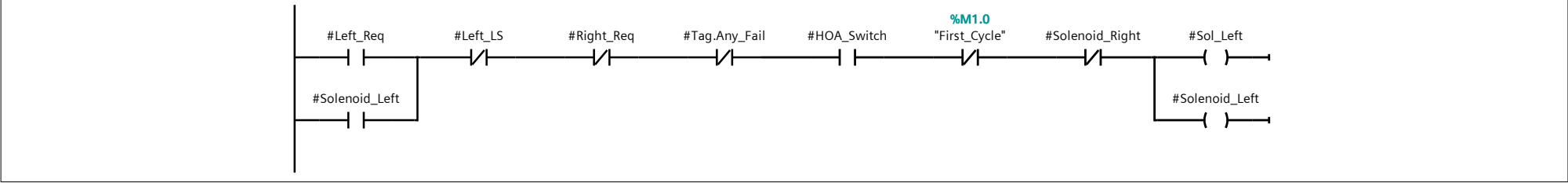
Program blocks / zzDevice_Control

Gate_Flop [FB1099]

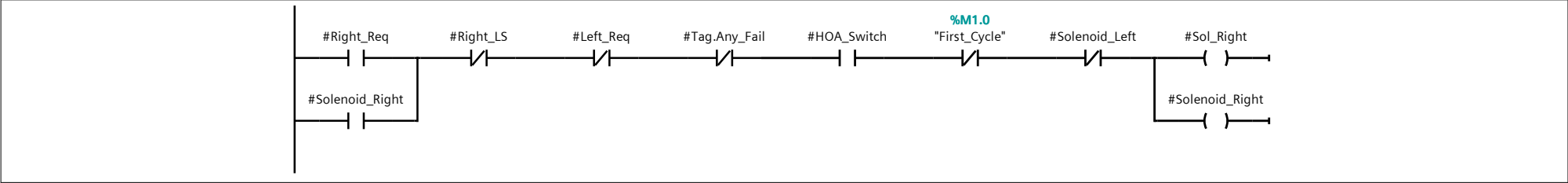
Gate_Flop Properties							
General							
Name	Gate_Flop	Number	1099	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Flop Gate Control	Author		Comment	Copyright (c) 2011, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value
▼ Input		
Left_LS	Bool	false
Right_LS	Bool	false
HOA_Switch	Bool	false
Alarm_Reset	Bool	false
Maint	Bool	false
Man_Left	Bool	false
Man_Right	Bool	false
Select_Dev_Num	DInt	0
This_Dev_Num	DInt	0
▼ Output		
Sol_Left	Bool	false
Sol_Right	Bool	false
▼ InOut		
Tag	"Gate_Flop_Type"	
▼ Static		
Left_Req	Bool	false
Right_Req	Bool	false
Alw_On	Bool	true
Solenoid_Left	Bool	false
Solenoid_Right	Bool	false
Fail_Tmr	TON_TIME	
Temp		
Constant		

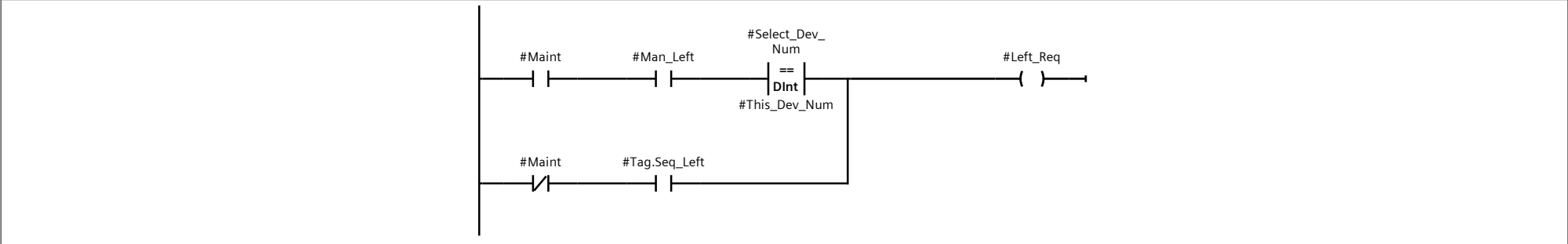
Network 1: Energize the left coil.



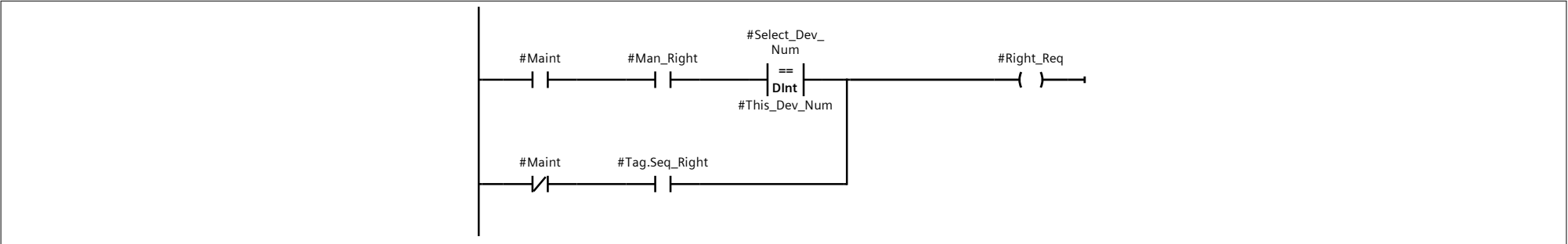
Network 2: Energize the right coil.



