

Main [OB1]

Main Properties

General

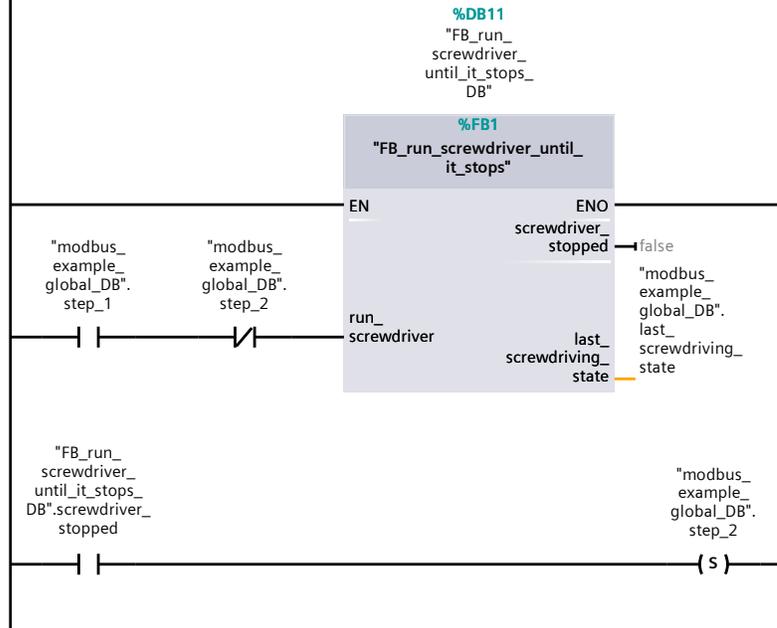
Name	Main	Number	1	Type	OB
Language	LAD	Numbering	Automatic		

Information

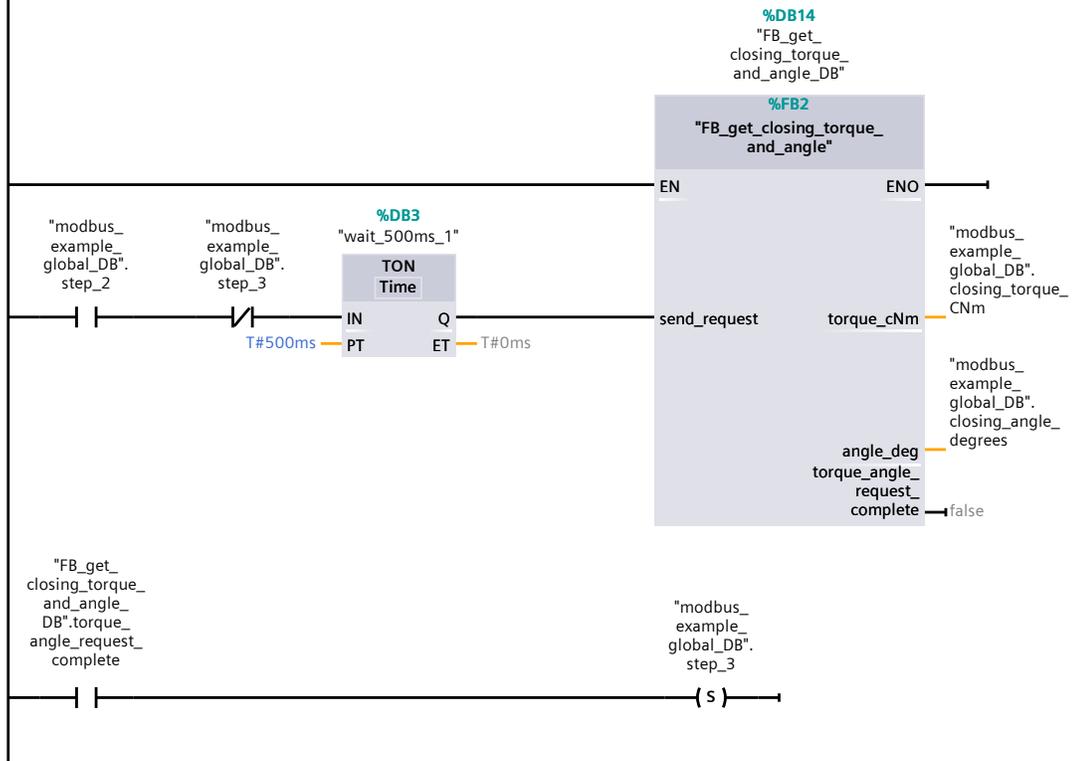
Title	"Main Program Sweep (Cycle)"	Author		Comment	*****WARNING***** SCREWDRIVER MOTOR WILL START RUNNING WHEN EXECUTING THIS PROGRAM Example of MODBUS re- mote control with K-Ducer and Siemens S7-1200
Family		Version	0.1	User-defined ID	

