Advanced Serial Data Logger

Trust in Confidence!

PRINTED MANUAL

Advanced NMEA Data Logger

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1 Introduction

1.1 About Advanced NMEA Data Logger

Advanced NMEA Data Logger inputs NEAM data stream from GPS, navigation or any other NMEA compatible device directly into file, Excel, Access, database or any Windows application. Advanced NMEA Data Logger provides real-time data collection from any device or instrument.

Advanced NMEA Data Logger captures serial or network data, custom parses it to your needs, then extract bits of data from data packets and transfers the data to any Windows or DOS application - either by sending keystrokes to the application's window, by passing the data through DDE (Dynamic Data Exchange) conversations, ODBC, OLE.

Key features of Advanced NMEA Data Logger are:

- capability to log multiple ports at the same time. Each port may have fully different settings.
- supports all talker types (GPS, Heading, Velocity sensors etc).
- captures all standard NMEA sentences and some proprietary sentences for Garmin, SiRFand StarLink devices.
- supports custom baud rates.
- supports date/time stamping;
- supports aggregation of multiple sentences to one data record.
- outputs received data without any changes to a log file.
- advanced data parsers that allows you to parse, filter and format your source data.
- data export to ready-to-use MS Excel files.
- data export to any ODBC-compatible database (MS SQL, Oracle, MS Access, dBase and others).
- Advanced NMEA Data Logger can run as DDE or OPC server and can export all received data.
- Advanced NMEA Data Logger can use direct connection (use OLE) to Microsoft Excel and write data directly to rows or columns.
- program messages logging.
- simple, menu-driven step by step set-up - programming is not required to configure the software to collect data.
- many plug-in modules that extending program features.
- It supports various operating systems. The logger runs on all versions starting from Windows 2000, including 32 and 64-bit systems.

Advanced NMEA Data Logger also transmits requests or commands over a network connection or serial port to control or query your instruments directly from Advanced NMEA Data Logger over ASCII protocol.

Unlike most other serial logging applications, Advanced NMEA Data Logger can run as a service so that it starts as soon as the operating system starts and doesn't require a user to log in and run it. It will continue to run even as a user logon and logoff the workstation.

It is extremely easy to use! The configuration process is fully menu-driven and has complete, context-sensitive, on-line help. You can easily customize all input to your exact specifications. Once you see how easy it is to use Advanced NMEA Data Logger, you will never again take data readings by hand!

Typical usage

A typical application for Advanced NMEA Data Logger is to log and aggregate data from one or more NMEA devices to disk or a software replacement for a hardware data logger.

Applications examples

- Data logging systems;
- Remote control systems;
- Remote control of displays and signaling.

Company home page: http://www.aggsoft.com/
Software home page: http://www.aggsoft.com/nmea-data-logger.htm

1.2 Glossary

ASCII - An acronym for American Standard Code for Information Interchange. ASCII files are plain, unformatted text files that are understood by virtually any computer. Windows Notepad and virtually any word processor can read and create ASCII files. ASCII files usually have the ".TXT" extension (e.g., README.TXT).

Binary File - A file that contains data or program instructions written in ASCII and extended ASCII characters.

Bit - A binary digit in the binary numbering system. Its value can be 0 or 1. In an 8-bit character scheme, it takes 8 bits to make a byte (character) of data.

Bytes - A collection of eight bits that represent a character, letter or punctuation mark.

Cable - Transmission medium of copper wire or optical fiber wrapped in a protective cover.

Client/Server - A networking system in which one or more file servers (Server) provide services; such as network management, application, and centralized data storage for workstations (Clients).

COM port - Short for a serial communication port. Most serial communication software communicates with a computer through a communication port, and most IBM and IBM-compatible computers support up to four serial ports COM1, COM2, COM3, and COM4. Additional ports can be added by adding additional hardware.

Data bits - A group of bits (1's and 0's) that represents a single character or a byte. Typically, there are seven or eight data bits. During an asynchronous communication (e.g., BitCom connecting to CompuServe), each side must agree on the number of data bits. Data bits are preceded by a start bit and followed by an optional parity bit and one or more stop bits.

DNS (Domain Name System) - A DNS server lets you locate computers on a network or the Internet (TCP/IP network) by the domain name. The DNS server maintains a database of domain names (hostnames) and their corresponding IP addresses. The IP address "8.8.8.8", corresponds to the DNS name www.google.com.

Flow control - A method of controlling the amount of data that two devices exchange. In data communications, flow control prevents one modem from "flooding" the other with data. If data comes in faster than it can be processed, the receiving side stores the data in a buffer. When the buffer is nearly full, the receiving side signals the sending side to stop until the buffer has space again. Between hardware (such as your modem and your computer), hardware flow control is used; between modems, software flow control is used.

Handshaking - is how the data flow between computers/hardware is regulated and controlled. Two distinct kinds of handshaking are described: Software Handshaking and Hardware Handshaking. An important distinction between the kinds of signals of the interface is between data signals and control signals. Data signals are simply the pins which actually transmit and receive the characters, while control signals are everything else.

Internet - A global network of networks used to exchange information using the TCP/IP protocol. It allows for electronic mail and the accessing ad retrieval of information from remote sources.

IP, Internet Protocol - The Internet Protocol, usually referred to as the TCP/IP protocol stack, allows computers residing on different networks to connect across gateways on wide-area networks. Each node on an IP network is assigned an IP address, typically expressed as 'xx.xx.xx.xx'.

IP address (Internet Protocol address) - The address of a computer attached to a TCP/IP network. Every client and server station must have a unique IP address. Client workstations have either a permanent address or one that is dynamically assigned to them each dial-up session. IP addresses are written as four sets of numbers separated by periods; for example, 198.63.211.24.

LAN (Local Area Network) - A network, connecting computers in a relatively small area such as a building.

NIC, Network Interface Card - A card containing the circuitry necessary to connect a computer to a particular network media. Typically, the NIC plugs into the computer's accessory bus, (PCI, USB, etc.) and provides a network connection such as 10baseFL (fiber Ethernet), thin-net, AUI, etc.

PC - abbreviation for a Personal Computer.

Parity - In data communications, parity is a simple procedure of checking the integrity of transmitted data. The most common type of parity is Even, in which the number of 1's in a byte of data adds up to an even number, and None, in which a parity bit is not added.

Ports - is a connection point for a cable.

Protocol - is a formal description of a set of rules and conventions that govern how devices on a network exchange information.

RS232, RS423, RS422, AND RS485 - The Electronics Industry Association (EIA) has produced standards for RS232, RS423, RS422, and RS485 that deal with data communications. EIA standards where previously marked with the prefix "RS" to indicate the recommended standard. Presently, the standards are now generally indicated as "EIA" standards to identify the standards organization.

Electronic data communications will generally fall into two broad categories: single-ended and differential. RS232 (single-ended) was introduced in 1962. RS232 has remained widely used, especially with CNC control builders. The specification allows for data transmission from one transmitter to one receiver at relatively slow data rates (up to 20K bits/second) and short distances (up to 50' @ the maximum data rate). This 50' limitation can usually be exceeded to distances of 200' or more by using low capacitance cable and keeping the data rates down to 9600 baud and lower.

RTS/CTS Hardware handshaking - uses additional wires to tell a sending device when to stop or start sending data. DTR and RTS refer to these Hardware handshaking lines. You can select whether you need to use DTR or RTS individually or use both lines for hardware handshaking. See also Xon/Xoff.

TCP/IP, Transport Control Protocol / Internet Protocol - TCP and IP are communications protocols, that is, structured languages in which data is communicated between one process and another, and between one network and another. TCP/IP is implemented in a multi-level layered structure.
TCP/IP is the 'glue' that ties together the many heterogeneous networks that make up the Internet.

Stop bits - In data communication, one or two bits used to mark the end of a byte (or character). At least one stop bit is always sent.

2 License, Registration and technical support

2.1 License

SOFTWARE LICENSE

Trial Limited Version

The trial limited version of this software may be used for evaluation purposes at the user's own risk for a trial period. At the end of the trial period, the user must either purchase a license to continue using the software or remove it from his/her system.

The trial limited version may be freely distributed, provided the distribution package is not modified. No person or company may charge a fee for the distribution of Advanced NMEA Data Logger without written permission from the copyright holder.

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On payment of the appropriate license fee, the user is granted a non-exclusive license to use Advanced NMEA Data Logger on one computer (i.e. a single CPU), for any legal purpose, at a time. The registered software may not be rented or leased but may be permanently transferred, if the person receiving it agrees to terms of this license. If the software is an update, the transfer must include the update and all previous versions.

Registered customers are entitled to free updates during one year from the date of purchase. It means that for one year you can download and install the latest registered versions of Advanced NMEA Data Logger from our site. If you don't want to purchase an update, you can use the program forever; it will never expire, but you won't be able to use the latest version. If you purchased the software more than one year ago, you are no longer entitled to free upgrade and technical support; however, you can purchase an update to the latest version at a special, greatly discounted price, and this update will allow you to have free updates and technical support for another year. The type of the update license must match the type of your existing license.

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If you do not agree to these conditions you should not install this software.

2.2 Limitations

The unlicensed program works in the trial mode. The program allows to test all features, but it limits the time and/or amount of processed data. The license key removes all limitations from the trial version. You may purchase a license key here 6.

The trial version of our software has the following limitations:

- The trial period is limited to 21 days. After that time, the program stops working.
- The continuous program work time is limited to two hours. After that period the program shows a message and stops working;
- All data export modules can handle the first 100 records only;

2.3 How to acquire a license

The unlicensed program works in the trial mode. The license key removes all limitations from the trial version and allows you to use our technical support for one year.

If you want to buy a program through the Internet, visit the order page of our site. On this page, you can get the newest information about the registration process, and also find an order link. Please, follow the “Buy now” link, enter your personal information, and choose the most convenient payment method for you. Further, you will get a notification and follow the notes in it.

You may find more information about our policies, payment terms, payment methods, and frequently asked questions on our web site.

2.4 Support

Technical questions	support@aggsoft.com
Common questions	info@aggsoft.com
Sales questions	sales@aggsoft.com

3 Installation

3.1 System requirements

Windows 2000 Professional - Windows 10 (2019), including x64 and x86 OS, Workstation, and Server OS.

It is necessary to have at least one free COM port, not busy by any device (mouse, for example) to connect an external device.
It is necessary to have at least one working network interface (card) in your PC.

3.2 Installation process

If any beta-version was installed on your computer, remove it.

Quit of the working Advanced NMEA Data Logger on installation time.

Run an installation file.

By default, the installation wizard installs Advanced NMEA Data Logger to "C:\Programs Files\Advanced NMEA Data Logger" or "C:\Programs Files (x86)\Advanced NMEA Data Logger" the directory of your system disk, but you can change this path.

In the standard distributive of Advanced NMEA Data Logger are no additional modules files, which you can download from our site.

4 Program use

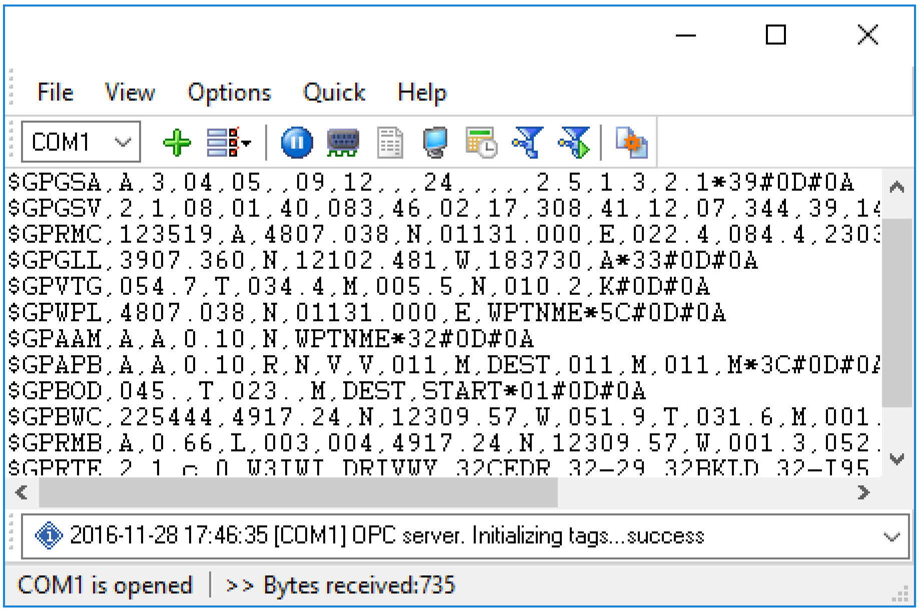
4.1 Getting started

After you have successfully installed Advanced NMEA Data Logger, use the following simple steps to configure and run it.

Open the Advanced NMEA Data Logger program from the Start Menu.

At program run, you get into the main program window (fig. 1.1.1), main elements of which are the main menu, the data window, the program messages list, and the status bar.

- The data window shows incoming data before or after processing. You can configure the data view mode in the settings
- The drop-down box at the bottom shows all logged program info, warning, and error messages.
- The status bar shows the current state of the selected data source, errors on the data interface, and how many bytes were sent or received.
- The toolbar above the data window provides fast access to the configuration.
- The main menu above the toolbar allows you to edit the program settings 8 ("Options -> Program settings..."), manage configurations, open the current logfile from the "File" menu (fig. 1.1.2).



```
$GPGSA,A,3,04,05,,09,12,,,24,,,,,2.5,1.3,2.1*39#0D#0A
$GPGSV,2,1,08,01,40,083,46,02,17,308,41,12,07,344,39,14
$GPRMC,123519,A,4807.038,N,01131.000,E,022.4,084.4,2303
$GPGLL,3907.360,N,12102.481,W,183730,A*33#0D#0A
$GPVTG,054.7,T,034.4,M,005.5,N,010.2,K#0D#0A
$GPWPL,4807.038,N,01131.000,E,WPTNME*5C#0D#0A
$GPAAM,A,A,0.10,N,WPTNME*32#0D#0A
$GPAPB,A,A,0.10,R,N,V,V,011,M,DEST,011,M,011,M*3C#0D#0A
$GPBOD,045.,T,023.,M,DEST,START*01#0D#0A
$GPBWC,225444,4917.24,N,12309.57,W,051.9,T,031.6,M,001.
$GPRMB,A,0.66,L,003,004,4917.24,N,12309.57,W,001.3,052.
$GPRTE,2,1,c,0,W3IWI,DRIVWY,32CEDR,32-29,32BKLD,32-I95
```

2016-11-28 17:46:35 [COM1] OPC server. Initializing tags...success

COM1 is opened | >> Bytes received:735

Fig. 1.1.1 Main program window

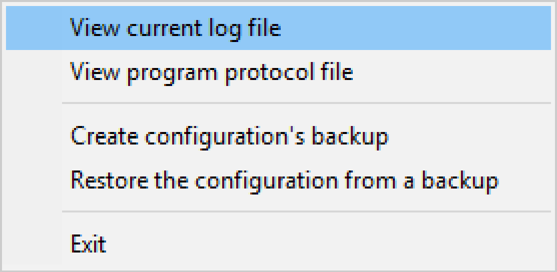

View current log file
View program protocol file
Create configuration's backup
Restore the configuration from a backup
Exit

Fig. 1.1.2. "File" menu item

By default (after installation), the program has not any data sources configured. If the list of data sources on the toolbar is empty, then the program will ask you to add a new configuration. Otherwise, the program will fill in the list of data sources and try to start logging of data sources configured. Yes, of course, all your settings are being saved while exiting from the program and loaded during the program start.

Set-Up is as Easy as 1-2-3

Step 1. Configure one or more data sources.

Click the "Add configuration" button on the toolbar with a big green plus and choose communication parameters 12 for your device. The "COM Port settings" tab of the "Configuration options" dialog lets you configure your settings.

Step 2. Configure log file.

Select the "Log file" header in the configuration dialog window and enable logging for a necessary data direction.

Step 3. Define how you want the NMEA data to be parsed and translated 35.

The "Plug-in" button on the toolbar in the main window or "Modules" tab in the dialog window lets you specify how to parse, filter and format your data to the fit the exact format required by your application. It also lets you pre-define automatic output strings to be sent to an external device.

Now, the program process and exports data from one or multiple data sources.

4.2 Introduction

The program can work with any serial devices. Before configuring our software, the following conditions should be executed:

- The device should have an RS-232 serial port interface (you need any additional hardware converter for the RS-485 interface).
- The device is configured to send data to a serial port with or without requests from a computer side.

- You know all information about serial port parameters of your device (If your device uses hardware or software flow control (please, read your device's datasheet), then you should know about flow control type).
- Device's serial port is connected with a computer serial port using a cable (a null-modem or other special cable).
- Computer's COM port, to which your device is connected is not busy, for example by another program.

How to configure port parameters, you can read in the next "Serial port settings 12" chapter.

The program can work with any network interface cards (NIC). Before configuring our software, the following conditions should be executed:

- If your computer has more than one network interface card (NIC) then Advanced NMEA Data Logger will display a list of all the IP addresses for each NIC installed in your system so that you can select the IP Address that you want to use. In order for Advanced NMEA Data Logger to act as a server, the computer that it is running on must have at least one network interface card with an IP address assigned to it.
- If Advanced NMEA Data Logger will work as a server and your computer receives the IP address dynamically from a DHCP server, then you should ask your network administrator to assign a static IP address to your computer.

How to configure port parameters, you can read in the next "IP settings 17" chapter.

Advanced NMEA Data Logger can save data to a log file(s) without any changes (i.e., create raw binary log files) or write to log files depending on the parser module selected. In the first case, you can view the log file with any hex editor and use this data for further analysis and remaking. In the second case, you can view data with any text editor. You can find more information about log files in the "Log rotation 30" chapter.

You can watch the data in the data window (fig. 1.1.1 7). The data view is fully customizable. You can watch data in decimal, hexadecimal, or your format. How to customize data view you can read in the "Data view 25" chapter and how to customize program view you can read in the "Window view 54" chapter.

The data can be exported or transferred to one or more targets. The simplest way is to configure the log file rotation. However, it is small a part of all features of Advanced NMEA Data Logger. Advanced NMEA Data Logger has many additional modules 35 (so-called plug-ins) that are appreciably extending possibilities of the logging software. You can download and install any module supported. Most modules are free of charge for our customers. How to install and configure modules you can read in the "Modules 35" chapter.

The program and their plug-ins generate many messages and write them to the list in the main window (fig. 1.1.1 7) and a protocol file that you can use for administration of the software. You can also configure types of system messages. More information about it you can read in the "Protocol and errors handling 57" chapter.

4.3 Data flow diagram

This diagram may help you to understand the flow of data within our software and a place of each module. The following chapters describe all plugin types.

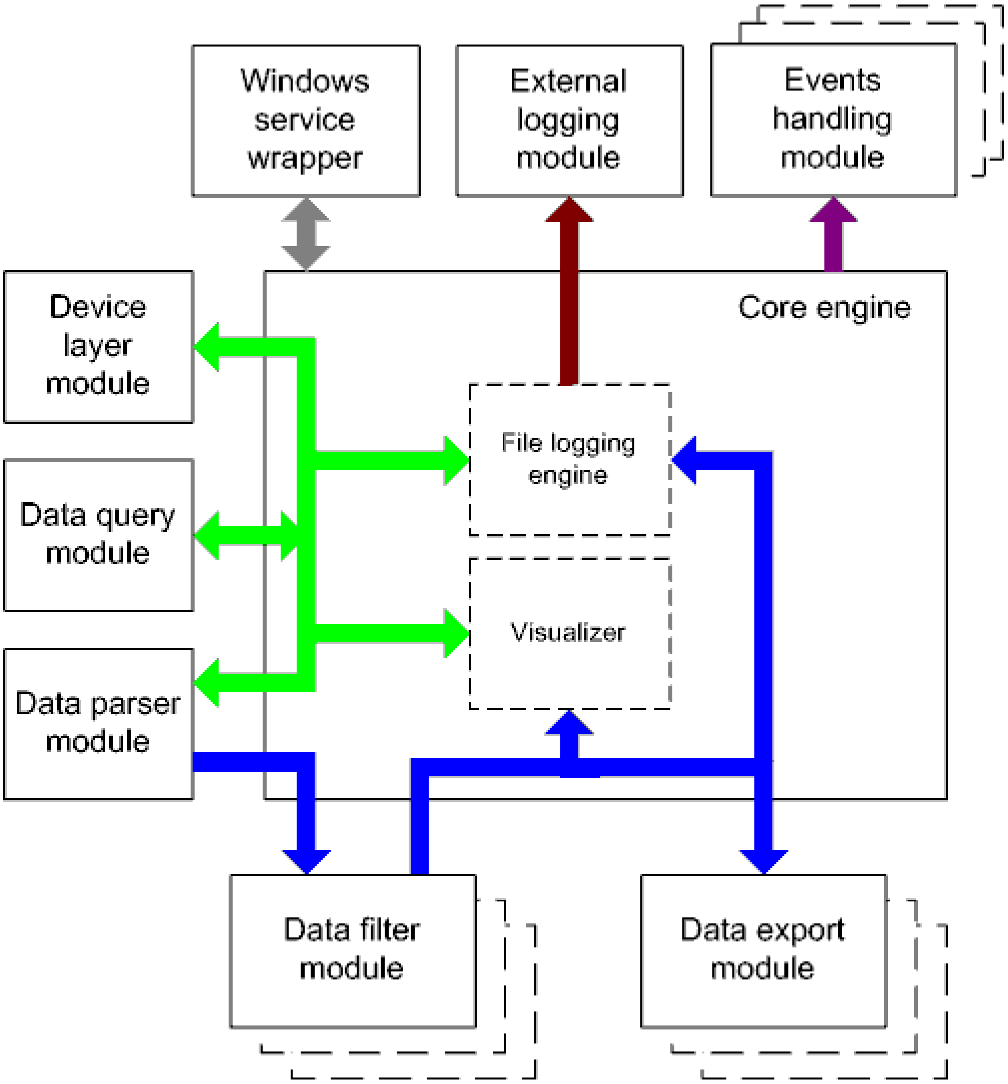


Fig. 1.2.1 Data flow diagram

History:

🟩 - The flow of binary data (RAW, unformatted data).

🟦 - The parsed data (formatted data). The data flow is separated into data packets and variables. Each data packet can be interpreted as a row, and each variable can be interpreted as a column.

Wires with other colors mark other relations with the unstructured data flow.

4.4 Work complete

The program saves all settings to the Windows registry when it stops working. All opened data sources will be automatically closed (unlocked, unallocated, or fried).

4.5 Useful advices

1. Look through hint helps on all window elements - it may help you to get a picture of this element's function.

2. You can change all program settings without restarting the program. To transfer settings to another computer, you can do the following:

1. Create a configuration backup from the "File" menu and restore it using the same menu.
2. Alternatively, export the registry node with all program settings. Start regedit.exe and export the following registry node:

   on Windows x64
   HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\AGG Software\Advanced NMEA Data Logger

   on Windows x32
   HKEY_LOCAL_MACHINE\SOFTWARE\AGG Software\Advanced NMEA Data Logger

3. On another computer import settings to the Windows registry.

Many main window elements have "hot" keys for quick access to its functions.

- Ctrl+S - analogs to click on "Start/Pause" button on the toolbar.
- Ctrl+C - analogs to click on "Clear" button on the toolbar.
- Ctrl+P - opens the window with the configuration settings.
- Ctrl+L - opens the window with the log file settings.
- Ctrl+W - allows you to configure the data view mode.
- Ctrl+R - shows the window with the program settings.
- Ctrl+E - shows the Windows 2000+ service settings.
- Ctrl+M - here you can configure data query plugins, data parser, and other plugins.

4. You can look at the summary statistic that contains summary about sent and received data, created files, etc. (View - Statistics)

5. You can save program settings to an INI file. It may help to install and use several copies of the program. You can make your choice from the "Options" menu.