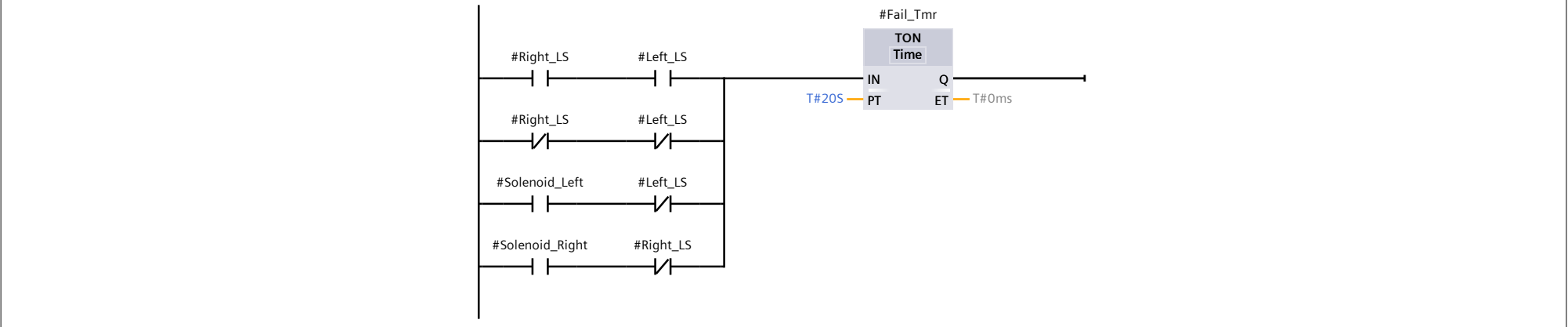
Network 3: Handle manual and sequence left requests.



Network 4: Handle manual and sequence right requests.

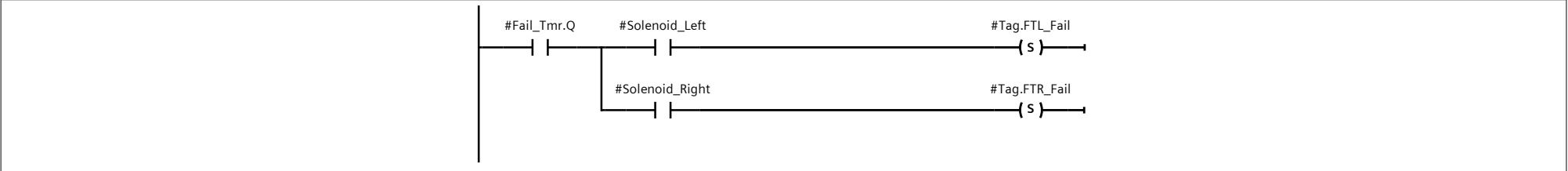


Network 5: Failure timer for any illegal condition.



Network 6: Failure Check: If any illegal condition persists for 20 sec., set failure bit

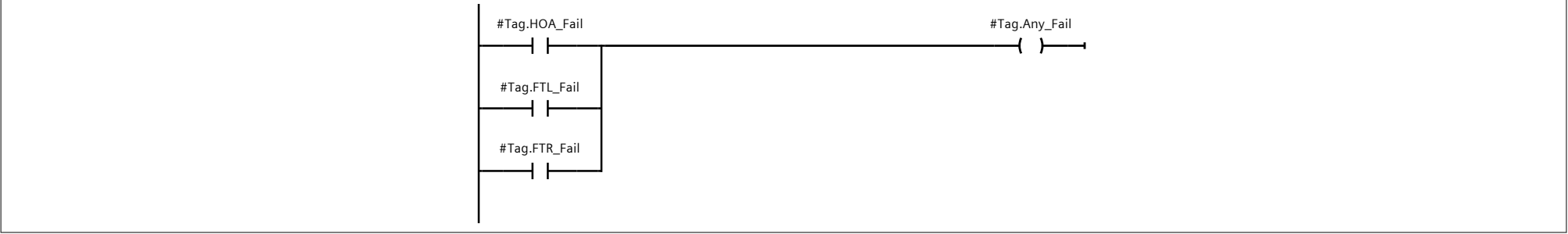
bit.



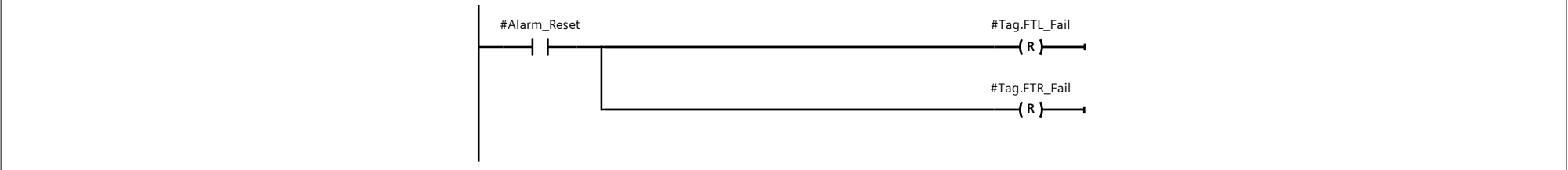
Network 7: Generate HOA failure indication



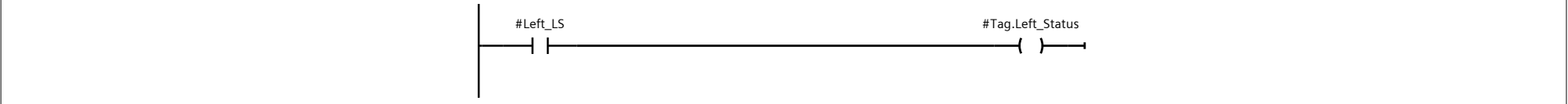
Network 8: Any failure indication



Network 9: Reset alarm indications.



Network 10: Gate status for OI



Network 11:

Totally Integrated Automation Portal		
<div><div></div><div><div>#Right_LS</div><div>#Tag.Right_Status</div></div></div>		
Network 12:		
<div><div></div><div><div>#Solenoid_Left</div><div>#Solenoid_Right</div></div><div>#Tag.Run_Status</div></div>		
Network 13: Reset sequence commands.		
<div><div></div><div><div>#Alw_On</div><div>#Tag.Seq_Left</div><div>#Tag.Seq_Right</div></div></div>		
Network 14: Set ENO on.		
<div><div></div><div><div>#Alw_On</div><div>RLO</div></div></div>		

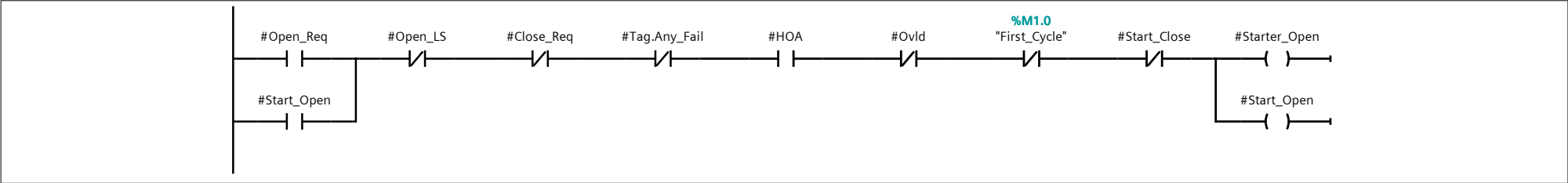
Program blocks / zzDevice_Control

Gate_Slide [FB1098]

