Advanced NMEAData 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 is:

- 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 baudrates.
- 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.
- Supporting various operating systems. It runs under 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 users 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 signalling.

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 extension .TXT (e.g., README.TXT).

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

Bit - 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 communicate 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 represent a single character or 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 domain name. The DNS server maintains a database of domain names (host names) and their corresponding IP addresses. PC aggsoft's IP address, 198.63.211.24, corresponds to the DNS name www.aggsoft.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 the way in which 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 add up to an even number, and None, in which a parity bit is not added.

Ports - A connection point for a cable.

Protocol -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 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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Registered customer are entitled to free updates during one year from the date of purchase. It means that during 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 updates, 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 updates to the latest version at a special, greatly discounted price, and this updates will allow you to have free updates and technical support for another year. The type of update license must match the type of your existing license.

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Should any term of these terms and conditions be declared void or unenforceable by any court of competent jurisdiction, such declaration shall have no effect on the remaining terms hereof.

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

2.2 Limitations

Program is distributed on shareware terms. This means limited and unavailable secondary program possibilities, which become valuable or available after program registration. To register the program read here 6.
In trial version of our program are the following limits:

- Trial period is limited by 21 days. After that time program won't work until it is registered.
- Continuous program work time is limited. After set period a message will be displayed and program stops its work;
- All data export modules can handle first 100 records only;

2.3 How to register

The program is distributed on shareware terms. This signifies limited or unavailable many features of the program, getting of full value or available after program registration.

If you'd like to be a registered user, to get information about the release of new versions, to use technical support and, at last, to get access to disabled functions of the program, register your copy. For registration, please, read license agreement 4.

If you want to buy a program through the Internet visit the registration page of our site. On this page you can get the newest information about the registration process, and also find an order link. After you've have the form of order registration. Enter your personal information and choose the most convenient payment method for you. Further, you'll get notification and follow the notes in it.

More information about services, registration documents, payment means you can get on our registration page of our 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 - Windowsa 8.1, 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 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, Advanced NMEA Data Logger will be installed to the directory "/Programs Files/ Advanced NMEA Data Logger" 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.