6. The program window can display only the last 10 messages. The full program log file (if activated) you can open using the "File - View program protocol file" menu item.

4.6 Configuration

4.6.1 Serial port

4.6.1.1 Serial (COM) port

COM port is short for a serial communication port. Most serial communication software communicates with a computer through a communication port, and most IBM and IBM-compatible computers support up to four serial ports COM1, COM2, COM3, and COM4. Additional ports can be added by adding additional hardware.

Advanced NMEA Data Logger can manipulate with many serial ports at the same time (up to 255 serial ports).

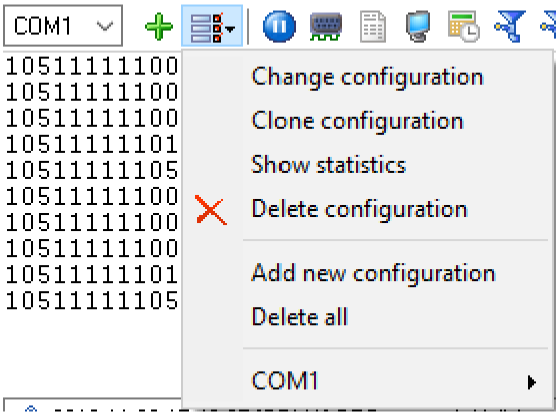
You can open serial ports in Advanced NMEA Data Logger software in two modes:

1. **Spy mode**. In this mode the program monitor data flow on ports selected. In this mode, Advanced NMEA Data Logger intercepts all data exchange between any Windows application and external device.
2. **Standard**. In this mode, the program opens a serial port through Windows API functions, and read/write data from/to a serial port as a regular Windows application. In this mode opens a serial port with exclusive rights and other application will not have access to a serial port.

If one or more ports are configured already, then Advanced NMEA Data Logger is opening these ports and starting logging. If the port is opened successful, then the status bar in the main window displays a status of this port (fig. 1.1.1 7). However, before you should configure serial port parameters. The configuration can include one or more serial ports with **identical** settings. For example, if you have many identical devices, that connected to different serial ports, then you can specify port numbers in one configuration only. However, if you want to use a serial port with different settings, then you should create more than one configuration.

You can create the new configuration by clicking the "Plus" button in the main window (fig. 1.1.1 7) or through the "Options" menu. After you clicked the "Plus" button, the dialog window will be opened (fig. 2.1.2). The dialog window contains few sections with parameters. The "COM port" section is described in this chapter.

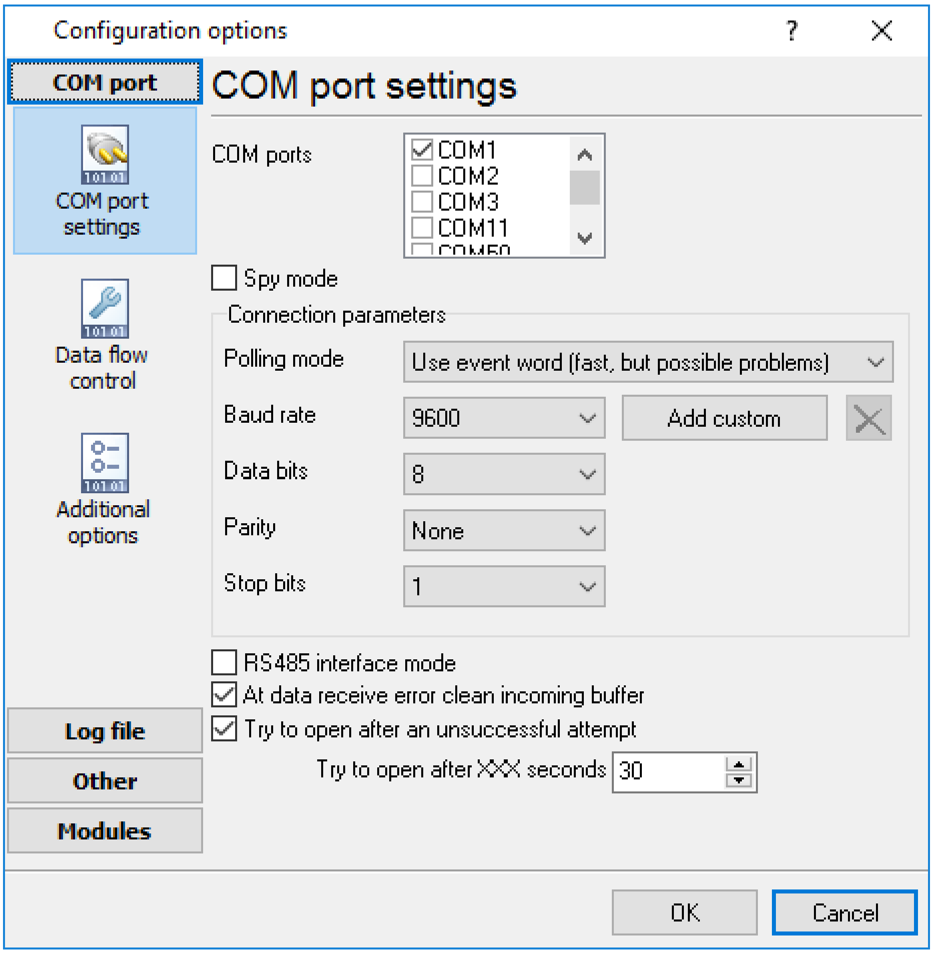
You can manage the configuration created with a drop-down menu near the "Plus" button (fig. 2.1.1).



```
10511111100
10511111100
10511111100
10511111101
10511111105
10511111100
10511111100
10511111100
10511111101
10511111105
```

Fig. 2.1.1 Access to the port configuration

The "COM port settings" tab contains indispensable settings of any serial port: baud rate, data bits, etc. You should configure it with the same values, that your external device uses for data exchange.



COM port settings

COM ports: ☑ COM1, □ COM2, □ COM3, □ COM11, □ COM50

□ Spy mode

Connection parameters

Polling mode: Use event word (fast, but possible problems)

Baud rate: 9600

Data bits: 8

Parity: None

Stop bits: 1

□ RS485 interface mode

☑ At data receive error clean incoming buffer

☑ Try to open after an unsuccessful attempt

Try to open after XXX seconds: 30

Fig. 2.1.2 COM port parameters

If you are logging data over RS-485 with an additional hardware converter and your converter doesn't support data direction auto-detection, then specify "**RS485 interface mode**". This option instructs Advanced NMEA Data Logger to set the RTS line at a low level while data receiving and vice versa. The serial port driver can detect errors while data receiving (for example, bad quality of a connection line). You can specify with the "**At data receive error clean incoming buffer**" option to ignore data blocks, that contain errors and clean an incoming buffer.

In some cases, the program can't open a serial port while starting (for example, the port is already used by other application). With the "**Try to open after an unsuccessful attempt**" option you can specify to try to open the serial port again after the interval specified. The program will try to open the serial port until an attempt will succeed.

Check line status mode

The Windows communication API provides two methods to check for received data and line/modem status changes: API calls (polling) and an event word. The event word is maintained by the Windows communications driver. As data is received or line/modem status changes occur, the driver sets bits in the event word. The application can check the bits to determine if any communication events occurred. If so, the application can make the appropriate API call to clear the event word and retrieve the data or the new line/modem status values.

Windows also provides API calls to retrieve the same status information provided by the event word but the API calls are slower. Advanced NMEA Data Logger uses the event word by default for the fastest possible performance. Unfortunately, there is at least one communication driver (WRPI.DRV, included with some U.S. Robotics modems) that doesn't appear to support the event word. For this and similar drivers, select another mode before Advanced NMEA Data Logger will receive data.

If you want to rise data transmit adequacy you can use hardware and/or software data flow control (fig. 2.1.3). When using hardware data flow control are used some lines (wires) of connecting cable. Depending on used lines, you must configure checks against corresponding fields.

Hardware flow control

When the hardware flow control options are an empty, as they are by default, there is no hardware flow control. The options can be combined to enable hardware flow control.

"Receive flow control" stops a remote device from transmitting while the local input buffer is too full. "Transmit flow control" stops the local device from transmitting while the remote input buffer is too full.

Receive flow control is enabled by including the "Use RTS" and/or "Use DTR" elements in the options. When enabled, the corresponding modem control signals (RTS and/or DTR) are lowered when the input buffer reaches the 90% size of the buffer. The remote must recognize these signals and stop sending data while they are held low.

As the application processes received characters, buffer usage eventually drops below the 10% size of the buffer. At that point, the corresponding modem control signals are raised again. The remote must recognize these signals and start sending data again.

Transmit flow control is enabled by including the "Require CTS" and/or "Require DSR" elements in the options. With one or both of these options enabled, the Windows communications driver doesn't transmit data unless the remote device is providing the corresponding modem status signal (CTS and/or DSR). The remote must raise and lower these signals when needed to control the flow of transmitted characters.

Note that flow control using RTS and CTS is much more common than flow control using DTR and DSR.

Software flow control

This routine turns on one or both aspects of automatic software flow control based on the value assigned to the property.

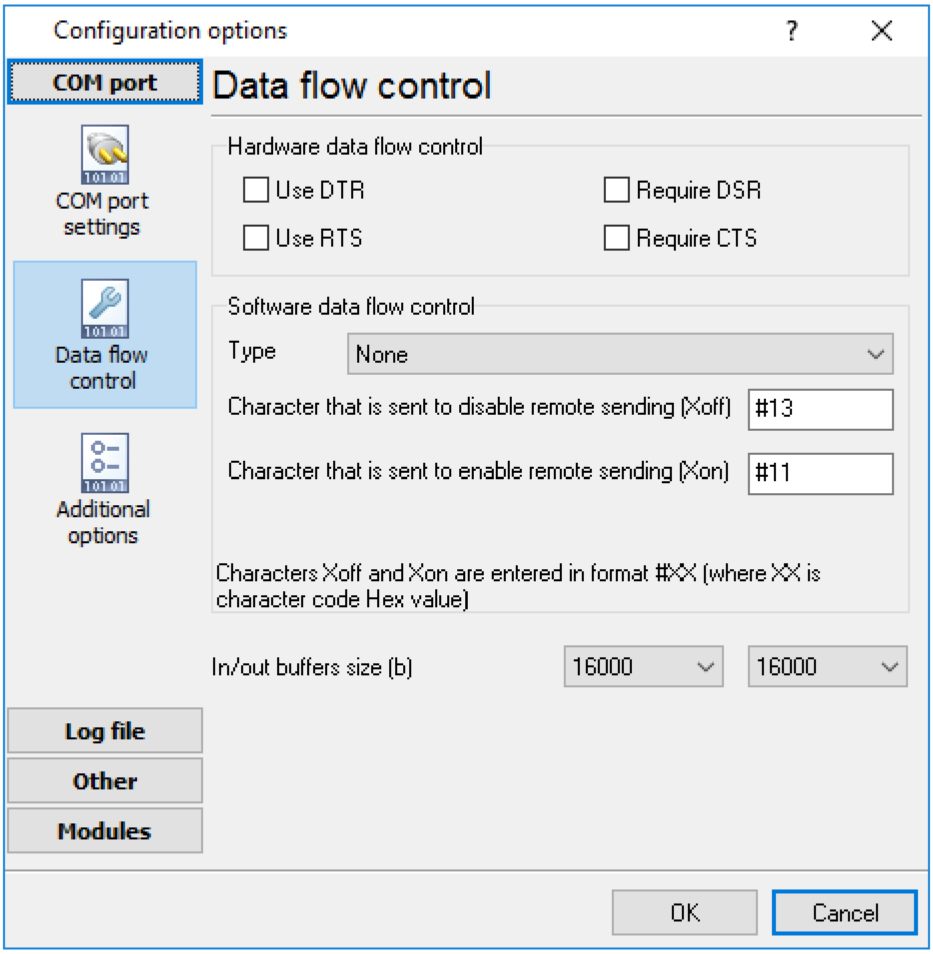
"Receive flow control" stops a remote device from transmitting while the local receive buffer is too full. "Transmit flow control" stops the local device from transmitting while the remote receive buffer is too full.

Receive flow control is enabled by assigning "On receiving" or "Both" to the "Type" property. When enabled, a Xoff character is sent when the input buffer reaches the 10% level of of the buffer size. The remote must recognize this character and stop sending data after it is received.

As the application processes received characters, buffer usage eventually drops below the 10% level of the buffer. At that point, a Xon character is sent. The remote must recognize this character and start sending data again.

Transmit flow control is enabled by assigning "On transmitting" or "Both" to the "Type" property. The 10% and 90% size of the buffer are not used in this case. When transmit flow control is enabled, the communications driver stops transmitting whenever it receives a Xoff character. The driver does not start transmitting again until it receives a Xon character, or the user sets software flow control to "None'.

Software data flow control can be configured on receive, transmit, or both modes, but so as the great number of a device doesn't need data sending, select the "On receive" control mode. In case of activation of data transmit control, a remote object (your device) can send special codes, signalizing about data transmit stop or start. On default, received from device character 0x11 Hex signalizes to COM port driver to start data receive and character 0x13 Hex - to stop data receiving from a device.



Data flow control

Hardware data flow control

□ Use DTR
□ Require DSR
□ Use RTS
□ Require CTS

Software data flow control

Type: None

Character that is sent to disable remote sending (Xoff): #13

Character that is sent to enable remote sending (Xon): #11

Characters Xoff and Xon are entered in format #XX (where XX is character code Hex value)

In/out buffers size (b): 16000 16000

Fig. 2.1.3 Data flow control

Spy mode

In this mode, Advanced NMEA Data Logger doesn't send and receive any data, and only spies on data exchange, made by other programs. You should enable the "Spy mode" checkbox.

Also, you must start the logger before any other program that can use the selected COM port.

After this, the logger will capture and show data exchange over the selected COM port in the main window.

Note: You must close the program you monitor, *before* closing Advanced NMEA Data Logger.

Serial data transfer errors

Line errors can occur during data exchange and displayed in the main program window in the status bar.

UART receiver parity error - occurs if you configured an invalid parity type.

UART receiver overrun,
UART receiver framing error - occurs if you configured an invalid number of stop or data bits.

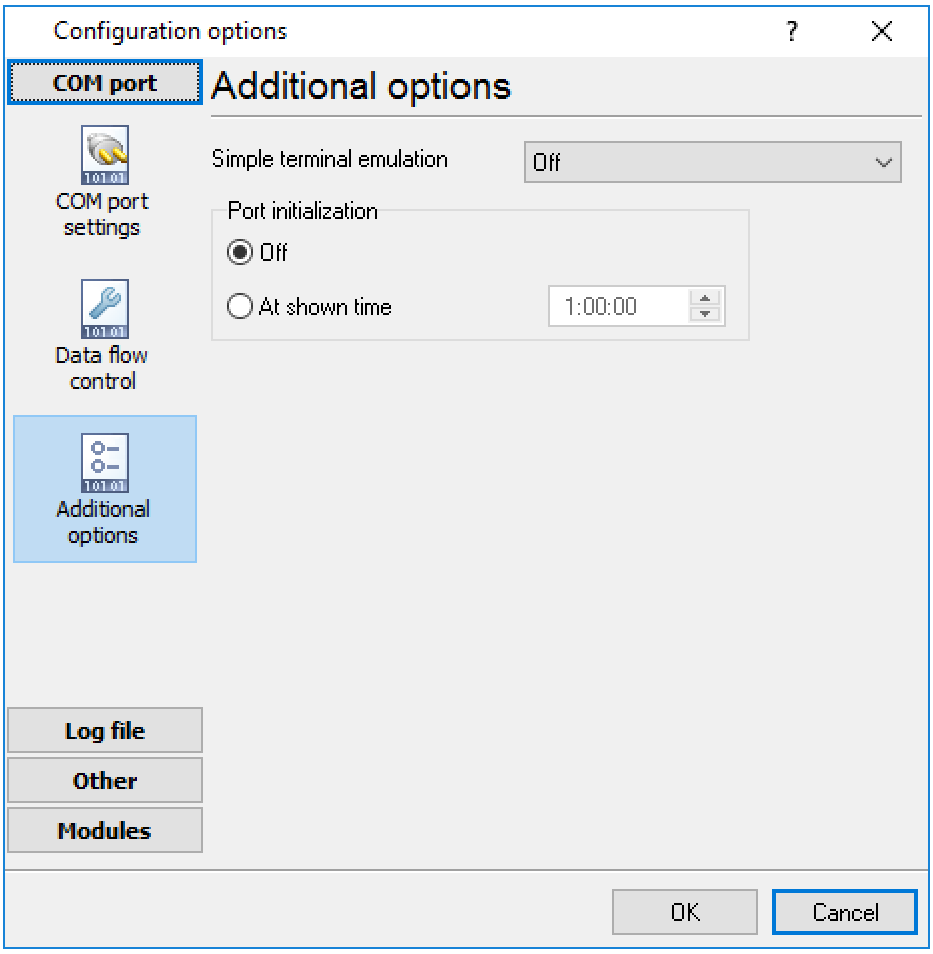
Transmit timeout waiting for CTS,
Transmit timeout waiting for DSR,
Transmit timeout waiting for RLSD - occurs if you configured invalid hardware flow control, or your serial interface cable isn't wired for hardware flow control.

Transmit queue is full - occurs if Advanced NMEA Data Logger can't send data to a remote device.

Break - Break signal is received.

Port restart

You can also set the program to initiate the serial interface at the specified time. On some old versions of the Windows NT operating system it could help to avoid the loss of data when the program has been working for a long time without restarting. Please use the "Additional options" tab (fig. 2.1.4)



Configuration options

Additional options

Simple terminal emulation: Off

Port initialization

● Off

○ At shown time 1:00:00

Fig. 2.1.4 Additional options

Here you can also select the terminal emulation mode. In this mode, the program will remove or interpret some special terminal sequences automatically.

4.6.2 Network connection

4.6.2.1 TCP/IP settings

UDP vs. TCP

The most commonly used network protocols today are TCP (Transport Control Protocol) and UDP (User Datagram Protocol). TCP is a proven and reliable protocol, and probably the most widely implemented protocol in use on IP networks today. However, TCP has a lot of overhead and payload issues, and can sometimes be ‘too-reliable’ or robust for many applications. In fact, when used as transport, for many serial-based applications TCP can hinder reliable communications. In contrast, UDP is a much simpler protocol and is being used more frequently today - particularly in areas where bandwidth or throughput is constrained. An example is the predominant use of UDP for transport of wireless data applications.

UDP is first a connectionless protocol. Like TCP, UDP runs on top of IP networks. But unlike TCP, UDP does little to help with transport delivery or error recovery. Instead, it offers a direct way to send and receive packets, letting the software application manage things like error recovery and data retransmission. Once primarily used for broadcasting small messages, UDP is now used for everything from browsers to Instant Messaging, Video, and Voice over IP applications.

While a powerful tool, the downside to using UDP is that there is not ‘connection’ report to know that you have end-to-end connectivity. This often makes detecting whether or not a packet is ‘making it’ from one place to another quite a hassle.

Client vs Server

Advanced NMEA Data Logger can be configured to log data from as many ports that you like simultaneously on a single computer. The program allows you to create multiple configurations for this task. Each configuration may contain different settings for each TCP/IP port. Each configuration has a set of TCP/IP parameters that are described below.

Each port configuration (i.e. TCP/IP connection) in Advanced NMEA Data Logger can act as:

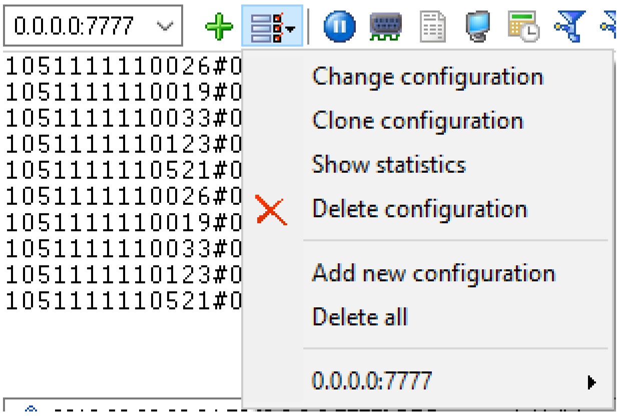
1. **Client**. You will need to specify the remote host IP address and the port number for the TCP/IP server that you want to connect to. The IP address that you specify in Advanced NMEA Data Logger when configuring it as a client may also be either a URL or the name of a computer located on your network. For example, if you want to connect to a computer named "Plant1", you can simply enter "Plant1" for the IP address instead of the actual IP address. If you are configuring Advanced NMEA Data Logger as a client and your network is set up to assign IP addresses dynamically to each workstation, then you may need to use the name of the computer that you want to connect to instead of an actual IP address to guarantee a connection.
2. **Server**. In this mode you should specify the IP address of the local computer will be used and you only need to specify the port number that you would like to use. If your computer has more than one network interface card (NIC) then Advanced NMEA Data Logger will display a list of all the IP addresses for each NIC installed in your system so that you can select the IP Address that you want to use. In order for Advanced NMEA Data Logger to act as a server, the computer that it is running on must have at least one network interface card with an IP address assigned to it. In Microsoft Windows, the TCP/IP protocol can be configured to automatically obtain an IP address from a host computer. It means that your computer may not have an IP address until it is connected to a network server or a host computer. You may need to contact your network administrator to assign an IP address to your computer if you wish to configure a TCP/IP server connection. This is done in the network settings for the TCP/IP protocol in your control panel.

After you enter the parameters that you would like to use, you must click the "OK" button to establish a connection between Advanced NMEA Data Logger and the TCP/IP port. If the current port configuration is set up as a client, it will immediately try to establish a connection to the specified remote server. If the server is not available, Advanced NMEA Data Logger will continually try to establish the connection until it is successful. If the port configuration is set up as a server, it will listen on the specified port until a client establishes a connection to it.

If one or more ports are configured already, then Advanced NMEA Data Logger is opening these ports and starting logging. If the port is opened successful, then the status bar in the main window displays a status of this port (fig. 1.1.1 7). However, before you should configure port parameters that are described below.

You can create the new configuration by clicking the "Plus" button in the main window (fig. 1.1.1 7) or through the "Options" menu. After you clicked the "Plus" button, the dialog window will be opened (fig. 2.2.2). The dialog window contains few sections with parameters. The "IP settings" section is described in this chapter.