Name	Data type	Default value	Comment
▼ Input			
Initial_Call	Bool		Initial call of this OB
Remanence	Bool		=True, if remanent data are available
Temp			
▼ Constant			
screw_OK_state	UInt	13	13 = Screw OK (torque control mode), 14 = Angle OK (angle control mode). Refer to K-Ducer MOD-BUS map.
angle_OK_state	UInt	14	13 = Screw OK (torque control mode), 14 = Angle OK (angle control mode). Refer to K-Ducer MOD-BUS map.

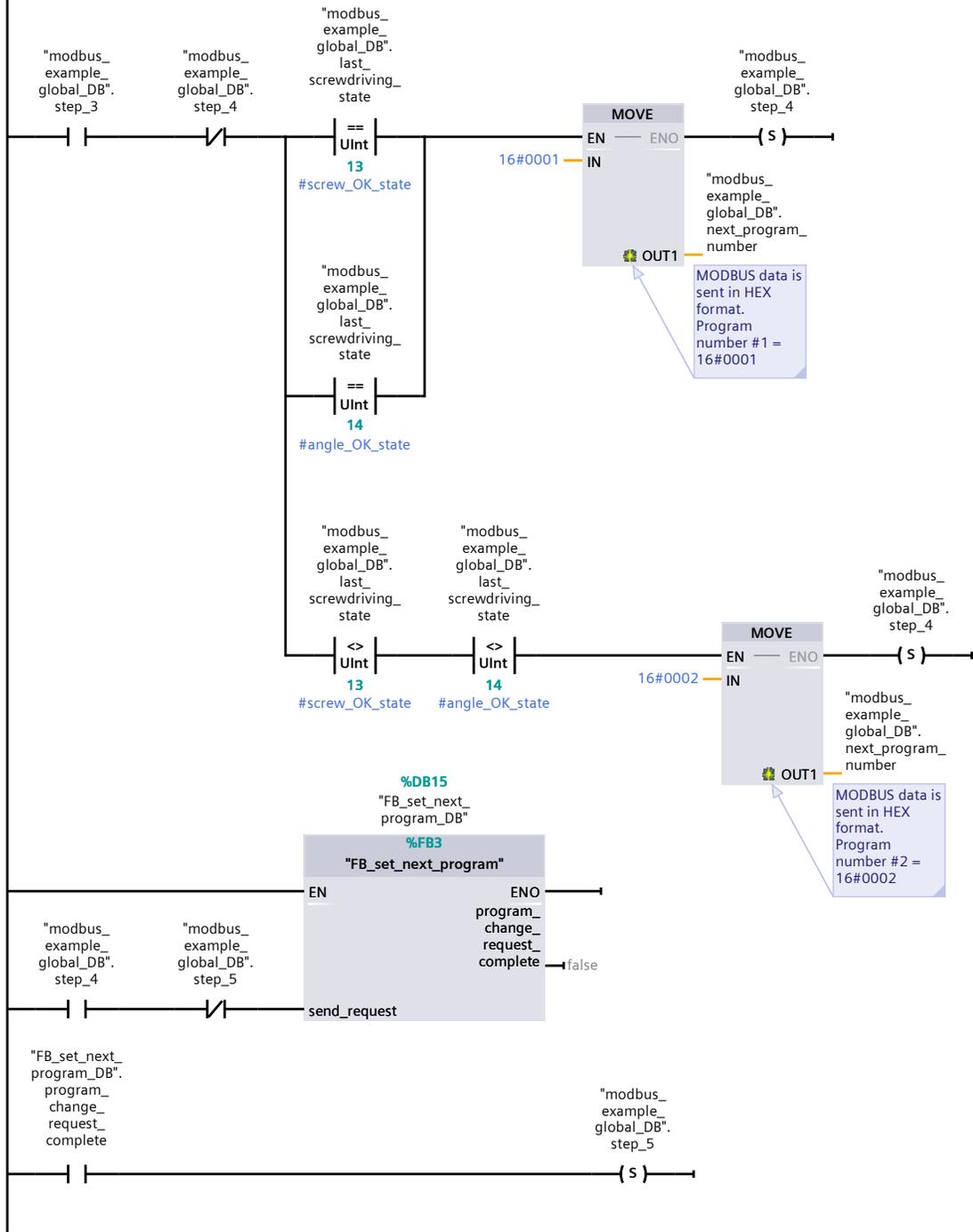
Network 1: run screwdriver until it stops