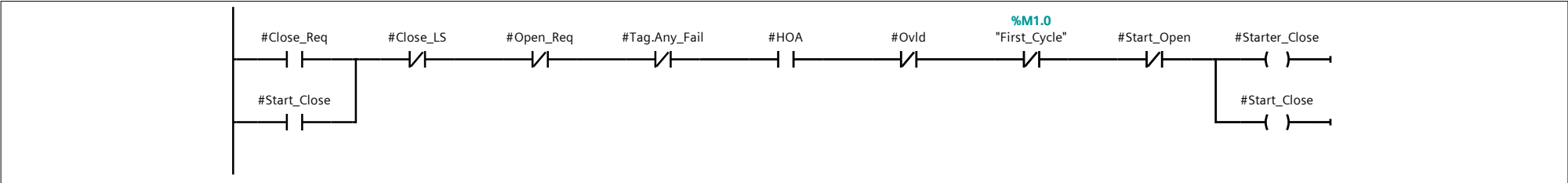
Gate_Slide Properties							
General							
Name	Gate_Slide	Number	1098	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Slide Gate Control	Author		Comment	Copyright (c) 2011, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value
▼ Input		
Open_Aux	Bool	false
Close_Aux	Bool	false
HOA	Bool	false
Ovld	Bool	false
Open_LS	Bool	false
Close_LS	Bool	false
Alarm_Reset	Bool	false
Maint	Bool	false
Man_Open	Bool	false
Man_Close	Bool	false
Select_Dev_Num	DInt	0
This_Dev_Num	DInt	0
▼ Output		
Starter_Open	Bool	false
Starter_Close	Bool	false
▼ InOut		
Tag	"Gate_Slide_Type"	
▼ Static		
Open_Req	Bool	false
Close_Req	Bool	false
Alw_On	Bool	true
Start_Open	Bool	false
Start_Close	Bool	false
Fail_Tmr	TON_TIME	
Temp		
Constant		

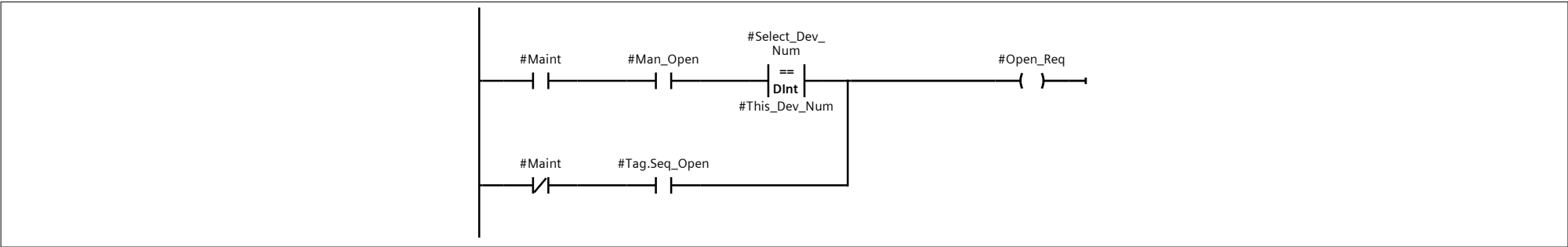
Network 1: Energize the open coil.



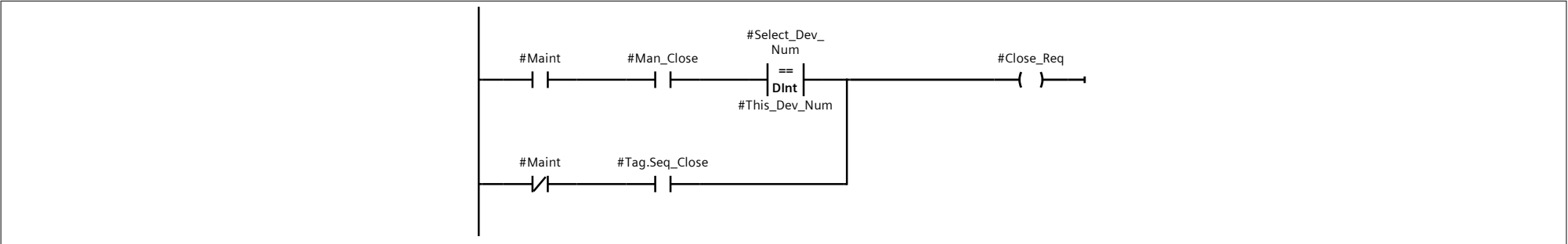
Network 2: Energize the close coil.



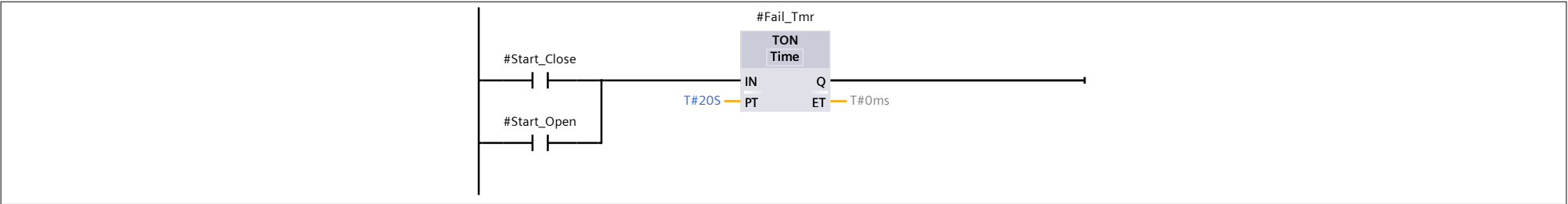
Network 3: Handle manual and sequence open requests.