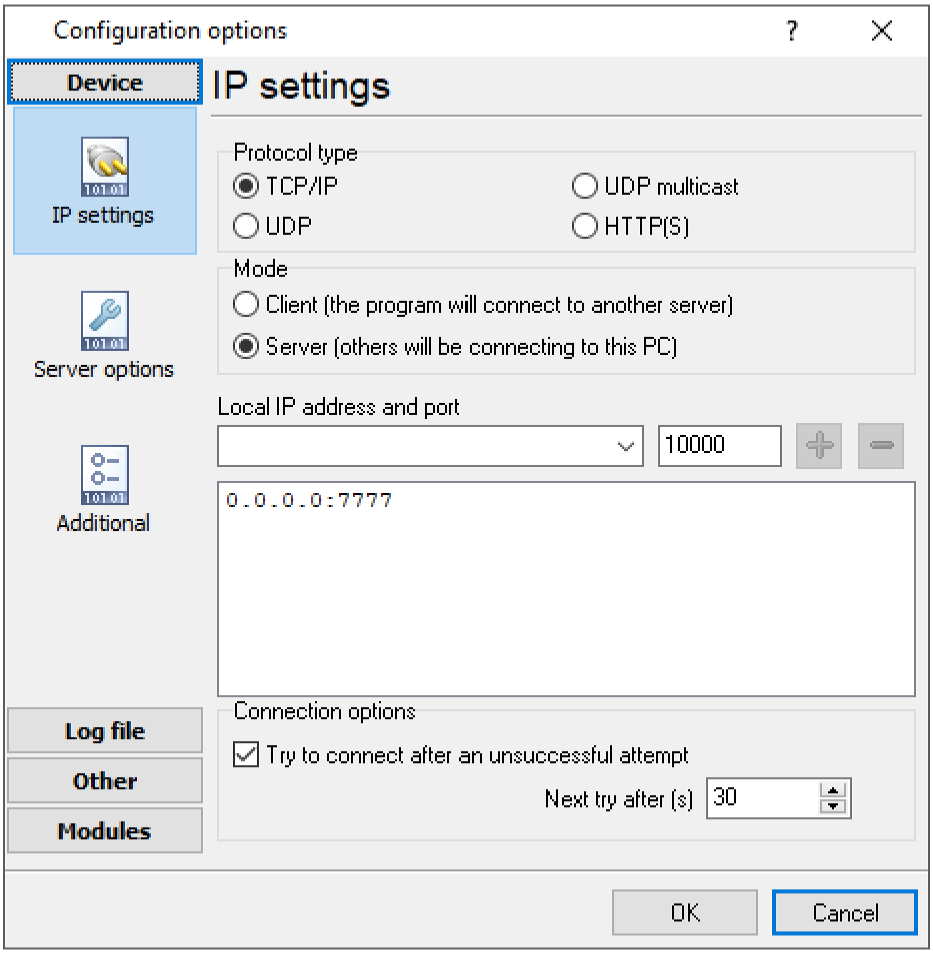
To log data from more than one TCP/IP connection, you would create and configure multiple port configurations. You can manage the configuration created with a drop-down menu near the "Plus" button (fig. 2.2.1).



```
1051111110026#0
1051111110019#0
1051111110033#0
1051111110123#0
1051111110521#0
1051111110026#0
1051111110019#0
1051111110033#0
1051111110123#0
1051111110521#0
```

Fig. 2.2.1 Access to the port configuration

The "IP settings" tab contains indispensable settings of any TCP/IP port: IP address and port.



IP settings

Protocol type
● TCP/IP ○ UDP multicast
○ UDP ○ HTTP(S)

Mode
○ Client (the program will connect to another server)
● Server (others will be connecting to this PC)

Local IP address and port: 10000

```
0.0.0.0:7777
```

Connection options
☑ Try to connect after an unsuccessful attempt
Next try after (s) 30

Fig. 2.2.2 TCP/IP parameters

Port

In addition to the IP address, you should specify how to connect to a remote machine. Our software can be thought of as a trunk line with thousands of individual lines (the ports) which are used to connect machines. Some ports are considered well-known ports. For example, the port typically used for network mail systems (SMTP) is port 25, the telnet port is port 23, the network news server port (NNTP) is typically port 119, and so on. To see a list of well-known ports, inspect the SERVICES file in the Windows directory (for Windows NT it is in the WINNT\SYSTEM32\DRIVERS\ETC directory). The SERVICES file is a text file used by Advanced NMEA Data Logger to perform port lookups (which return the service name for the specified port) and port name lookups (which return the port number for the specified service name). You can open this file in any text editor to see a list of port numbers, and their corresponding service names. While these well-known ports are not set in stone, they are traditional and their use should be reserved for the service which they represent. When writing network applications, you should select a port number that is not likely to be duplicated by other applications on your network. In most cases, you can choose a port number other than any of the well-known port numbers.

The IP address and port number are used in combination to create a socket. A socket is first created and then is used to establish a connection between two computers. How the socket is used depends on whether the application is a client or a server. If an application is a server, it creates the socket, opens it, and then listens on that socket for computers trying to establish a connection. At this point, the server is in a polling loop listening and waiting for a possible connection. A client application, on the other hand, creates a socket using the IP address of a particular server and the port number that the server is known to be listening on. The client then uses the socket to attempt to connect to the server. When the server hears the connection attempt, it wakes up and decides whether or not to accept the connection. Usually, this is done by examining the IP address of the client and comparing it to a list of known IP addresses (some servers don’t discriminate and accept all connections). If the connection is accepted, the client and server begin communicating, and data is transmitted.

Connection options

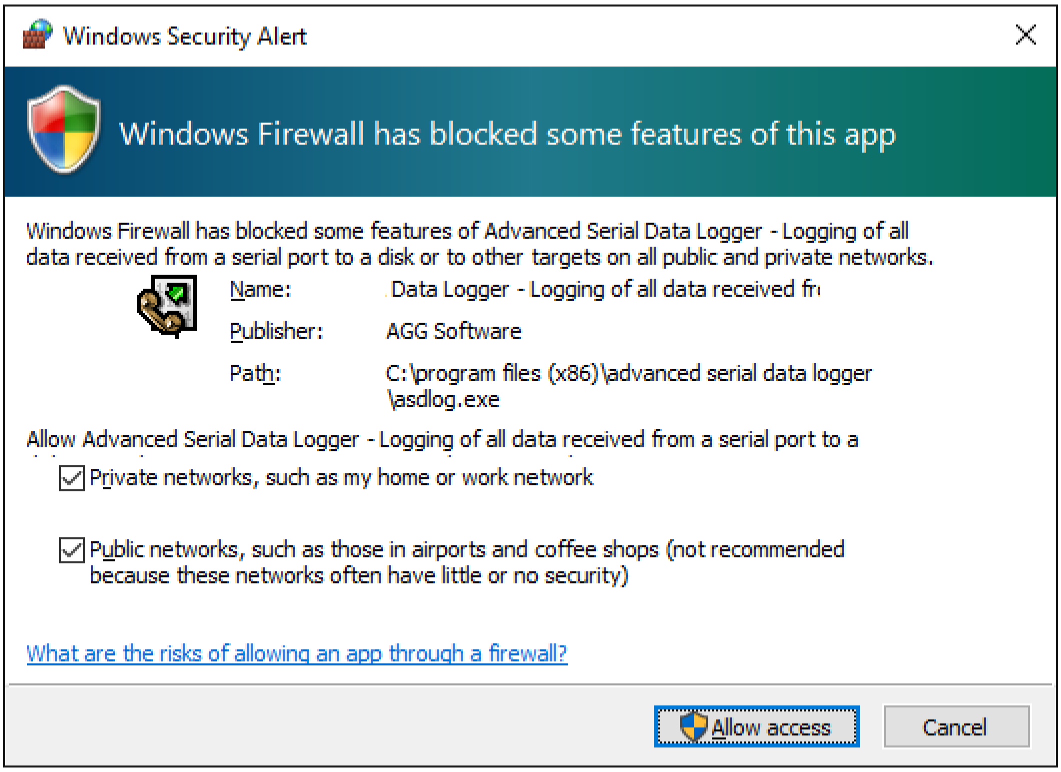
If the remote server (in the client mode) or local network interface (in the server mode) is not available and the "**Try to connect after unsuccessful attempt**" options is True, then Advanced NMEA Data Logger will continually try to establish the connection until it is successful. The program will try to establish the connection every N seconds that you can specify in the "**Next try after XXX seconds**" field.

Allowed IP addresses

This option is active in the server mode and allows you to enter one or more IP addresses that have access to the server. The server refuses connections from any other IP address. This option is very useful if you transfer your data over an Internet connection or your server computer is connected to a big corporate network. You can specify multiple addresses - one per row. If you do not specify any address here, then Advanced NMEA Data Logger will accept connections from all IP addresses.

Firewall settings

After you install Microsoft Windows XP Service Pack 2 (SP2), our Advanced NMEA Data Logger may not seem to work. Windows Firewall, enabled by default, blocks unsolicited access to your computer via the network and may be blocking the normal operation of the program. To provide increased security to Windows XP users, Windows Firewall blocks unsolicited connections to your computer. When Windows Firewall detects incoming network traffic that it does not recognize, a Security Alert dialog box appears. The security alert dialog box looks like this:



Windows Security Alert

Windows Firewall has blocked some features of this app

Windows Firewall has blocked some features of Advanced Serial Data Logger - Logging of all data received from a serial port to a disk or to other targets on all public and private networks.

Name: Data Logger - Logging of all data received fr

Publisher: AGG Software

Path: C:\program files (x86)\advanced serial data logger \asdlog.exe

Allow Advanced Serial Data Logger - Logging of all data received from a serial port to a

☑ Private networks, such as my home or work network

☑ Public networks, such as those in airports and coffee shops (not recommended because these networks often have little or no security)

What are the risks of allowing an app through a firewall?

Fig. 2.2.3 Firewall alert

The dialog box includes the following buttons:

- Unblock this program.
- Keep Blocking this program.
- Keep blocking this program, but Ask Me Later.

For our program to function properly, you must unblock the program by clicking the Unblock button. Unblocking allows Windows XP SP2 to allow the program to continue to work by adding it as an exception to your Windows Firewall configuration. Exceptions are specific programs and processes that you allow bypassing the firewall. After you add a program as an exception, you no longer receive the security alert. If you choose to continue blocking the program, certain functions will be disabled.

Note: If you are using another firewall software, then please, refer to a firewall manual for corresponding settings.

Limitations

The specific limit of connections is dependent on how much physical memory your server has and how busy the connections are:

The Memory Factor: According to Microsoft, the WinNT and successor kernels allocate sockets out of the non-paged memory pool. (That is, the memory that cannot be swapped to the page file by the virtual memory subsystem.) The size of this pool is necessarily fixed, and is dependent on the amount of physical memory in the system. On Intel x86 machines, the non-paged memory pool stops growing at 1/8 the size of physical memory, with a hard maximum of 128 megabytes for Windows NT 4.0, and 256 megabytes for Windows 2000. Thus, for NT 4, the size of the non-paged pool stops increasing once the machine has 1 GB of physical memory. On Win2K, you hit the wall at 2 GB.

The "Busy-ness" Factor: The amount of data associated with each socket varies depending on how that socket's used, but the minimum size is around 2 KB. Overlapped I/O buffers also eat into the non-paged pool, in blocks of 4 KB. (4 KB is the x86's memory management unit's page size.) Thus, a simplistic application that's regularly sending and receiving on a socket will tie up at least 10 KB of non-pageable memory.

The Win32 event mechanism (e.g., WaitForMultipleObjects()) can only wait on 64 event objects at a time. Winsock 2 provides the WSAEventSelect() function which lets you use Win32's event mechanism to wait for events on sockets. Because it uses Win32's event mechanism, you can only wait for events on 64 sockets at a time. If you want to wait on more than 64 Winsock event objects at a time, you need to use multiple threads, each waiting on no more than 64 of the sockets.

If you have more than 64 connection at a time, then we recommend creating multiple configurations in our software (the "Green Plus" button). Each configuration will use different port number and will run in a different thread. This change will allow decreasing the influence of Windows limitations.

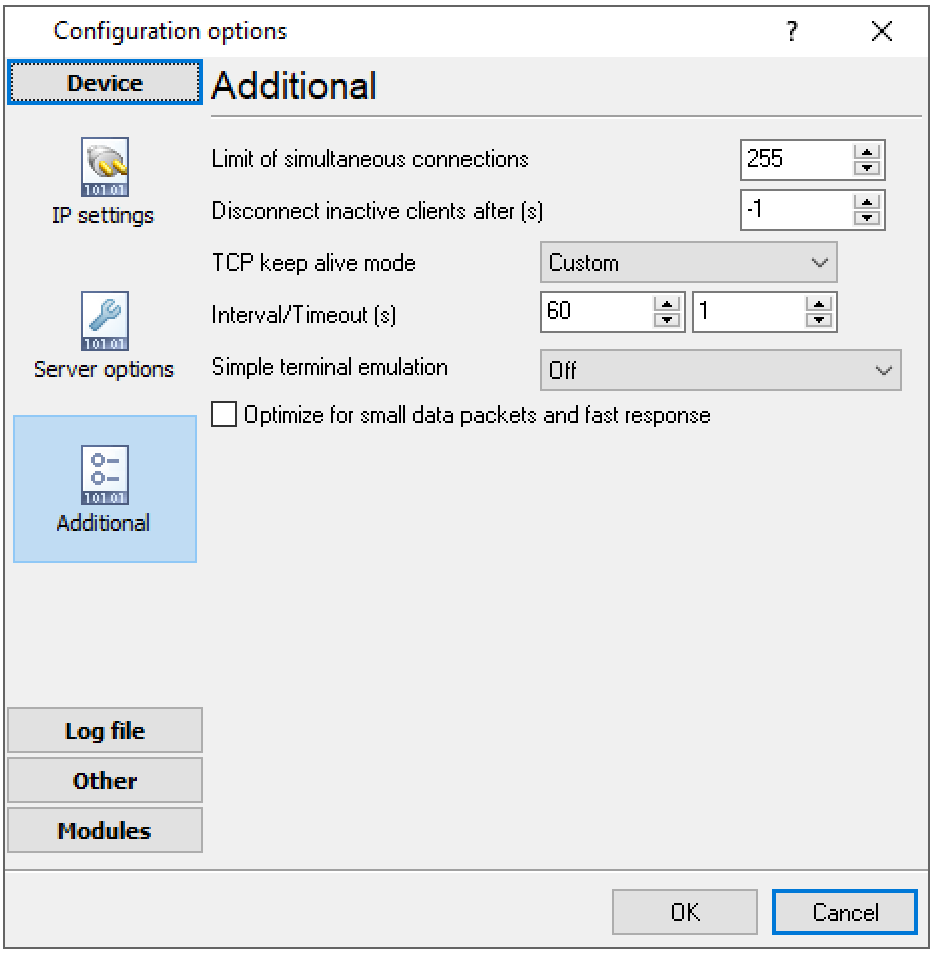
Additional parameters

The "Additional" tab contains additional settings of a TCP/IP or UDP connection (fig. 2.2.4).

Simple terminal emulation - the program realizes the simple implementation of some terminal protocols. If this emulation is enabled, then the program will process some special commands and character sequences.

Following options are effective only in the "TCP/IP server" mode:

Limit of simultaneous connections - you can define the number of clients that can connect to the server at the same time. It allows optimizing a server load with a large number of TCP clients.
Disconnect inactive clients after (s) - if a client is connected, but didn't send or receive any data within the specified time, then the connection with this client will be closed. If you will specify "-1," then the clients will not be disconnected.



Configuration options

Additional

Limit of simultaneous connections: 255

Disconnect inactive clients after (s): -1

TCP keep alive mode: Custom

Interval/Timeout (s): 60 / 1

Simple terminal emulation: Off

□ Optimize for small data packets and fast response

Fig. 2.2.4. Additional parameters

Following options are effective only in the TCP/IP server or client modes:

TCP keep-alive mode

A TCP keep-alive packet is a short packet which is sent periodically by the OS to keep the connection alive. The connection stays alive because those packets and their replies generate small traffic on the connection when the application is idle.

Keep-alives can be used to verify that the computer at the remote end of a connection is still available.

It is simply an ACK with the sequence number set to one less than the current sequence number for the connection. A host receiving one of these ACKs responds with an ACK for the current sequence number.

TCP keep-alive can be sent once every KeepAliveTime (defaults to 7,200,000 milliseconds or two hours) if no other data or higher-level keep-alive have been carried over the TCP connection. If there is no response to a keep-alive, it is repeated once every KeepAliveInterval seconds. KeepAliveInterval defaults to 1 second. Some (buggy) routers may not handle keep-alive packets properly.

Our software supports three modes of keep-alive (fig 2.2.4):

1. **Off -** the program doesn't use the keep-alive feature at all. You can disable it if your network is very stable or your routers do not support it.

2. **System** - the program will use the keep-alive feature, but use system values of KeepAliveTime and KeepAliveInterval. These values are stored in the following registry branch:

```
[HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Tcpip\Parameters]
KeepAliveTime (32-bit number) = milliseconds
KeepAliveInterval (32-bit number) = milliseconds
```

3. **Custom** - the program will use keep-alive, but you can specify your values of KeepAliveTime and KeepAliveInterval, that are more applicable for your network and system. **Note**: in our software, you should define these values in seconds.

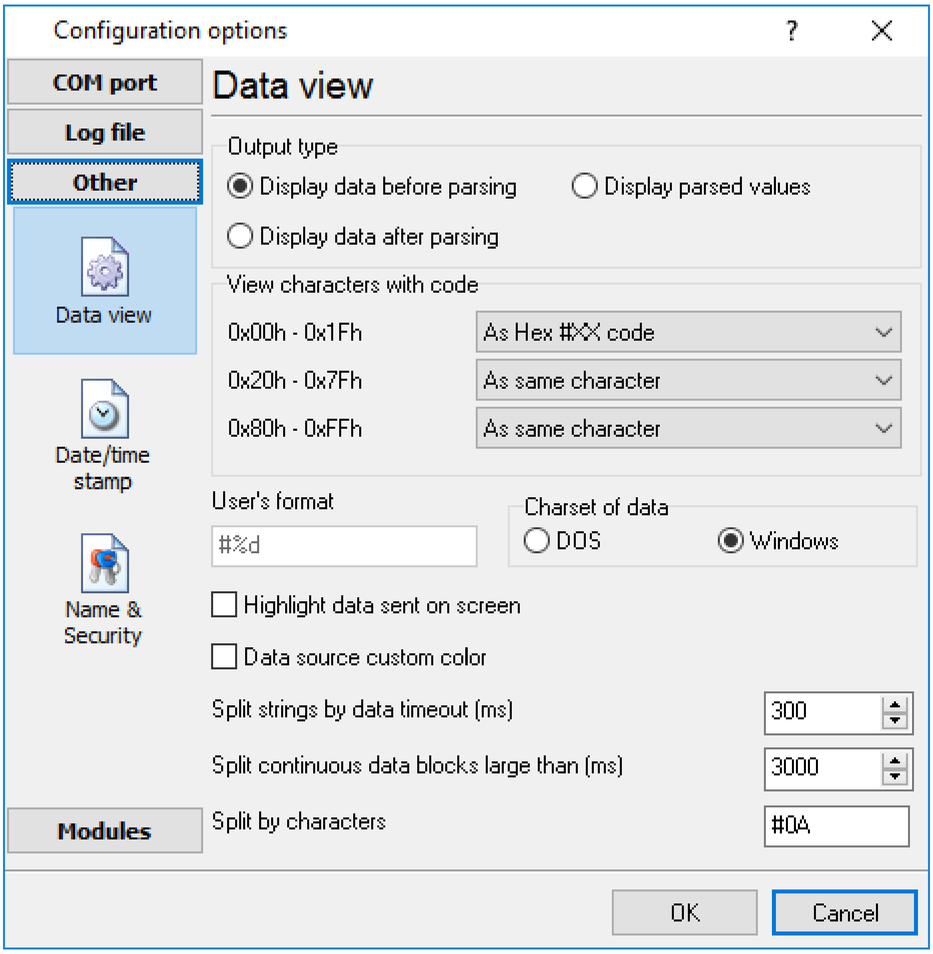
Note: Some routers may not allow keep-alive TCP packets. In this case, the "keep-alive" function will not work.

4.6.3 Additional parameters

4.6.3.1 Data view change

The data in the main window (fig.1.1.1 7) can be displayed in two modes (fig. 3.1.1):

1. **The data can be displayed before processing**. Before processing the data I fully comply with that has been read.
2. **The data can be displayed after processing**. After processing the data can be modified depending on the parser.



Data view

Output type

● Display data before parsing ○ Display parsed values

○ Display data after parsing

View characters with code

0x00h - 0x1Fh: As Hex #XX code

0x20h - 0x7Fh: As same character

0x80h - 0xFFh: As same character

User's format: #%d

Charset of data: ○ DOS ● Windows

□ Highlight data sent on screen

□ Data source custom color

Split strings by data timeout (ms): 300

Split continuous data blocks large than (ms): 3000

Split by characters: #0A

Fig. 3.1.1. Data view

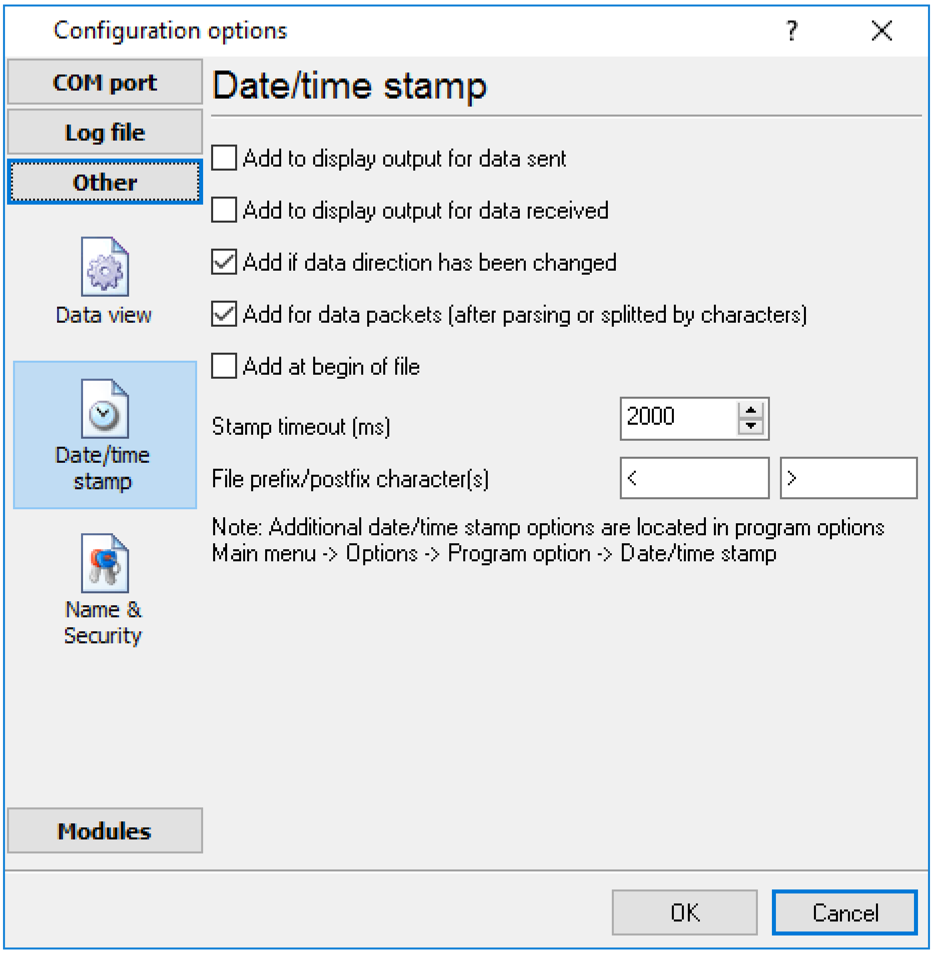
Data view settings, that can be configured on the "Data view" tab:

1. **View characters with code** - the program can interpret and decode bytes as characters. You can select decoding mode for each range of character codes. If the range doesn't have the corresponding character, that's why these data can be displayed only in hexadecimal and decimal code.
2. You can set up the **user's format** to display a data byte. The directive %d shows to display a decimal code, the directive %x - hex code. You can set any framing characters before/after the user format.
3. **Highlight data sent on screen** - a string with sent data will be highlighted by the selected color.
4. **Character set** - allows you to define the character set of incoming data. Windows - Windows ANSI character set, DOS - OEM character set.
5. Data source custom color - if you've created several configurations then you can define a custom color for each data source that allows you to distinguish data flows on the "All data" page in the main window.
6. **Split strings by data timeout** - this option allows visually splitting data packets in the program window. Data packets that will be received after the specified interval will be shown on a new line. If this value is set to 0, then data packets will not be split.

7. **Split continuous data blocks large than** - this option allows visually splitting continuous data flow in the program window. The program will show data on a new line if continuous data is longer than the specified number of bytes.
8. **Split by characters** - this option allows to visually splitting continuous data flow in the program window using the specified symbols. For example (fig. 3.1.1), the program will use a character with the 0Ah hexadecimal code that is equal to the "LF" ASCII code.

4.6.3.2 Date/time configuration

This group of options (fig. 3.2.1) allows you to configure how timestamps appear in the log file and on the screen. You can configure the stamp format in the program options 56.