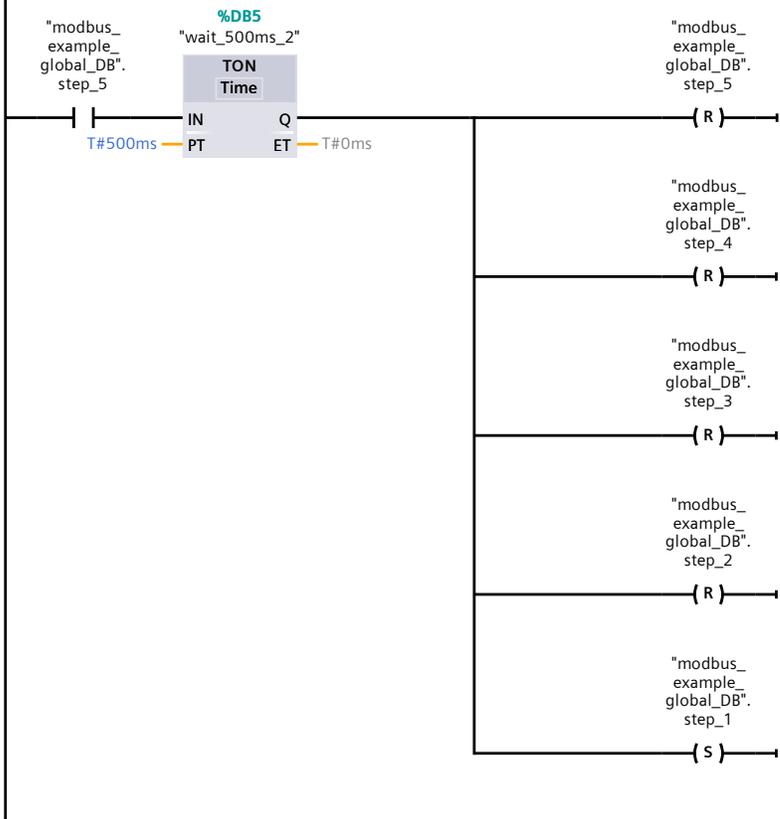
Network 2: get torque and angle results



Network 3: select next program to run



Network 4: restart cycle



modbus_example_Step7-1200 / SMN_PLC [CPU 1212C AC/DC/Rly] / Program blocks

modbus_connection_settings [DB2]

