S8 device communication protocol

with TMR (DDD read) technology

Technical Documentation

1.01

14.07.2016

Attention!

[TMR technology is supported now as S8.5 devices check albatross.com.pl site for details]

Tachograph Memory Reading (TMR) Device

Tachograph Memory Reading (TMR) is upgradable add on module similar to CAN module, which supports reading of tachograph memory. Three types of memory files are possible to read: main tachograph memory form specified range of time, driver card in slot and driver card in slot 2. Every combination of these memories can be readed in one session resulting in up to 3 files uploaded to the server. All dedicated command are described at the end of this chapter. Tachograph file downloading session is a multiphase process, and should be described using a log file from real session.

Log file contain some prefixes added by the server software like **29.10.2014 11:25:13 >>:** containing current date and direction (<<:, >>:) of data flow. They are left in examples for reference and general example of timings of the whole session. Al examples are from one and the same session.

Note: TMR session can be terminated at any time using TACHOREQ command without parameters.

1. TACHOREQ command issue.

First step is issue of TACHOREQ command. User should decide which files are requested for download. To download main tachograph file start and end time should be issued (Unix time stamp format). Leaving one of these fields empty or 0 means no download of main tachograph file. To download driver card files we must only set proper parameter to 1. See TACHOREQ command description. Example below starts session with only tachograph file download. Then command is confirmed and TACHOSTATUS report is send.

29.10.2014 11:25:36 >>:$ST+TACHOREQ+5=0000,1404165600,1409522400,0,0,0

29.10.2014 11:25:37 <<:$OK:TACHOREQ+5

29.10.2014 11:25:40 <<:$QR:TACHOSTATUS+5=11,00

2. Authorization using enterprise card

After successful submission of TACHOREQ command authorization process begins. Card reader must be connected to the computer where the TACHOREQ command was issued. Enterprise card must be inserted to the reader. Server and S8 with TMR device will exchange tachograph authorization data numerous times. S8 device will first read data from TMR and send asynchronous TACHODATA packet (See TACHODATA command description). Server should send received data to card reader and read back answer data. Readed data should be transferred do S8 device using similar TACHODATA command. Please note than first

parameter of TACHODATA is packet sequence number for current section. It is crucial for the server to send back answer with THE SAME seq number. Data field in TACHODATA is in ASCII hex format. During authorization data exchange standard telemetry frames can be transferred and other non TMR related command can be issued. After authorization process complete TACHOSTATUS asynchronous report is send. Here is presented full data log from example authorization process.

29.10.2014 11:25:41 <<:$QR:TACHODATA+5=1,0100A4020C020002

29.10.2014 11:25:43 <<:1041000001,20141029100225,F7,20.936964,52.150997,0,0,20,0,26003,2,32769,0,04.19, 23.57,01.15,01.11,0,,0,,0,,,,,,,,,,,,0000,,,,,0,,,,,,,,,,,,,,,,,,,46,9F90

29.10.2014 11:25:44 >>:\xfb\xf9

29.10.2014 11:25:57 >>:$ST+TACHODATA+5=0000,1,9000

29.10.2014 11:25:58 <<:$OK:TACHODATA+5

29.10.2014 11:25:59 <<:$QR:TACHODATA+5=2,0000B0000009

29.10.2014 11:26:00 >>:$ST+TACHODATA+5=0000,2,0006180C0D061490899000

29.10.2014 11:26:01 <<:$OK:TACHODATA+5

29.10.2014 11:26:02 <<:$QR:TACHODATA+5=3,0000A4040C06FF544143484F

29.10.2014 11:26:02 >>:$ST+TACHODATA+5=0000,3,9000

29.10.2014 11:26:03 <<:$OK:TACHODATA+5

29.10.2014 11:26:03 <<:$QR:TACHODATA+5=4,0000A4020C020501

29.10.2014 11:26:04 >>:$ST+TACHODATA+5=0000,4,9000

29.10.2014 11:26:04 <<:$OK:TACHODATA+5

29.10.2014 11:26:05 <<:$QR:TACHODATA+5=5,0000B0000001

29.10.2014 11:26:06 >>:$ST+TACHODATA+5=0000,5,049000

29.10.2014 11:26:07 <<:$OK:TACHODATA+5

29.10.2014 11:26:08 <<:$QR:TACHODATA+5=6,000022C1B60A83080310F64C0612FFA1

29.10.2014 11:26:09 >>:$ST+TACHODATA+5=0000,6,9000

29.10.2014 11:26:10 <<:$OK:TACHODATA+5

29.10.2014 11:26:11 <<:$QR:TACHODATA+5=7,00008800001074A3C9C5E691F2070310F64C0612FFA180

29.10.2014 11:26:13 >>:$ST+TACHODATA+5=0000,7,60ED5939381548AF472F21D28D90B32770F9080F6 E385B20F34FD2A8D3DA7310805D670661FC8D7EE86A4C28CC80BB5BE1B47379DEF27D2D3 0E33FD590BF82806A1E361C4BBA1CDF92CE9FCC7B13399FCC4D4FCA81D29E4D7E0D062FA

9C230183DEB2C476DB7CCD9C7C4DDA64BEA037EAF11F3CCD1C3A041697ADFA176E5E2F39
000

29.10.2014 11:26:13
<<:1041000001,20141029100255,F7,20.936964,52.150997,0,0,20,0,26003,2,32769,0,04.19,
23.60,01.15,01.11,0,,0,,0,,,,,,,,,,,,0000,,,,,0,,,,,,,,,,,,,,,,,,,,,47,D399

29.10.2014 11:26:13 >>:\xfb\xf9

29.10.2014 11:26:13 <<:$OK:TACHODATA+5

29.10.2014 11:26:16 <<:$QR:TACHODATA+5=8,000084000008

29.10.2014 11:26:17 >>:$ST+TACHODATA+5=0000,8,37BB10DDD73873029000

29.10.2014 11:26:19 <<:$OK:TACHODATA+5

29.10.2014 11:26:21
<<:$QR:TACHODATA+5=9,000082000080090BE350D2D414815E3B31EC112477139CAC6261
84BC77494BC0CCAEE6E03D0F08401A2CDC4DB07FD0F5C8C5E25C8E7FEEA2E71092456EC09
A97A65B505BD0A57FF3F4B5CC10E7847F5080EBAA0E9594521CA68CA12A30E87989A4F130
6C301735CB1FC875683F2D233DA14016950286FBEA2E2A3736973BC2031F5BFC453A2B

29.10.2014 11:26:22 >>:$ST+TACHODATA+5=0000,9,9000

29.10.2014 11:26:23 <<:$OK:TACHODATA+5

29.10.2014 11:26:24 <<:$QR:TACHODATA+5=10,0000A4020C020501

29.10.2014 11:26:25 >>:$ST+TACHODATA+5=0000,10,9000

29.10.2014 11:26:25 <<:$OK:TACHODATA+5

29.10.2014 11:26:27 <<:$QR:TACHODATA+5=11,000CB00000099701018E04BA2D285300

29.10.2014 11:26:29 >>:$ST+TACHODATA+5=0000,11,8101048E045D2F11B09000

29.10.2014 11:26:30 <<:$OK:TACHODATA+5

29.10.2014 11:26:30 <<:$QR:TACHODATA+5=12,0000A4020C020520

29.10.2014 11:26:30 >>:$ST+TACHODATA+5=0000,12,9000

29.10.2014 11:26:31 <<:$OK:TACHODATA+5

29.10.2014 11:26:31 <<:$QR:TACHODATA+5=13,000CB000000997018B8E04AAF2ABFE00

29.10.2014
11:26:33 >>:$ST+TACHODATA+5=0000,13,81818B283435323631373737373030313030313030
0150575057205732E412E202020202020202020202020202020202020202020202020202053
979C0053979C005CFEEEFF01464F524D554C4120202020202020202020202020202020202020
20202020202020202020200130312D36303320576172737A61777612020202020202020202020
20202020202020202020706C8E04341437929000

29.10.2014 11:26:34 <<:$OK:TACHODATA+5

29.10.2014 11:26:37 <<:$QR:TACHOSTATUS+5=0A,00

3. Authorization via TachoCardAuthorizer

Application enables remote authorization of Requests for reading files from tachograph by using TMR technology. It uses the Service on intermediate server which should provide API described further in dedicated document. During authorization process a smart card (called company card) is used to authenticate APDU packets downloaded from the tachograph through the intermediate server.

After the application is started, it places its icon in the system tray. This icon is used for showing notifications to user. In addition, by clicking on it with right mouse button, the user can access application's context menu which provides management options.

The application requires Java Runtime Environment (version 1.7.0 or above) to be installed on the user's machine (download is available free of charge from website https://www.java.com/en/download/).

The application communicates with the server by using HTTP/HTTPS protocol for data transfer and JSON as default data format (unless there is said otherwise in a particular request's description).

[Please request dedicated document with integration description of TachoCardAuthorizer]

4. Internal file transfer

After successful authorization TMR device will transfer requested files from tachograph to internal TMR memory. This process can take long time – typically 1 minute for 10-20kB of data. During internal file transfer card reader can be disconnected from client computer and telemetry data and commands can be transferred. The S8 device can send some asynchronous TACHOSTATUS reports during this process.

5. File transfer to server

After internal file transfer complete the S8 will start sending TACHOFILE packets containing following parts of requested files. Packets contain up to 256 bytes of raw binary data directly readed from TMR device. Packets should be confirmed like standard telemetry packets by sending binary 0xFB 0xF9 answer to S8 device. Lack of TACHOFILE packet confirmation cause packet retransmission. During tachograph file transfer transmission of standard telemetry packets is SUSPENDED and will continue after completion or termination

the whole transfer. During file transfer communication commands can be issued (like TACHOSTATUS in example log below)

29.10.2014 11:38:58 <<:$QR:TACHOSTATUS+5=00,01

29.10.2014 11:39:02 <<:$QR:TACHOFILE+5=<binary data>

29.10.2014 11:39:02 >>:\xfb\xf9

29.10.2014 11:39:02 <<:$QR:TACHOFILE+5=<binary data>

29.10.2014 11:39:02 >>:\xfb\xf9

29.10.2014 11:39:04 >>:$al+tachostatus=0000,?

