Signal Exchange List

Fuel Gas Analyser

Revision status

Revision	Date	Prepared	Checked	Approved
Rev. 03	01.03.2022	ALI	PJE	MBA
Rev. 04	12.04.2022	ALI	PJE	TESA

Document history

Revision	Reason for issue
Rev. 03	Revision table is added
Rev. 04	Modbus map revised

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Important

Before using the equipment, read all instructions thoroughly and follow all precautions and warnings contained within this document. Improper use may cause personal injury and/or damage to the equipment and may void the warranty. Norsk Analyse disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

Initial Settings

The PLC har two network interfaces; X1 and X2.
X1 is configurable by client.
X2 is for internal use for the system.

IP settings:		
Client network	PLC X1:	Configurable by client
FGA network	PLC X2:	192.168.1.55
FGA network	Analyser module:	192.168.1.50

FTP Server:	
Port:	21
User:	
Password:	

Modbus Slave:	
Port:	502
Modbus function code support:	FC: 3, 6 & 16

RS-485	
Device ID	33
Baudrate	9600
Databits	8
Parity	Even
Stop bits	1
Flow control	none

Modbus Map

IP: Configurable (X1) Customer network
IP2: 192.168.1.50 (X2) FGA network
Port: 502
Zerobased addressing

	Register	Datatype	Size[register]	Unit	Comments:
Software version	900	REAL	2		Optional for information only , Example value "1.2"
Software version, Major	902	INT	1		Optional for information only, Example value "1"
Software version, Minor	903	INT	1		Optional for information only, Example valu "2"
Measurement					
MeasureCounter	1000	UINT32	2		Analyser sample Counter
Invalid measurement	1002	INT	1		Value > 0 = Active alarm/warning on system or operated outside specification
Methane	1003	REAL	2	%	
Ethane	1005	REAL	2	%	
Propane	1007	REAL	2	%	
Butane	1009	REAL	2	%	
Isobutane	1011	REAL	2	%	
C5 total	1013	REAL	2	%	
CO2	1015	REAL	2	%	
Nitrogen	1017	REAL	2	%	
Gas Density , STP	1050	REAL	2	Kg/Nm3	STP => 0 degC , 1.013 BarAbs.
Gas Density, NTP	1052	REAL	2	Kg/Nm3	NTP => 20degC , 1.013BarAbs.
Gas Lower heat value	1054	REAL	2	MJ/Kg	
Gas higher heat value	1056	REAL	2	MJ/Kg	
Methane noumber	1058	REAL	2		
Alarms & Warnings					
Active Alarm(s)	2000	INT	1		Value > 0 = Active Alarm(s)
`- Alarm Tripped Fuse ECB 4 channel	2001	BOOL	1		1= Active Alarm
`- Alarm Tripped Fuse ECB 8 channel	2002	BOOL	1		1= Active Alarm
Healthcheck Alarm Code #1	2003	WORD	1		
Alarm Tripped Fuse ECB 4 Channel	2003.0	BOOL	1 BIT		
Alarm Tripped Fuse ECB 8 Channel	2003.1	BOOL	1 BIT		
Alarm High ExdBox Temperature	2003.2	BOOL	1 BIT		
Alarm CommunicationFault Tunable	2003.3	BOOL	1 BIT		
MotorProtectionActivated	2003.4	BOOL	1 BIT		
MotorHeatProtectionActivated	2003.5	BOOL	1 BIT		
....	2003.x				
Healthcheck Alarm Code #2	2004				
....	2004.0				
Active warning(s)	2100	INT	1		Value > 0 = Active Warning(s)
- Warning OP switch invalid value	2101	BOOL	1		1 = Active Warning
Healthcheck Warning Code #1	2102	WORD	1		
Wirebreak Pressure SampleIn	2102.0	BOOL	1 BIT		
Wirebreak PressureBeforeAnalyser	2102.1	BOOL	1 BIT		
Wirebreak PressureAfterAnalyser	2102.2	BOOL	1 BIT		
Wirebreak PressureSampleReturnLine	2102.3	BOOL	1 BIT		
Wirebreak PressureSampleFlow	2102.4	BOOL	1 BIT		
Wirebreak Tempsensor ExdBox	2102.5	BOOL	1 BIT		
Wirebreak Tempsensor Heater	2102.6	BOOL	1 BIT		
...	2102.x				
Healthcheck Warning Code #2	2103	WORD			
...	2104.0				
Active Maintenance Request(s)	2150	INT	1		Value > 0 = Active Maintenance Request(s)
- Maintenenace Request ZERO verification failed	2151	BOOL	1		1 = Active Maintenence request
- Maintenenace Request SPAN verification failed	2152	BOOL	1		1 = Active Maintenence request
- Maintenenace Request ZERO calibration > 1 month old	2153	BOOL	1		1 = Active Maintenence request
- Maintenenace Request SPAN calibration > 1 year old	2154	BOOL	1		1 = Active Maintenence request
Healthcheck Maintenance Request Code #1	2155				
Maintenenace Request ZERO verification failed	2155.0				
Maintenenace Request SPAN verification failed	2155.1				
Maintenenace Request ZERO calibration > 1 month old	2155.2				
Maintenenace Request SPAN calibration > 1 year old	2155.3				
...	2155.x				
Healthcheck Maintenance Request Code #2	2156				
...	2156.x				
Diagnostics					
Alive	2200	INT	1		Counter 0-100. Updates every 1 second
Sample flow	2201	REAL	2	Nl/hr	
Analyser_AbsTransmission	2300	UINT	1	%	
Analyser_RelTransmission	2301	UINT	1	%	
Analyser Sampe pressure	2303	REAL	2	BarAbs	
Analyser Sample temperature	2305	REAL	2	Deg C	
Measurement Flag	2350	INT32	2		* See decode table
System state	2352	INT	1		* See decode table
LED state	2353	INT	1		* See decode table
Minutes left to next autocal	2354	INT	1		Minutes left to autocal procedure is started. Value "-1" means autocatic verification is
Commands from client					
Start Zero validation/calibration	32000	INT	1		Value > 0 = Start validation/calibration
SPACEHOLDER: Start Span validation	32001	INT	1		Not implemented. Reserved for future use
Zero Validation Adjust enable	32002	INT	1		Value > 0 = Enabled
SPAN Validation Adjust enable	32003	INT	1		Value > 0 = Enabled
Reset tripped fuses	32004	INT	1		Value > 0 = Resets all 24V fuses.
Info from client					
Engine Running	32100	INT	1		Value > 0 = Engine running => System starts measure
Tank pressure	32101	REAL	2		Max pressure = 4.5 BarG. Above this system will not start measure

Decode Tables

Measurement flags	
Bit 0	Data ready
Bit 1	Fabry Perot filter temperature high
Bit 2	Fabry Perot filter temperature low
Bit 3	Sample gas temperature high
Bit 4	Sample gas temperature low
Bit 5	Sample gas pressure high
Bit 6	Sample gas pressure low

System state	
Value = 0	Idle
Value = 1	Measuring
Value = 2	Zero calibrating/verification running
Value = 3	Span calibrating/Verification running

LED state	
Value = 0 , Lamp status fixed OFF	System OFF
Value = 100 , Lamp status fixed ON	Normal operation
Value = 1, Lamp status blink 1 Hz	Maintenance/validation in progress
Value = 3, Lamp status blink 3 Hz	Active Alarm/warning

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