

Modbus Exoline variables

TOPVEX SX/TX 03-06, SR/TR 03-06

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1. Introduction

Signal types	All signals that are accessible from a SCADA system are described further in this document. The signals that have a default value are settings that can be changed from SCADA, the signals without default values is actual values and they can <u>not</u> be changed from SCADA.
Address	The address of the controller is always as default PLA=254 and ELA=30. To change this address so it correspond to the address that is configured in EXOcontroller use EXOdesigner.
EXOL Type	The EXOL type of the signals: R = Real (-3.3E38 - 3.3E38) I = Integer (-32768 - 32767) X = Index (0 - 255) L = Logic (0/1)
Modbus Type	The Modbus type of the signals (type in the list below): 1 = Coil Status (Modbus function = 1, 5 and 15) 2 = Input Status (Modbus function = 2) 3 = Holding Register (Modbus function = 3, 6 and 16) 4 = Input Register (Modbus function = 4) Supported Modbus functions: 1 = Read Coils 2 = Read Discrete Input 3 = Read Holding Register 4 = Read Input Register 5 = Write Single Coil 6 = Write Single Register 15 = Write Muntiple Coils 16 = Write Multiple Registers
Max 47 register	Max 47 register can be read in one message
Communication limits	The modbus master must wait for a minimum of 3.5 charactertimes (4ms at 9600 bps) between two messages. When the modbus master communicate with more than one controller on the same communication line (RS485), the modbus master must wait for a minimum of 14 charactertimes (16ms at 9600bps) between the answer and the first question for the next controller.

In the controller there is a limit of 10 fast communications in every half minute, the other communications will have a delayed answer of approximately 1 second.

Modbus addresses



In the variable list below the column "**Modbus address**" shows the register addresses.

Please observe that the Modbus register number = Modbus register address + 1.

2. Variables

2.1. Input Status

Signal name	Type	Modbus address	Modbus Scale factor	Default value	Description
TimePro.TimeGroupUnit	L,2	1	*	*	Unit (Off,On)
QDig.DI1	L,2	2	*	*	Fan alarm (On,Off <i>Inverted</i>)
QDig.DI2	L,2	3	*	*	Overheat. (Off,On)
QDig.DI3	L,2	4	*	*	Timer/push (Off,On)
QDig.DI4	L,2	5	*	*	AlarmExchanger (Off,On)
QDig.DI5	L,2	6	*	*	Fire alarm (Off,On)
QDig.DQ1	L,2	7	*	*	Fanspeed Low (Off,On)
QDig.DQ2	L,2	8	*	*	Fanspeed Medium (Off,On)
QDig.DQ3	L,2	9	*	*	Fanspeed High (Off,On)
QDig.DQ4	L,2	10	*	*	Exchanger (Off,On)
QDig.DQ5	L,2	11	*	*	Sum Alarm (Off,On)
AlaPts.FilterAlarm	L,2	50	*	*	<i>Alarm</i> "Filter change"
AlaPts.AlarmFanMotor	L,2	51	*	*	<i>Alarm</i> "Alarm fan motor"
AlaPts.Overheat	L,2	52	*	*	<i>Alarm</i> "Overheat electric"
AlaPts.ExchangerRotatingAlarm	L,2	53	*	*	<i>Alarm</i> "Alarm exchanger."
AlaPts.AlarmFrostProt	L,2	54	*	*	<i>Alarm</i> "Frost protection"
AlaPts.FireAlarm	L,2	55	*	*	<i>Alarm</i> "Fire alarm"
	L,2	56	*	*	<i>Not used</i>
AlaPts.SensorAlarm_SupplyTemp	L,2	57	*	*	<i>Alarm</i> "Sensor error Supply."
AlaPts.SensorAlarm_ExhaustTemp	L,2	58	*	*	<i>Alarm</i> "Sensor error exhaust"
AlaPts.SensorAlarm_FrostTemp	L,2	59	*	*	<i>Alarm</i> "Sensor error frost"
AlaPts.SensorAlarm_OutDoorTemp	L,2	60	*	*	<i>Alarm</i> "Sensor error outtemp."
AlaPts.InternalBatteryError	L,2	61	*	*	<i>Alarm</i> "Internal battery error"