modbus_connection_settings Properties

General

Name	modbus_connection_settings	Number	2	Type	DB
Language	DB	Numbering	Automatic		

Information

Title		Author		Comment	
Family		Version	0.1	User-defined ID	

modbus_connection_settings

Name	Data type	Start value	Comment
▼ Static			
▼ CONNECT	TCON_IP_v4		
Interfaceld	HW_ANY	64	HW-identifier of IE-interface submodule
ID	CONN_OUC	1	connection reference / identifier
ConnectionType	Byte	11	type of connection: 11=TCP/IP, 19=UDP (17=TCP/IP)
ActiveEstablished	Bool	true	active/passive connection establishment
▼ RemoteAddress	IP_V4		remote IP address (IPv4) of K-DUCER. Set via Menu > General Settings > Communication Protocol.
▼ ADDR	Array[1..4] of Byte		IPv4 address of K-DUCER
ADDR[1]	Byte	192	IPv4 address
ADDR[2]	Byte	168	IPv4 address
ADDR[3]	Byte	32	IPv4 address
ADDR[4]	Byte	103	IPv4 address
RemotePort	UInt	502	Use port 502 for MODBUS
LocalPort	UInt	0	local UDP/TCP port number
DISCONNECT	Bool	false	

modbus_example_Step7-1200 / SMN_PLC [CPU 1212C AC/DC/Rly] / Program blocks

modbus_example_global_DB [DB4]

modbus_example_global_DB Properties

General

Name	modbus_example_global_DB	Number	4	Type	DB
Language	DB	Numbering	Automatic		

Information

Title		Author		Comment	
Family		Version	0.1	User-defined ID	

modbus_example_global_DB

Name	Data type	Start value	Comment
▼ Static			
step_1	Bool	true	run screwdriver until it stops
step_2	Bool	false	get closing torque and angle
step_3	Bool	false	choose next program to run
step_4	Bool	false	select next program to run
step_5	Bool	false	restart cycle
next_program_number	Word	16#0	next program number in HEX
last_screwdriving_state	UInt	0	last screwdriving state at end of rundown
closing_torque_CNm	UInt	0	last end of rundown torque
closing_angle_degrees	UInt	0	last end of rundown angle
coil_high_HEX	Word	16#FF00	FF00 is the high value for coils (bits) in MODBUS

modbus_example_Step7-1200 / SMN_PLC [CPU 1212C AC/DC/Rly] / Program blocks

FB_run_screwdriver_until_it_stops [FB1]

FB_run_screwdriver_until_it_stops Properties

General

Name	FB_run_screwdriver_until_it_stops	Number	1	Type	FB
Language	LAD	Numbering	Automatic		

Information

Title		Author		Comment	Writes REMOTE_LEVER coil every 100ms while screwdriving state = 11 (tightening, refer to K-Ducer MODBUS map). Checks and updates screwdriving state every 500ms.
Family		Version	0.1	User-defined ID	