Date/time stamp

☐ Add to display output for data sent
☐ Add to display output for data received
☑ Add if data direction has been changed
☑ Add for data packets (after parsing or splitted by characters)
☐ Add at begin of file

Stamp timeout (ms) 2000

File prefix/postfix character(s) < >

Note: Additional date/time stamp options are located in program options
Main menu -> Options -> Program option -> Date/time stamp

Fig. 3.2.1 Time stamp configuration

Add to display output for data sent - the time stamp will be added for the sent data displayed on the screen. The stamp will be added according to the timeout (if the data flow is uninterrupted) or when a data packet is sent.

Add to display output for data received - the same but for the received data.

Add if data direction has been changed - if the program is sending and receiving data, the time stamp will be also added when the data transfer direction changes (sending/receiving).

Add for data packets - if the data is displayed after it is processed, the stamp will be added to each processed data packet.

Add at begin of file - the stamp will be added at the beginning of every new log file.

Stamp timeout - if the data flow is uninterrupted, the stamp will be added regularly at the interval specified in milliseconds.

File prefix/postfix character(s) - the program will use these characters instead of those specified in the program options 56 while writing data to a file. For example, it allows you to add the new line character or another sequence of characters before or after the stamp. Example: >#0D#0A

4.6.3.3 Name and security

This group of options (fig. 3.3.1) allows you to configure the following parameters:

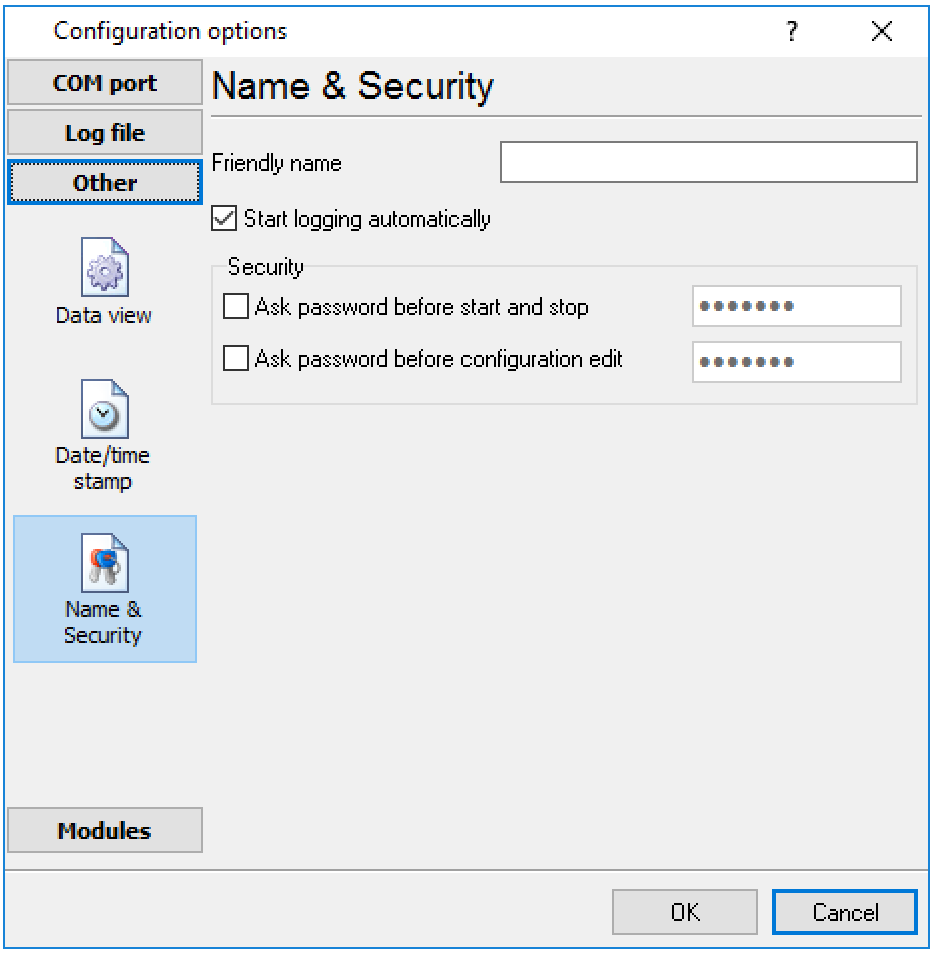
Friendly name - this name will be added before the port number or the data source in the drop-down list in the main window of the program. It allows you to describe the data source.

Start logging automatically - if this option is enabled the program will start receiving and logging data automatically when it is launched.

The "Security" option group allows you to protect user operations in this particular configuration with a password. You can specify advanced security options applied to the entire program in the program options 63.

Ask password before start and stop - the password will be required when the user clicks the "Start/Pause" button in the main window of the program.

Ask password before configuration edit - the password will be required when the user tries to open the Configuration options dialog box.



Name & Security

Friendly name

☑ Start logging automatically

Security

□ Ask password before start and stop •••••••

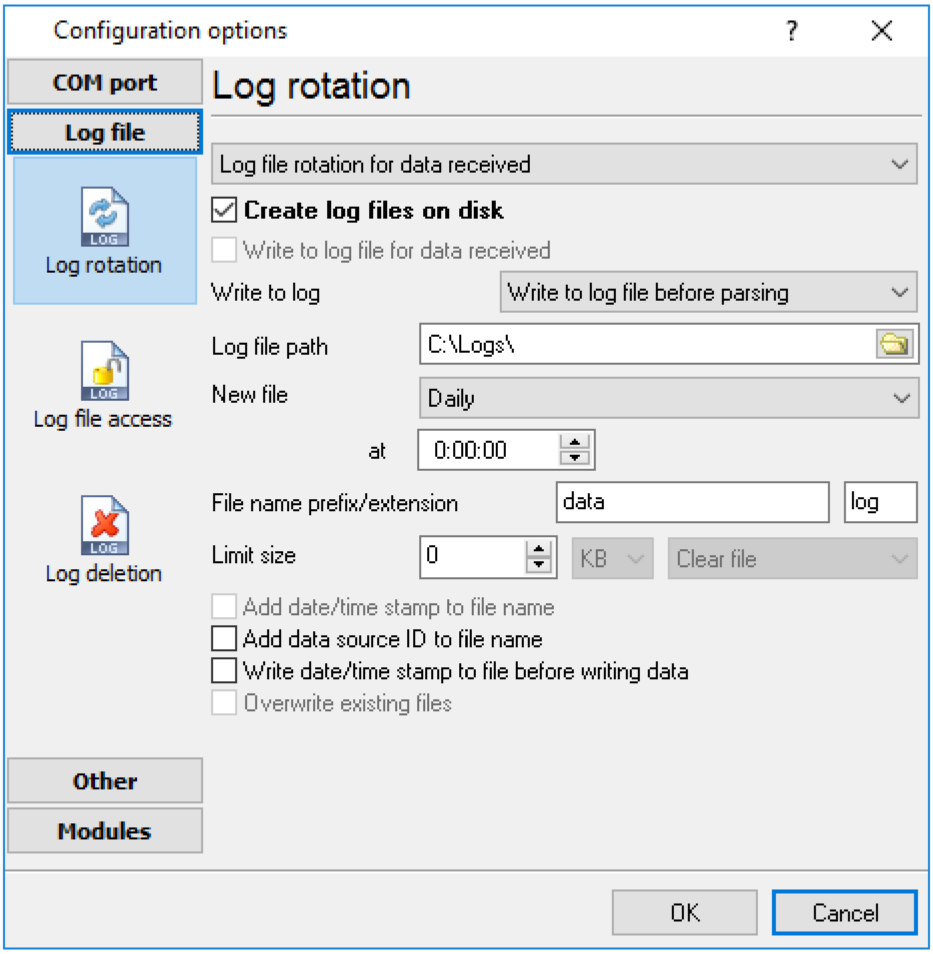
□ Ask password before configuration edit •••••••

Fig. 3.3.1. Name and security

4.6.4 Log files

4.6.4.1 Log rotation

The main function of Advanced NMEA Data Logger is logging data to a file (so-called, log file). The "Log rotation" tab has a rich set of options for it. (fig. 4.1.1).



Log rotation

Log file rotation for data received

☑ Create log files on disk

□ Write to log file for data received

Write to log: Write to log file before parsing

Log file path: C:\Logs\

New file: Daily

at 0:00:00

File name prefix/extension: data log

Limit size: 0 KB Clear file

□ Add date/time stamp to file name

□ Add data source ID to file name

□ Write date/time stamp to file before writing data

□ Overwrite existing files

Fig. 4.1.1 Log-file forming modes

First of all, select log file what you can configure:

- **Log file for data received** - all data received will be saved using these settings.
- **Log file for data sent -** these settings will be used to save sent data. If you want to save data to the same file, as data received, then select the "Log file rotation for data sent" option from the list and enable two options: "Create log files on disk" and "Write to log for data received." Of course, you should configure a log rotation for data received before.

Set the "Create log file on disk" option to the checked state. Then you can set path to a folder, where files will be created with the help of a dialog window, which will be showed up after clicking a button with the "Folder" picture. You should select a necessary folder in the dialog window and click the "OK" button.

Log file path - the full path to a local or network folder, where the program will create new log files. The network path should be specified as: \\COMPUTER NAME\Folder\

Note: If the program works with network files, it greatly increases data flow through your network and decreases writing speed. Please, consider creating small log files. If your incoming data flow is fast, you may create log files locally. Later, you may sync a local folder with a remote folder using any 3rd party utility.

A log file name can be stamped with date and time. In this case, a new log file is created periodically. The format of a timestamp depends on the selected period. For instance, if the "**File name prefix**" field is set to "sample," the "**File extension**" field to "log," and the "**File name format**" option is "Daily," then each log file created will have the format "sampleYYYYMMDD.log". On March 21st, 2003, the log file will be "sample20030321.log". Please, note, that the final extension (after the final period), remains at the end of the file name.

Write to log - the option allows you to select when the program writes data to a log file. This feature is disabled in some loggers, and if the parser plugin is not available.

- **Before parsing** - the program saves all incoming data without any modifications. If an external device sends binary data, the logger will create binary files.
- **After parsing** - the program saves data after parsing. Generally, it is a parsed data packet.
- **After filtering** - the program saves data after all filter plugins. The logger saves the content of the "FULL_DATA_PACKET" variable. A filter plugin may transform or fully change the variable. If you do not use any filter plugin, then this mode works as the previous.
- **Screen content** - the program saves data to a log file as you see it in the main window. Generally, it is text content; therefore, the program creates a text log file.

The log rotation mode is defined by the following key parameters:

- **File name prefix** - the text string, which will be added at file name beginning. The prefix may contain special placeholders like {NAME}. If you create log files before parsing the NAME can be any date formatting values below. For example: "data{YYYY}_{MM}_{DD}" returns a prefix like "data2019_01_01". If you create log files after parsing or filtering, you may use any parser variable. Then the file name may depend on some value in your incoming data.
- **File name extension** - the text string, which will be a file extension (characters after the dot).

Limit size - the "Limit size" field specifies the maximum size in kilobytes of any log file. If you specify the zero file size, then the file size is not limited.

You may select from the following modes:

1. **Clear file** - if the log file size will exceed the limit specified, then the log file content will be deleted, and file filling will start from the beginning.
2. **Rename old** - if the log file size will exceed the limit specified, then the existing log file will be renamed.
3. **Shift (no threshold)** - the older data over the limit specified will be removed from the log file.
4. **Shift (with threshold) -** in this mode the program will wait when the file size will exceed the limit specified + the threshold value. After this, the older data over the limit specified will be removed from the log file.

If the program continuously works for a long time, it is possible that the log file will have a large size and this file will be inconvenient for looking and analyzing. Therefore, there is the possibility to create files in dependence with the time on a computer. You can select one variant predefined or set up a new one:

- **Daily** - the file will be created with a name containing a prefix, and date in format DDMMYYYY, where DD is two-digit day sign, MM is two-digit month sign, and YYYY is four digits of the current year. The filename extension will be added at the end of the file.
- **Monthly** - the file will be created with a name containing a prefix, and date in MMYYYY format. The filename extension will be added at the end of the file.
- **Each data packet in different file** - in this mode, the program splits data flow to a different file. In this mode you should configure the parser or the program will split a data by timeout about 300 milliseconds.
- **Don't create new file** - in this mode, the program will write all data to one file. It is recommended for a small data flow. Otherwise, your log file will be too big, and a performance of the program will fall down.
- **User's format** - a file will be created with a name containing a prefix and date in showed by you format (for example, DDMMYYYY). The filename extension will be added at the end of the file. The file may not contain format signs, then file name will be constant. You should not use characters, that the OS doesn't allow in a file name, such as "/,\.*,?" and some others.
- **Weekly** - create a new file every week. The file name will contain a week number.
- **After data timeout** - the program will create a new file if the program didn't receive any data at the specified interval.
- **Hourly** - the file will be created with a name containing a prefix, and date in format YYYYMMDDHH, where HH is two-digit hour sign, DD is two-digit day sign, MM is two-digit month sign and YYYY is four digits of the current year. The filename extension will be added at the end of the file.
- **Constantly named file** - the current log file will have a constant name. When creating a new file, the existing log file will be saved using the new file name that will contain a date and time stamp.

Date and time formatting codes:

D - a day number (1-31).
DD - a day number with a leading zero (01-31).
DDD - a day of the week in the text form (Mon-Sat), according to the regional settings on this computer.
DDDD - a day of the week in the full text form (Monday-Saturday), according to the regional settings on this computer.
M - a month number (1-12).
MM - a month with a leading zero (01-12).
MMM - a month name in the text form (Jan-Dec), according to the regional settings on this computer.
MMMM - the full month name (January- December).
YY - last two digits of the year (00-99).
YYYY - the full year number (0000-9999).
H - the hour number (0-23).
HH - the hour number with a leading zero (00-23).
N - minutes (0-59)
NN - minutes with a leading zero (00-59).
S - seconds (0-59).
SS - seconds with a leading zero (00-59).

Example: You want to create a log file every hour. It is desired that file name starts from "sample_log" and the file extension "txt".

Answer: set file prefix = sample_log_, file extension= txt (without dot!). In file name format show HHDDMMYYYY. Now the file will be created every hour. Naturally, you can set any formatting characters combination, described higher.

If you want to access to a log file while the program work, then you should configure access mode settings 33 for the log file in the next chapter.

Add date/time stamp to file name - this option is available for modes #4 and #7 and allows adding date and time to the file name.

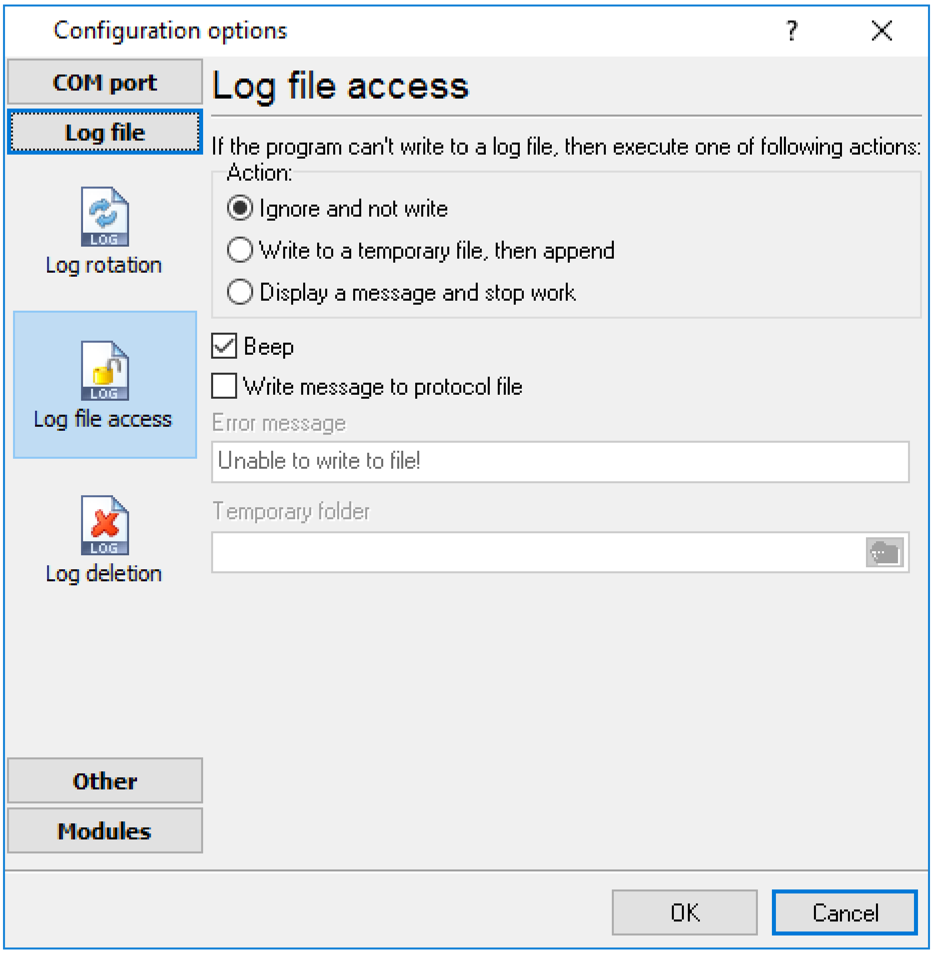
Add data source ID to file name - if this option is activated, then the program will append the data source name at the beginning of the file name, for example, COM1-sample20030321.log.

Write data/time stamp to file before writing data - if this option is activated, then the program will write a date/time stamp to a file before each data portion.

Overwrite existing files - this option is available for modes #4 and #7 and allows you to delete an existing log file before creating a new log file.

4.6.4.2 Log file access

During work can be such situations, when it is necessary to get access to a file with *current* data (current log file) from other applications (for example, for data processing). However, while you are accessing the current log file Advanced NMEA Data Logger can't write data to a log file and all data at this moment will be lost. We recommend using a temporary file for data storage. It is the safest way. (fig. 4.2.1).



Log file access

If the program can't write to a log file, then execute one of following actions:

Action:

● Ignore and not write

○ Write to a temporary file, then append

○ Display a message and stop work

☑ Beep

☐ Write message to protocol file

Error message: Unable to write to file!

Temporary folder:

Fig. 4.2.1 File access mode.

You can select one from the following variants:

- **Ignore and not write** - in this mode, the program stop writing to a log file until it is locked. Therefore, data will be **lost**.
- **Write to a temporary file, then append** - a temporary file will be created, to which writing will be done. After access to the current file will be got, temporary file content will be added to the end of the main file. However, mind that if file has a timestamp in the name, there can be a situation when the program copies the content of a temporary file to a new log file, for the next time.
- **Display a message and stop work** - data will be lost until the dialog window is closed.

You can define your message text, which will be displayed at writing error to a log file. The sound signal can be on for an additional indication. You can also enable writing a message to a protocol file.

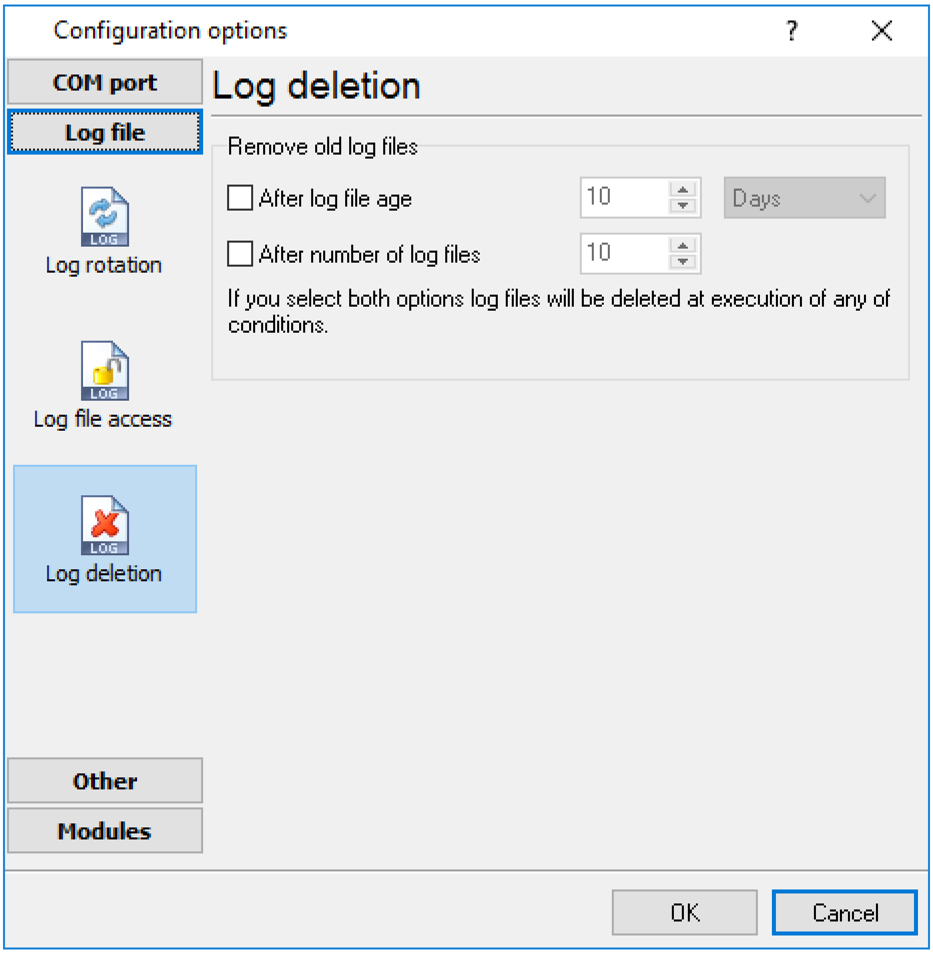
4.6.4.3 Log deletion

The deletion of files (fig. 4.3.1) will help you to avoid stuffing your hard disk with needless information. Log files can be deleted either depending on the time of storing or when the maximal number of files is exceeded.

When deleting files by the time of their storage, the files that were modified last time before the specified period are deleted.

When controlling the number of files, the files with the oldest modification dates are deleted first.

You can select both variants of file deletion. In that case, files will be deleted when either of the conditions is true.



Log deletion

Remove old log files

□ After log file age 10 Days

□ After number of log files 10

If you select both options log files will be deleted at execution of any of conditions.

Fig. 4.3.1 Log deletion

4.6.5 Modules

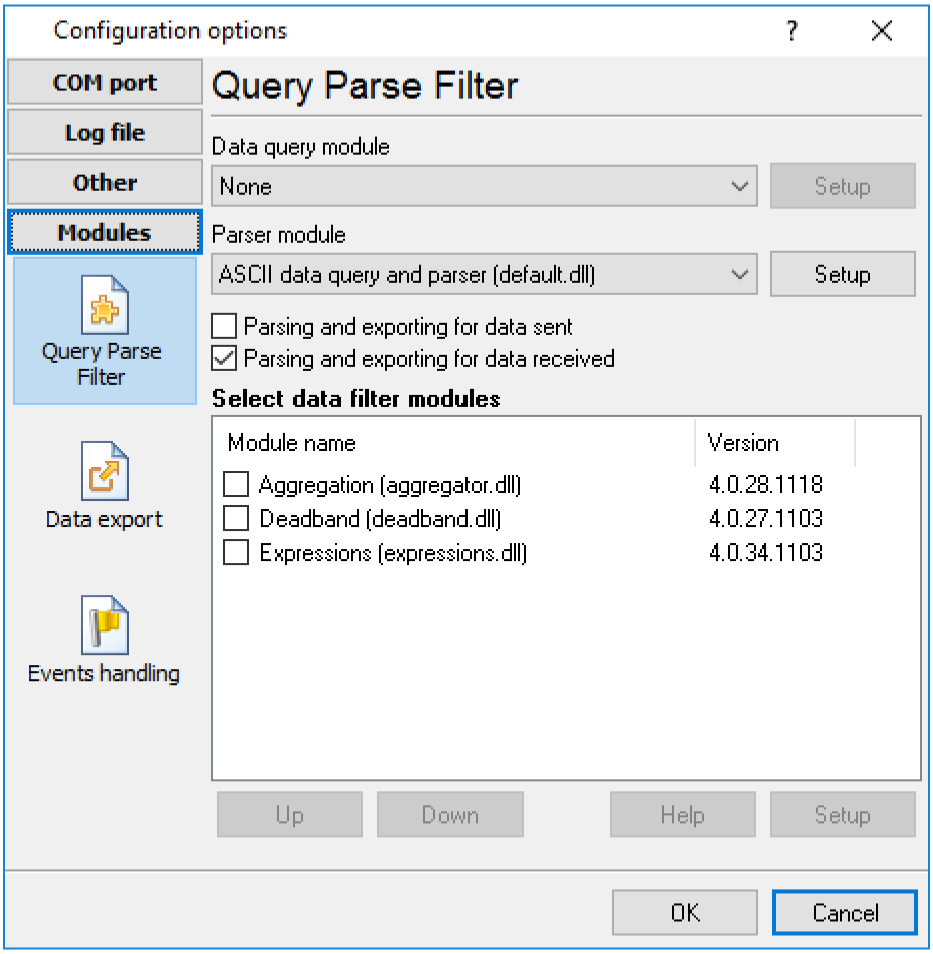
4.6.5.1 Introduction & setup

To extend program functionality, we implemented plug-in modules. The module structure lets you to reduce your program size and purchase costs (you pay only functionality, which you need).