2.2. Coil Status

Signal name	Type	Modbus address	Modbus Scale factor	Default value	Description
Vpac1.TimeExtension	L,1	1	*	0	Activates time extension
Vpac1.FilterAlarmReset	L,1	2	*	0	Reset the filter alarm counter time
StdObjs1.FireAlarmActive	L,1	3	*	0	Activates the fire alarm function
StdObjs1.AktiveFanFire	L,1	4	*	0	Fan speed if fire alarm Shut off, High
Vpac1.NightCool_Enable	L,1	5	*	0	Activates nightcooling

2.3. Input Registers

Signal name	Type	Modbus address	Modbus Scale factor	Default value	Description
StdObjs1.Ai1_SupplyTemp_Output	R,4	1	10	*	The scaled and filtered value of AI1 (<i>Supply temperature</i>)
StdObjs1.Ai2_ExhaustAirTemp_Output	R,4	2	10	*	The scaled and filtered value of AI2 (<i>Exhaust temperature</i>)
StdObjs1.Ai3_FrostProtectionTemp_Output	R,4	3	10	*	The scaled and filtered value of AI3 (<i>Frost protection temperature</i>)
StdObjs1.Ai4_OutDoorTemp_Output	R,4	4	10	*	The scaled and filtered value of AI4 (<i>Outdoor temperature</i>)
QAnaln.AI1	R,4	5	10	*	Value of AI1
QAnaln.AI2	R,4	6	10	*	Value of AI2
QAnaln.AI3	R,4	7	10	*	Value of AI3
QAnaln.AI4	R,4	8	10	*	Value of AI4
StdObjs1.Ao1_Heating_OutPut	R,4	9	10	*	Heating output
StdObjs1.Ao2_Cooling_OutPut	R,4	10	10	*	Cooling output
StdObjs1.Ao3_RotatingSpeed_OutPut	R,4	11	10	*	Fan speed output (%)
QAnaOut.AQ1	R,4	12	10	*	Value of AO1 (0-10V)
QAnaOut.AQ2	R,4	13	10	*	Value of AO2 (0-10V)
QAnaOut.AQ3	R,4	14	10	*	Value of AO3 (0-10V)
QAnaOut.AQ4	R,4	15	10	*	Value of AO4 (0-10V)
QAnaOut.AQ5	R,4	16	10	*	Value of AO5 (0-10V)

AlaData.FilterAlarm_Status	X,4	50	*	*	AlarmStatus "Filter change" Alarm no: 1
AlaData.AlarmFanMotor_Status	X,4	51	*	*	AlarmStatus "Alarm fan motor" Alarm no: 2
AlaData.Overheat_Status	X,4	52	*	*	AlarmStatus "Overheat electric" Alarm no: 3
AlaData. ExchangerRotatingAlarm_Status	X,4	53	*	*	AlarmStatus "Alarm exchanger." Alarm no: 4
AlaData.AlarmFrostProt_Status	X,4	54	*	*	Alarm "Frost protection" Alarm no: 5
AlaData.FireAlarm_Status	X,4	55	*	*	AlarmStatus "Fire alarm" Alarm no: 6
		56	*	*	NOT USED
AlaData. SensorAlarm_SupplyTemp_Status	X,4	57	*	*	Alarm Status "Sensor error Supply" Alarm no: 8
AlaData. SensorAlarm_ExhaustTemp_Status	X,4	58	*	*	AlarmStatus "Sensor error exhaust" Alarm no: 9
AlaData. SensorAlarm_FrostTemp_Status	X,4	59	*	*	AlarmStatus "Sensor error frost" Alarm no: 10
AlaData. SensorAlarm_OutDoorTemp_Status	X,4	60	*	*	AlarmStatus "Sensor error outtemp." Alarm no: 11
AlaData.InternalBatteryError_Status	X,4	61	*	*	AlarmStatus "Internal battery error" Alarm no: 12

