

Selecting specific bit as data (using bit_select)

Description

Some devices send single-point data (0 and 1) in one register. To access the individual bits of the register you need to use the optional parameter - **bit_select** parameter in the excel configuration. You can read about other optional parameters in the **manual section 18**. In short, you need to add one more column in the signals sheet with the name **bit_select**, and in the signals, you use to specify which **bit** is assigned to the specific signal, starting from 0 to 15 if the register is 16 bits, if we need 2 registers, then from 0 to 32 and so on. In this example, we will explain how to read states from the Fanox fault protection relay.

Configuration

The Fanox relay is communicating via Modbus, the address of the register is 500 using function 3 and the size of the register is 32 bits. So in the **job_todo** field, we enter **3;500;2** because we need to read 2 registers. The number type is SIGNED32.

Below is the data that is written in the register as bits.

Address	Description	Bit	Event NO	Status	Associated Measurement	Format
500	General	00	1	Trip	Imax (A)	BIT32
		01	2	External Trip	-	
		02	6	No Trip Power	-	
		03	7	50 Hz	-	
		04	8	Trip Block Enable	-	
		05	16	Measure Error	-	
		06	17	Ready	1: Vaux power 2: Self-powering 4: USB power	
		07	19	Settings Changed	-	
		08	21	Set Date/Time	-	
		09	22	Local Activity	-	
		10	23	Factory Settings	-	
		11	24	EEPROM Error	-	
		12	28	EEPROM Changed	-	
		13	32	Events Error	-	
		15	15	Reset	-	
		16	49	Pickup	Imax (A)	
		17	50	Phase A Pickup	IA (A)	
		18	51	Phase B Pickup	IB (A)	
		19	52	Phase C Pickup	IC (A)	
		20	53	Neutral Pickup	IN (A)	
		21	54	Phase A Trip	IA (A)	
		22	55	Phase B Trip	IB (A)	
		23	56	Phase C Trip	IC (A)	
		24	57	Neutral Trip	IN (A)	
		25	58	50 Trip	-	
		26	59	50G Trip	-	

To read this data as signals we need to assign each of the bits from 0 to 26 to the created signals. All of the signals have the same **job_todo**, **tag_job_todo**, and **number_type**. But each signal has a specific bit. Below you can see the configuration of these signals.

signal_name	device_alias	signal_alias	enable	tag_type	job_todo	tag_job_todo	number_type	bit_select
Trip	fanox	F_1	1	Normal	3,500,2	3,500,2	SIGNED32	0
External Trip	fanox	F_2	1	Normal	3,500,2	3,500,2	SIGNED32	1
No Trip Power	fanox	F_3	1	Normal	3,500,2	3,500,2	SIGNED32	2
50 Hz	fanox	F_4	1	Normal	3,500,2	3,500,2	SIGNED32	3
Trip Block Enable	fanox	F_5	1	Normal	3,500,2	3,500,2	SIGNED32	4
Measure Error	fanox	F_6	1	Normal	3,500,2	3,500,2	SIGNED32	5
Ready	fanox	F_7	1	Normal	3,500,2	3,500,2	SIGNED32	6
Settings Changed	fanox	F_8	1	Normal	3,500,2	3,500,2	SIGNED32	7
Set Date/Time	fanox	F_9	1	Normal	3,500,2	3,500,2	SIGNED32	8
Local Activity	fanox	F_10	1	Normal	3,500,2	3,500,2	SIGNED32	9
Factory Settings	fanox	F_11	1	Normal	3,500,2	3,500,2	SIGNED32	10
EEPROM Error	fanox	F_12	1	Normal	3,500,2	3,500,2	SIGNED32	11
EEPROM Changed	fanox	F_13	1	Normal	3,500,2	3,500,2	SIGNED32	12
Events Error	fanox	F_14	1	Normal	3,500,2	3,500,2	SIGNED32	13
Reset	fanox	F_15	1	Normal	3,500,2	3,500,2	SIGNED32	15
Pickup	fanox	F_16	1	Normal	3,500,2	3,500,2	SIGNED32	16
Phase A Pickup	fanox	F_17	1	Normal	3,500,2	3,500,2	SIGNED32	17
Phase B Pickup	fanox	F_18	1	Normal	3,500,2	3,500,2	SIGNED32	18
Phase C Pickup	fanox	F_19	1	Normal	3,500,2	3,500,2	SIGNED32	19
Neutral Pickup	fanox	F_20	1	Normal	3,500,2	3,500,2	SIGNED32	20
Phase A Trip	fanox	F_21	1	Normal	3,500,2	3,500,2	SIGNED32	21
Phase B Trip	fanox	F_22	1	Normal	3,500,2	3,500,2	SIGNED32	22
Phase C Trip	fanox	F_23	1	Normal	3,500,2	3,500,2	SIGNED32	23
Neutral Trip	fanox	F_24	1	Normal	3,500,2	3,500,2	SIGNED32	24
50 Trip	fanox	F_25	1	Normal	3,500,2	3,500,2	SIGNED32	25
50G Trip	fanox	F_26	1	Normal	3,500,2	3,500,2	SIGNED32	26

This example only displays how to read bit states via modbus, if you are using any other protocol you will need other parameters to read the data, but **bit_select** parameter will stay.

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