FB_run_screwdriver_until_it_stops

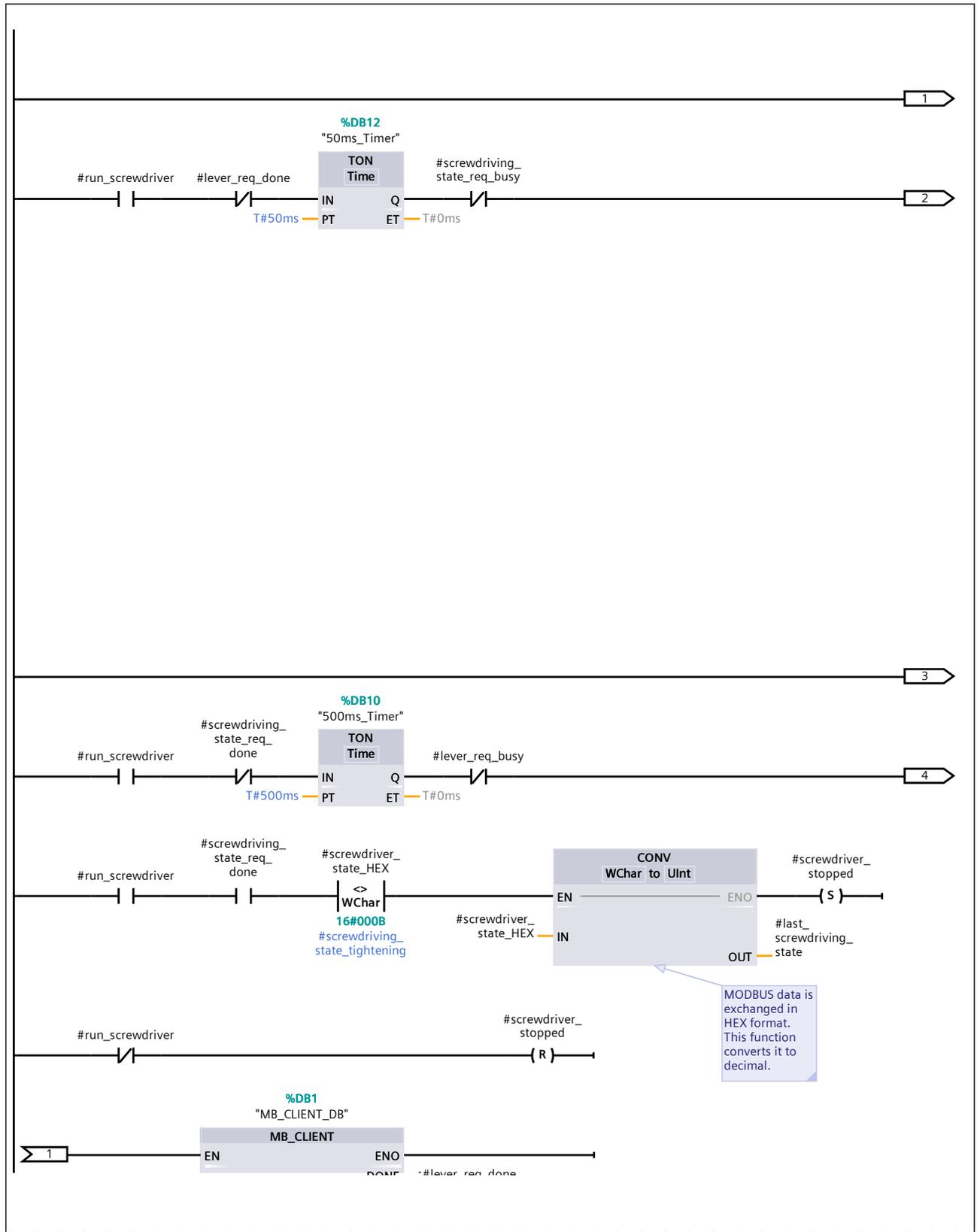
Name	Data type	Default value	Comment
▼ Input			
run_screwdriver	Bool	false	
▼ Output			
screwdriver_stopped	Bool	false	
last_screwdriving_state	UInt	0	
InOut			
▼ Static			
screwdriver_state_HEX	Word	16#0	
lever_req_busy	Bool	false	
lever_req_done	Bool	false	
screwdriving_state_req_busy	Bool	false	
screwdriving_state_req_done	Bool	false	
Temp			
▼ Constant			
write_single_coil	USInt	105	105 = MB function code 05 = write single coil
REMOTE_LEVER_address	UDInt	32	modbus coil address 33 = REMOTE_LEVER per K-Ducer MODBUS map. Decrease by 1 for 0-indexing.
read_input_register	UDInt	104	104 = MB function code 04 = read input register
screwdriving_state_address	UDInt	137	modbus input register address 138 = screwdriving state per K-Ducer MODBUS map. Decrease by 1 for 0-indexing.
screwdriving_state_tightening	Word	16#000B	(hex)000B = 11 = tightening. Refer to K-Ducer MODBUS map.