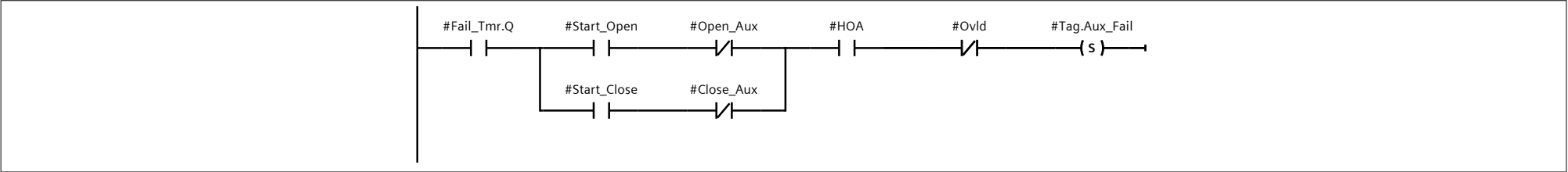
Network 4: Handle manual and sequence close requests.



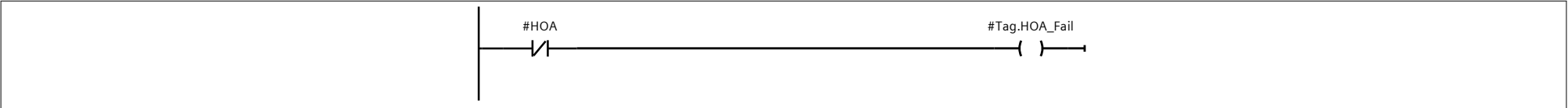
Network 5: Fail timer



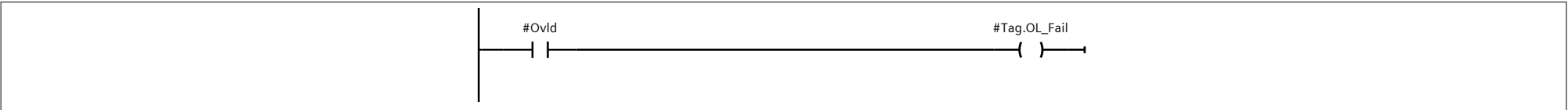
Network 6: Aux failure: No aux after first 20 seconds HOA switch auto and not overload.



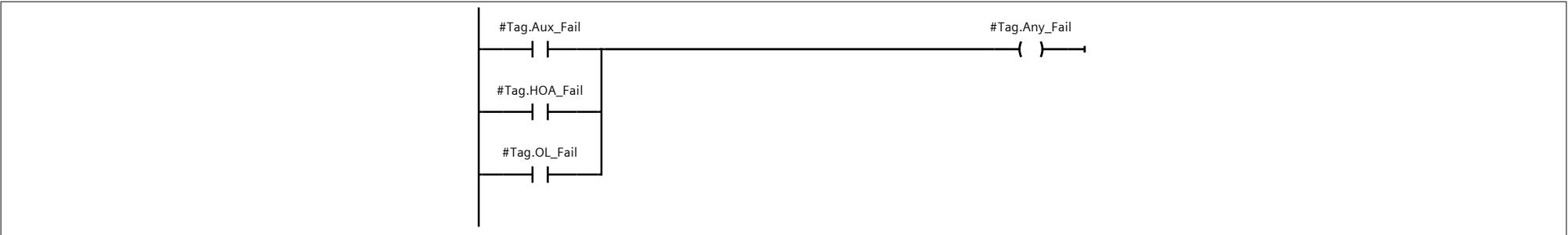
Network 7: HOA failure



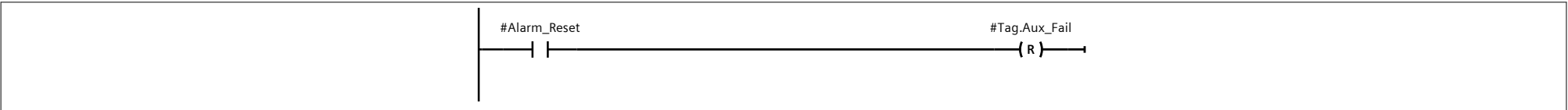
Network 8: Overload failure



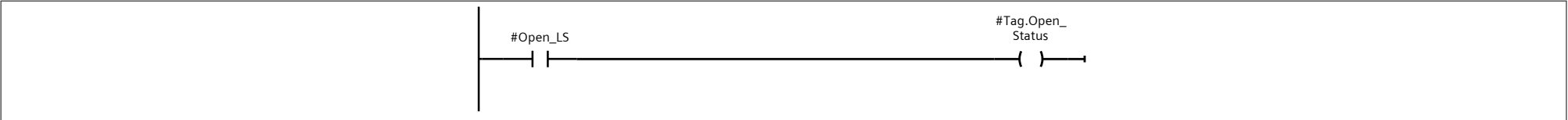
Network 9: Any failure indication.



Network 10: Reset alarm indication.



Network 11: Open status for OI



Network 12: Close status for OI

Totally Integrated Automation Portal		
<div><div></div><div><div>#Close_LS</div><div>#Tag.Close_Status</div></div></div>		
Network 13: Running status for OI		
<div><div></div><div><div>#Open_Aux</div><div>#Close_Aux</div></div><div>#Tag.Run_Status</div></div>		
Network 14: Reset sequence commands.		
<div><div></div><div><div>#Alw_On</div><div>#Tag.Seq_Open</div><div>#Tag.Seq_Close</div></div></div>		
Network 15: Set ENO on.		
<div><div></div><div><div>#Alw_On</div><div>RLO</div></div></div>		

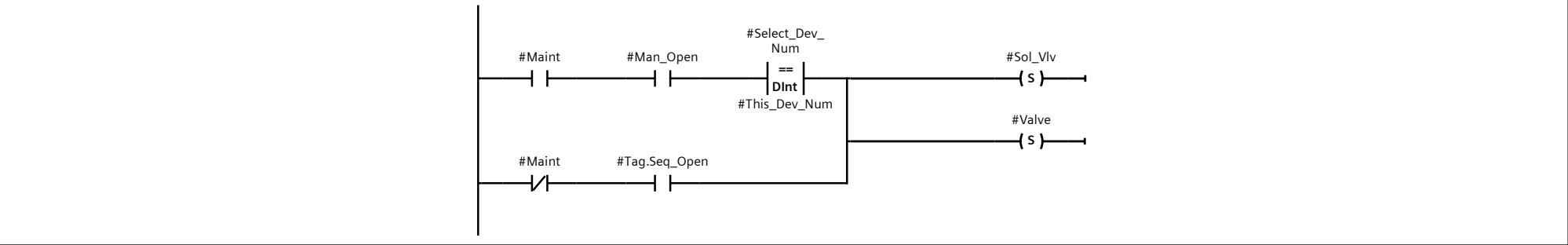
Program blocks / zzDevice_Control

Valve_Disc [FB1097]