Advanced NMEA Data Logger supports a few types of modules (fig. 5.1.1 - 5.1.3):

- **Data query** - transmits queries or commands out the data source to control or query your devices.

- **Data parser** - the data parser allows you to parse, filter, and format data from your data sources. Some of the advanced features of the parser are the ability to work with raw binary or hex data.
- **Data filter** - data filters allow you to filter your data and modify a value of parser variables.
- **Data export** (fig.11) - Advanced NMEA Data Logger has many modules and method for passing data to other applications, for example, there are modules for various databases, file formats (CSV, XML), data interfaces (OPC, DDE, MQTT), and many others.
- **Events handling** (fig.12) - these plug-ins are used to handle events generated by the Advanced NMEA Data Logger software. Once an event occurs (for example, "Data source is opened" or "Configuration changed"), the plug-in creates a text message using the specified template, sends a notification, does some actions, executes a program or a script, etc. The form of the notification or actions depends on the plug-in settings.



Query Parse Filter

Data query module: None [Setup]

Parser module: ASCII data query and parser (default.dll) [Setup]

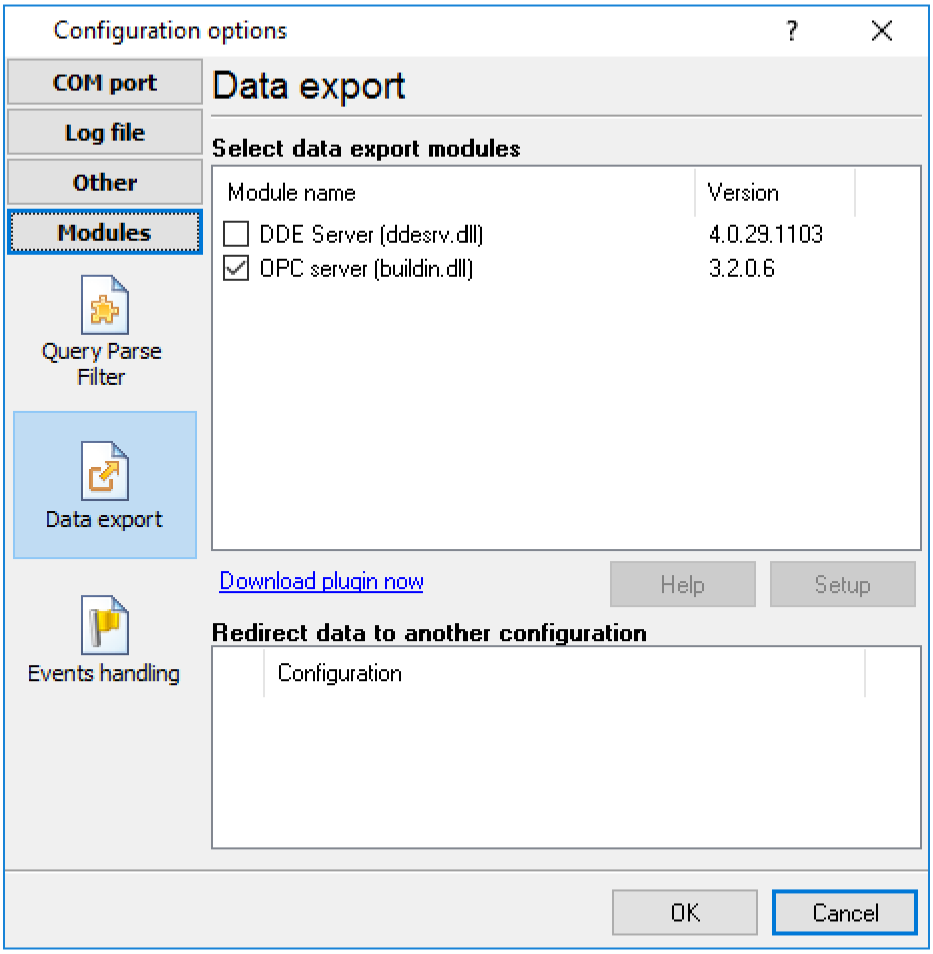
☐ Parsing and exporting for data sent

☑ Parsing and exporting for data received

Select data filter modules

Module name	Version
☐ Aggregation (aggregator.dll)	4.0.28.1118
☐ Deadband (deadband.dll)	4.0.27.1103
☐ Expressions (expressions.dll)	4.0.34.1103

Fig. 5.1.1. Activating plug-ins



Configuration options

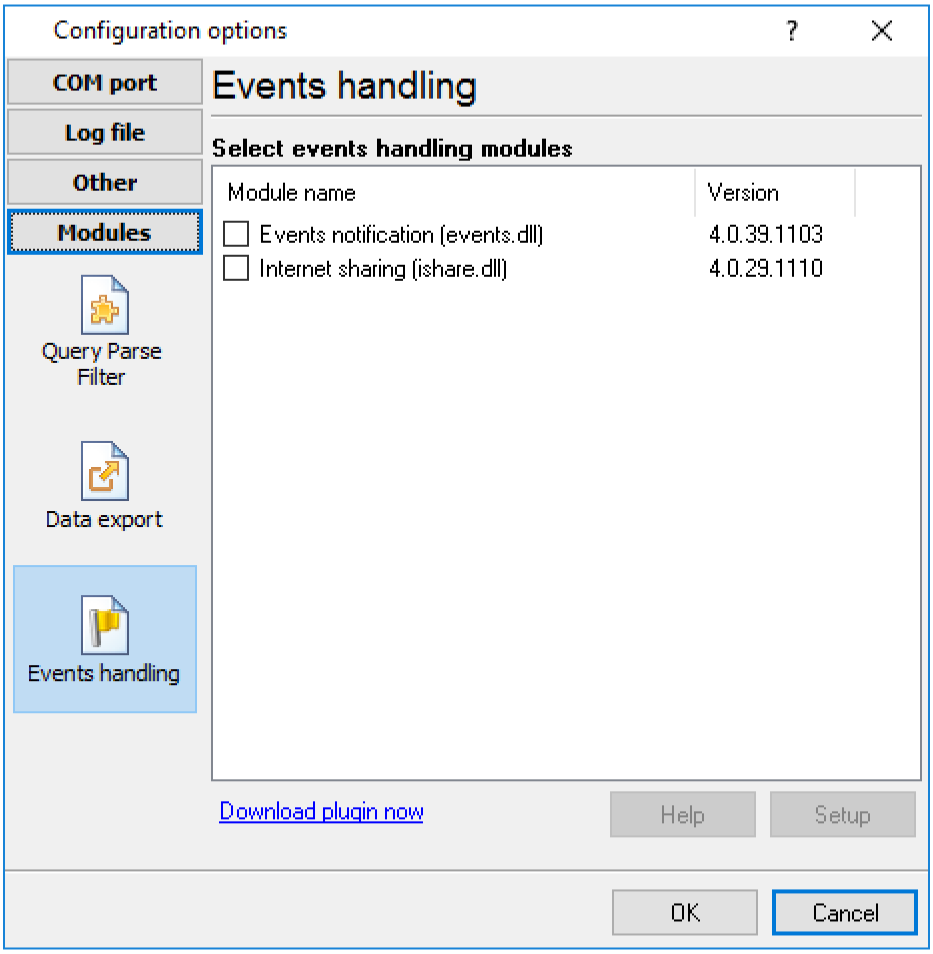
Data export

Select data export modules

	Module name	Version
□	DDE Server (ddesrv.dll)	4.0.29.1103
☑	OPC server (buildin.dll)	3.2.0.6

Redirect data to another configuration

Fig. 5.1.2 Activating data export plug-ins



Events handling

Select events handling modules

Module name	Version
□ Events notification (events.dll)	4.0.39.1103
□ Internet sharing (ishare.dll)	4.0.29.1110

Fig. 5.1.3 Activating events handling plug-ins

You can parse and export data sent and received (fig. 5.1.1). By default, only data received will be parsed.

Installation

You can easily install a new module. Usually, you should start the installation file and click the "Next" button for a few times. The installation wizard will detect a place of your Advanced NMEA Data Logger software and place a plug-in module and all distributive files to the "Plugins" folder, which is in the program folder (by default X:\\Program Files\Advanced NMEA Data Logger\Plugins).

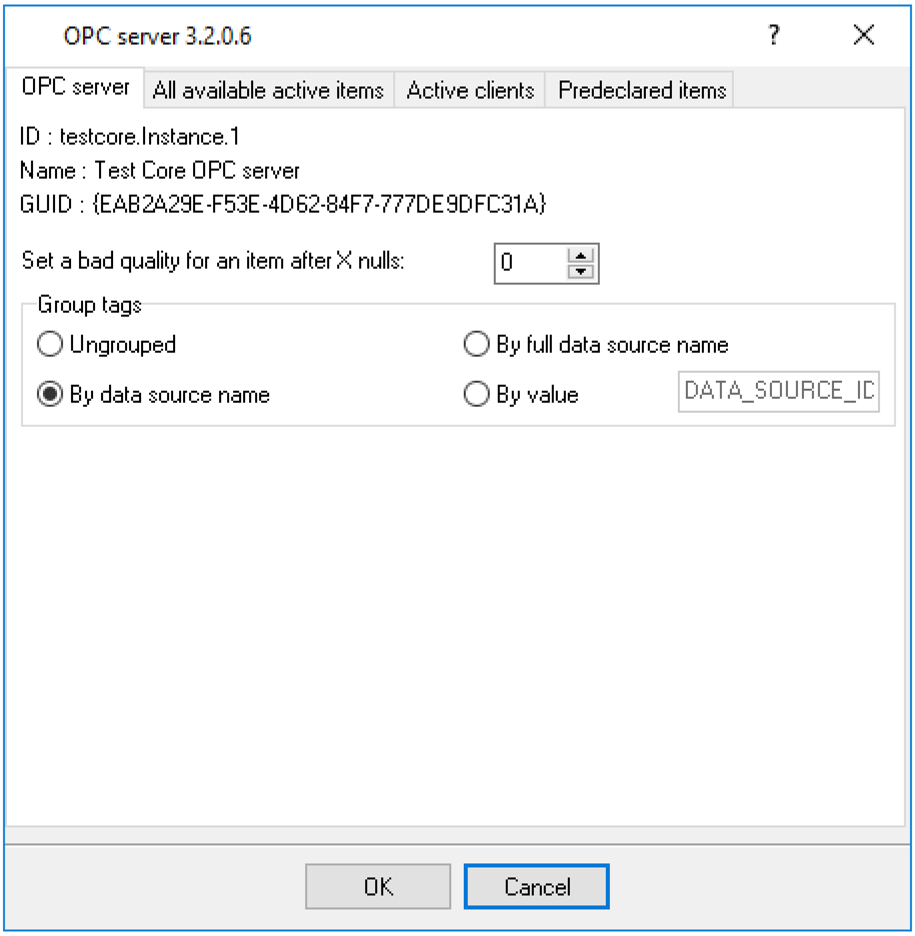
After the program restart, a module will be loaded and initialized. If the module is supported by our software, the module name will appear the modules list (Fig. 5.1.1-5.1.3). Most modules require additional settings. If you want to configure the plug-in module, click the "Setup" button near it. If you selected the module and the "Setup" button is not active, then the module doesn't have additional settings and can work without additional settings. Please, read a user's manual of the corresponding plug-in for additional information.

Configuration steps

1. Select and configure a query module. You may use a module of this type if you need to send some data to your device (for example, initialization strings or request strings).
2. Select and configure a parser module. This step is necessary because filter and export modules can use parsed data only. If you didn't select the parser module, then you can't configure the data filter and data export modules.
3. Activate and configure data export modules. You can select one or more modules simultaneously. The program will use selected modules simultaneously. Please, note, the program can' use the data export module, if you didn't configure the parser module.
4. Activate and configure event modules. You can select one or more modules simultaneously.

4.6.5.2 OPC server

Since the version 2.1.1 Advanced NMEA Data Logger has an internal OPC server. It means that any OPC compatible client application can get data from Advanced NMEA Data Logger without any additional software. To connect to the OPC server, you need the server ID and name (Fig. 5.2.1). Before using the OPC server on your computer, you should download and install the OPC Core Components Redistributable from www.opcfoundation.org (registration required).



ID : testcore.Instance.1

Name : Test Core OPC server

GUID : {EAB2A29E-F53E-4D62-84F7-777DE9DFC31A}

Set a bad quality for an item after X nulls: 0

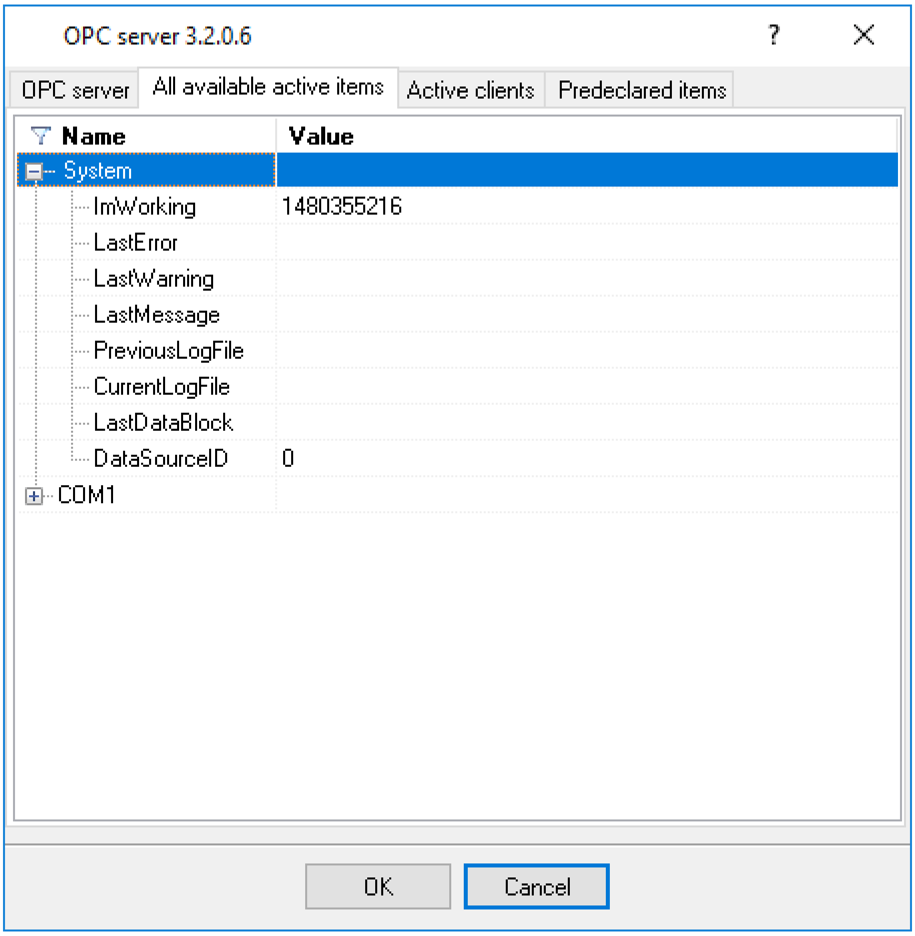
Group tags

○ Ungrouped ○ By full data source name

● By data source name ○ By value DATA_SOURCE_ID

Fig. 5.2.1 OPC server parameters

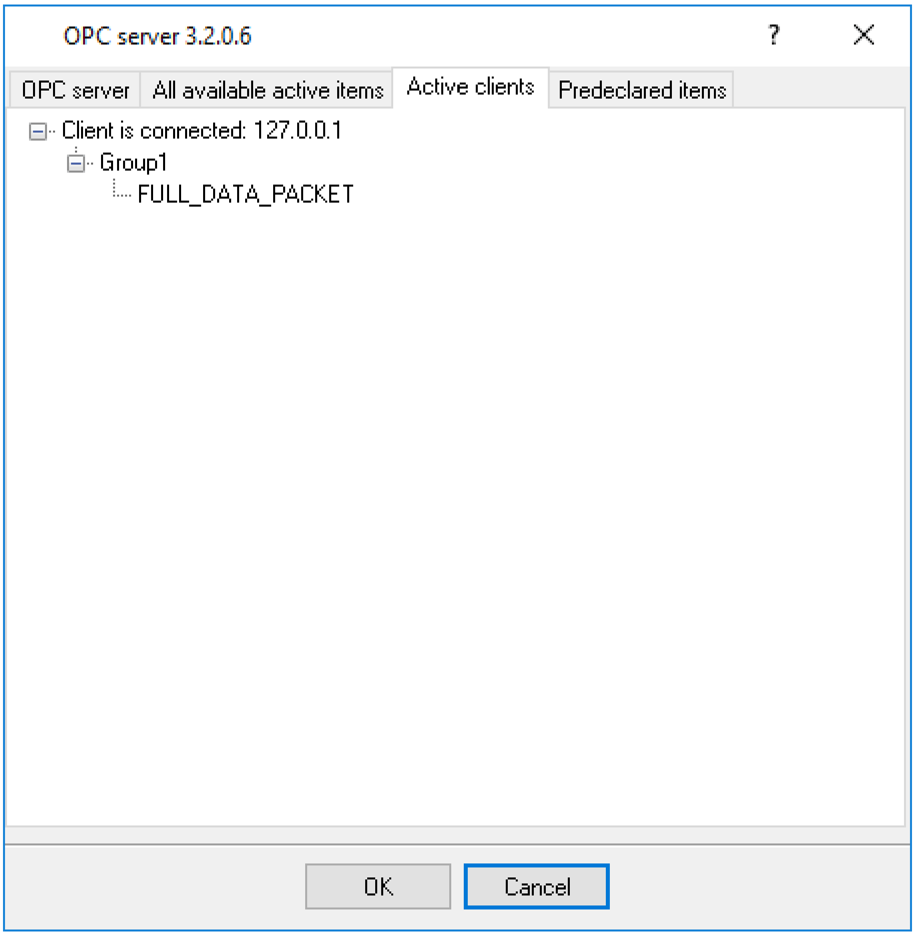
Advanced NMEA Data Logger parses all incoming data to one or more variables, and an OPC client gets it (fig. 5.2.2). After connecting to the OPC server, you will get a list of all variables.



Name	Value
System	
ImWorking	1480355216
LastError	
LastWarning	
LastMessage	
PreviousLogFile	
CurrentLogFile	
LastDataBlock	
DataSourceID	0
COM1	

Fig. 5.2.2 OPC server active items

Clients activity is showed on the "Active clients" tab. The top node is client, below is a group of items and connected items. By double-clicking, you can get detailed information about each node.



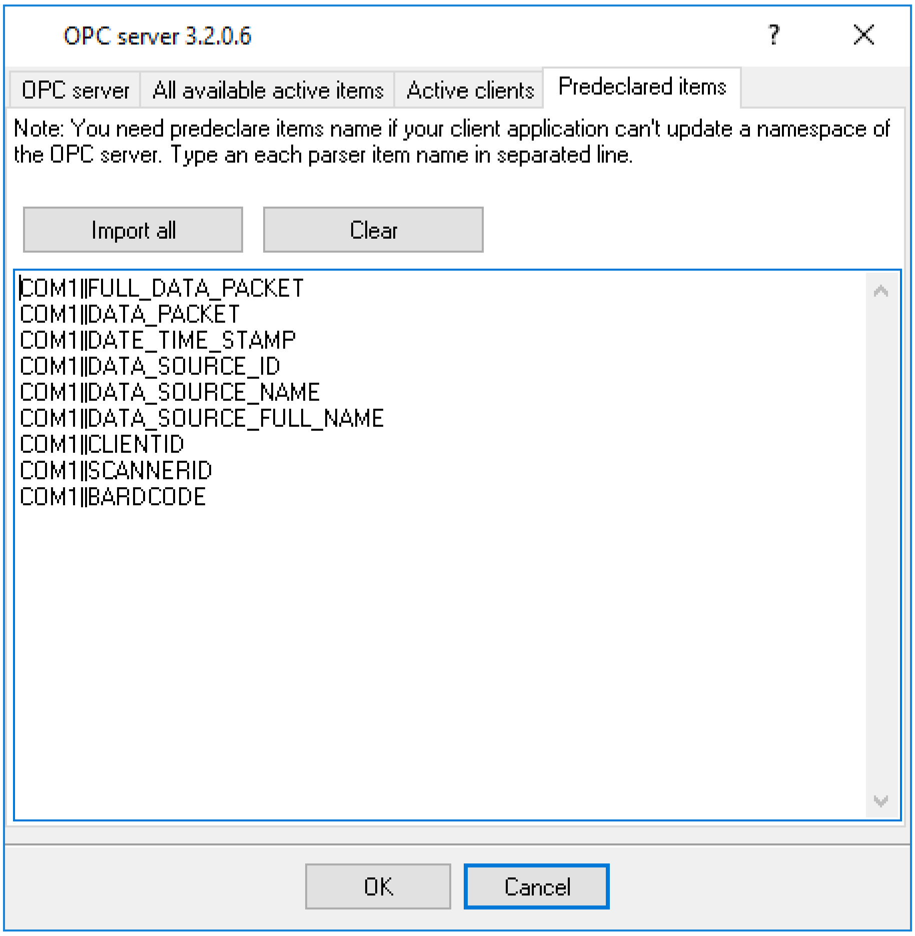
Client is connected: 127.0.0.1

Group1

FULL_DATA_PACKET

Fig. 5.2.3 OPC server clients

Advanced NMEA Data Logger creates new variables at "on-the-fly" mode. The Advanced NMEA Data Logger starts without any variables and gets it only after first data had been received. If your client OPC will connect to the OPC server before than data had been processed, then it will get an empty list of variables, and your OPC client should poll the OPC server for updating list of variables. If your OPC client doesn't allow it, then you can pre-define all variables (fig.5.2.4). In this case, the OPC server will create these variables with empty values, immediate after starting, and your OPC client will get these names while connecting.



Note: You need predeclare items name if your client application can't update a namespace of the OPC server. Type an each parser item name in separated line.

```
COM1||FULL_DATA_PACKET
COM1||DATA_PACKET
COM1||DATE_TIME_STAMP
COM1||DATA_SOURCE_ID
COM1||DATA_SOURCE_NAME
COM1||DATA_SOURCE_FULL_NAME
COM1||CLIENTID
COM1||SCANNERID
COM1||BARDCODE
```

Fig. 5.2.4 OPC server pre-declaration

4.6.5.3 NMEA data parser

4.6.5.3.1 Introduction

The National Marine Electronics Association (NMEA) has developed a specification that defines the interface between various pieces of marine electronic equipment. An NMEA standard defines an electrical interface and data protocol for communications between marine instrumentation. (They may also have standards for other things.)

