

Single point to double point and double point to single point information

Single point to double point information

For this example of changing single point information to double point information 2 protocols are being used. For single point signals - Modbus RTU master and results are going to be returned as double point information to IEC 60870-5-104 slave protocol. Firstly, configuration for Devices sheet should look something like this:

name	description	device_alias	enable	protocol	id	device	baudrate	databits	stopbits	parity	flowcontrol	scan_rate_mns	poll_retry_count	timeout_ms	serial_delay	mode	host	port	asdu_size	cot_size	ioa_size	rtt	svrt	t1	t2	t3	time_sync	sp_time	dp_time	me_time	message_size	cache_size
Modbus_device	modbus	Modbus	1	Modbus RTU		PORT2	9600	8	1	none	none	300	3	10000	50	rtu	192.168.1.221	2404	2	2	3	8	12	15	10	20	1	1	1	1	249	100
SCADA_device	SCADA	SCADA_104	1	IEC 60870-5-104 slave																												

Device field should indicate which physical port is used in WCC Lite for Modbus protocol. Host field should be IP address of computer from which monitoring is happening. Other parameters should be specified according to protocol specifications or solution needed.

Signals tab should look similar to this:

signal_name	device_alias	signal_alias	source_device_alias	source_signal_alias	enable	source_math_expression	absolute_threshold	log	job_todo	tag_job_todo	number_type	common_address	info_address	gi	data_type
signal1	Modbus	signal1			1		1		1,3,1,1	3,1,1	SIGNED16				
signal2	Modbus	signal2			1		1		1,3,2,1	3,2,1	SIGNED16				
double	SCADA_104	double	Modbus	Modbus	1	2*TagValue("tag/Modbus/signal1/out")+TagValue("tag/Modbus/signal2/out")		1				1	1	1	31

For source device alias and source signal alias there should be 2 names specified and separated with space. That way IEC104 protocol will take information from both of these signals. Single point information is changed to double point information via source math expression. In this case if signal1 and signal2 are both have values of 0, result will also be 0. If both of these values are 1 result will be 3. If signal1 value is 1 and signal2 value is 0 result will be 2, if reversed - 1.

To test this case, VINCI simulation program and VINCI Expert could be used. Connect VINCI Expert with WCC Lite PORT2 and with computer via USB cable. Then open one VINCI program window and select IEC104 master, make sure all setting match Excel configuration. On another VINCI window select Modbus RTU slave and VINCI Expert port (usually the lowest possible). Upload Excel configuration to WCC Lite, run both simulations and make sure both protocols are connected. On Modbus slave tab create 2 tags with matching settings (function, data type etc.). Change tag values accordingly and observe the results on the web and IEC104 master tab:

IMPORTED SIGNALS						
Device	Signal	Value	Units	State	Attributes	Time
Modbus_device	signal1	1				2023-06-08 10:15:46.33
Modbus_device	signal2	1				2023-06-08 10:15:46.44
SCADA_device	double	3				2023-06-08 10:15:46.44

07:31:34:904	192.168.1.1:2404	RSN:0 SSN:115	M_DP_TB_1 (31)	Spontan (3)	1	1	Indeterminate3[3]	2023-6-8 7:29:34:...	68 15 E6 00 00 00 1F 01 03 00 01 00 01 00 00 03 11 86 9D 07 88 06 17
07:31:41:591	Vinci	RSN:116						68 04 01 00 E8 00	
07:31:45:630	Vinci	Test Frame activ...						68 04 43 00 00 00	
07:31:45:631	192.168.1.1:2404	Test Frame confir...						68 04 83 00 00 00	

IMPORTED SIGNALS						
Device	Signal	Value	Units	State	Attributes	Time
Modbus_device	signal1	0				2023-06-08 10:17:45.83
Modbus_device	signal2	1				2023-06-08 10:15:46.44
SCADA_device	double	1				2023-06-08 10:17:45.83

07:33:01:047	192.168.1.1:2404	RSN:0 SSN:116	M_DP_TB_1 (31)	Spontan (3)	1	1	Off[1]	2023-6-8 7:31:04:...	68 15 E8 00 00 00 1F 01 03 00 01 00 01 00 00 01 AE 01 9F 07 88 06 17
07:33:05:351	Vinci	Test Frame activ...						68 04 43 00 00 00	
07:33:05:351	192.168.1.1:2404	Test Frame confir...						68 04 83 00 00 00	

IMPORTED SIGNALS						
Device	Signal	Value	Units	State	Attributes	Time
Modbus_device	signal1	1				2023-06-08 10:18:17.73
Modbus_device	signal2	0				2023-06-08 10:18:12.41
SCADA_device	double	2				2023-06-08 10:18:17.73

07:33:37:059	192.168.1.1:2404	RSN:0 SSN:118	M_DP_TB_1 (31)	Spontan (3)	1	1	0x02	2023-6-8 7:31:36...	68 15 EC 00 00 00 1F 01 03 00 01 00 01 00 00 02 6E 8E 9F 07 88 06 17
07:33:43:683	Vinci	RSN:119							68 04 01 00 EE 00
07:33:45:709	Vinci	Test Frame activ...							68 04 43 00 00 00