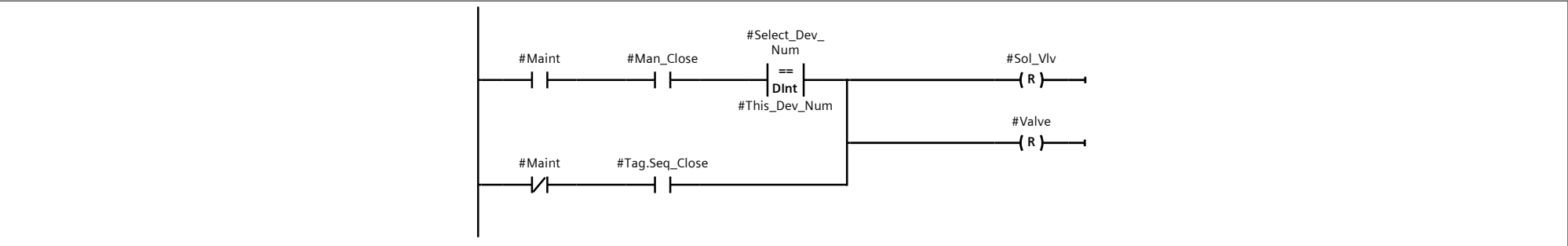
Valve_Disc Properties							
General							
Name	Valve_Disc	Number	1097	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Discrete Valve Device Control	Author		Comment	Copyright (c) 2011, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value
▼ Input		
Open_LS	Bool	false
Close_LS	Bool	false
Alarm_Reset	Bool	false
Maint	Bool	false
Man_Open	Bool	false
Man_Close	Bool	false
Select_Dev_Num	DInt	0
This_Dev_Num	DInt	0
▼ Output		
Sol_Vlv	Bool	false
▼ InOut		
Tag	"Valve_Disc_Type"	
▼ Static		
Alw_On	Bool	true
Valve	Bool	false
Fail_Tmr	TON_TIME	
Temp		
Constant		

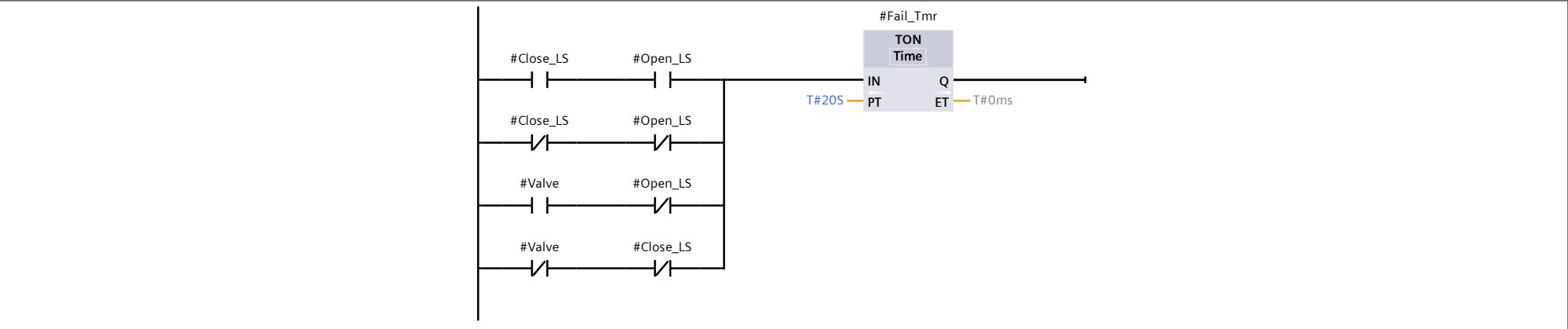
Network 1: Handle manual and sequence open requests



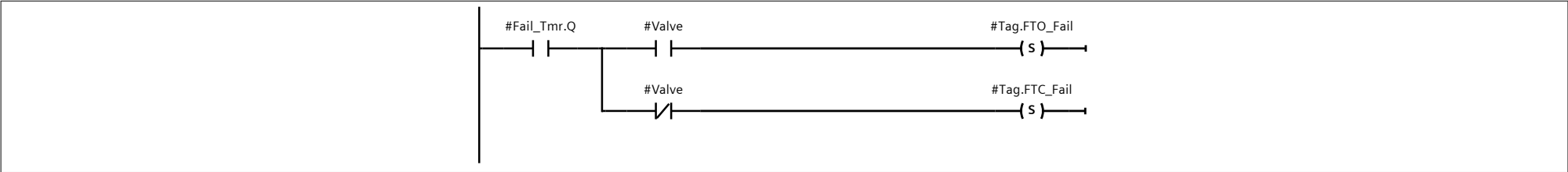
Network 2: Handle manual and sequence close requests.



Network 3: Failure timer for any illegal condition.



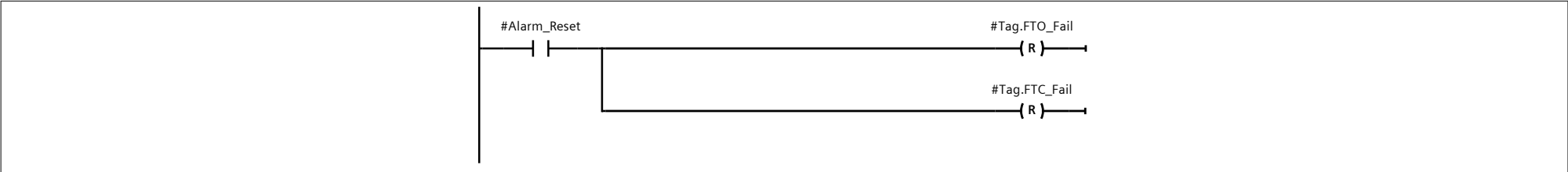
Network 4: Failure check. If any illegal condition persists for 20 sec., set failure bit.