Name	Data type	Default value	Comment
length_1	UInt	1	

Network 1:

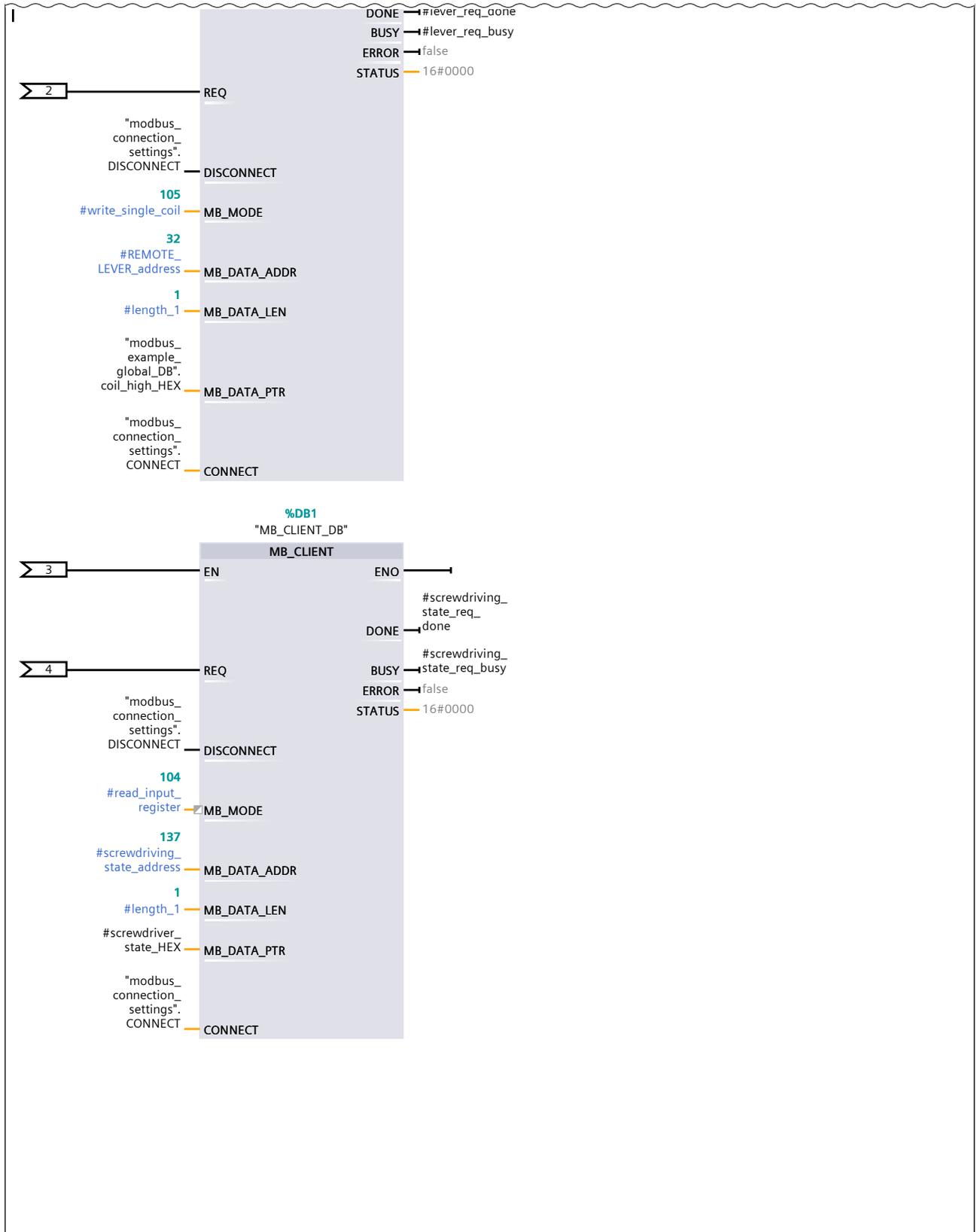
Writes REMOTE_LEVER coil every 100ms while screwdriving state = 11 (tightening, refer to K-Ducer MODBUS map).
Checks and updates screwdriving state every 500ms.