NMEA 0183 devices are designated as either **talkers** or **listeners** (with some devices being both), employing an asynchronous serial interface with the following parameters: **Baud rate**: 4800, **Number of data bits**: 8 (bit 7 is 0), **Stop bits**: 1 (or more), **Parity**: none, **Handshake**: none. NMEA 0183 allows a single talker and several listeners on one circuit.

GPS receiver communication is defined within this specification. Most computer programs that provide real time position information understand and expect data to be in NMEA format. This data includes the complete PVT (position, velocity, time) solution computed by the GPS receiver. The idea of NMEA is to send a line of data called a **sentence** that is totally self contained and independent from other sentences. There are standard sentences for each device category and there is also the ability to define proprietary sentences for use by the individual company. All of the standard sentences have a two letter prefix that defines the device that uses that sentence type. (For

GPS receivers the prefix is GP.) which is followed by a three letter sequence that defines the sentence contents. In addition NMEA permits hardware manufactures to define their own proprietary sentences for whatever purpose they see fit. All proprietary sentences begin with the letter P and are followed with 3 letters that identifies the manufacturer controlling that sentence. For example a Garmin sentence would start with PGRM and Magellan would begin with PMGN.

Our module parse each sentence begins with a '$' and ends with CRLF (a carriage return/line feed sequence). The data is contained within this single line with data items separated by commas. The data itself is just ASCII text and may extend over multiple sentences in certain specialized instances but is normally fully contained in one variable length sentence. The data may vary in the amount of precision contained in the message. For example time might be indicated to decimal parts of a second or location may be show with 3 or even 4 digits after the decimal point. There is a provision for a checksum at the end of each sentence which may or may not be checked by the unit that reads the data. The checksum field consists of a '*' and two hex digits.

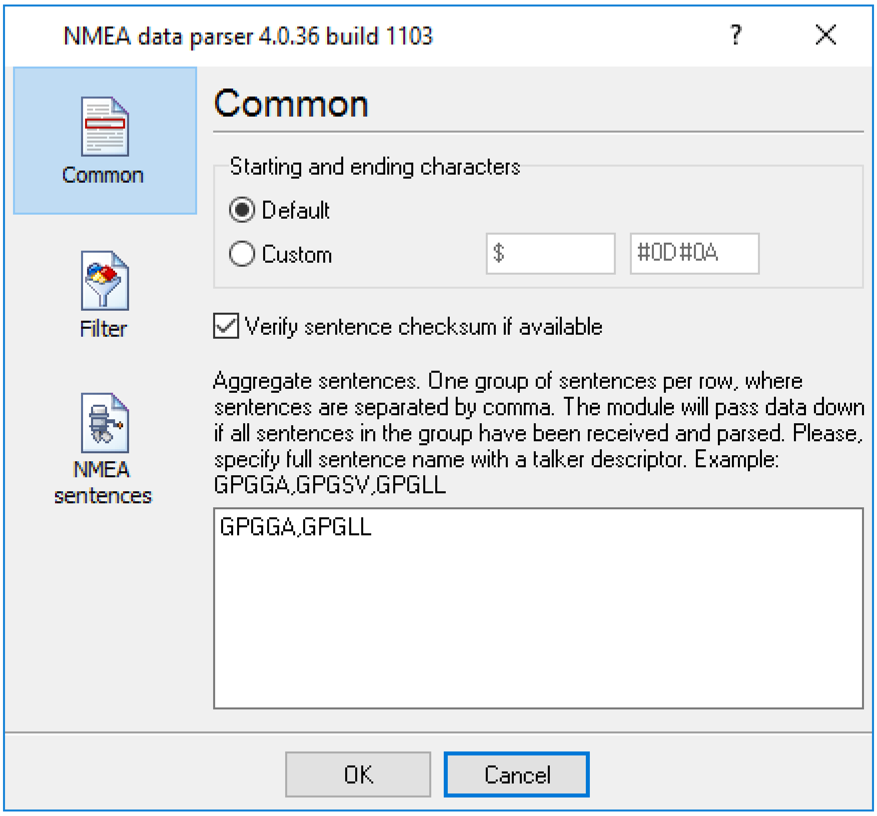
Our parser module splits all data to variables and this variables can be used in data export modules.

4.6.5.3.2 Common parameters

These parameters are used for data parsing (fig. 5.3.1).

1. **Add date/time stamp to each sentence parsed -** the parser will add an additional stamp value to other values, that the parser will extract from a data block;
2. **Add serial port number to each sentence parsed -** the parser will add an additional value with serial port number, that received this data block. You can use it in a multi port configuration, for identifying sentences from different serial ports.
3. **Verify sentence checksum if available -** the parser will calculate a checksum and verify it for each sentence that will contain '*' characters at the end of sentence:

   Sentence example:
   ```
   GPGGA,123519,4807.038,N,01131.000,E,1,08,0.9,545.4,M,46.9,M,,*47
   ```



NMEA data parser 4.0.36 build 1103

Common

Starting and ending characters

● Default

○ Custom $ #0D#0A

☑ Verify sentence checksum if available

Aggregate sentences. One group of sentences per row, where sentences are separated by comma. The module will pass data down if all sentences in the group have been received and parsed. Please, specify full sentence name with a talker descriptor. Example: GPGGA,GPGSV,GPGLL

GPGGA,GPGLL

Fig. 5.3.1 Common parameters

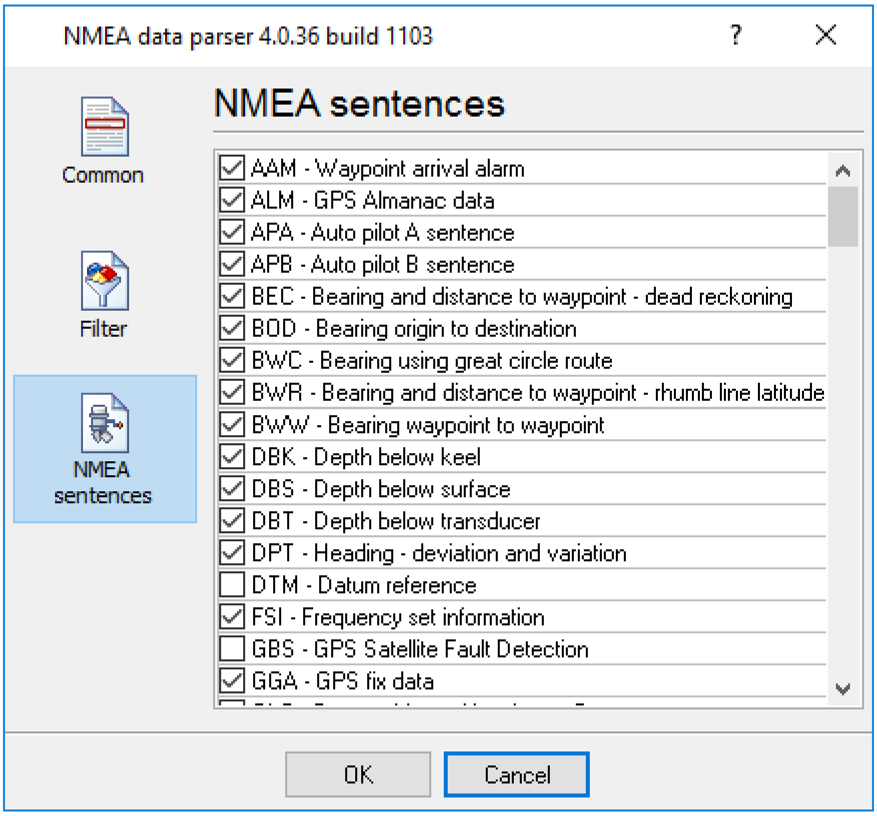
Aggregate sentences

This option is very useful if your talker sends more than one sentence and you want to save data to a file at single row. You can aggregate two or more sentences and data of these sentences will be send to data export modules at same moment with one date time stamp. If you'll specify sentence names then the module will store all data in a temporary buffer, while all sentences isn't received. When all data is received the module sends data to a data export module, clears the buffer and starts waiting for new data.

You can specify one or more different aggregate groups. Simply add sentence name to different rows. Sentences in the row should be separated by comma and a sentence should contain a talker name.

4.6.5.3.3 NMEA sentences parser

If you want to export to any target, then you should configure a parser module. The ASCII data parser allows you to extract data from data flow, that contains a ASCII characters. The parser module splits data flow to data block and extracts data values from each data block. On the "sentence" tab (fig. 5.3.2) you should specify sentences, that the parser will parse. Other sentences will be ignored.



NMEA data parser 4.0.36 build 1103

NMEA sentences

- ☑ AAM - Waypoint arrival alarm
- ☑ ALM - GPS Almanac data
- ☑ APA - Auto pilot A sentence
- ☑ APB - Auto pilot B sentence
- ☑ BEC - Bearing and distance to waypoint - dead reckoning
- ☑ BOD - Bearing origin to destination
- ☑ BWC - Bearing using great circle route
- ☑ BWR - Bearing and distance to waypoint - rhumb line latitude
- ☑ BWW - Bearing waypoint to waypoint
- ☑ DBK - Depth below keel
- ☑ DBS - Depth below surface
- ☑ DBT - Depth below transducer
- ☑ DPT - Heading - deviation and variation
- ☐ DTM - Datum reference
- ☑ FSI - Frequency set information
- ☐ GBS - GPS Satellite Fault Detection
- ☑ GGA - GPS fix data

Fig. 5.3.2 NMEA sentences

The full list of supported sentences and variables that parsed from each sentence is listed here 46.

Our software create variables with following types:

- **String** - Characters array with length from 1 to 65535 characters;
- **Boolean** - Logical value (True/False) - 0 or 1;
- **Float** - Real number - value range: -2.9 x 10^-39 .. 1.7 x 10^38
- **Integer** - Integer value: -2147483648..2147483647;
- **DateTime** - Date and time.

Note: Our modules doesn't support Time and Date data types. Therefore time variables, that exists in a sentence contains current date, but with time from the sentence.

4.6.5.3.4 Supported talkers

AG - Autopilot - General
AP - Autopilot - Magnetic
CD - Communications – Digital Selective Calling (DSC)
CR - Communications – Receiver / Beacon Receiver
CS - Communications – Satellite
CT - Communications – Radio-Telephone (MF/HF)
CV - Communications – Radio-Telephone (VHF)
CX - Communications – Scanning Receiver
DF - Direction Finder
EC - Electronic Chart Display & Information System (ECDIS)

EP - Emergency Position Indicating Beacon (EPIRB)
ER - Engine Room Monitoring Systems
GP - Global Positioning System (GPS)
HC - Heading – Magnetic Compass
HE - Heading – North Seeking Gyro
HN - Heading – Non North Seeking Gyro
II - Integrated Instrumentation
IN - Integrated Navigation
LC - Loran C
P - Proprietary Code
RA - RADAR and/or ARPA
SD - Sounder, Depth
SN - Electronic Positioning System, other/general
SS - Sounder, Scanning
TI - Turn Rate Indicator
VD - Velocity Sensor, Doppler, other/general
DM - Velocity Sensor, Speed Log, Water, Magnetic
VW - Velocity Sensor, Speed Log, Water, Mechanical
WI - Weather Instruments
YX - Transducer
ZA - Timekeeper – Atomic Clock
ZC - Timekeeper – Chronometer
ZQ - Timekeeper – Quartz
ZV - Timekeeper – Radio Update, WWV or WWVH

4.6.5.3.5 Supported sentences

AAM - Waypoint arrival alarm
- **AAM_ARIV_ENT** - Arrival circle entered
- **AAM_PERP_PASS** - Perpendicular passed
- **AAM_CIRCLE_RAD** - Circle radius
- **AAM_CIRCLE_RAD_UNIT** - Circle radius units
- **AAM_WPTNAME** - Waypoint name

ALM - GPS Almanac data
- **ALM_SENT_NUM** - Number of sentences
- **ALM_SENT_CNT** - Sentence count
- **ALM_PRN_ID** - Satellite PRN number
- **ALM_WEEK_NO** - GPS week number
- **ALM_SV_HEALTH** - SV health
- **ALM_ECCENTRICITY** - Eccentricity
- **ALM_REF_TIME** - Almanac reference time
- **ALM_INC_ANGLE** - Inclination angle
- **ALM_RA_RATE** - Rate of right ascension
- **ALM_AXIS_ROOT** - Root of semi-major axis
- **ALM_PEREGREE_ARG** - Argument of perigee
- **ALM_NODE_LONG** - Longitude of ascension node
- **ALM_MEAN_ANN** - Mean anomaly
- **ALM_F0_CLOCK** - F0 clock parameter
- **ALM_F1_CLOCK** - F1 clock parameter

APA - Auto pilot A sentence
- **APA_STATUS1** - Loran-C blink/SNR warning, general warning
- **APA_STATUS2** - Loran-C cycle warning

- **APA_CROSS_TRACK_RAD** - Cross-track error distance
- **APA_STEER** - Steer to correct
- **APA_CROSS_TRACK_RAD_UNIT** - Cross-track error units
- **APA_ARIV_ALRM_C** - Arrival alarm - circle
- **APA_ARIV_ALRM_P** - Arrival alarm - perpendicular
- **APA_MAG_BEAR_OD** - Magnetic bearing, origin to destination
- **APA_MAG_BEAR_OD_UNIT** - Magnetic bearing unit
- **APA_DEST_WPTID** - Destination waypoint ID

APB - Auto pilot B sentence

- **APB_STATUS1** - Loran-C blink/SNR warning, general warning
- **APB_STATUS2** - Loran-C cycle warning
- **APB_CROSS_TRACK_RAD** - Cross-track error distance
- **APB_STEER** - Steer to correct
- **APB_CROSS_TRACK_RAD_UNIT** - Cross-track error units
- **APB_ARIV_ALRM_C** - Arrival alarm - circle
- **APB_ARIV_ALRM_P** - Arrival alarm - perpendicular
- **APB_MAG_BEAR_OD** - Magnetic bearing, origin to destination
- **APB_MAG_BEAR_OD_UNIT** - Magnetic bearing unit
- **APB_DEST_WPTID** - Destination waypoint ID
- **APB_MAG_BEAR_PD** - Magnetic bearing, present position to destination
- **APB_MAG_BEAR_PD_UNIT** - Magnetic bearing unit
- **APB_MAG_BEAR_HS** - Magnetic heading to steer
- **APB_MAG_BEAR_HS_UNIT** - Magnetic heading unit

BEC - Bearing and distance to waypoint – dead reckoning

- **BEC_UTC** - UTC time of fix
- **BEC_WPT_LAT** - Latitude of waypoint
- **BEC_WPT_LAT_H** - Latitude hemisphere
- **BEC_WPT_LONG** - Longitude of waypoint
- **BEC_WPT_LONG_H** - Longitude hemisphere
- **BEC_BEARING** - Bearing to waypoint
- **BEC_BEAR_TYPE** - Bearing to waypoint type
- **BEC_DIST** - Distance to waypoint
- **BEC_DIST_UNIT** - Distance to waypoint units
- **BEC_WPTID** - Waypoint ID

BOD - Bearing origin to destination

- **BOD_BEARING** - Bearing from START to DEST, degrees
- **BOD_BEAR_TYPE** - Bearing from START to DEST type
- **BOD_DEST_WPTID** - Destination waypoint ID
- **BOD_ORIG_WPTID** - Origin waypoint ID

BWC - Bearing using great circle route

- **BWC_DEPTH** - Depth
- **BWC_DEPTH_UNIT** - Depth unit

DBS - Depth below surface

- **DBS_DEPTH** - Depth, meters
- **DBS_OFFSET** - Offset from transducer

FSI - Frequency set information

- **FSI_TX_FREQ** - Transmitting frequency
- **FSI_RX_FREQ** - Receiving frequency
- **FSI_COMM_MODE** - Communications mode
- **FSI_POWER_LEVEL** - Power Level

GGA - GPS fix data

- **GGA_TAKEN_AT** - Fix taken at

- **GGA_LATITUDE_DEG** - Latitude
- **GGA_LATITUDE_DEG_H** - Latitude hemisphere
- **GGA_LONGITUDE_DEG** - Longitude
- **GGA_LONGITUDE_DEG_H** - Longitude hemisphere
- **GGA_QUALITY** - Fix quality
- **GGA_SAT_NUM** - Number of satellites being tracked
- **GGA_HOR_DIL** - Horizontal dilution of position
- **GGA_ALTITUDE** - Altitude above mean sea level
- **GGA_ALTITUDE_UNIT** - Altitude units
- **GGA_HEIGHT_OF_GEOID** - Height of geoid (mean sea level) above WGS84 ellipsoid
- **GGA_HEIGHT_OF_GEOID_UNIT** - Height of geoid units
- **GGA_TIME_SNC_DGPS** - Time in seconds since last DGPS update
- **GGA_DGPS_ID** - DGPS station ID number

GLC - Geographic position, Loran-C

- **GLC_GRI_MS** - GRI Microseconds
- **GLC_TOA_MS** - Master TOA microseconds
- **GLC_TOA_STATUS** - Master TOA signal status
- **GLC_TIME_DIFF_MS** - Time difference in microseconds
- **GLC_TIME_DIFF_STATUS** - Time difference signal status

GLL - Geographic position, lat/lon data

- **GLL_LATITUDE_DEG** - Latitude
- **GLL_LATITUDE_DEG_H** - Latitude hemisphere
- **GLL_LONGITUDE_DEG** - Longitude
- **GLL_LONGITUDE_DEG_H** - Longitude hemisphere
- **GLL_TAKEN_AT** - Fix taken at
- **GLL_STATUS** - Status

GSA - Overall satellite data

- **GSA_AUTO_SEL** - Auto selection of 2D or 3D fix
- **GSA_3D_FIX** - 3D fix
- **GSA_SAT_PRN** - Sat used for fix
- **GSA_PDOP** - Dilution of precision
- **GSA_HDOP** - Horizontal dilution of precision
- **GSA_VDOP** - Vertical dilution of precision

GSV - Detailed satellite data

- **GSV_SENT_NUM** - Number of sentences
- **GSV_SENT_CNT** - Sentence count
- **GSV_SAT_IN_VIEW** - Number of satellites in view
- **GSV_SAT_PRN** - Satellite PRN number
- **GSV_ELEVATION** - Elevation, degrees
- **GSV_AZIMUTH** - Azimuth, degrees
- **GSV_SNR** - SNR - higher is better

GTD - Geographic location in time differences

- **GTD_TIME_DIFF** - Time difference

HDG - Heading, deviation and variation

- **HDG_MAG_HEAD** - Magnetic sensor heading in degrees
- **HDG_MAG_DEV** - Magnetic deviation in degrees
- **HDG_MAG_DEV_DIR** - Magnetic deviation direction
- **HDG_MAG_VAR** - Magnetic variation in degrees
- **HDG_MAG_VAR_DIR** - Magnetic variation direction

HDM - Heading, magnetic

- **HDM_HEADING** - Heading in degrees
- **HDM_HEADING_UNIT** - Heading unit

HDT - Heading, true
- **HDT_HEADING** - Heading in degrees
- **HDT_HEADING_UNIT** - Heading unit

LCD - Loran-C signal data
- **LCD_GRI_MS** - GRI Microseconds
- **LCD_MR_SNR** - Master relative SNR
- **LCD_MR_ECD** - Master relative ECD
- **LCD_TIME_DIFF_MS** - Time difference in microseconds
- **LCD_TIME_DIFF_STATUS** - Time difference signal status

MSK - Send control for a beacon receiver
- **MSK_FREQ** - Frequency
- **MSK_FREQ_MODE** - Frequency mode
- **MSK_BITRATE** - Bitrate
- **MSK_BITRATE_MODE** - Bitrate mode
- **MSK_FREQ_STATUS** - Frequency for MSS message status

MSS - Beacon receiver status information
- **MSS_SIGNAL_S** - Signal strength in dB
- **MSS_SIGNAL_N** - Signal to noise ratio in dB
- **MSS_BEACON_FREQ** - Beacon frequency in KHz
- **MSS_BEACON_BITRATE** - Beacon bitrate in bps

MTW - Water temperature
- **MTW_DEGREES** - Degrees
- **MTW_DEGREES_UNIT** - Unit of measurement

MWV - Wind speed and angle
- **MWV_ANGLE** - Wind angle
- **MWV_REF** - Reference
- **MWV_SPEED** - Wind speed
- **MWV_SPEED_UNIT** - Wind speed unit
- **MWV_STATUS** - Status

OSD - Own ship data
- **OSD_HEADING** - Heading true, degrees
- **OSD_STATUS** - Status
- **OSD_VESSEL** - Vessel course true, degrees
- **OSD_VESSEL_REF** - Course reference
- **OSD_VESSEL_SPEED** - Vessel speed
- **OSD_SPEED_REF** - Speed reference
- **OSD_VESSEL_SET** - Vessel set true, degrees
- **OSD_VESSEL_DRIFT** - Vessel drift true, degrees
- **OSD_VESSEL_DRIFT_UNIT** - Vessel drift unit

ROO - Waypoints in active route
- **ROO_WPT_ID** - Waypoint identifier

RMA - Recommended minimum navigation information
- **RMA_STATUS** - Status
- **RMA_LATITUDE_DEG** - Latitude
- **RMA_LATITUDE_DEG_H** - Latitude hemisphere
- **RMA_LONGITUDE_DEG** - Longitude
- **RMA_LONGITUDE_DEG_H** - Longitude hemisphere
- **RMA_TIME_DIFF_A** - Time difference A
- **RMA_TIME_DIFF_B** - Time difference B
- **RMA_SPEED** - Speed over the ground in knots
- **RMA_TRACK_ANGLE** - Track angle in degrees
- **RMA_MAGN_VAR** - Magnetic variation

RMA_MAGN_VAR_H - Magnetic variation hemisphere

RMB - Recommended minimum navigation information

RMB_STATUS - Status
RMB_CROSS_TRACK_ERR - Cross-track error
RMB_CROSS_TRACK_ERR_DIR - Cross-track error steer
RMB_ORIG_WPTID - Origin waypoint ID
RMB_DEST_WPTID - Destination waypoint ID
RMB_WPT_LAT - Latitude of destination waypoint
RMB_WPT_LAT_H - Latitude hemisphere
RMB_WPT_LONG - Longitude of destination waypoint
RMB_WPT_LONG_H - Longitude hemisphere
RMB_RANGE - Range to destination, nautical miles
RMB_BEAR - True bearing to destination
RMB_BEAR - Velocity towards destination, knots
RMB_ARIV_ALRM - Arrival alarm

RMC - Recommended minimum navigation information

RMC_TAKEN_AT - Fix taken at
RMC_STATUS - Status
RMC_LATITUDE_DEG - Latitude
RMC_LATITUDE_DEG_H - Latitude hemisphere
RMC_LONGITUDE_DEG - Longitude
RMC_LONGITUDE_DEG_H - Longitude hemisphere
RMC_SPEED - Speed over the ground in knots
RMC_TRACK_ANGLE - Track angle in degrees
RMC_DATE - Date
RMC_MAGN_VAR - Magnetic variation
RMC_MAGN_VAR_H - Magnetic variation hemisphere

ROT - Rate of turn

ROT_RATE_OF_TURN - Rate of turn, degrees per minute
ROT_STATUS - Status

RPM - Revolutions

RPM_SOURCE - Source
RPM_NUM - Engine or shaft number
RPM_SPEED - Speed, revolutions per minute
RPM_PITCH - Propeller pitch, % of maximum
RPM_STATUS - Status

RSA - Rudder sensor angle

RSA_SR_SENSOR - Starboard (or single) rudder sensor
RSA_STATUS - Starboard rudder sensor status
RSA_PR_SENSOR - Port rudder sensor
RSA_STATUS - Port rudder sensor status