Network 5: Any failure indication



Network 6: Reset alarm indications



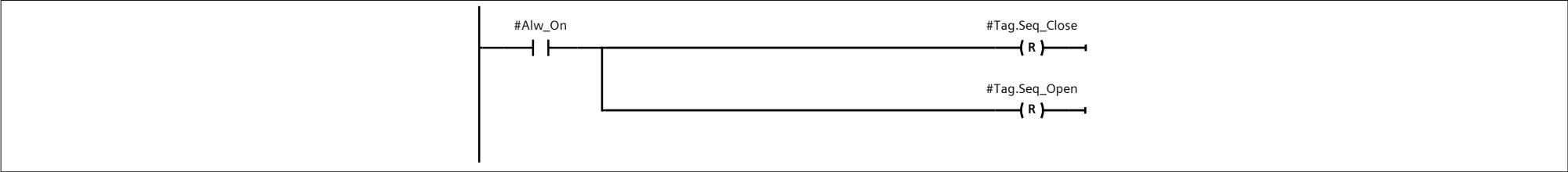
Network 7: Valve Status for OI



Network 8:



Network 9: Reset sequence open/close commands



Network 10: Set ENO on.



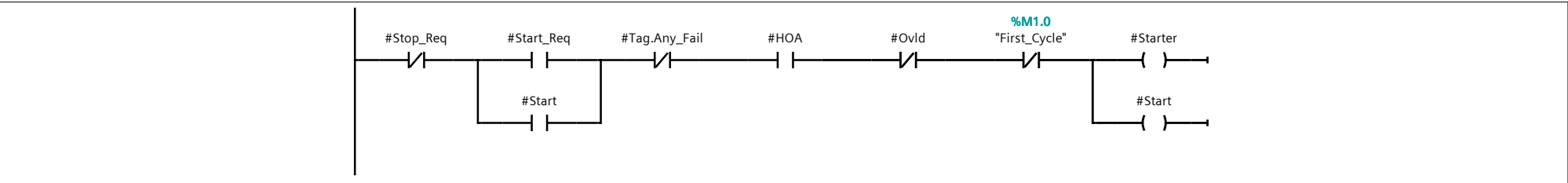
Program blocks / zzDevice_Control

Motor_Std [FB1095]

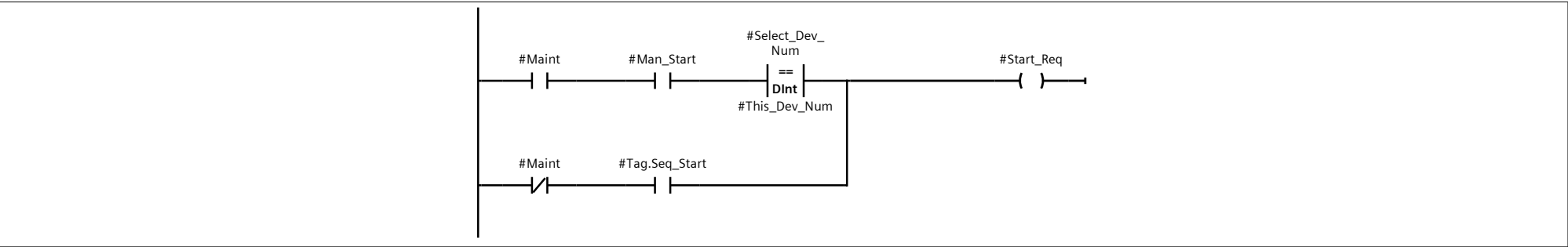
Motor_Std Properties							
General							
Name	Motor_Std	Number	1095	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Standard Motor Device Control	Author		Comment	Copyright (c) 2011, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value
▼ Input		
Aux	Bool	false
HOA	Bool	false
Ovld	Bool	false
Alarm_Reset	Bool	false
Maint	Bool	false
Man_Start	Bool	false
Man_Stop	Bool	false
Select_Dev_Num	DInt	0
This_Dev_Num	DInt	0
▼ Output		
Starter	Bool	false
▼ InOut		
Tag	"Motor_Std_Type"	
▼ Static		
Start_Req	Bool	false
Stop_Req	Bool	false
Alw_On	Bool	true
Start	Bool	false
Fail_Tmr	TON_TIME	
Fail_Tmr_Q	Bool	false
Temp		
Constant		

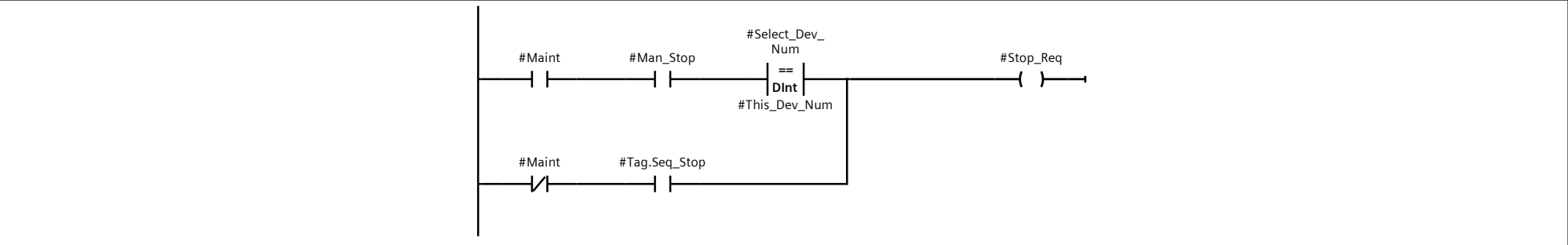
Network 1: Main control that drives motor starter contact.



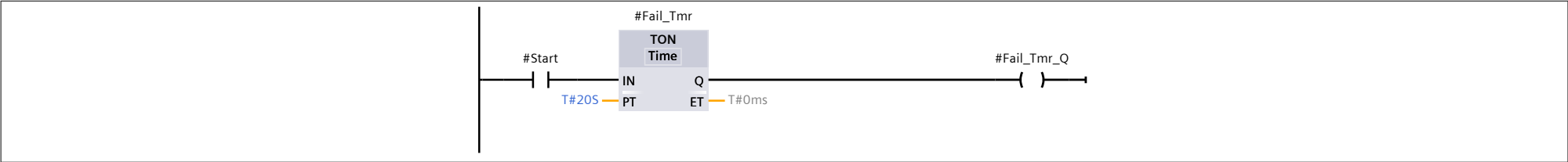
Network 2: Handle manual and sequence start requests.