2.4. Holding Registers

Signal name	Type	Modbus address	Modbus Scale factor	Default value	Description
Vpac1. UnitType	X,3	1	*	0	0 = TopVex-R AC 1 = TopVex-R 2 = TopVex-X 3 = TopVex-C
Vpac1.Unitmode	X,3	2	*	4	0 = Manual off 1 = Manual Low 2 = Manual medium 3 = Manual high 4 = Auto
Vpac1.Regulation	X,3	3	*	0	0 = Supply 1 = Supply & outcomp. 2 = Exhaust
Vpac1.UnitOffLow	X,3	4	*	1	Fanspeed if unit is off: 0 = Shut off 1 = Low

Vpac1.FanSpeedChoice	X,3	5	*	1	Fanspeed if unit is on: 0 = Low 1 = Medium 2 = High
Vpac1.FilterAlarmModBus	X,3	6	*	6	Time until filter alarm activates(1-15 month)
Vpac1.SupplyTempModBus	X,3	7	*	18	Supply air temp setpoint (5-30°C)
Vpac1.Cooling	X,3	8	*	0	Activates Cooling: 0 = Not Active 1 = Active
Vpac1.CoolRecycling	X,3	9	*	0	Activates Coolrecycling: 0 = Not Active 1 = Active
Vpac1.HeatBatteryType	X,3	10	*	0	Type of heater: 0 = Electric heating 1 = Water heating
StdObjs1.Do4_ Exchanger_ Select	X,3	11	*	2	0 = Off 1 = On 2 = Auto
StdObjs1.Ao1_Heating_ Select	X,3	12	*	2	0 = Off 1 = Manual 2 = Auto
StdObjs1.Ao2_ Cooling_ Select	X,3	13	*	2	0 = Off 1 = Manual 2 = Auto
StdObjs1. Ao3_ RotatingSpeed_ Select	X,3	14	*	2	0 = Off 1 = Manual 2 = Auto
Vpac1.Ao1_ ManInput	R,3	15	10	0	Manual output heating (V)
Vpac1.Ao2_ ManInput	R,3	16	10	0	Manual output cooling (V)
Vpac1.Ao3_ ManInput	R,3	17	10	0	Manual output Rotating fan speed (V)
Vpac1.FanSpeed_ HighsetP	R,3	18	1	100	High fan speed control set point in %
Vpac1.FanSpeed_ MediumSetP	R,3	19	1	75	Medium fan speed control set point in %
Vpac1.FanSpeed_ LowsetP	R,3	20	1	35	Low fan speed control set point in %
Vpac1.SetPoint_ M20	R,3	21	1	20	Outdoor temp.comp. At -20
Vpac1.SetPoint_ M15	R,3	22	1	0	Outdoor temp.comp. At +15
Vpac1.MinSupplyTemp	R,3	23	1	12	Supply setpoint Min
Vpac1.MaxSupplyTemp	R,3	24	1	30	Supply setpoint Max
Vpac1.Unit_ Pgain	R,3	25	1	30	Control parameter
Vpac1.Unit_ Itime	R,3	26	1	100	Control parameter
Vpac1.Unit_ Cascade_ PGain	R,3	27	1	10	Cascade Control parameter
Vpac1.Unit_ cascade_ ITime	R,3	28	1	100	Cascade Control parameter
Vpac1.TimeExtensionSetPoint	R,3	29	1	180	Extended running time
Not used	R,3	30	1	0	Not used

