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FAFNIR DVRC-2 Protocol

Version 1.01

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History

Version	Modifications	Name	Date
1.00	First Draft	Maurer	07/14/03
1.01	New IDs	Maurer	14.08.04

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1 Hardware interface for the site controller

RS485 (2-wire)

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2 Communication format

2.1 Communication parameters

Mode:	Halfduplex
Baudrate:	9600bps
Databits:	8
Stopbits:	1
Parity:	none

VAPORIX-Control:

Minimum Response time (start of reply):	20ms
Maximum Response time (start of reply):	1s
Maximum delay between Characters:	30ms

Master:

Required delay between reply and next command:	> 1ms
Allowed delay between the characters:	< 2s

2.2 Message format

The ASCII based communication protocol works on the master slave principle. The VAPORIX Control can handle one command at a time. It means that the site controller has to wait for the VAPORIX Controls reply before sending the next command. No leading 0's are send or required.

2.2.1 Format of read and write command

The read command (sent by the site controler) consists of the letter 'R' (case sensitive) and the write command consists of the letter 'W', the serial number of one Control (sn), a side indicator (si), a variable identifier and a checksum, each seperated by semicolons. The command is concluded by carriage return and line feed.

R ; *sn* ; *si* ; *id* ; *cs cr lf*

sn : Serial number of VAPORIX-Control. The value range is '0' to '999999'

si : side indicator:
'A' = side A of VAPORIX-Control
'B' = side B of VAPORIX-Control
'C' = data independent of the side

id : Identifier of the desired variable. See chapter 3.

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cs : Checksum. MOD255 + 1 of the sum of the previous command letters including the last semicolon.

cr : Carriage Return, ASCII 13_{Dec}.

lf : Line Feed, ASCII 10_{Dec}.

2.2.2 *Reply Format*

The reply of the VAPORIX Control consists of the letter 'r' (read) or 'w' (write), a copy of the received command parameters and the contents of the variable. No leading 0's are send.

r ; *sn* ; *si* ; *id* ; *v* ; *cs cr lf*

sn : serial number of the answering control unit.

si : side indicator.

id : variable identifier.

v : Contents of the variable. See chapter 3.

cs : Checksum. MOD255 + 1 of the sum of the previous command letters including the last semicolon.

cr : Carriage Return, ASCII 13_{Dec}.

lf : Line Feed, ASCII 10_{Dec}.

2.2.3 *Error messages*

If one VAPORIX Control cannot reply to a read command it answers with an error message. For reply the leading letter, seriel number, format and checksum must fit.

e ; *sn* ; *si* ; *ec* ; *cs cr lf*

e : Letter 'e' indicates an error message.

sn : serial number

si : side indicator

ec : Error code.

1 - unknown ID
2 - unable to execute command (e.g. range exhausted, 'si' wrong)
3 - variable is not available at this point of configuration (e.g. ID1007 and pulse rate is not configured)

cs : Checksum. MOD255 + 1 of the sum of the previous command letters including the last semicolon.

cr : Carriage Return, ASCII 13_{Dec}.

lf : Line Feed, ASCII 10_{Dec}.

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3 Variables

3.1 Systemwide variables

3.1.1 ID 101 - Version of communication protocol (read only)

Range:	1 to 9999
Side:	C
Resolution:	0.01
Unit:	None
Description:	Version of this communication protocoll. For example 100 would mean version 1.00.

3.1.2 ID 102 - Version of VAPORIX Control Hardware (read only)

Range:	1 to 65535
Side:	C
Resolution:	0.01
Unit:	None
Description:	Version of VAPORIX Control Hardware. For example 7 would mean version 0.07.

3.1.3 ID 103 - Version of VAPORIX Control Firmware (read only)

Range:	1 to 65535
Side:	C
Resolution:	0.01
Unit:	None
Description:	Version of VAPORIX Control Firmware. For example 202 would mean version 2.02.

3.1.4 ID 104 – Country code (read only)

Range:	1 to 99999
Side:	C
Unit:	None
Description:	Defines which country specific vapor recovery laws and regulations are currently used by the VAPORIX Control at the fueling point. The

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country code is the international dialling code. This variable indicates which country specific variables are available. At this protocol version only Germany has regulations for vapor recovery monitoring.