Network 3: Handle manual and sequence stop requests.

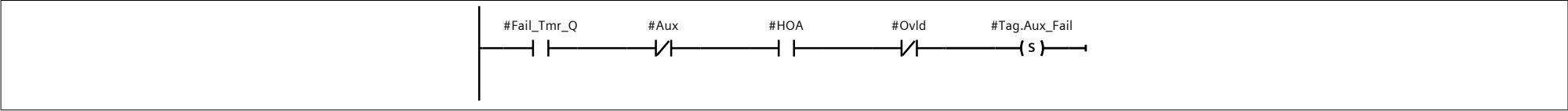


Network 4: Aux fail timer



Network 5: If aux not on in 20 seconds and HOA in auto and not overload, set failure.

Failures:



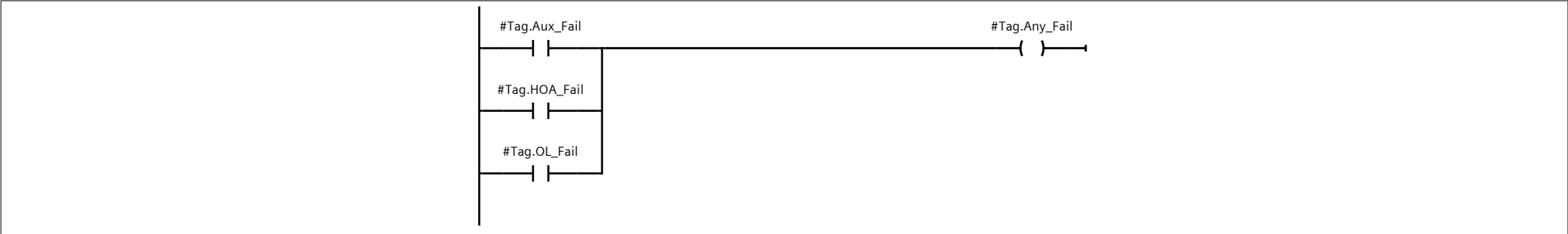
Network 6: HOA failure indication



Network 7: Overload failure indication



Network 8: Any failure indication



Network 9: Running status for OI

Comment

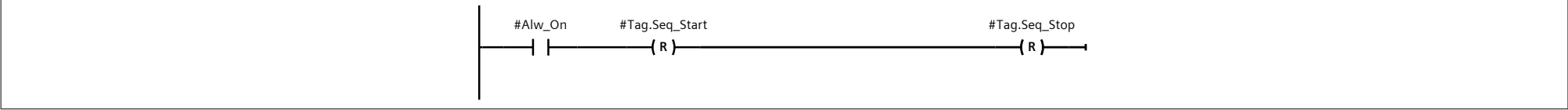


Network 10:

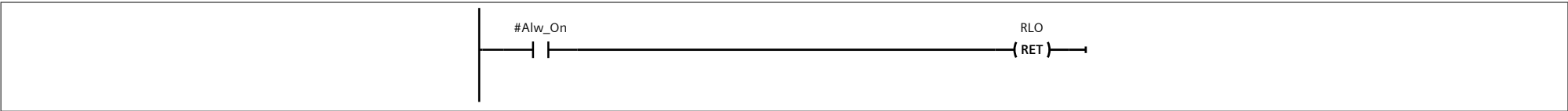
Reset alarm indication



Network 11: Reset sequence commands



Network 12: Always set ENO true



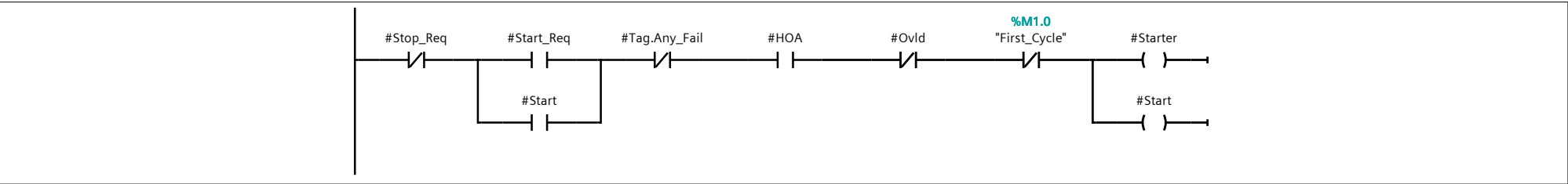
Program blocks / zzDevice_Control

Motor_Conv [FB1096]

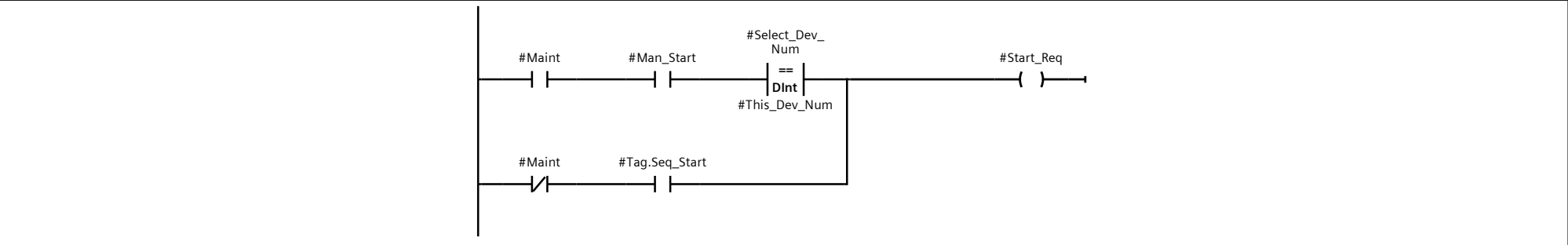
Motor_Conv Properties							
General							
Name	Motor_Conv	Number	1096	Type	FB	Language	LAD
Numbering	Manual						
Information							
Title	Conveyor Motor Control	Author		Comment	Copyright (c) 2011, Dogwood Valley Press, LLC	Family	
Version	0.1	User-defined ID					