Network 1: (1.1 / 2.1)



Network 1: (2.1 / 2.1)

1.1 (Page1 - 3)



modbus_example_Step7-1200 / SMN_PLC [CPU 1212C AC/DC/Rly] / Program blocks

FB_get_closing_torque_and_angle [FB2]

FB_get_closing_torque_and_angle Properties

General

Name	FB_get_closing_torque_and_angle	Number	2	Type	FB
Language	LAD	Numbering	Automatic		

Information

Title		Author		Comment	Sends MODBUS request to read torque and angle input registers. Each register is 2-span. As register addresses are adjacent, they can be obtained with a single MODBUS request spanning 4 registers. Refer to K-Ducer MODBUS map for details.
Family		Version	0.1	User-defined ID	

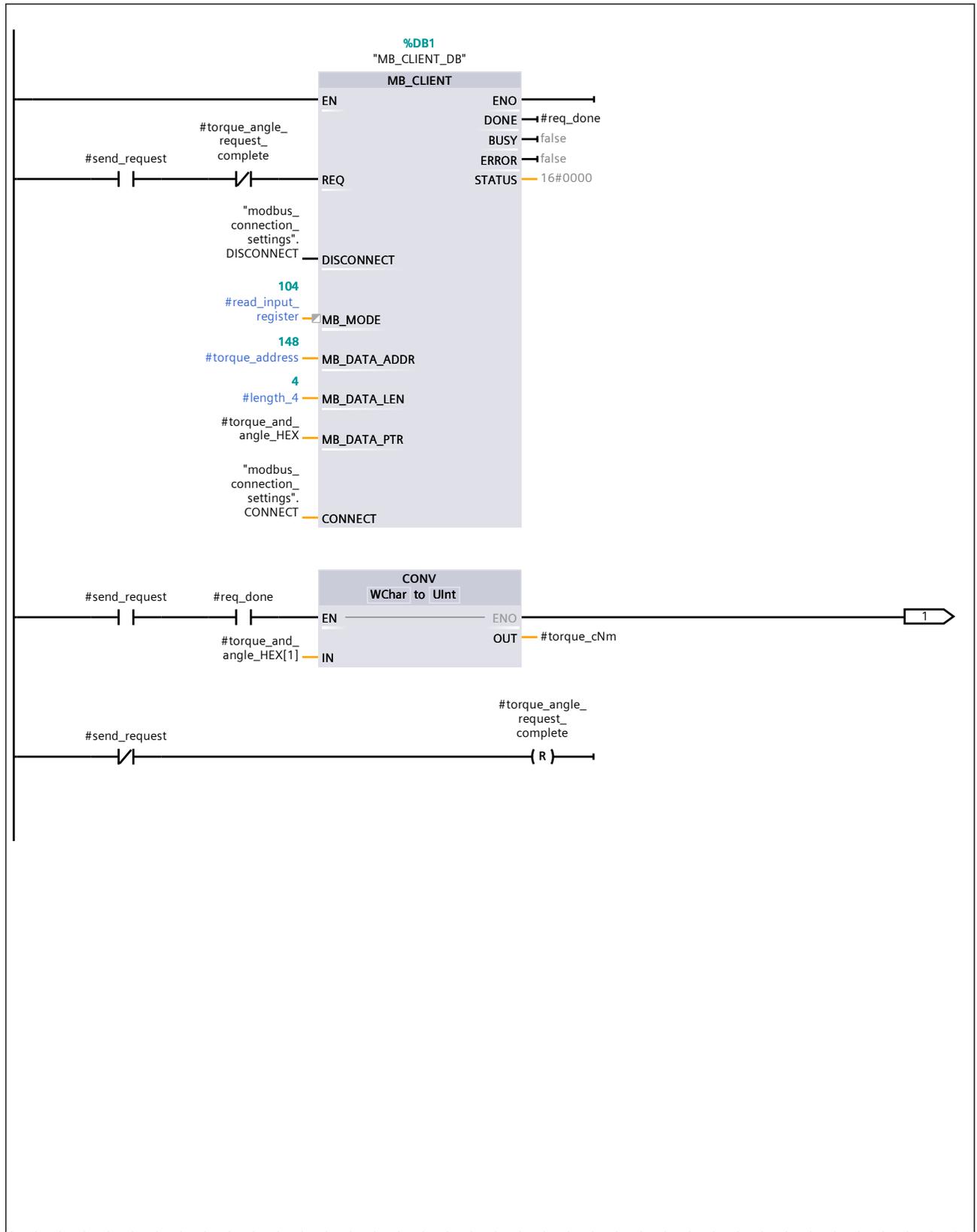
FB_get_closing_torque_and_angle

Name	Data type	Default value	Comment
▼ Input			
send_request	Bool	false	
▼ Output			
torque_cNm	UInt	0	torque in centi-Newton-meter
angle_deg	UInt	0	angle in degrees
torque_angle_request_complete	Bool	false	
InOut			
▼ Static			
▼ torque_and_angle_HEX	Array[0..3] of Word		[1] will contain torque in cNm, [3] will contain angle in degrees
torque_and_angle_HEX[0]	Word	16#0	[1] will contain torque in cNm, [3] will contain angle in degrees
torque_and_angle_HEX[1]	Word	16#0	[1] will contain torque in cNm, [3] will contain angle in degrees
torque_and_angle_HEX[2]	Word	16#0	[1] will contain torque in cNm, [3] will contain angle in degrees
torque_and_angle_HEX[3]	Word	16#0	[1] will contain torque in cNm, [3] will contain angle in degrees
req_done	Bool	false	
Temp			
▼ Constant			