3.1.5 ID 106 – pulse inputs (read and write, stored in flash)

Range:	0 to 255 0: not activated 1: 33.3/liter 2: 50/liter 3: 100/liter 4: 132/liter 5: 200/liter 255: unknown free: for future use, all numbers selectable
Side:	C
Resolution:	1

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3.2 Fueling point specific variables

3.2.1 ID 108 – Status of VAPORIX Control (read only)

Range: 0 to 65535

Side: A/B/C

Resolution: 1

Unit: None

Description: If Side C is adressed, status for both sides (first A , then B) are send with a blank in between. The value of these status variable represents two bytes with the status bits 0 to 15:

Bit	Description	Bit = 0	Bit = 1
LSB 0	VAPORIX Flow	Ok	VAPORIX Flow not available. Possibly not/wrong connected or defect. Automatic Reset when the problem is solved.
1	Fueling point asignment	Ok	VAPORIX Control detects fuel and vapor flow at different sides of the dispenser. Possibly something is permuted in the vapor recovery system or in the wiring of the monitoring system. Automatic Reset when the problem is solved.
2	Battery low	Ok	Clock backup battery warning
3	Battery low low	Ok	Clock backup battery alarm. If bit 2 and 3 = 1 are set, battery is empty and VAPORIX-Control has to be exchanged.
4	VAPORIX Control selftest	Ok	Internal error. Take of power from VAPORIX-Control for a few seconds. If no improvement, exchange VAPORIX-Control.
5	VAPORIX Flow detects liquid	No liquid	Liquid comes back. Messured gasflows may be too high. Automatic reset after the liquid is evaporated.
6	Reserved		
7	maintenance mode activated	Operation mode	A dongle has activated the maintenance mode.
8...15	Reserved for future options	–	–

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3.2.2 ID 109 – Test functions (read only)

Range: 0 to 12

Side: C

Resolution: 1

Unit: None

Description: Position of the Dongle turn switch. The VAPORIX Control offers different test functions for the maintenance on site. These functions can be used by the superior system, but it is also possible that the superior system has an own service interface to perform test procedures. Answers 0...9 are the real positions of the turn switch with 10 positions, 10...12 additional signals.

0: Maintenance mode activated

1: Simulate that 10 consecutive errors or more have been detected for side A.

11: Simulate timeout of 72h timer for side A.

2: Simulate that 10 consecutive errors or more have been detected for side B.

12: Simulate timeout of 72h timer for side B.

3: Temporary unlock of a fueling point A (if turned off) for troubleshooting.

4: Temporary unlock of a fueling point B (if turned off) for troubleshooting.

5: Unlock of fueling point A after defect repaired. This function will reset all turn off related components of fueling point A.

6: Unlock of fueling point B after defect repaired. This function will reset all turn off related components of fueling point B.

7: Turn switch is in position 7

8: Turn switch is in position 8

9: Turn switch is in position 9 -> Dongle unlog (operation mode selected), it stays 9 until maintanace mode is activated

10: Dongle has been removed without unlogging (operation mode selected) , it stays 10 until maintanace mode is activated

3.2.3 ID 110 – Date and Time (read and write, stored in flash)

Range:	0 ... 991231, 0 ... 2359
Dimension:	Datum, Uhrzeit
Resolution:	1
Side:	C
Description:	Date and time are transmitted as two numbers, seperated by a semicolon.
	The first number represents the date consisting of two digits for the year, two for the month and two for the day, without leading zeros.
	Example: 103 = 03.01.2000 or 130417 = 17.04.2013
	The second number represents the time.
	Example: 7 = 00:07 or 1422 = 14:22

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3.3 Country specific variables

3.3.1 ID 1000 – Switch Off Timer (read only)

Range:	0 ... 65535
Unit:	Minutes
Resolution:	1
Side:	A/B
Beschreibung:	This number shows the remaining time until the pump is switched off. If there is no failure the transmitted value is 65535. When a failure is detected, the value changes to 4320 (72 hours) and counts down to zero every minute. When zero is reached, the fueling point has to be switched of. The only way to make a Reset is to use the VAPORIX-Dongle.

3.3.3 ID 1003 – VRC-Rate of the last evaluable filling (read only)

Range:	0 ... 200
Unit:	%
Resolution:	1
Side:	A/B
Description:	The Vapor Recovery Rate of the last evaluable filling. The value is updated with every new evaluable filling.

3.3.4 ID 1007 – mean fuelflow of the last evaluable filling (read only)

Range:	0 ... 99
Unit:	Liter/Minute
Resolution:	1
Side:	A/B

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3.4 History

3.4.1 ID 1200 – Fillinghistory, oldest entry (read only in maintenance mode)

Range: 0 .. 991231, 0 .. 2359, 0 .. 99, 0 .. 99, -99 .. 99, 0 .. 200

Unit: Date, Time, l/min (fuel), l/min (gas), °C (gas), VRC (%)

Resolution: 1

Side: A/B

Description: Delivers the oldest entry of the filling history. The numbers represent date, time, the mean fuelflow, the mean vaporflow, the mean temperature of the vapor, the vapor recovery rate, seperated by semicolons.

3.4.2 ID 1201 – Fillinghistory, previous entry (read only in maintenance mode)

Description: Delivers the next younger entry in the filling history.

3.4.3 ID 1202 – Fillinghistory, next entry (read only in maintenance mode)

Description: Delivers the next older entry in the filling history.

3.4.4 ID 1203 – Fillinghistory, newest entry (read only in maintenance mode)

Description: Delivers the newest entry of the filling history.

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