Name	Data type	Default value
▼ Input		
Aux	Bool	false
HOA	Bool	false
Ovld	Bool	false
Speed_Switch	Bool	false
Alarm_Reset	Bool	false
Maint	Bool	false
Man_Start	Bool	false
Man_Stop	Bool	false
Select_Dev_Num	DInt	0
This_Dev_Num	DInt	0
▼ Output		
Starter	Bool	false
▼ InOut		
Tag	"Motor_Conv_Type"	
▼ Static		
Start_Req	Bool	false
Stop_Req	Bool	false
Alw_On	Bool	true
Start	Bool	false
Fail_Tmr	TON_TIME	
Fail_Tmr_ET	Time	T#0ms
Fail_Tmr_Q	Bool	false
Temp		
Constant		

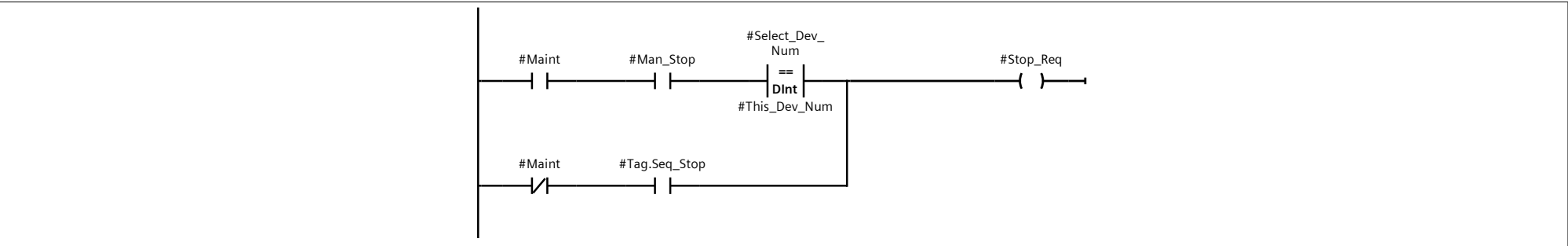
Network 1: Main control that drives motor starter contact.



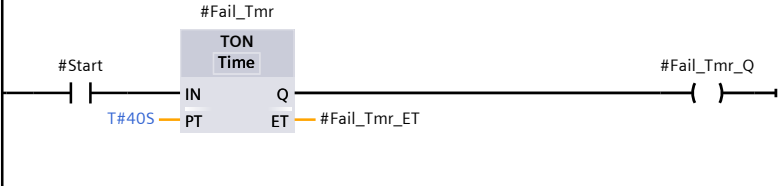
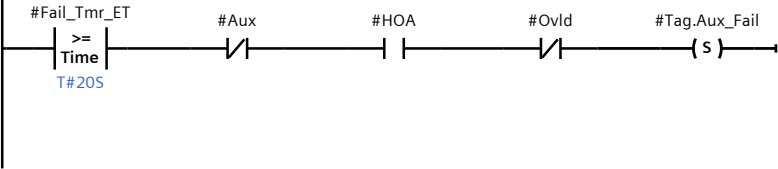
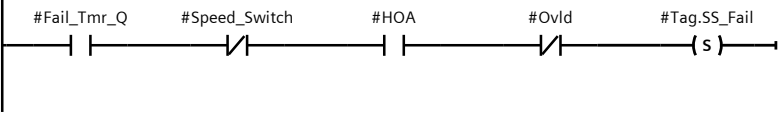
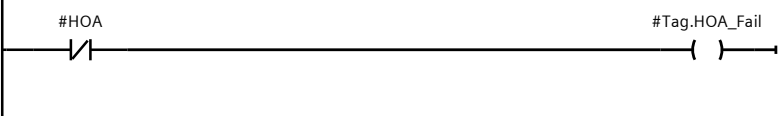
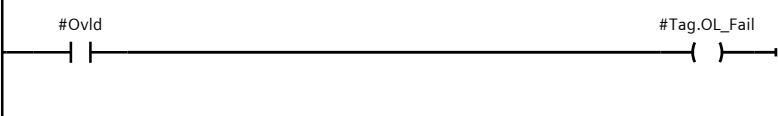

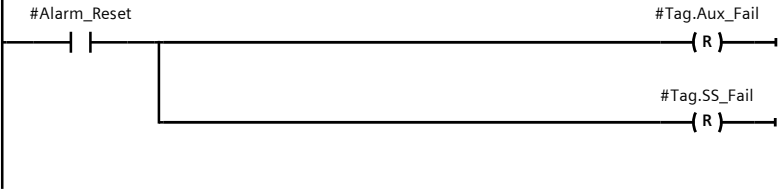
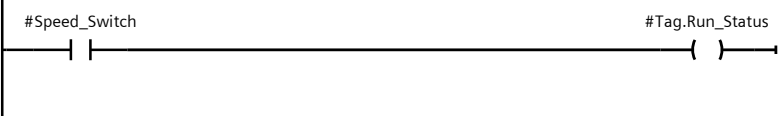
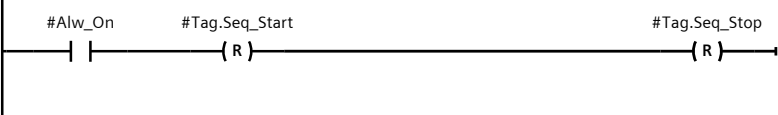
Network 2: Handle manual and sequence start requests.



Network 3: Handle manual and sequence stop requests.



Network 4: Timer for aux and speed switch failures.

Totally Integrated Automation Portal		
	<div></div>	
Network 5: Aux failure No aux after first 20 seconds and HOA auto and not overload.		
	<div></div>	
Network 6: Speed switch failure No speed switch after 40 secs and HOA auto and not overload.		
	<div></div>	
Network 7: HOA failure		
	<div></div>	
Network 8: Overload failure		
	<div></div>	
Network 9: Any failure indication		
	<div></div>	
Network 10: Reset alarm indication		
	<div></div>	
Network 11: Running status for OI		
	<div></div>	
Network 12: Reset sequence commands		
	<div></div>	

Network 13: Always set ENO true