read_input_register	UDInt	104	104 = MB function code 04 = read input register
torque_address	UDInt	148	modbus input register address 149 = screwdriving state per K-Ducer MODBUS map. Decrease by 1 for 0-indexing.

Name	Data type	Default value	Comment
angle_address	UDInt	150	modbus input register address 151 = screwdriving state per K-Ducer MODBUS map. Decrease by 1 for 0-indexing.
length_4	UInt	4	because torque (2-span) and angle (2-span) registers are adjacent, we can obtain them in a single request of length 4

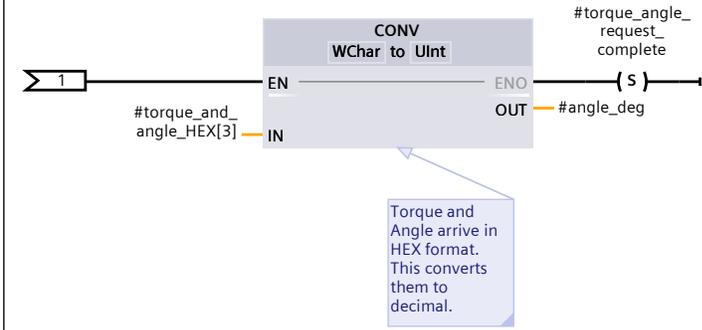
Network 1:

Network 1: (1.1 / 2.1)



Network 1: (2.1 / 2.1)

1.1 (Page1 - 3)



modbus_example_Step7-1200 / SMN_PLC [CPU 1212C AC/DC/Rly] / Program blocks

FB_set_next_program [FB3]

FB_set_next_program Properties

General

Name	FB_set_next_program	Number	3	Type	FB
Language	LAD	Numbering	Automatic		

Information

Title		Author		Comment	Sends MODBUS request to change current selected program. Refer to K-Ducer MODBUS map for details.
Family		Version	0.1	User-defined ID	

FB_set_next_program

Name	Data type	Default value	Comment
▼ Input			
send_request	Bool	false	
▼ Output			
program_change_request_complete	Bool	false	
InOut			
▼ Static			
req_done	Bool	false	
▼ Temp			
program_number_internal	Word		
▼ Constant			
write_holding_register	UDInt	106	106 = MB function code 06 = write holding register
currentprogram_address	UDInt	7372	modbus holding register address 7373 = current program per K-Ducer MODBUS map. Decrease by 1 for 0-indexing.
length_1	UInt	1	

Network 1:

