

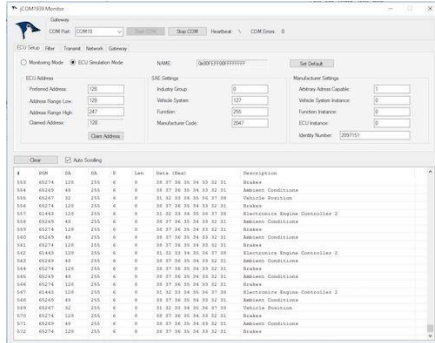
JCOM1939 Monitor Pro/Pro-X

Windows Software to Monitor, Record, Analyze, and Simulate SAE J1939 Data Traffic

Table of Content

Table of Content.....	2
Introduction.....	3
Features (Pro, Pro-X)	3
Extended Features (Pro-X Only)	3
SAE J1939 Gateways	4
Main Screen.....	5
Switching the CAN Baud Rate.....	6
Data Display	6
Special Case: Transport Protocol (TP).....	7
ECU Setup.....	7
Filter Messages.....	8
Transmit Messages.....	8
Display Options	9
Transmitting PGNs Using a Frequency	9
Transmitting PGNs Upon Request	10
Setting Up a Request Message	10
Transmitting Messages Longer Than 8 Bytes (TP – Transport Protocol)	11
Data Recorder	11
Extensions.....	12
Network Scanner	13
Gateway Modus	14
Gateway Hardware and Firmware Version.....	14
Byte & Bit Editing Mode.....	14
Byte Data Editing – Simulation of Analog Signals.....	14
Bit Data Editing – Simulation of Digital Signals	15
JCOM1939 Monitor Pro-X – Extensions & Modifications	16
PGN Filters – Assigning a Sample Frequency	16
Gateway Recorder – J1939 Data Recording Programming	17
Data Record Retrieval	18

Introduction



The JCOM1939 Monitor Software is the perfect tool to monitor, record, analyze, and simulate SAE J1939 data traffic. The system works in combination with our SAE J1939 gateways.

This comprehensive and easy-to-use, easy-to-understand Windows software displays not only SAE J1939 data traffic; it also allows to scan the network, simulate an ECU (incl. full node address negotiation features), and respond to data request messages.

The communication protocol between the gateway and the host system (PC, Embedded System, Android System, etc.) is well documented, and we provide C/C# source code to read and write CAN data frames.

Features (Pro, Pro-X)

- FREE download
- ECU Simulation Setup (Preferred Node Address, Negotiable Address Range, NAME, and more)
- Filter J1939 PGNs for Display
- Design J1939 PGNs for Transmission (Data and Request Messages)
- Design J1939 PGNs for Request Responses
- Simulate Digital and Analog Signals
- Scan a J1939 Network (Number of Nodes, Node IDs, NAMES)
- Record SAE J1939 Data Traffic
- Simulate SAE J1939 Data Traffic
- Check Gateway Status (Error Messages, Software/Hardware Version)
- Set Gateway Parameters (Heartbeat Frequency, Message Acknowledgment)
- Free Updates

Extended Features (Pro-X Only)

- SAE J1939 Data Display and Recording Includes Timestamp
- PGN Filter Setup Includes a Sample Frequency
- SAE J1939 Data Recording to Micro SD Card Independent from PC Connection
- Recorded SAE J1939 Data Transfer to PC - In Preparation

The extended features are explained in chapter [JCOM1939 Monitor Pro-X – Extensions & Modifications](#).

The JCOM1939 Monitor software versions work directly with the following SAE J1939 gateways:

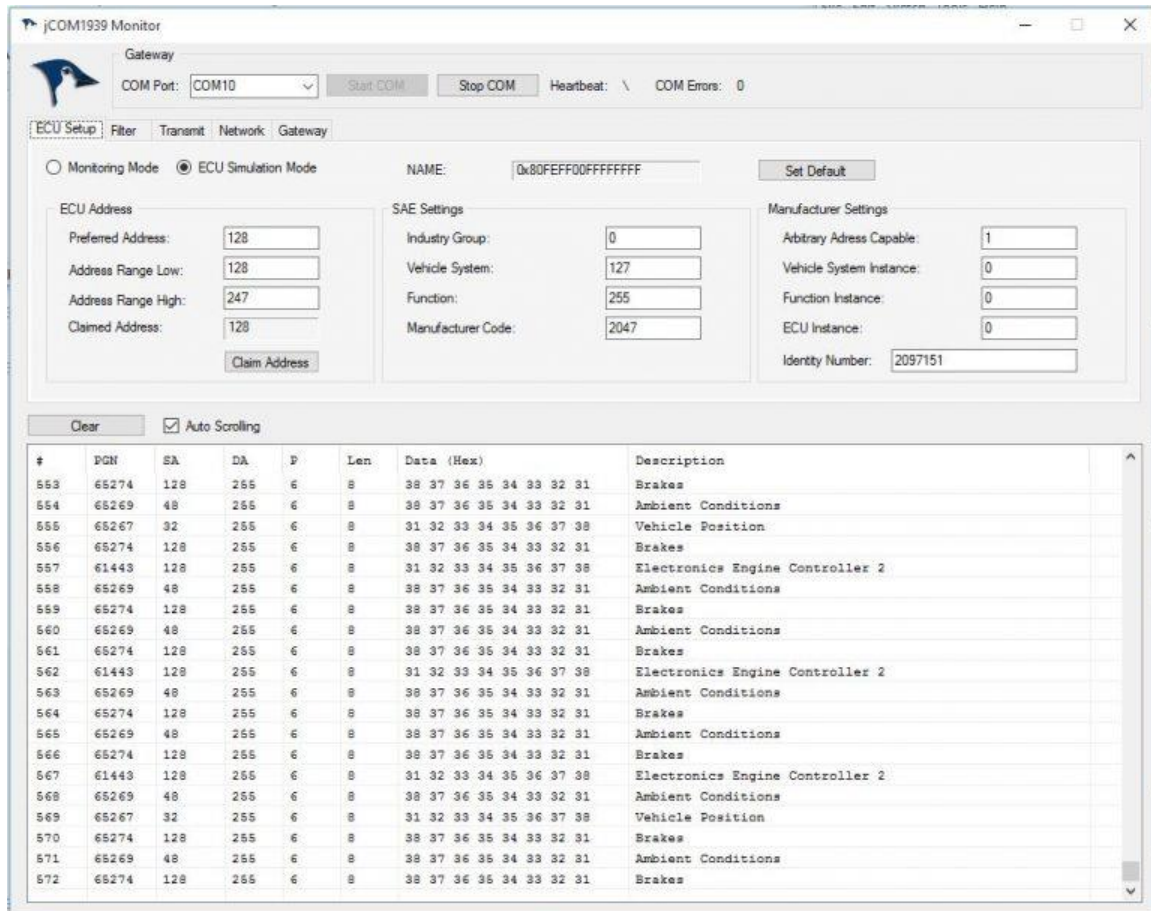
JCOM1939 Monitor Pro

- SAE J1939 ECU Simulator Board with USB Port
- JCOM.J1939 Starter Kit and Network Simulator
- SAE J1939 to Bluetooth Gateway with 9-Pin Deutsch Connection Cable
- SAE J1939 to RS232 & USB Gateway with 9-Pin Deutsch Connection Cable

JCOM1939 Monitor Pro-X

- SAE J1939 Gateway Module with USB Port, RTC, MicroSD Memory Card
- SAE J1939 Gateway and Data Logger with Real-Time Clock

Main Screen



When you run the Windows software for the first time, you need to first select the COM port that relates to the J1939 Gateway. In the *Windows Device Manager* look for and select “Ports (COM & LPT)”. If the driver was installed successfully, you will see “Silicon Labs CP210x USB to UART Bridge” followed by the COM port associated with it. This is the port you must select in the Windows software. Should the software not show that particular COM port, please try again after rebooting the computer.

Also, it is mandatory that the simulator hardware is connected to a J1939 network. The simulator cannot send or monitor any data without being connected to a network.

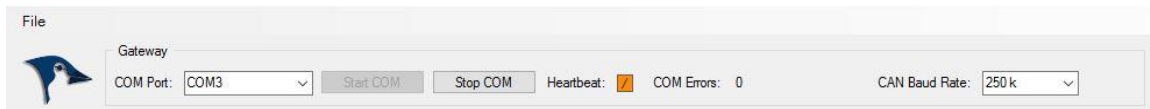
The jCOM1939 Monitor software for Windows contains three main areas:

1. On top, you will find the COM port section where you select the port number associated with your USB port. Click on *Start COM* to initiate the connection to the J1939 gateway. When the connection is made, you will see the Heartbeat bar changing in a one-second interval. If the heartbeat does not change, please check that you have selected the correct COM port number and that you have a connection with the gateway. If this does not help, try with re-booting your computer.

2. The next section is divided through several tabs such as ECU Setup, Filter, Transmit, Network, and Gateway. They are explained in the following chapters.
3. The bottom section shows the SAE J1939 data as it is received or transmitted through the gateway.

In general, you can save the complete current setup to a file or load an existing file by using the File menu items.

Switching the CAN Baud Rate



The JCOM1939 Monitor program allows the switching of the CAN baud rate between 250k and 500k.

Use the selector in the top right-hand corner of the screen to select the baud rate. The default is 250k.

Please be aware that switching the baud rate requires the program to switch to mere monitoring mode (in case you already acquired a node address).

Data Display

As you can gather from the previous image, the program lists all received PGNs according to the PGN filter settings. The displayed information includes:

- PGN Index
- PGN
- Source Address – SA
- Destination Address – DA
- Priority
- Message Length
- Data
- Description (assigned in PGN filter settings as described below)

As of Version 3.11.00, the data display has been extended to indicate whether the SAE J1939 data frame has been received or transmitted:

#	RX	TX	PGN	SA	DA	P	Len	Data (Hex)	Description
5050		x	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	Sample PGN 2
5051	x		65288	136	255	6	8	31 32 33 34 35 36 37 38	
5052		x	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	Sample PGN 1
5053		x	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	Sample PGN 2
5054		x	65290	200	255	3	8	44 55 66 77 88 99 AA BB	Sample PGN
5055		x	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	Sample PGN 2
5056		x	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	Sample PGN 2
5057		x	65290	200	255	3	8	44 55 66 77 88 99 AA BB	Sample PGN
5058		x	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	Sample PGN 1
5059		x	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	Sample PGN 2
5060	x		65288	136	255	6	8	31 32 33 34 35 36 37 38	
5061		x	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	Sample PGN 2

Special Case: Transport Protocol (TP)

Please be aware that the displayed priority will be 255 when a data frame of more than 8 bytes was received (TP – Transport Protocol). The Transport Protocol itself uses a Priority = 7 but it does not transmit the priority of the original message.

ECU Setup

The screenshot shows the 'ECU Setup' window with the following configuration:

- Monitoring Mode:** (Unselected)
- ECU Simulation Mode:** (Selected)
- NAME:** 0x80FEFF00FFFFFF
- Set Default:** [Button]
- ECU Address:**
 - Preferred Address: 128
 - Address Range Low: 128
 - Address Range High: 247
 - Claimed Address: 128
 - [Claim Address] [Button]
- SAE Settings:**
 - Industry Group: 0
 - Vehicle System: 127
 - Function: 255
 - Manufacturer Code: 2047
- Manufacturer Settings:**
 - Arbitrary Address Capable: 1
 - Vehicle System Instance: 0
 - Function Instance: 0
 - ECU Instance: 0
 - Identity Number: 2097151

If your intention is the mere monitoring of SAE J1939 data traffic, you don't need to do anything here, but if you want to transmit SAE J1939 data (PGNs), you need to claim a node address.

This section is where you configure an SAE J1939 ECU through parameters such as Preferred Node Address, Negotiable Address Range, and the NAME setup. If you are not sure how to set the parameters, simply go with the default parameters. They are set up to have the ECU operate on the safe side without interfering with your J1939 network.

Don't forget to click on *ECU Simulation Mode* and then the *Claim Address* command button before proceeding.

Filter Messages

The screenshot shows the 'Filter' tab in the ECU Setup software. At the top, there are tabs for 'ECU Setup', 'Filter', 'Transmit', 'Network', and 'Gateway'. Below the tabs, there are input fields for 'PGN:' (65269) and 'Description:' (Ambient Conditions). To the right of these fields are 'Save' and 'Delete' buttons. Below the input fields is a table with two columns: 'PGN' and 'Description'. The table contains three rows: (65267, Vehicle Position), (65269, Ambient Conditions), and an empty row. To the right of the table is a section titled 'Apply Filter PGNs' with two radio buttons: 'As Defined in Table' (selected) and 'Pass All'.

The Filter section allows you to filter any PGNs (Parameter Group Numbers) from your network. Simply enter the PGN of your choice and a description (optional), then hit the *Save* command button. The PGN, provided it is part of your J1939 data traffic will show on the data screen below. If you are not sure which PGN to filter, you can also click on the *Pass All* option. This will give you an overview of all PGNs in the network, and you can choose which one to filter.

In order to modify a specific PGN, simply click on it in the table. All parameters will appear in the editing section. Modify the parameters to your liking, then hit *Save* again.

Transmit Messages

The screenshot shows the 'Transmit' tab in the ECU Setup software. At the top, there are tabs for 'ECU Setup', 'Filter', 'Transmit', 'Network', and 'Gateway'. Below the tabs, there are input fields for 'PGN:' (65280), 'Request' (a button), 'ECU Address: 128', 'Dest. Address: 255', 'Priority: 6', 'Transmission Rate: Manually', and 'Interval [msec]: 0'. Below these fields is a 'Data:' field containing the hexadecimal string '0x11 0x22 0x33 0x44 0x55 0x66 0x77 0x88'. Below the data field is a 'Descr.:' field containing 'Sample PGN' and a 'Display' checkbox (checked). To the right of the 'Descr.:' field are 'Save', 'Transmit', and 'Delete' buttons. Below the 'Descr.:' field is a table with columns: 'PGN', 'DA', 'P', 'Len', 'Data', 'Interval', 'Display', and 'Description'. The table contains one row: (65280, 255, 6, 8, 11 22 33 44 55 66 77 88, 0, Y, Sample PGN).

Please be aware that you can only transmit messages when you have chosen *ECU Simulation Mode* in the *ECU Setup* tab and you have claimed an ECU address (see paragraph *ECU Setup* above). Otherwise, the software will indicate that there is no node ID available. You can design messages by entering the PGN, Destination Address (255 = Global Address = Broadcasting), Priority, Data, Transmit Interval (optional), and Description (optional).

Click the *Save* command button to transfer the PGN into the Transmit table. If you have entered a transmission frequency, you will see the PGN appear in the Receive window below. For single (manual) transmission, leave the Interval at zero, select the PGN in the table and click on the *Transmit* command button.

In order to modify a specific PGN, simply click on it in the table. All parameters will appear in the editing section. Modify the parameters to your liking, then hit *Save* again.

Display Options

ECU Setup Filter Transmit Network Gateway

PGN: 65280 Request ECU Address: 128 Dest. Address: 255 Priority: 6 Transmission Rate: Manually Interval [msec]: 0

Data: 0

Descr.: Sample PGN Display Save Transmit Delete

PGN	DA	P	Len	Data	Interval	Display	Description

Clear Auto Scrolling Display Tx Messages: Individual Enable All Disable All

#	PGN	SA	DA	P	Len	Data (Hex)	Description
1	59904	0	255	6	3	E5 FE 00	
2	59904	0	255	6	3	DC FE 00	

In cases where you set up PGN transmission at high frequencies (e.g., 10 milliseconds), it doesn't make sense to display the message on the screen since the human eye will have problems following the data flow. Also, you will most likely miss other, received messages. For this case, the program offers a "Display" option.

To stress the point, checking the "Display" option for messages with a frequency of fewer than 100 milliseconds will put some burden on the communication with the PC, which should be avoided when possible.

In addition, it also offers a display mode affecting all transmitted PGNs by providing options such as Individual (as assigned through the "Display" option), Enable All, or Disable All.

Transmitting PGNs Using a Frequency

ECU Setup Filter Transmit Network Gateway

PGN: 65280 Request ECU Address: 128 Dest. Address: 255 Priority: 6 Transmission Rate: Interval Interval [msec]: 1000

Data: 0x11 0x22 0x33 0x44 0x55 0x66 0x77 0x88

Descr.: Sample PGN Display Save Transmit Delete

PGN	DA	P	Len	Data	Interval	Display	Description
65280	255	6	8	11 22 33 44 55 66 77 88	1000	Y	Sample PGN

In case you want to transmit a PGN using a frequency, select the corresponding option in the "Transmission Rate" list box, then enter the frequency in milliseconds and click *Save*. The program will automatically send the PGN using the assigned frequency.

Transmitting PGNs Upon Request

The screenshot shows the 'ECU Setup' window with the 'Transmit' tab selected. The configuration is as follows:

- PGN: 65280
- Request button: Request
- ECU Address: 128
- Dest. Address: 255
- Priority: 6
- Transmission Rate: On Request
- Interval [msec]: 0
- Data: 0x11 0x22 0x33 0x44 0x55 0x66 0x77 0x88
- Descr.: Sample PGN
- Buttons: Display, Save, Transmit, Delete

PGN	DA	P	Len	Data	Interval	Display	Description
65280	255	6	8	11 22 33 44 55 66 77 88	ON REQ	Y	Sample PGN

In order to simulate an SAE J1939 ECU, it may be necessary to simulate the transmission of a PGN upon request. Edit the PGN as you would do with any regular PGN but select “On Request” in the “Transmission Rate” list box, then click *Save*. The message will be transmitted as soon as the program receives a request for it.

Setting Up a Request Message

The screenshot shows the 'ECU Setup' window with the 'Transmit' tab selected. The configuration is as follows:

- PGN: 65253
- Request button: Request
- ECU Address: 128
- Dest. Address: 255
- Priority: 6
- Transmission Rate: Manually
- Interval [msec]:
- Data: 0x00
- Descr.: Engine Hours
- Buttons: Display, Save, Transmit, Delete

PGN	DA	P	Len	Data	Interval	Display	Description
-----	----	---	-----	------	----------	---------	-------------

A small set of PGNs are only available per Request message. In this example, we are setting up a request for “Engine Hours” – PGN 65253. Please note that you cannot set a frequency for request messages; the program will override any such entries. After editing the PGN, click on the *Request* command button (not the *Save* button).

The PGN for a Request message is 59904 and the data represents the requested PGN (LSB first, MSB last). All this reflects on the screen after hitting *Request*.

The screenshot shows the 'ECU Setup' window with the 'Transmit' tab selected. The configuration is as follows:

- PGN: 59904
- Request button: Request
- ECU Address: 128
- Dest. Address: 255
- Priority: 6
- Transmission Rate: Manually
- Interval [msec]: 0
- Data: 0xE5 0xFE 0x00
- Descr.: Engine Hours
- Buttons: Display, Save, Transmit, Delete

PGN	DA	P	Len	Data	Interval	Display	Description
59904	255	6	3	E5 FE 00	0	Y	Engine Hours

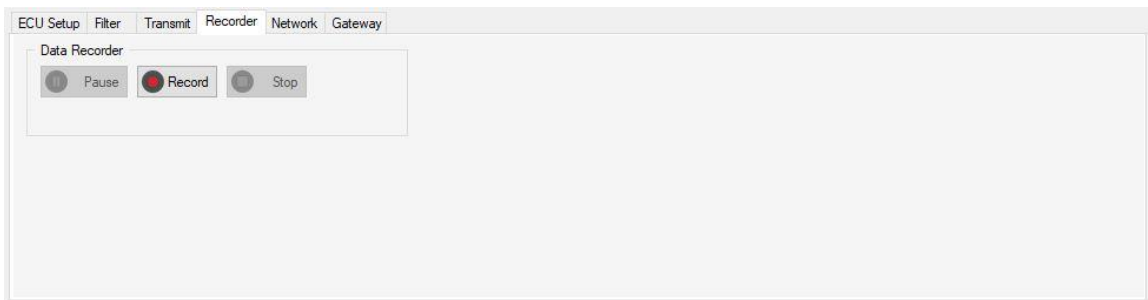
Transmitting Messages Longer Than 8 Bytes (TP – Transport Protocol)

The setup of a TP (Transport Protocol) message, i.e., a message with more than 8 data bytes, is identical to the process as described above, with the only exception that you cannot assign a transmit frequency since TP messages are only transmitted after a *Message Request*. The number of transmitted data can be between 9 and 1785 bytes.

The USB gateway will automatically manage the switching between regular PGNs (8 data bytes) and a TP transmission.

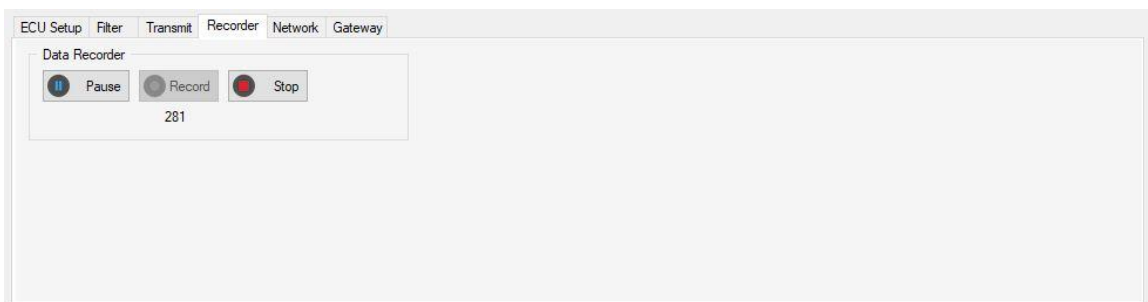
Data Recorder

The *Recorder* function allows the user to store received (filtered) PGNs into an MS-Excel-compatible csv file.



*Note: The JCOM1939 Monitor Pro-X version shows the tab as **PC Recorder**, in order to separate it from the second recording mode, the **Gateway Recorder**.*

The control buttons are self-explanatory, since they resemble those of any standard recording device. Click *Record* to start the recording process, and the program will display the number of current records as shown below.



After clicking the *Stop* button, the software will prompt you to store the file with a name and at a location of your choice.

The data format is .csv (comma-separated values), which can be viewed either per an ASCII text editor or Microsoft Excel.

```

jCOM1939-Rec - Notepad
File Edit Format View Help
PGN,DA,SA,P,LEN,DATA
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65290,200,255,3,8,44 55 66 77 88 99 AA BB
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65288,136,255,6,8,31 32 33 34 35 36 37 38
65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65290,200,255,3,8,44 55 66 77 88 99 AA BB
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65290,200,255,3,8,44 55 66 77 88 99 AA BB
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65288,136,255,6,8,31 32 33 34 35 36 37 38
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65290,200,255,3,8,44 55 66 77 88 99 AA BB
65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65290,200,255,3,8,44 55 66 77 88 99 AA BB
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65288,136,255,6,8,31 32 33 34 35 36 37 38
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65290,200,255,3,8,44 55 66 77 88 99 AA BB
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65288,136,255,6,8,31 32 33 34 35 36 37 38
65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F
65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F

```

	A	B	C	D	E	F	G	H
1	PGN	DA	SA	P	LEN	DATA		
2	65290	200	255	3	8	44 55 66 77 88 99 AA BB		
3	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
4	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
5	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
6	65290	200	255	3	8	44 55 66 77 88 99 AA BB		
7	65288	136	255	6	8	31 32 33 34 35 36 37 38		
8	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
9	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
10	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
11	65290	200	255	3	8	44 55 66 77 88 99 AA BB		
12	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
13	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
14	65290	200	255	3	8	44 55 66 77 88 99 AA BB		
15	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
16	65288	136	255	6	8	31 32 33 34 35 36 37 38		
17	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
18	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
19	65290	200	255	3	8	44 55 66 77 88 99 AA BB		
20	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
21	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
22	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F		
23	65290	200	255	3	8	44 55 66 77 88 99 AA BB		
24	65288	136	255	6	8	31 32 33 34 35 36 37 38		

Extensions

The JCOM gateways with Real-Time Clock (RTC) allow the storing of extended features, such as timestamp, reception mode (RX or TX), and PGN description:

```

jCOM1939-Rec - Notepad
File Edit Format View Help
TIME,M,PGN,DA,SA,P,LEN,DATA,DESCR
11:33:57.586,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.600,RX,65290,200,255,3,8,44 55 66 77 88 99 AA BB,-
11:33:57.620,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.650,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.700,RX,65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.706,RX,65290,200,255,3,8,44 55 66 77 88 99 AA BB,-
11:33:57.720,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.750,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.800,RX,65290,200,255,3,8,44 55 66 77 88 99 AA BB,-
11:33:57.820,RX,65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.826,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.850,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.900,RX,65290,200,255,3,8,44 55 66 77 88 99 AA BB,-
11:33:57.920,RX,65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.946,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:57.950,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:58.000,RX,65290,200,255,3,8,44 55 66 77 88 99 AA BB,-
11:33:58.020,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:58.050,RX,65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:58.066,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:58.100,RX,65290,200,255,3,8,44 55 66 77 88 99 AA BB,-
11:33:58.120,RX,65281,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-
11:33:58.150,RX,65299,200,255,4,8,78 79 7A 7B 7C 7D 7E 7F,-

```

	A	B	C	D	E	F	G	H	I
1	TIME	M	PGN	DA	SA	P	LEN	DATA	DESCR
2	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
3	11:33:58	RX	65290	200	255	3	8	44 55 66 77 88 99 AA BB	-
4	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
5	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
6	11:33:58	RX	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
7	11:33:58	RX	65290	200	255	3	8	44 55 66 77 88 99 AA BB	-
8	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
9	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
10	11:33:58	RX	65290	200	255	3	8	44 55 66 77 88 99 AA BB	-
11	11:33:58	RX	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
12	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
13	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
14	11:33:58	RX	65290	200	255	3	8	44 55 66 77 88 99 AA BB	-
15	11:33:58	RX	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
16	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
17	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
18	11:33:58	RX	65290	200	255	3	8	44 55 66 77 88 99 AA BB	-
19	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
20	11:33:58	RX	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
21	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
22	11:33:58	RX	65290	200	255	3	8	44 55 66 77 88 99 AA BB	-
23	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
24	11:33:58	RX	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
25	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
26	11:33:58	RX	65290	200	255	3	8	44 55 66 77 88 99 AA BB	-
27	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
28	11:33:58	RX	65281	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-
29	11:33:58	RX	65299	200	255	4	8	78 79 7A 7B 7C 7D 7E 7F	-

jCOM1939-Rec +

Note: The Time column in the Excel file view has been modified to display the data correctly.

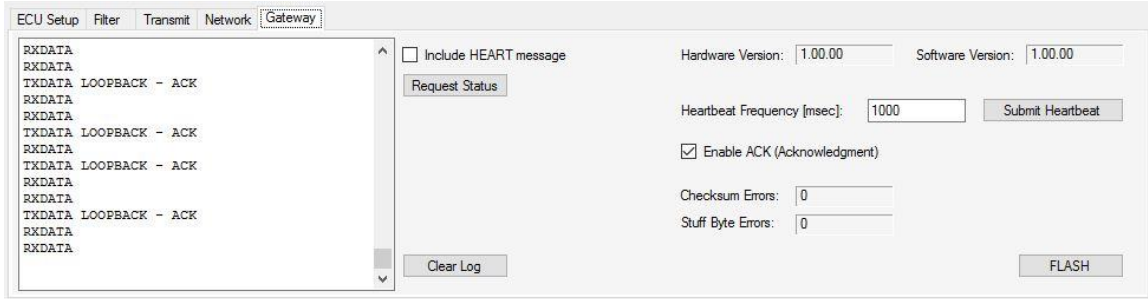
Network Scanner

ECU Setup Filter Transmit Network Gateway											
Scan Network ECU Address: 128											
Addr	NAME	AAC	Ind. Grp.	Veh. Sys.	Veh. Sys. Inst.	Fct.	Fct. Inst.	ECU Inst.	Manuf.	Identity No.	
128	0x80FEFF00FFFFFFFF	1	0	0	127	255	0	0	2047	2097151	

Please be aware that you can only scan the network when you have chosen *ECU Simulation Mode* in the *ECU Setup* tab. Otherwise, the software will indicate that there is no node ID available.