Vpac1.FanSpeedChoice_Forced	X,3	31	*	1	Fanspeed forced running 0=Low,1=Medium,2=High
Vpac1.NightCool_OutdoorDay	R,3	32	1	10	Outdoor temp. activation
Vpac1.NightCool_OutdoorHighNight	R,3	33	1	10	Outdoor temp. Night high
Vpac1.NightCool_OutdoorLowNight	R,3	34	1	10	Outdoor temp. Night low
Vpac1.NightCool_RoomLimit	R,3	35	1	10	Room temp min.
StdObjs1. Ao4_RotatingSpeedEAF_Select	X,3	36	*	2	0 = Off 1 = Manual 2 = Auto
StdObjs1.Ao5_Bypass_Select	X,3	37	*	2	0 = Off 1 = Manual 2 = Auto
Alarms.AlaAcknow	X,3	150	*	255	External alarm acknowledge by setting this signal to the alarm number that should be acknowledge.
Alarms.AlaBlock	X,3	151	*	255	External alarm blocking by setting this signal to the alarm number that should be blocked.
Alarms.AlaUnBlock	X,3	152	*	255	External alarm unblocking by setting this signal to the alarm number that should be unblocked.

2.5. Holding Registers Time Settings

Signal name	Type	Modbus address	Modbus Scale factor	Default value	Description
TimeDp.Posts(0).T1	R,3	50	100	7	Start time period 1 Monday (h)
TimeDp.Posts(0).T2	R,3	51	100	16	Stop time period 1 Monday (m)
TimeDp.Posts(0).T3	R,3	52	100	0	Start time period 2 Monday
TimeDp.Posts(0).T4	R,3	53	100	0	Stop time period 2 Monday
TimeDp.Posts(1).T1	R,3	54	100	7	Start time period 1 Tuesday
TimeDp.Posts(1).T2	R,3	55	100	16	Stop time period 1 Tuesday
TimeDp.Posts(1).T3	R,3	56	100	0	Start time period 2 Tuesday
TimeDp.Posts(1).T4	R,3	57	100	0	Stop time period 2 Tuesday
TimeDp.Posts(2).T1	R,3	58	100	7	Start time period 1 Wednesday
TimeDp.Posts(2).T2	R,3	59	100	16	Stop time period 1 Wednesday
TimeDp.Posts(2).T3	R,3	60	100	0	Start time period 2 Wednesday
TimeDp.Posts(2).T4	R,3	61	100	0	Stop time period 2 Wednesday
TimeDp.Posts(3).T1	R,3	62	100	7	Start time period 1 Thursday
TimeDp.Posts(3).T2	R,3	63	100	16	Stop time period 1 Thursday

TimeDp.Posts(3).T3	R,3	64	100	0	Start time period 2 Thursday
TimeDp.Posts(3).T4	R,3	65	100	0	Stop time period 2 Thursday
TimeDp.Posts(4).T1	R,3	66	100	7	Start time period 1 Friday
TimeDp.Posts(4).T2	R,3	67	100	16	Stop time period 1 Friday
TimeDp.Posts(4).T3	R,3	68	100	0	Start time period 2 Friday
TimeDp.Posts(4).T4	R,3	69	100	0	Stop time period 2 Friday
TimeDp.Posts(5).T1	R,3	70	100	7	Start time period 1 Saturday
TimeDp.Posts(5).T2	R,3	71	100	16	Stop time period 1 Saturday
TimeDp.Posts(5).T3	R,3	72	100	0	Start time period 2 Saturday
TimeDp.Posts(5).T4	R,3	73	100	0	Stop time period 2 Saturday
TimeDp.Posts(6).T1	R,3	74	100	7	Start time period 1 Sunday
TimeDp.Posts(6).T2	R,3	75	100	16	Stop time period 1 Sunday
TimeDp.Posts(6).T3	R,3	76	100	0	Start time period 2 Sunday
TimeDp.Posts(6).T4	R,3	77	100	0	Stop time period 2 Sunday