RSD - Radar system data

RSD_CURSOR_RANGE - Cursor range from own ship
RSD_CURSOR_BEARING - Cursor bearing CW from zero, degrees
RSD_RANGE_SCALE - Range scale
RSD_RANGE_UNIT - Range units

RTE - Route message

RTE_SENT_NUM - Number of sentences
RTE_SENT_CNT - Sentence count
RTE_TYPE - Type
RTE_TYPE_NAME - Type name
RTE_ID - Route identifier

- **RTE_WPT_ID** - Waypoint identifier

SFI - Scanning frequency information

- **SFI_SENT_NUM** - Number of sentences
- **SFI_SENT_CNT** - Sentence count
- **SFI_FREQ** - Frequency
- **SFI_MODE** - Mode

STN - Multiple data ID

- **STN_ID** - Talker ID number

TTM - Tracked target message

- **TTM_TARGET_NUM** - Target number
- **TTM_TARGET_DIST** - Target distance
- **TTM_BEARING** - Bearing from own ship
- **TTM_BEAR_TYPE** - Bearing units
- **TTM_TARGET_SPEED** - Target speed
- **TTM_TARGET_COURSE** - Target course
- **TTM_COURSE_UNIT** - Course units
- **TTM_DIST_CPA** - Distance of closest-point-of-approach
- **TTM_TIME_CPA** - Time until closest-point-of-approach '-' means increasing
- **TTM_SIGN** - '-' means increasing
- **TTM_TARGET_NAME** - Target name
- **TTM_TARGET_STATUS** - Target status
- **TTM_REF_TARGET** - Reference target

VBW - Dual ground/water speed

- **VBW_WATER_LONG_SPEED** - Longitudinal water speed
- **VBW_WATER_TRAV_SPEED** - Transverse water speed
- **VBW_WATER_STATUS** - Water speed status
- **VBW_GROUND_LONG_SPEED** - Longitudinal ground speed
- **VBW_GROUND_TRAV_SPEED** - Transverse ground speed
- **VBW_GROUND_STATUS** - Ground speed status

VDR - Set and drift

- **VDR_DEGRESS** - Degress
- **VDR_DEGRESS_TYPE** - Degress type
- **VDR_SPEED** - Speed
- **VDR_SPEED_UNIT** - Speed units

VHW - Water speed and heading

- **VHW_DEGRESS** - Degress
- **VHW_DEGRESS_TYPE** - Degress type
- **VHW_SPEED** - Speed
- **VHW_SPEED_UNIT** - Speed units

VLW - Distance traveled through water

- **VLW_TOTAL** - Total cumulative distance
- **VLW_TOTAL_UNIT** - Total cumulative distance unit
- **VLW_RESET** - Distance since Reset
- **VLW_RESET_UNIT** - Distance since Reset unit

VPW - Speed, measured parallel to wind

- **VPW_SPEED** - Speed
- **VPW_SPEED_UNIT** - Speed units

VTG - Vector track an speed over the ground

- **VTG_MAG_TRACK** - Track made
- **VTG_MAG_TRACK_TYPE** - Track made type
- **VTG_SPEED** - Ground speed
- **VTG_SPEED_UNIT** - Ground speed units

VWR - Relative wind speed and angle

- **VWR_WIND_DIR** - Wind direction magnitude in degrees
- **VWR_WIND_DIR_TYPE** - Wind direction type
- **VWR_SPEED** - Speed
- **VWR_SPEED_UNIT** - Speed units

WCV - Waypoint closure velocity

- **WCV_VELOCITY** - Velocity
- **WCV_VELOCITY_UNIT** - Velocity units
- **WCV_WPT_ID** - Waypoint identifier

WNC - Distance, waypoint to waypoint

- **WNC_DISTANCE** - Distance
- **WNC_DISTANCE_UNIT** - Distance units
- **WNC_DEST_WPTID** - Destination waypoint ID
- **WNC_ORIG_WPTID** - Origin waypoint ID

WPL - Waypoint information

- **WPL_LATITUDE_DEG** - Latitude
- **WPL_LATITUDE_DEG_H** - Latitude hemisphere
- **WPL_LONGITUDE_DEG** - Longitude
- **WPL_LONGITUDE_DEG_H** - Longitude hemisphere
- **WPL_WPTNAME** - Waypoint name

XDR - Multiple cross track error, dead reckoning

- **XDR_TRANS_TYPE** - Transducer type
- **XDR_MEASURE_DATA** - Measurement data
- **XDR_MEASURE_UNIT** - Measurement data units
- **XDR_TRANS_NAME** - Name of transducer

XTE - Measured cross track error

- **XTE_GEN_WARN** - General warning flag
- **XTE_LORAN_LOCK** - Loran-C cycle lock flag
- **XTE_CROSS_TRACK_DIST** - Cross track error distance
- **XTE_STEER** - Steer
- **XTE_DIST_UNIT** - Distance units

XTR - Cross track error, dead reckoning

- **XTR_TRANS_TYPE** - Transducer type
- **XTR_MEASURE_DATA** - Measurement data
- **XTR_MEASURE_UNIT** - Measurement data units
- **XTR_TRANS_NAME** - Name of transducer

ZDA - Date and Time

- **ZDA_TIME** - Time
- **ZDA_DAY** - Day
- **ZDA_MONTH** - Month
- **ZDA_YEAR** - Year
- **ZDA_ZONE_HOUR** - Local zone hours
- **ZDA_ZONE_MIN** - Local zone minutes

ZFO - UTC and time to destination waypoint

- **ZFO_TIME** - Time
- **ZFO_TIME_REMAIN** - Time remaining
- **ZFO_WPT_ID** - Waypoint identifier

GRMC - Sensor configuration information

- **GRMC_MODE** - Fix mode
- **GRMC_ALT** - Altitude above/below mean sea level
- **GRMC_DATUM_INDEX** - Earth datum index
- **GRMC_DATUM_AXIS** - User earth datum semi-major axis

GRMC_DATUM_FACTOR - User earth datum inverse flattening factor

GRMC_DATUM_DELTA_X - User earth datum delta x earth centered coordinate

GRMC_DATUM_DELTA_Y - User earth datum delta y earth centered coordinate

GRMC_DATUM_DELTA_Z - User earth datum delta z earth centered coordinate

GRMC_DIFF_MODE - Differential mode

GRMC_BAUD_RATE - NMEA Baud rate

GRMC_FILTER_MODE - Filter mode

GRMC_PPS_MODE - PPS mode

GRME - Estimated position error

GRME_HPE - Estimated horizontal position error (HPE)

GRME_HPE_UNIT - HPE units

GRME_VPE - Estimated vertical error (VPE)

GRME_VPE_UNIT - VPE units

GRME_OSEPE - Overall spherical equivalent position error (OSEPE)

GRME_OSEPE_UNIT - SEPE units

GRMF - Position fix sentence

GRMF_WEEK_NO - GPS week number

GRMF_SEC_NUM - GPS seconds

GRMF_UTC_DATE - UTC date of position fix

GRMF_UTC_TIME - UTC time of position fix

GRMF_LEAP_SEC_NUM - GPS leap second count

GRMF_LATITUDE_DEG - Latitude

GRMF_LATITUDE_DEG_H - Latitude hemisphere

GRMF_LONGITUDE_DEG - Longitude

GRMF_LONGITUDE_DEG_H - Longitude hemisphere

GRMF_MODE - Mode

GRMF_FIX_TYPE - Fix type

GRMF_SPEED - Speed over ground, km/h

GRMF_COURSE - Course over ground, degrees

GRMF_DIL_POS - Position dilution of precision

GRMF_TIME_DIL_POS - Time dilution of precision

GRMI - Sensor initialization information

GRMI_LATITUDE_DEG - Latitude

GRMI_LATITUDE_DEG_H - Latitude hemisphere

GRMI_LONGITUDE_DEG - Longitude

GRMI_LONGITUDE_DEG_H - Longitude hemisphere

GRMI_UTC_DATE - Current UTC date

GRMI_UTC_TIME - Current UTC time

GRMM - Map datum

GRMM_DATUM - Currently active horizontal datum

GRMO - Output sentence enable/disable

GRMO_NAME - Target sentence description

GRMO_MODE - Target sentence mode

GRMV - 3D velocity

GRMV_EAST_VEL - True east velocity

GRMV_NORTH_VEL - True north velocity

GRMV_UP_VEL - Up velocity

GRMZ - Altitude information

GRMZ_ALT - Altitude

GRMZ_ALT_UNIT - Altitude units

GRMZ_POS_FIX_DIM - Position fix dimensions

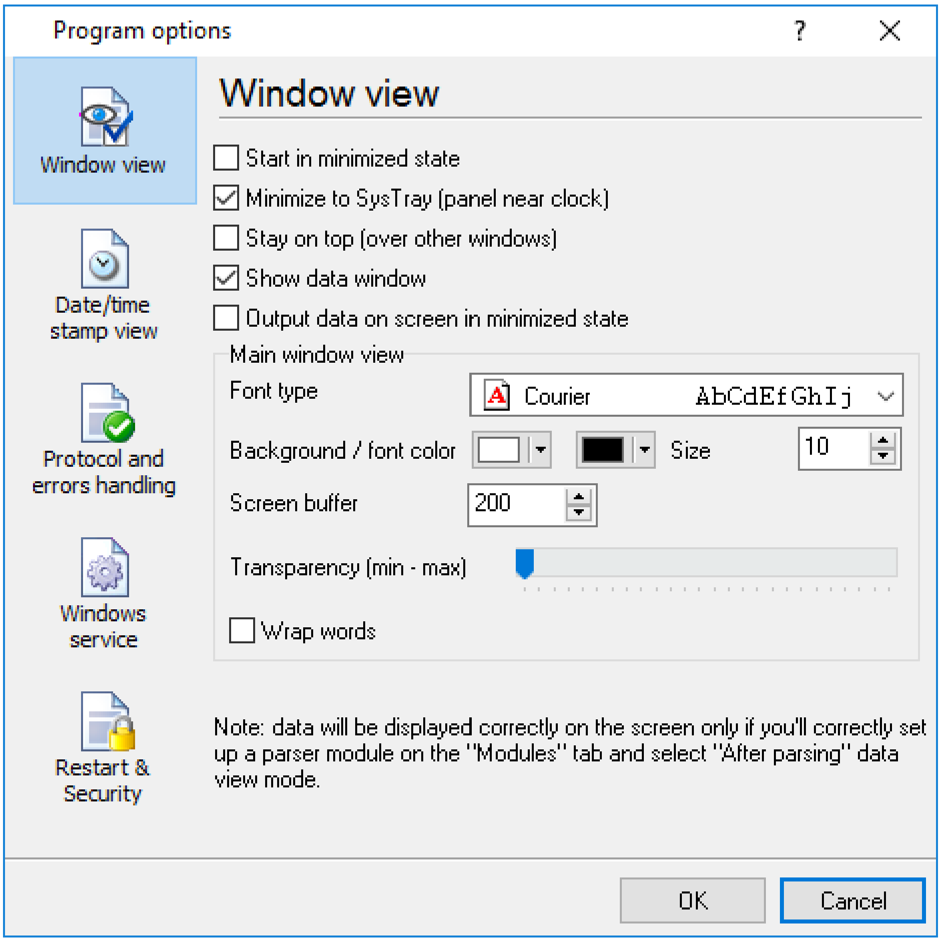
SLIB - Differential GPS beacon receiver control

SLIB_FREQ - Frequency
SLIB_BITRATE - Bit rate
SLIB_REQ_TYPE - Request type
SRF150 - OK to send
SRF150_STATUS - Status
SRF161 - OK to send
SRF161_ANT_STATUS - Antenna status
SRF161_AGC - AGC

4.7 Program options

4.7.1 Window view

This tab in program options (fig. 6.1.1) allows you to customize the appearance of the main window of the program (fig.1.1.1 7). You can access this tab through the "Options -> Program options" menu item in the main window.



Window view

□ Start in minimized state
☑ Minimize to SysTray (panel near clock)
□ Stay on top (over other windows)
☑ Show data window
□ Output data on screen in minimized state

Main window view

Font type: Courier AbCdEfGhIj

Background / font color

Size: 10

Screen buffer: 200

Transparency (min - max)

□ Wrap words

Note: data will be displayed correctly on the screen only if you'll correctly set up a parser module on the "Modules" tab and select "After parsing" data view mode.

Fig. 6.1.1 Window view setting

You can set the following parameters:

- **Start in minimized state** - at start Advanced NMEA Data Logger will automatically minimize the program window to the taskbar or to the Systray (fig. 6.1.2).
- **Minimize to Systray** - while the main window of Advanced NMEA Data Logger minimizes, the program will automatically put its icon to the system panel near the clock.
- **Show data window** - if you specify this option, then the program will display all data in the main window. You may disable this option if you log data from many ports on a slow computer. It reduces the computer's CPU usage.
- **Output data on screen in minimized state** - if you'll enable this option, then the program will display processed data in minimized state. If you are logging many data sources on a slow computer, then you can decrease computer central processor load rate with disabling of this option.
- **Font type** - the data will be displayed with this font type in the main window. We recommend using mono-spaced fonts in this field, such as Terminal, Courier, or System.
- **Screen buffer** - when the number of lines in the main window exceeds the specified value, the program deletes old lines from the screen buffer.
- **Window view** - this option group lets you configure data window view mode (a font color, a font type, a background color).
- **Transparency** - in Windows 2000 and later lets you set the transparency of the main window. The most left position is the normal window view, and the most right position is maximum transparency.
- **Wrap words** - if you didn't configure a parser module or your data flow doesn't contain a blocks separator, then your data without this option enabled will be displayed as one long string in the data window.

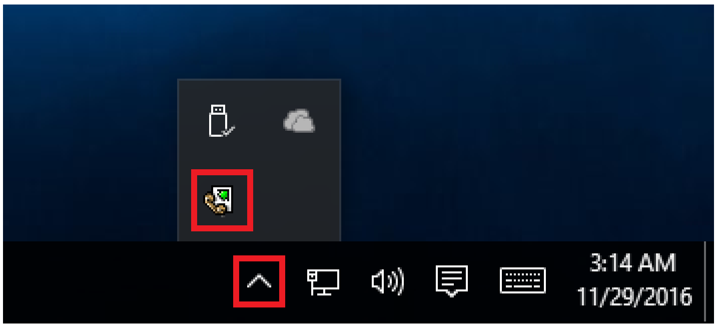
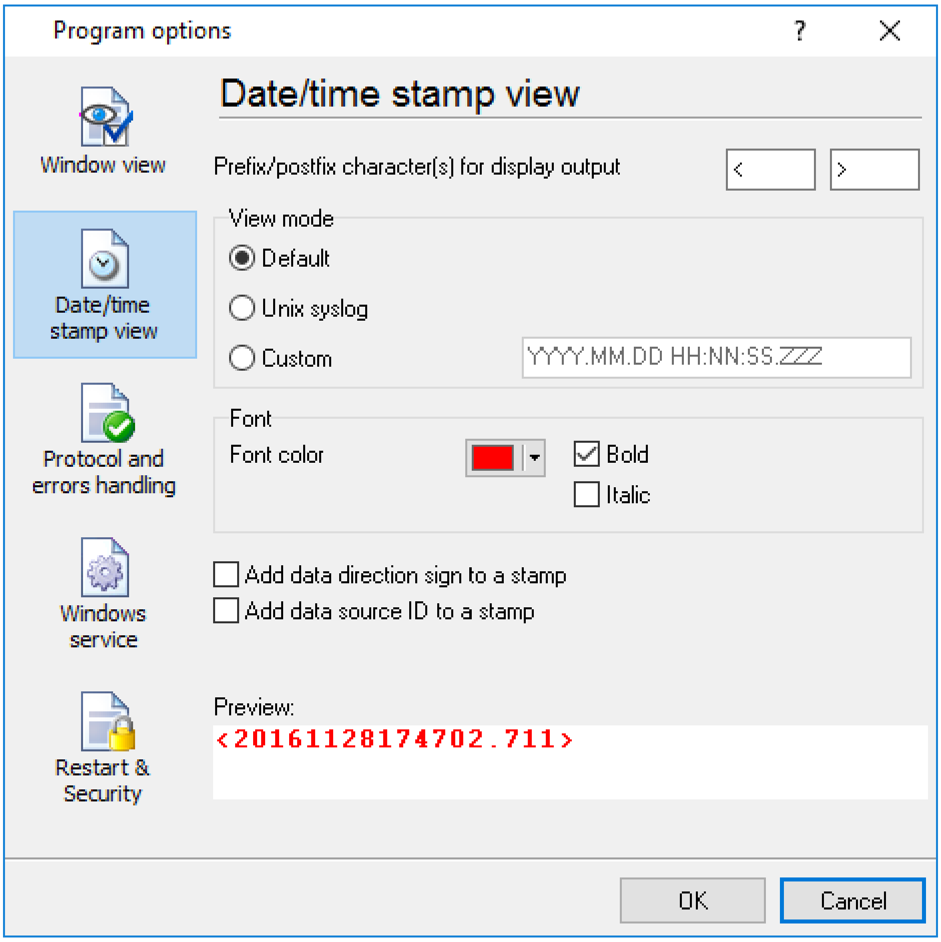


Fig. 6.1.2 Systray - panel near clock

4.7.2 Date/time stamp view

This group of options (fig. 6.2.1) allows configuring the format of date/time stamps that will be used in the main program window and log files.



Program options

Date/time stamp view

Prefix/postfix character(s) for display output: < >

View mode
● Default
○ Unix syslog
○ Custom: YYYY.MM.DD HH:NN:SS.ZZZ

Font
Font color: 🟥
☑ Bold
□ Italic

□ Add data direction sign to a stamp
□ Add data source ID to a stamp

Preview:
<20161128174702.711>

Fig. 6.2.1 Configuring data/stamp view

Prefix/Postfix characters for display output - these options allow you to define the beginning and ending characters of a date/time stamp that will be shown in the program window. When outputting data to a log file, the program uses individual characters 27 for each configuration.

View mode - allows you to select the standard or define the custom format of the date/time stamp.

Font - this group allows you to define the color and font of date/time stamp.

Add data direction sign to a stamp - if this option is activated, then the program will append TX or RX to the end of the stamp.

Add data source ID to a stamp - if this option is activated then the program will data append data source ID at the beginning of the stamp, for example, COM1.

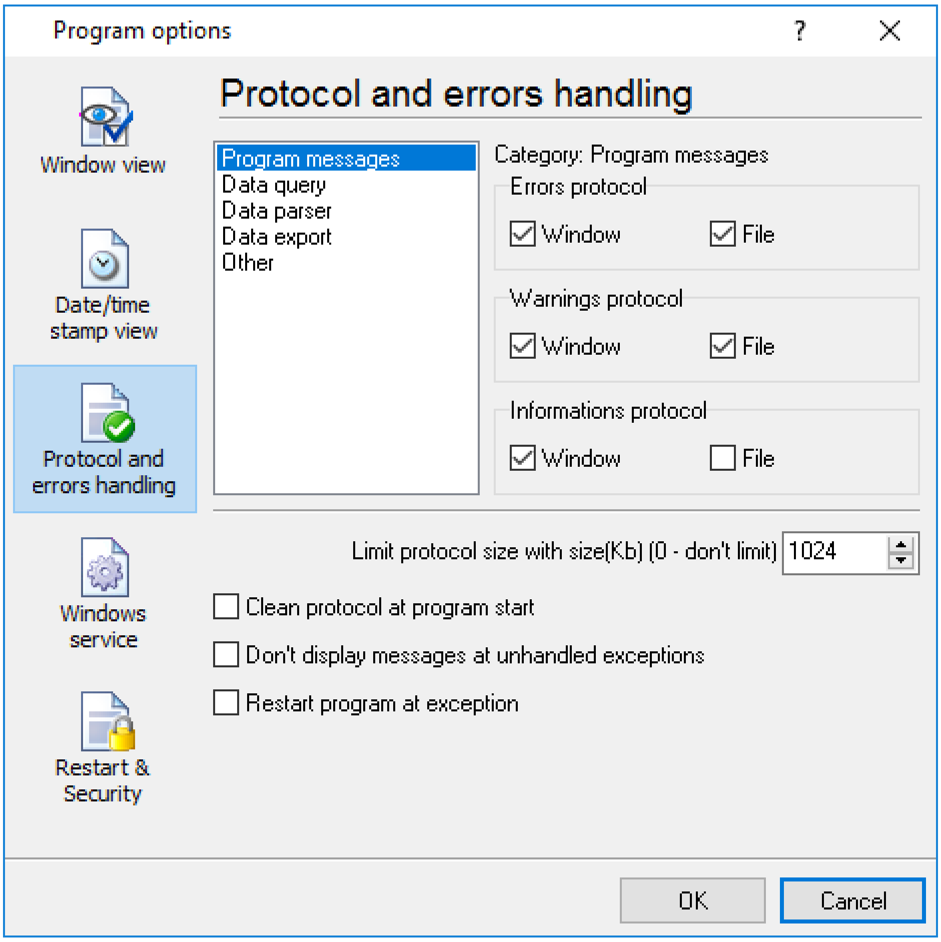
4.7.3 Protocol and errors handling

While the program is running, it may generate many messages about errors or events. All these messages are being registered in a protocol file. The protocol file may contain messages from the main program and all working plugins. On this tab, you can define the kind of messages, which you want to put a protocol file (fig. 6.3.1). Here you can set the maximum protocol file size and the formatting mode.

Usually, the protocol file is in the "AppData" folder and has the name of the program with the 'log' extension.

On Windows 7 and higher: c:\ProgramData\Advanced NMEA Data Logger\
On old OS: c:\Document and Settings\All Users\Advanced NMEA Data Logger\

You can also open the protocol file from the “File” menu in the main window.



Protocol and errors handling

Program messages
Data query
Data parser
Data export
Other

Category: Program messages

Errors protocol
☑ Window ☑ File

Warnings protocol
☑ Window ☑ File

Informations protocol
☑ Window ☐ File

Limit protocol size with size(Kb) (0 - don't limit) 1024

☐ Clean protocol at program start
☐ Don't display messages at unhandled exceptions
☐ Restart program at exception

Fig. 6.3.1 Protocol settings

Advanced NMEA Data Logger works with three types of messages:

- **Information messages** - this type of messages informs you about current operations.
- **Warnings** - warns you about possible failures or errors. Immediately user reaction is not required.

- **Errors -** the program has detected an error which requires user attention.

There is the possibility to log the following events:

- **Program messages** - messages about start or stop of the program, etc.
- **Data query** - messages which are generated in a data query module.
- **Data parser** - messages from a data parser module.
- **Data export** - messages issued by a data export module.
- **Other** - other message types.

You can write each type of messages to a protocol file or/and to the list in the main window. Please, specify necessary options for each message type at "Window" and "File" fields.

If you don't want to allow growing a protocol file size to an unlimited size, then you can enable the "Clean protocol at program start" or limit protocol file size in the "Size" field.

Some exceptional (unhandled) messages may occur while the program is running. In most cases, these messages affect the program, and the safest way is to restart the program. Please, specify the "Restart program at exception" option and the program will be restarted automatically.

If you want to look all program messages, then you can disable the "Don't display messages at unhandled exceptions" checkbox, and the program will open the exception message window with detailed information.