Click on the *Scan Network* command button, and the system will send a *Request for Address Claimed* message into the network. All other ECUs will respond and send their information, which will be displayed in the table.

Gateway Modus



The *Gateway Modus* allows you to check the communication between your Windows computer and the gateway. The information as displayed here is described in the manual for the *JCOM1939 Protocol*.

Note: The *FLASH* command button will set the gateway into programming mode, meaning it will cease its regular operation. The only way to resume regular operation is to reset the device per power-cycle (off-on). This feature can be used to load firmware updates into the device. Please check with the product page on this website for possible updates.

Gateway Hardware and Firmware Version

The *Gateway Modus* section also displays the gateway's hardware and firmware version, which helps to determine whether or not an update will be necessary.

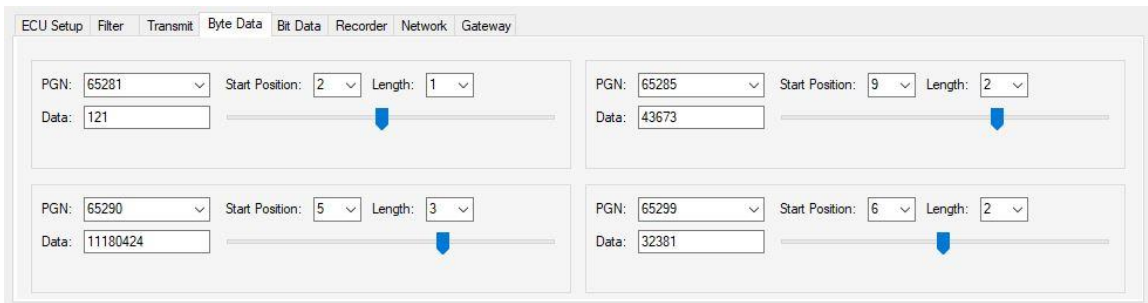
In the upper right position of the tab, check the *Software Version* number and verify it with the newest version as documented as shown above on this page.

Note: For a detailed description of the firmware update procedure, please refer to the [wiki section on our website](#) dedicated to the *JCOM* gateway's hardware. The firmware updating procedure is identical between devices but the reference to the firmware file will be different.

Byte & Bit Editing Mode

As of version 3.20.00, we have added two sections to the software that allows the comfortable editing of selected data bits and bytes, resembling digital and analog signals:

Byte Data Editing – Simulation of Analog Signals



In the *Byte Data* section of the jCOM1939Monitor software, the user can select a previously designed PGN, the data start position, and the data length (1, 2, 3, or 4 bytes). The program will display the data as selected and allows the user to modify the data either per text input or sliding the associated track bar.

This mode was specifically designed with simulation of analog signals in mind. However, due to the generic nature of the software, it does not verify that the selected PGN data represents an analog parameter. In the above sample, we chose a random selection of proprietary PGNs, and, while the screen shows four different PGNs, the program also allows the simultaneous modification of several bytes in the PGN data field.

The following screenshot demonstrates how several bytes in one PGN were modified:

The screenshot shows the 'Byte Data' configuration area with four panels:

- Panel 1: PGN: 65280, Start Position: 1, Length: 1, Data: 106
- Panel 2: PGN: 65280, Start Position: 2, Length: 1, Data: 64
- Panel 3: PGN: 65280, Start Position: 3, Length: 2, Data: 26067
- Panel 4: PGN: 65280, Start Position: 5, Length: 4, Data: 1548746751

Below the configuration area is a table of transmitted data:

#	RX	TX	PGN	SA	DA	P	Len	Data (Hex)	Description
1		x	65280	128	255	6	8	11 22 33 44 55 66 77 11	Sample PGN
2		x	65280	128	255	6	8	9B 22 33 44 55 66 77 11	Sample PGN
3		x	65280	128	255	6	8	9B 22 33 44 55 66 77 11	Sample PGN
4		x	65280	128	255	6	8	9B 22 33 44 55 66 77 11	Sample PGN
5		x	65280	128	255	6	8	9B 22 33 44 55 66 77 11	Sample PGN
6		x	65280	128	255	6	8	9B 63 33 44 55 66 77 11	Sample PGN
7		x	65280	128	255	6	8	9B 63 33 44 55 66 77 11	Sample PGN
8		x	65280	128	255	6	8	9B 63 93 B9 55 66 77 11	Sample PGN
9		x	65280	128	255	6	8	9B 63 93 B9 55 66 77 11	Sample PGN
10		x	65280	128	255	6	8	9B 63 93 B9 55 66 77 11	Sample PGN
11		x	65280	128	255	6	8	9B 63 93 B9 FF FF F1 8A	Sample PGN
12		x	65280	128	255	6	8	9B 63 93 B9 FF FF F1 8A	Sample PGN
13		x	65280	128	255	6	8	9B 63 93 B9 FF FF F1 8A	Sample PGN
14		x	65280	128	255	6	8	9B 63 93 B9 FF FF F1 8A	Sample PGN
15		x	65280	128	255	6	8	9B 63 93 B9 FF FF F1 8A	Sample PGN
16		x	65280	128	255	6	8	9B 63 93 B9 FF FF F1 8A	Sample PGN
17		x	65280	128	255	6	8	9B 63 8D B9 FF FF F1 8A	Sample PGN
18		x	65280	128	255	6	8	9B 63 D3 65 FF FF F1 8A	Sample PGN
19		x	65280	128	255	6	8	6A 63 D3 65 FF FF F1 8A	Sample PGN
20		x	65280	128	255	6	8	6A 40 D3 65 FF FF F1 8A	Sample PGN

Note that the data is being updated and transmitted as soon as it is modified by the user.