IMPORTED SIGNALS						
Device	Signal	Value	Units	State	Attributes	Time
Modbus_device	signal1	0				2023-06-08 10:18:44.24
Modbus_device	signal2	0				2023-06-08 10:18:12.41
SCADA_device	double	0				2023-06-08 10:18:44.24

07:34:05:880	Vinci	Test Frame activ...							68 04 43 00 00 00
07:34:05:881	192.168.1.1:2404	Test Frame confir...							68 04 83 00 00 00
07:34:14:464	192.168.1.1:2404	RSN:0 SSN:119	M_DP_TB_1 (31)	Spontan (3)	1	1	Indeterminate[0]	2023-6-8 7:32:13...	68 15 EE 00 00 00 1F 01 03 00 01 00 01 00 00 00 3B 36 A0 07 88 06 17

Double point to single point information

To change double point information to single point Devices sheet and protocols to be used will be the same as earlier. Signals sheet should look similar to this:

signal_name	device_alias	signal_alias	source_device_alias	source_signal_alias	enable	absolute_threshold	log	job_todo	tag_job_todo	number_type	common_address	info_address	gl	data_type
signal	Modbus	signal			1	1	1	1;1;2	1;1;2	SIGNED8				
single	SCADA_104	single	Modbus	signal	1	1	1				1	1	1	31

In this case Modbus master reads 2 information units at once. To simulate this case connect WCC Lite and VINCI Expert analogously to the first example, protocol connections on VINCI app should also stay the same. For this test, Modbus tags will be:

▼ Tag

Name:

Type:

Slave: Address:

Value

Lookup values:

Use

Value	Custom value
False	
True	

Tag

Name:

Type:

Slave: Address:

Value

Lookup values:

Use

Value	Custom value
False	
True	

If Value box is checked, it means that this value is 1. Change tag values accordingly and observe the results on the web and IEC104 master tab:

IMPORTED SIGNALS						
Device	Signal	Value	Units	State	Attributes	Time
<input type="text"/>						
Modbus_device	signal	0			type=dp	2023-06-08 10:58:57.47
SCADA_device	single	0			type=dp	2023-06-08 10:58:57.47

08:00:57:403	192.168.1.1:2404	Test Frame confir...				68 04 83 00 00 00			
08:00:58:051	192.168.1.1:2404	RSN:0 SSN:5	M_DP_TB_1 (31)	Spontan (3)	1	1	Indeterminate(0)	2023-6-8 7:58:57:...	68 15 0A 00 00 00 1F 01 03 00 01 00 01 00 00 00 7D E0 BA 07 88 06 17
08:01:04:466	Vinc	RSN:6					68 04 01 00 0C 00		

IMPORTED SIGNALS						
Device	Signal	Value	Units	State	Attributes	Time
<input type="text"/>						
Modbus_device	signal	1			type=dp	2023-06-08 10:59:55.66
SCADA_device	single	1			type=dp	2023-06-08 10:59:55.66

08:01:55.628	192.168.1.1:2404	RSN:0 SSN:8	M_DP_TB_1 (31)	Spontan (3)	1	1	Off(1)	2023-6-8 7:59:55...	68 15 10 00 00 00 1F 01 03 00 01 00 01 00 00 01 1A D7 BB 07 88 06 17
08:01:55.879	Vinci	RSN:9							68 04 01 00 12 00
08:01:56.889	Vinci	Test Frame activ...							68 04 43 00 00 00

IMPORTED SIGNALS

Device	Signal	Value	Units	State	Attributes	Time
<input type="text"/>						
Modbus_device	signal	2			type=dp	2023-06-08 11:01:04.45
SCADA_device	single	2			type=dp	2023-06-08 11:01:04.45

08:03:05.028	192.168.1.1:2404	RSN:0 SSN:10	M_DP_TB_1 (31)	Spontan (3)	1	1	On(2)	2023-6-8 8:1:44...	68 15 14 00 00 00 1F 01 03 00 01 00 01 00 00 02 5F 11 81 08 88 06 17
08:03:11.504	Vinci	RSN:11							68 04 01 00 16 00
08:03:16.539	Vinci	Test Frame activ...							68 04 43 00 00 00

IMPORTED SIGNALS

Device	Signal	Value	Units	State	Attributes	Time
<input type="text"/>						
Modbus_device	signal	3			type=dp	2023-06-08 11:01:39.41
SCADA_device	single	3			type=dp	2023-06-08 11:01:39.41

08:03:36.698	192.168.1.1:2404	Test Frame confir...							68 04 83 00 00 00
08:03:39.968	192.168.1.1:2404	RSN:0 SSN:11	M_DP_TB_1 (31)	Spontan (3)	1	1	Indeterminate(3)	2023-6-8 8:1:39.4...	68 15 16 00 00 00 1F 01 03 00 01 00 01 00 00 03 EF 99 81 08 88 06 17
08:03:49.812	Vinci	RSN:12							68 04 01 00 18 00

Configurations:

Double point to single point --> [Download](#)

Single point to double point --> [Download](#)

🔄Revision #7

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