29.10.2014 11:39:04 <<:$QR:TACHOSTATUS=00,01

29.10.2014 11:39:05 <<:$QR:TACHOFILE+5=

29.10.2014 11:39:05 >>:\xfb\xf9

...

<multiple TACHOFILE frames and confirmations>

...

29.10.2014 11:57:24 <<:$QR:TACHOFILE+5=<binary data>

29.10.2014 11:57:24 >>:\xfb\xf9

29.10.2014 11:57:26 <<:$QR:TACHOFILE+5=<binary data>

29.10.2014 11:57:26 >>:\xfb\xf9

29.10.2014 11:57:32 <<:$QR:TACHOREQ+5=M_20141029_1039_WZ 1234A _VIN TACHOREADER.DDD,,,

29.10.2014 11:57:33
<<:1041000001,20141029101555,F7,20.936964,52.150997,0,0,20,0,26003,2,32769,0,04.19,23.60,01.15,01.15,0,,0,,0,,,,,,,,,,,,0000,,,,,0,,,,,,,,,,,,,,,,,,,,73,DF27

29.10.2014 11:57:33 >>:\xfb\xf9

File transfer is finished with asynchronous QR:TACHOREQ report containing names of files currently send. Only fields representing currently requested files are not blank. First field is the name of main tachograph file, second is driver card in slot 1, third is driver card in slot 2. The last fourth field is intentionally empty for future purposes. After completion of file transfer process S8 will continue sending telemetry frames.

TACHOREQ

Command	TACHOREQ
Description	This command provides possibility to start or terminate tachograph file transfer session
Command Syntax	$AL+TACHOREQ+[TAG]=[Password],[timeBegin],[timeEnd],[readDrvSlot1],[readDrvSlot2],[readExtSlot]
Abort command syntax	$AL+TACHOREQ+[TAG]=[Password]

Field Description	TAG	Command specific TAG number. If present unit answer must contain the same TAG number. (Max. 5 characters)
	Password	Unit current password. (Max. 4 characters)
	timeBegin	Start date of tahograph file in Linux Time Stamp format
	timeEnd	End date of tahograph file in Linux Time Stamp format
	readDrvSlot1	0 or 1 – optional reading of driver card 1 slot
	readDrvSlot2	0 or 1 – optional reading of driver card 2 slot
	readExtSlot	0 or 1 – optional reading of external card slot (not supported yet)

Example	$AL+TACHOREQ=0000,1406332800,1406764799,0,1,0 $OK:TACHOREQ
Example (abort command)	$AL+TACHOREQ=0000 $OK:TACHOREQ
Error Answer	$ER:TACHOREQ+[TAG]=[ErrorCode]

TACHOSTATUS

Command	TACHOSTATUS	
Description	This command provides possibility to query TMR device status.	
Query Syntax	$AL+TACHOSTATUS+[TAG]=[Password],?	
Answer Syntax	$QR:TACHOSTATUS+[TAG]=[S1],[S2]	
Field Description	TAG	Command specific TAG number. If present unit answer must contain the same TAG number. (Max. 5 characters)
	Password	Unit current password. (Max. 4 characters)
	S1	First byte of TMR status
	S2	Second byte of TMR status
Example Query	Query: $AL+TACHOSTATUS=0000,? Answer: $QR:TACHOSTATUS=0A,00	
Error Answer	$ER:TACHOSTATUS+[TAG]=[ErrorCode]	

TACHOVER

Command	TACHOVER	
Description	This command provides possibility to query TMR device software version	
Query Syntax	$AL+TACHOVER+[TAG]=[Password],?	
Answer Syntax	$QR:TACHOVER+[TAG]=[Version string]	
Field Description	TAG	Command specific TAG number. If present unit answer must contain the same TAG number. (Max. 5 characters)
	Password	Unit current password. (Max. 4 characters)
	Version string	TMR version string
Example Query	Query: $AL+TACHOVER=0000,? Answer: $QR:TACHOVER=1.1.14.0	
Error Answer	$ER:TACHOVER+[TAG]=[ErrorCode]	

TACHODATA

Command	TACHODATA
Description	This command provides possibility to respond to authorization data from

	TMR device	
Comamnd Syntax	$AL+TACHODATA+[TAG]=[Password],[packet_number],[data]	
Answer Syntax	$QK:TACHODATA+[TAG]	
Field Description	TAG	Command specific TAG number. If present unit answer must contain the same TAG number. (Max. 5 characters)
	Password	Unit current password. (Max. 4 characters)
	packet_number	Packet number to which we want to send response
	data	Date to send in ASCII hex format (up to 220 bytes of raw data)
Example	Command: $AL+TACHODATA=0000,3,FABC340000F4 Answer: $OK:TACHODATA	
Error Answer	$ER:TACHODATA+[TAG]=[ErrorCode]	