4.7.4 Service mode on Windows 2000+

4.7.4.1 Configuration

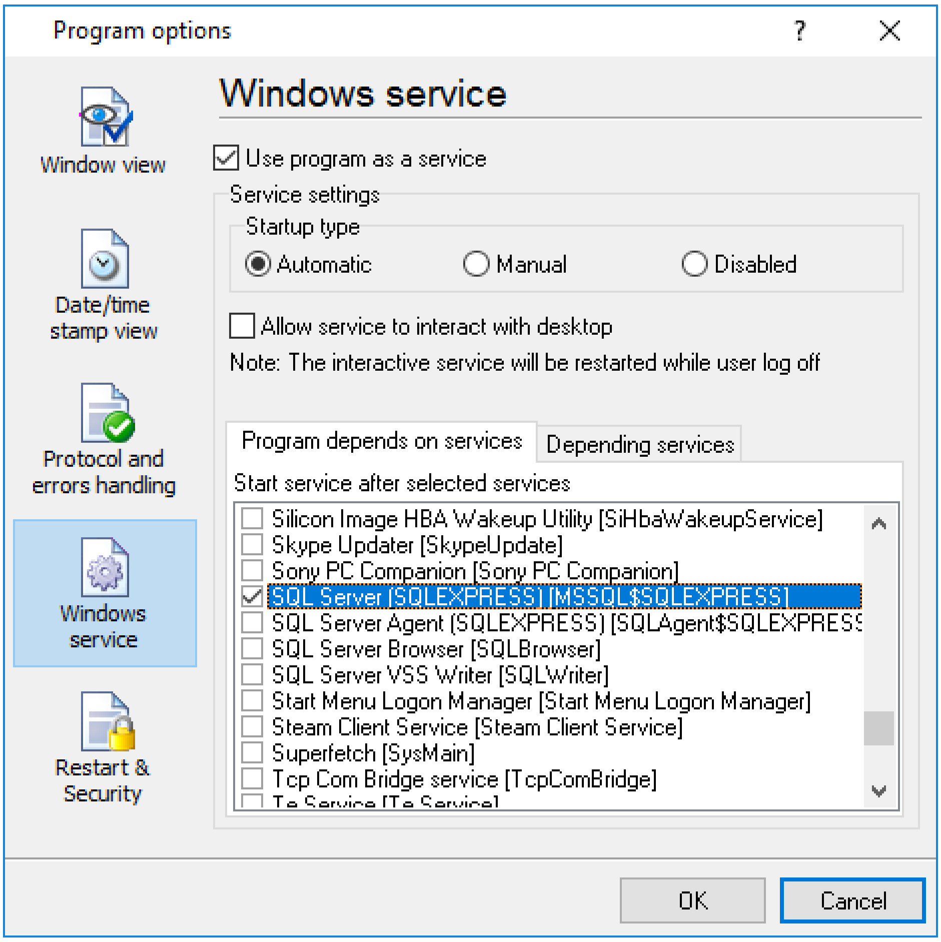
Windows 2000+ services let you:

- Control service on local and remote computers, including remote computers with Windows 2000+ system.
- Setup actions on emergency service restore in case of failure, for example, auto service or computer restart (only on computers with Windows 2000 or later).
- Create for services other names and descriptions, to find them easier (only on computers with system Windows 2000 or later).
- Run service before user login (password input).
- Service can be configured on automatic start after operation system load.

Note 1: you must be logged in as an administrator to change the configuration or control the service in any way (start, stop, pause, continue).

Note 2: On Windows Vista and later you should start the program with elevated administrator privileges.

If you want to use the program as a service application, then, please, go to the "Options -> Program options -> Windows service" tab (fig. 6.4.1), then enable the "Use program as a service" checkbox. Later, please, specify the start-up type of the service. There are the following variants:



Windows service

☑ Use program as a service

Service settings

Startup type

● Automatic ○ Manual ○ Disabled

□ Allow service to interact with desktop

Note: The interactive service will be restarted while user log off

Program depends on services | Depending services

Start service after selected services

□ Silicon Image HBA Wakeup Utility [SiHbaWakeupService]
□ Skype Updater [SkypeUpdate]
□ Sony PC Companion [Sony PC Companion]
☑ SQL Server [SQLEXPRESS] [MSSQL$SQLEXPRESS]
□ SQL Server Agent [SQLEXPRESS] [SQLAgent$SQLEXPRES
□ SQL Server Browser [SQLBrowser]
□ SQL Server VSS Writer [SQLWriter]
□ Start Menu Logon Manager [Start Menu Logon Manager]
□ Steam Client Service [Steam Client Service]
□ Superfetch [SysMain]
□ Tcp Com Bridge service [TcpComBridge]
□ Te Service [Te Service]

Fig. 6.4.1 Service settings

1. **Automatic** - the service starts automatically with Windows, before user login.
2. **Manual** - you can start the service application from the "Services" control panel (fig. 6.4.1).
3. **Disabled** - the service is disabled, and does not start at all.

If you want to change the program settings while the program works in the service mode, you can start a second instance of the program on your desktop, make the necessary changes, and restart the service with the new settings.

Old Windows versions (before Windows Vista) allows you to use the service in the interactive mode. In this case, the program places an icon in the system area (fig. 6.4.2).

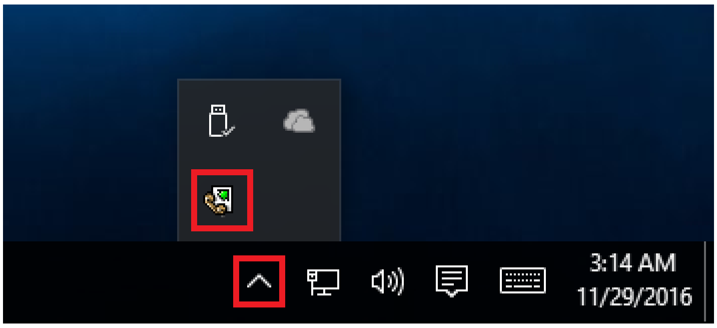
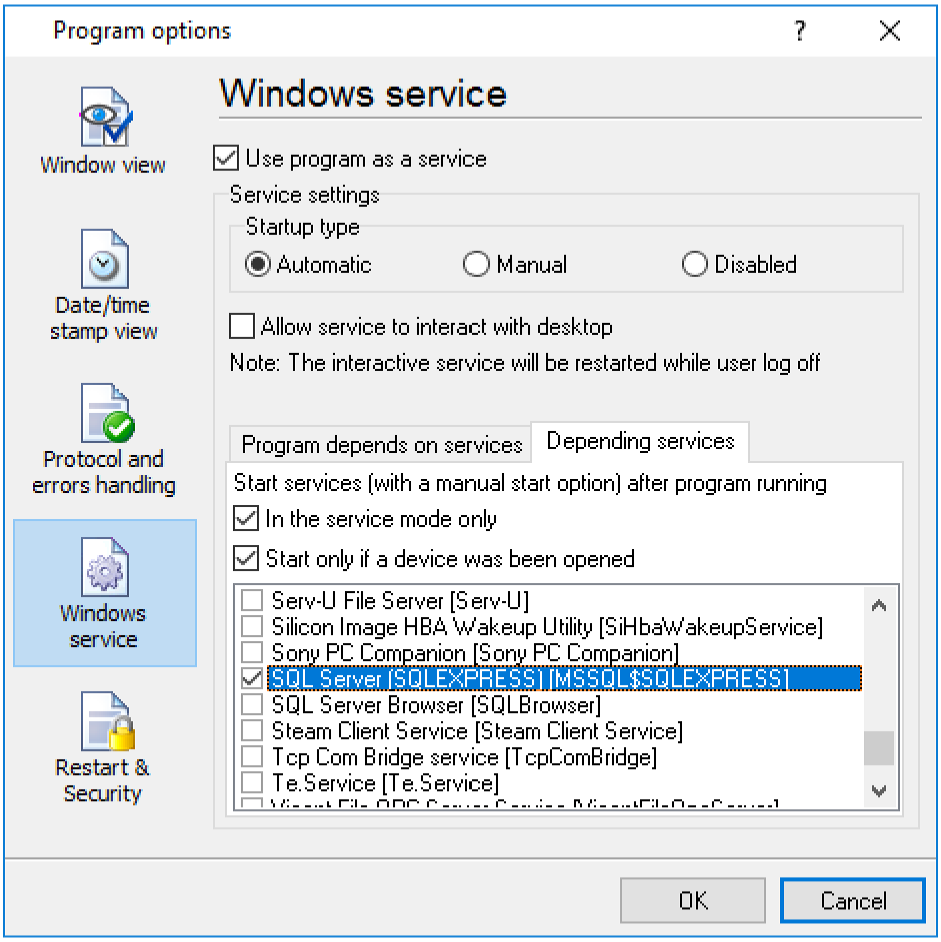


Fig. 6.4.2 Service icon in Systray

If the service should write data a database or use another service on your computer, they should be started before Advanced NMEA Data Logger. You can configure a list of these services on the "Program depends on services" tab (fig. 6.4.3).



Program options

Windows service

☑ Use program as a service

Service settings

Startup type

● Automatic ○ Manual ○ Disabled

□ Allow service to interact with desktop

Note: The interactive service will be restarted while user log off

Program depends on services | Depending services

Start services (with a manual start option) after program running

☑ In the service mode only

☑ Start only if a device was been opened

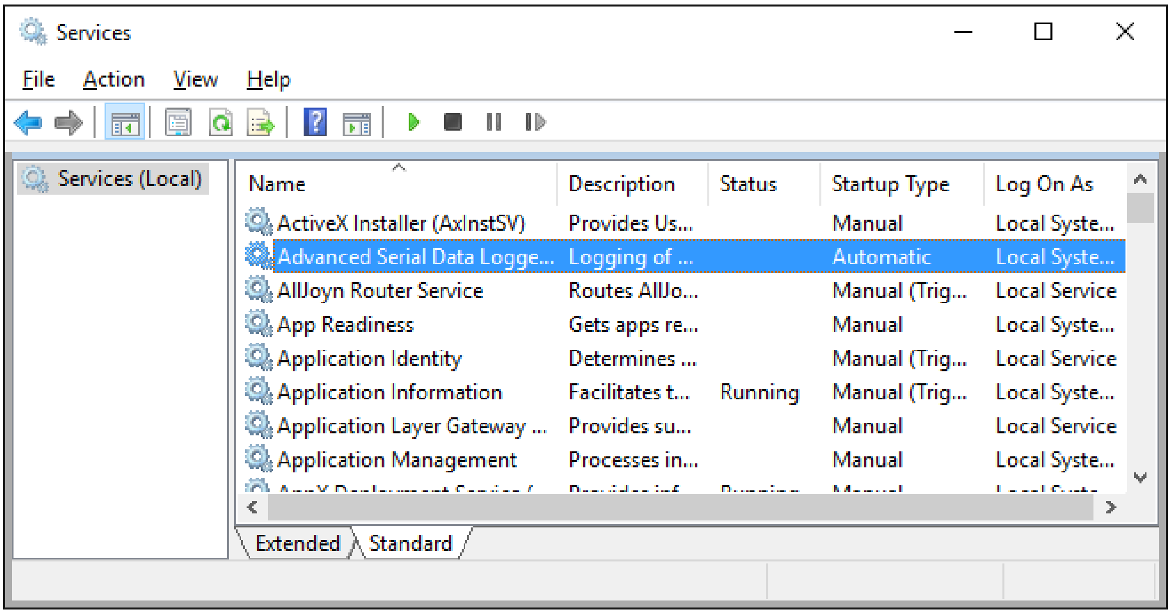
□ Serv-U File Server [Serv-U]
□ Silicon Image HBA Wakeup Utility [SiHbaWakeupService]
□ Sony PC Companion [Sony PC Companion]
☑ SQL Server (SQLEXPRESS) [MSSQL$SQLEXPRESS]
□ SQL Server Browser [SQLBrowser]
□ Steam Client Service [Steam Client Service]
□ Tcp Com Bridge service [TcpComBridge]
□ Te.Service [Te.Service]

Fig. 6.4.3 Service settings #2

Sometimes, you may need to start Advanced NMEA Data Logger before starting other services. In this case, you should:

- Switch the start mode of a target service to "Manual."
- Start Advanced NMEA Data Logger.
- Select the necessary service on the "Depending services" tab.
- Select the mode when the logger will start the selected service.
- Restart Advanced NMEA Data Logger.

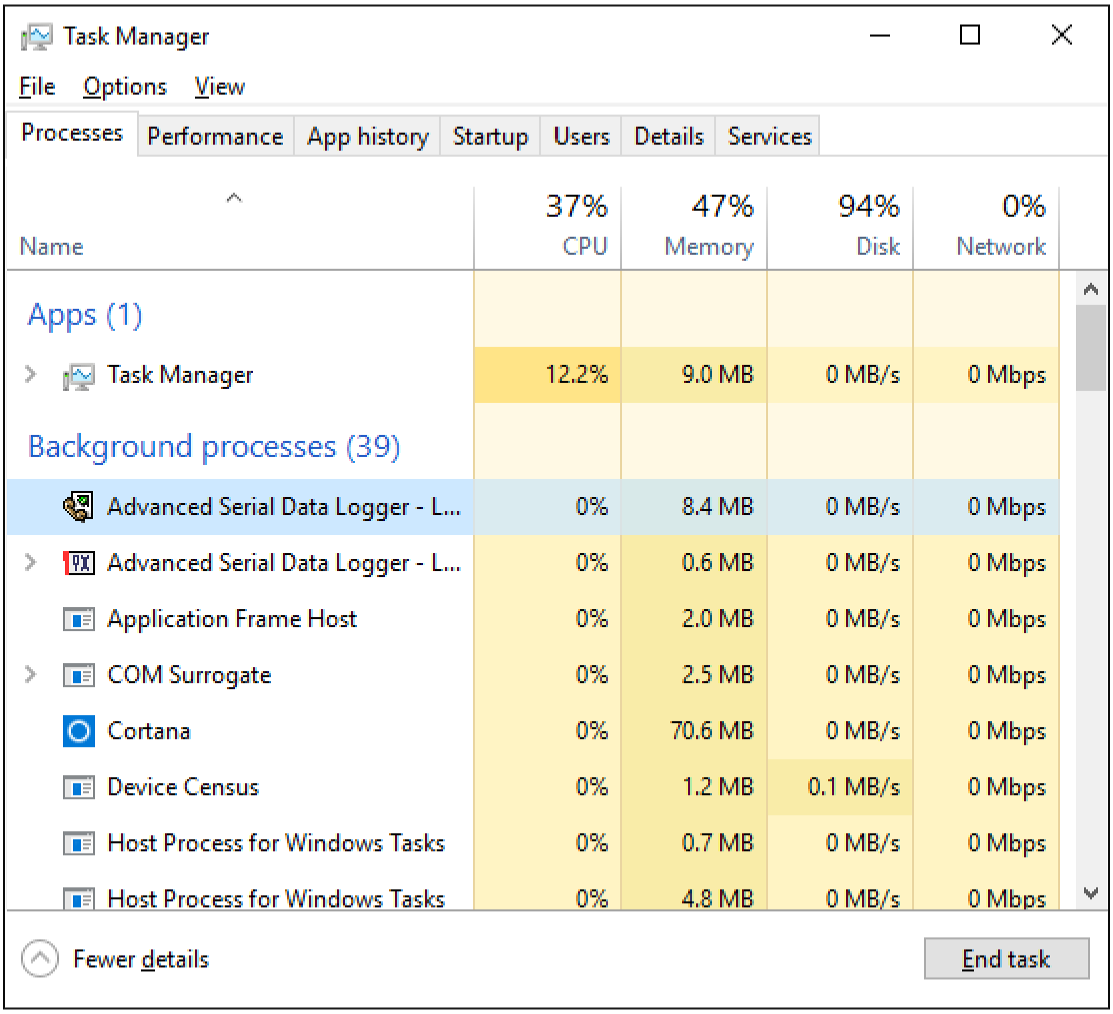
After you configured Advanced NMEA Data Logger to work in the service mode, you need to restart a computer or start the service manually from the "Services" control panel (fig. 6.4.4).



Name	Description	Status	Startup Type	Log On As
ActiveX Installer (AxInstSV)	Provides Us...		Manual	Local Syste...
Advanced Serial Data Logge...	Logging of ...		Automatic	Local Syste...
AllJoyn Router Service	Routes AllJo...		Manual (Trig...	Local Service
App Readiness	Gets apps re...		Manual	Local Syste...
Application Identity	Determines ...		Manual (Trig...	Local Service
Application Information	Facilitates t...	Running	Manual (Trig...	Local Syste...
Application Layer Gateway ...	Provides su...		Manual	Local Service
Application Management	Processes in...		Manual	Local Syste...
AppX Deployment Service (	Provides inf	Running	Manual	Local Syste

Fig. 6.4.4 Manual service run (in Windows 2000)

When the service is running, two processes should appear in the Task Manager: nmealoggersrv.exe and nmealogger.exe (fig. 6.4.5). The 'nmealoggersrv.exe' application implements an interface between the service manager and the Advanced NMEA Data Logger software. Unlike srvany.exe utility, our service stops safely.



Name	37% CPU	47% Memory	94% Disk	0% Network
Apps (1)				
Task Manager	12.2%	9.0 MB	0 MB/s	0 Mbps
Background processes (39)				
Advanced Serial Data Logger - L...	0%	8.4 MB	0 MB/s	0 Mbps
Advanced Serial Data Logger - L...	0%	0.6 MB	0 MB/s	0 Mbps
Application Frame Host	0%	2.0 MB	0 MB/s	0 Mbps
COM Surrogate	0%	2.5 MB	0 MB/s	0 Mbps
Cortana	0%	70.6 MB	0 MB/s	0 Mbps
Device Census	0%	1.2 MB	0.1 MB/s	0 Mbps
Host Process for Windows Tasks	0%	0.7 MB	0 MB/s	0 Mbps
Host Process for Windows Tasks	0%	4.8 MB	0 MB/s	0 Mbps

Fig. 6.4.5 Process list

If you want to configure the program as a service, then you must be logged with administrator rights. The service application can be controlled, stopped, or removed with the help of a command-line. Run nmealoggersrv.exe with the following parameters:

- /? - a short help.
- /I - install service for starting in then manual mode.
- /A - install service for starting in the automatic mode.
- /D - install service in the disabled state.
- /R - remove service from the computer.

4.7.4.2 Windows Vista+ notes

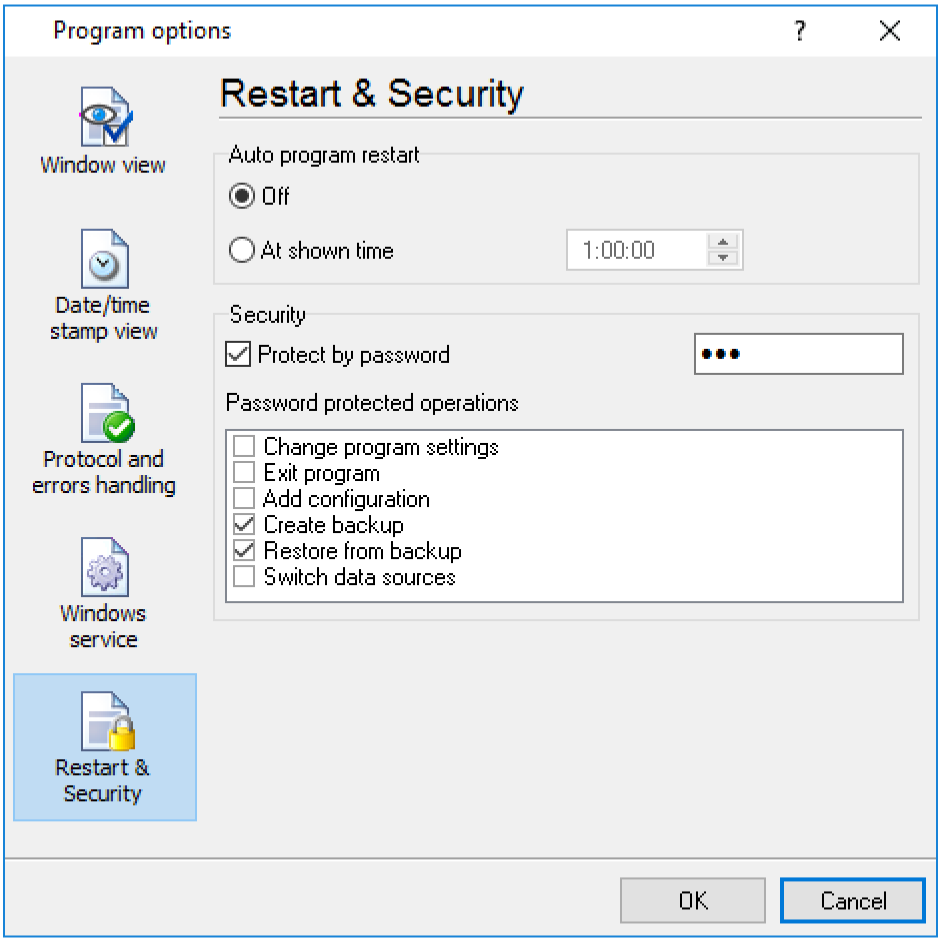
One of the ways Vista's security was improved was by separating system services and user applications into separate 'sessions'. Keeping the system services isolated helps to secure them better, but also makes any interactive interface unavailable to the user. That's where the Interactive Services Detection service comes in. When a service needs to interact with the user, Interactive Services Detection presents a dialog that will switch the user to the session where the service is running so they can interact with the service. For an excellent, detailed description of this, see next paragraph.

Many sites recommend disabling this service, but doing so will result in you not being able to interact with any services that require your attention. This service is run manually by default, so there is little point to disabling it unless you don't want to be bothered by important information from the software you may be trying to run.

- **Display Name**: Interactive Services Detection
- **Service Name**: UI0Detect
- **Process Name**: UI0Detect.exe
- **Description**: Enables user notification of user input for interactive services, which enables access to dialogs created by interactive services when they appear. If this service is stopped, notifications of new interactive service dialogs will no longer function, and there may no longer be access to interactive service dialogs. If this service is disabled, both notifications of and access to new interactive service dialogs will no longer function.
- **Path to Executable**: %windir%\system32\UI0Detect.exe
- **Default Start-up**:
  * Home Basic: Manual
  * Home Premium: Manual
  * Business: Manual
  * Enterprise: Manual
  * Ultimate: Manual

4.7.5 Restart & Security

Sometimes the program should be restarted. For example, if you've changed the program settings remotely and want to reload program automatically with the new settings. To do that, specify the time for restarting the program on the "Restart & Security" tab in program options "Options->Program options". Just specify the time of day, when the program should be being restarted.



Restart & Security

Auto program restart

● Off

○ At shown time 1:00:00

Security

☑ Protect by password ●●●

Password protected operations

□ Change program settings
□ Exit program
□ Add configuration
☑ Create backup
☑ Restore from backup
□ Switch data sources

Fig. 6.5.1 Program restart settings

On this tab, you can also protect some actions with the program by a password. To do that, activate the "Protect by password" option, define a password and select protectable actions.

6 Having problems?

6.1 Program doesn't run or work

It is necessary to make sure in proper time installation on your computer, so as if you put clock after program installation, protection from use after trial period works.

Also, the program will not work, if you use a software debugger in your environment like WinDbg. In any other case, please, contact us on support@aggsoft.com.

6.2 FAQ

Question: Does the program work with virtual COM ports? USB-COM converters?
Answer: Absolutely!

Question: Why COM port doesn't open?
Answer: Probably, another program already uses it (the selected COM port). It can be a service application, for example.

Question: What to do?
Answer: Close the application that uses this communicative port (for a DOS application close also a DOS session window). Alternatively, use another communicative port. Probably, a COM port wasn't properly closed.

Question: Is it possible to set variable data transmit rate or transmit 9 data bits?
Answer: No, the Windows operating system doesn't have such the feature.

Question: What socket type to use: DB25 or DB9?
Answer: It does not matter. All modern computers have DB9 only. Alternatively, they do not have DB9 sockets at all.

Question: What cable do I need: straight or crossed (null-modem)?
Answer: It depends on your device. Generally, you should use a null-modem (crossed) cable with the following layout:

```
Device   |   Computer
     _____________
      RXD <--> TXD
      TXD <--> RXD
      GND <--> GND
```

If a device uses special signals like DTR or RTS, and you don't want to use hardware data transmit control, you need to connect pins 7 and 8 of the DB9 socket on the device side.

You can find more hardware related articles on our site https://www.aggsoft.com.