Bit Data Editing – Simulation of Digital Signals

The screenshot shows the 'Bit Data' configuration area with four panels:

- Panel 1: PGN: 65281, Byte Position: 8, Data: 0x7F / 127d
- Panel 2: PGN: 65281, Byte Position: 2, Data: 0x79 / 121d
- Panel 3: PGN: 65290, Byte Position: 3, Data: 0x66 / 102d
- Panel 4: PGN: 65299, Byte Position: 4, Data: 0x7B / 123d

The *Bit Data* section was designed with the modification of digital signals in mind. It functions very similar to the *Byte Data* section, however, limited to one byte. Also, instead of a slider, the program uses check boxes to set or reset digital information.

The following screenshot demonstrates how several bits in one PGN were modified:

#	RX	TX	PGN	SA	DA	P	Len	Data (Hex)	Description
1		x	65280	128	255	6	7	11 22 33 44 55 66 77	Sample PGN
2		x	65280	128	255	6	7	11 22 33 44 55 66 77	Sample PGN
3		x	65280	128	255	6	7	F1 22 33 44 55 66 77	Sample PGN
4		x	65280	128	255	6	7	F1 22 33 44 55 66 77	Sample PGN
5		x	65280	128	255	6	7	F1 22 33 44 55 66 77	Sample PGN
6		x	65280	128	255	6	7	F1 22 33 44 55 66 77	Sample PGN
7		x	65280	128	255	6	7	F1 3E 33 44 55 66 77	Sample PGN
8		x	65280	128	255	6	7	F1 3E 73 44 55 66 77	Sample PGN
9		x	65280	128	255	6	7	F1 3E 70 44 55 66 77	Sample PGN
10		x	65280	128	255	6	7	F1 3E 70 C4 55 66 77	Sample PGN
11		x	65280	128	255	6	7	F1 3E 70 C3 55 66 77	Sample PGN
12		x	65280	128	255	6	7	F1 3E 70 C3 55 66 77	Sample PGN
13		x	65280	128	255	6	7	F1 3E 70 C3 55 66 77	Sample PGN
14		x	65280	128	255	6	7	F1 3E 70 C3 55 66 77	Sample PGN
15		x	65280	128	255	6	7	F1 3E 70 C3 55 66 77	Sample PGN
16		x	65280	128	255	6	7	F1 3E 70 C3 55 66 77	Sample PGN
17		x	65280	128	255	6	7	F1 3E 70 C3 55 66 77	Sample PGN
18		x	65280	128	255	6	7	F1 3E 70 C3 55 66 77	Sample PGN
19		x	65280	128	255	6	7	F1 3E 70 C3 55 66 77	Sample PGN
20		x	65280	128	255	6	7	F1 3E 70 C3 55 66 77	Sample PGN

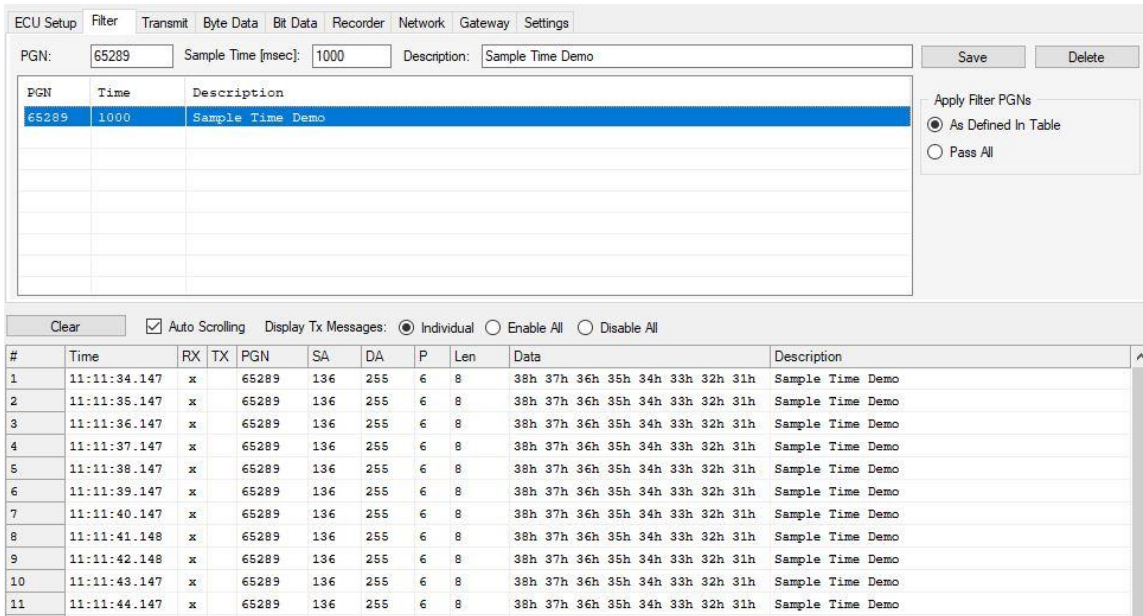
JCOM1939 Monitor Pro-X – Extensions & Modifications

The following features are only supported by JCOM gateways with Real-Time Clock (RTC).

Note: Please make sure to check that your current JCOM1939 Monitor version and the gateway's firmware version are up to date. Otherwise, there will be inconsistencies in functionality.

PGN Filters – Assigning a Sample Frequency

Starting with V 4.01.00 (Gateway firmware version 2.01.00), the JCOM1939 Monitor Pro-X software, besides some slight design modifications, comes with an extended "Filter" section:

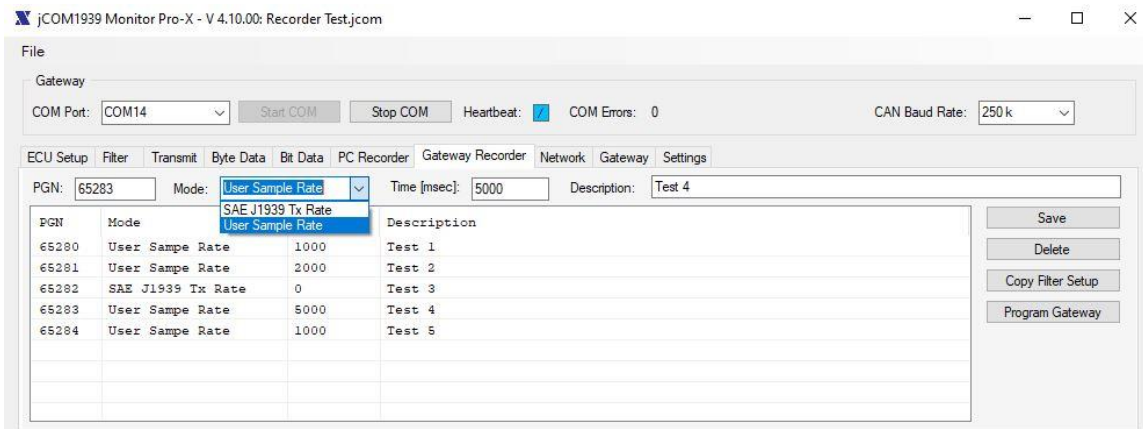


This new version allows editing a sample rate. Keeping the sample time at zero will result in real-time data reception, i.e., the original data rate.

In the screenshot above, we have assigned a sample rate of one second (1000 milliseconds) to PGN 65289 (we used a transmission rate of 50 milliseconds through our simulator).

Gateway Recorder – J1939 Data Recording Programming

Starting with V 4.10.00 (Gateway firmware version 2.20.00), the onboard microSD card is being used to store SAE J1939 data traffic and to set up the recording configuration. For that purpose, the JCOM1939 Monitor software has been extended by the “Gateway Recorder” section, as shown in the following image:



The setup allows defining which PGN to record and which sample frequency to use. A sample frequency of zero indicates that the recorder should store the data immediately, i.e., according to the frequency defined by the SAE J1939 Standard.

This model assumes the recording of selected PGNs (message filtering) for diagnostics and analysis purposes. Depending on the number of PGNs, the maximum recording time can be between 4 to 12 weeks at 8 hours/day using a 16 GB microSD card.

Once the board is programmed (clicking the “Program Gateway” command button), the PC connection can be removed, and the gateway can be connected to a running SAE J1939 network (as simulated in our setup). Upon the next power-up cycle (Reset), the gateway will record the PGNs as defined in the setup without a PC connection.

The board will resume regular gateway operation as soon as it is re-connected to the PC running the JCOM1939 Monitor software.

[Data Record Retrieval](#)

At this time, data retrieval is accomplished by removing the SD card from the board and using a PC card reader.

For the purpose of improved data sampling and storage time, part of the real-time information, namely the date and hour of day, is integrated into the filename. This will reduce a great amount of redundant information.

Since the filename includes the recording date and hour, there will be one file per hour and a new file will be created at the beginning of a new hour (precision is plus/minus five seconds without loss of data).

Filename Format: DATA`YYMMDDHH`.txt

YY – Years since 2000

MM – Month

DD – Day

HH – Hour (0...23)

All information (data) is stored in ASCII text format, providing easy readability and adding basic means to verify data validity.

The file format is, however, MS-Excel-compatible. The screenshot below shows an example of one of our recording sessions.

Note: It almost appears that only PGN 65282 (FF02) is being recorded. However, this PGN is sampled at the highest frequency (20 msec). We checked, and the recording session does sample all PGNs as specified.

```
HH:MM:SS,MS ,D, PGN ,DA, SA, P, L, D1, D2, D3, D4, D5, D6, D7, D8,
00:00:02,985,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:02,986,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:02,990,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,010,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,030,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,050,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,070,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,090,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,110,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,130,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,150,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,170,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,190,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,210,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,230,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,250,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,270,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,290,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,310,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,330,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,350,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,370,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,390,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,410,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,430,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,450,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,470,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,490,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
00:00:03,510,0, FF02, FF, C8, 6, 8, 10, 11, 12, 13, 14, 15, 16, 11,
```

The data columns include time of day, milliseconds, Data Page, PGN, destination address (DA), source address (SA), and the data.

Note: We separated the milliseconds from the time of day to maintain a basic level of MS-Excel-Compatibility (Excel does not support time formatting down to milliseconds).

The next screenshot shows the same data as read by MS-Excel:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	HH:MM:SS	MS	D	PGN	DA	SA	P	L	D1	D2	D3	D4	D5	D6	D7	D8
2	0:00:02	985	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
3	0:00:02	986	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
4	0:00:02	990	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
5	0:00:03	10	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
6	0:00:03	30	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
7	0:00:03	50	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
8	0:00:03	70	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
9	0:00:03	90	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
10	0:00:03	110	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
11	0:00:03	130	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
12	0:00:03	150	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
13	0:00:03	170	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
14	0:00:03	190	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
15	0:00:03	210	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
16	0:00:03	230	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
17	0:00:03	250	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
18	0:00:03	270	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
19	0:00:03	290	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
20	0:00:03	310	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
21	0:00:03	330	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
22	0:00:03	350	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
23	0:00:03	370	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11
24	0:00:03	390	0	FF02	FF	C8	6	8	10	11	12	13	14	15	16	11

However, in order to create this view, we made a few modifications: We renamed the file from .txt to .csv to establish Excel-compatibility. We formatted the time column (HH:MM:SS) according to Excel format. Lastly, we formatted all columns to left margin and adjusted the column width.

The test setup created text file sizes of 250MB per 24-hour recording session, which translates into roughly 48 days recording capacity at 24 hours per day using a 16GB SD card.