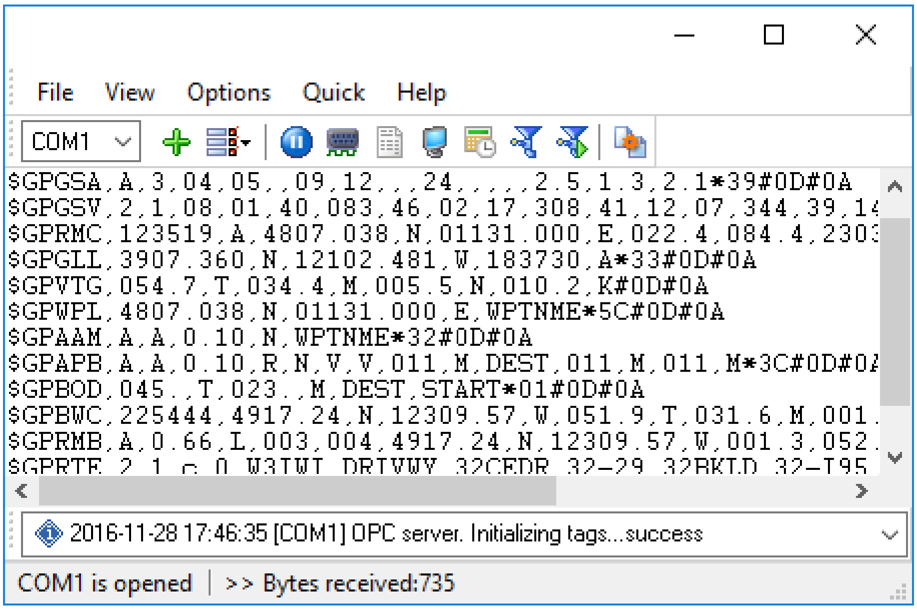
4 Program use

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. In the data window will be viewed formatted data processig. In the messages list are logged information, warning and error messages. The status bar shows current state of the selected data source, interface error messages and a number of bytes processed. Through the main menu, placed above the data window, you can get access to program settings 9 ("Options/Program settings...") and from the menu "File" (fig. 1.1.2) can open an current log-file or clean the data window.



```
$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

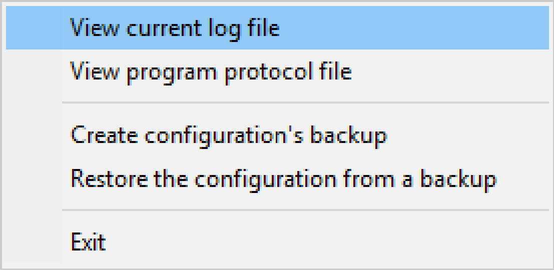

View current log file
View program protocol file
Create configuration's backup
Restore the configuration from a backup
Exit

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 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 while 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 big green plus and choose communication parameters 13 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

Program can work with any kind of serial devices. Before configuring our software, the following conditions should be executed:

- Device should have a RS-232 serial port interface (can be also used a RS-485 interface with an additional hardware converter);
- Device is configured to send data to serial port with or without requests from a PC 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 data sheet), then you should know about flow control type);
- Device's serial port is connected with computer serial port with a cable (null-modem or other special cable);
- Computer's COM port, to which your device is connected is not busy, for example by mouse software driver.

How to configure port parameters, you can read in the next chapter "Serial port settings 13".

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

- If your PC 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 PC 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 PC receives the IP address dynamically from a DHCP server, then you should ask your network administrator to assign a static IP address to your PC.

How to configure port parameters, you can read in the next chapter "IP settings 18".

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 31" 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 own format. How to customize data view you can read in the "Data view 26" 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. Most simple way is to configure the log file rotation. But it is small 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 generates many messages and writes they 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 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. All modules are described in following chapters.

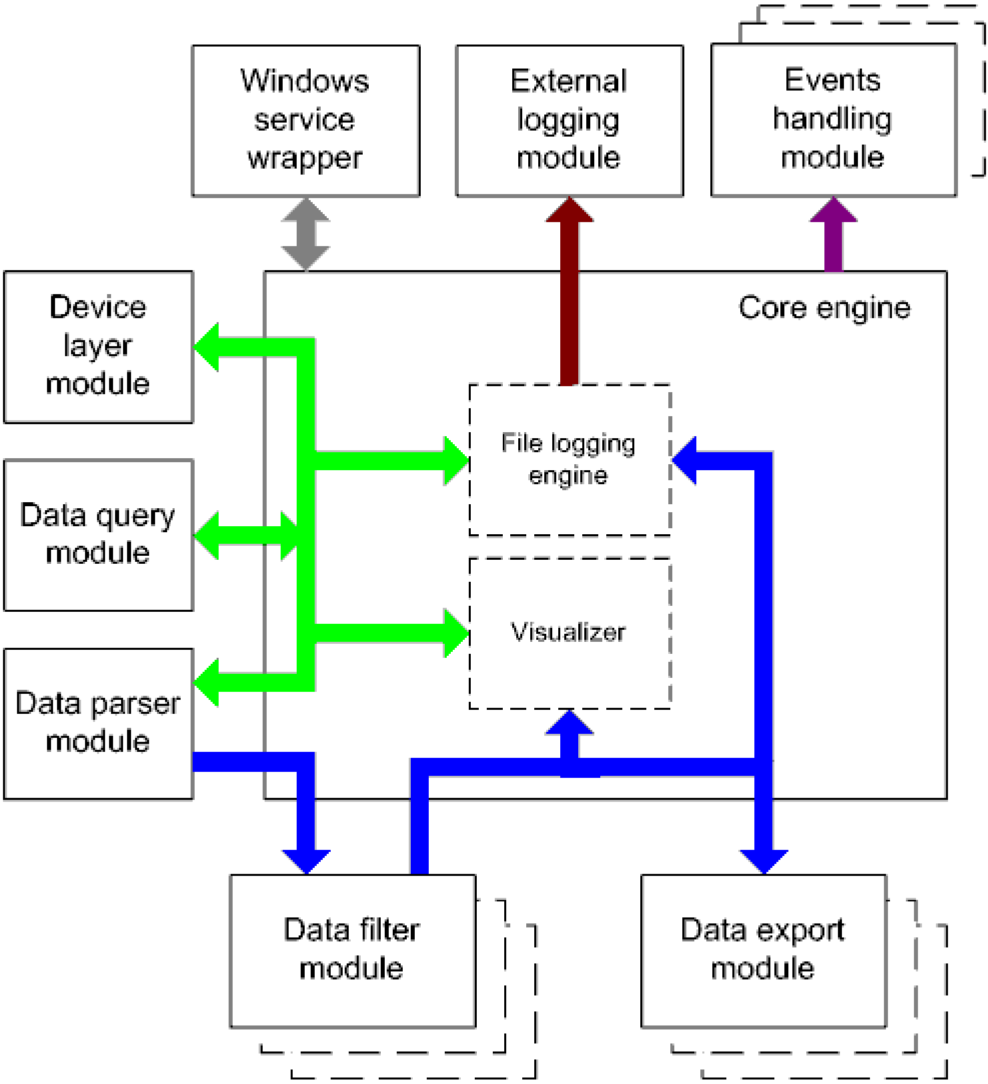


Fig. 1.2.1 Data flow diagram

History:

🟩 - Binary flow of data (RAW, unformatted data).

🟦 - Parsed data (formatted data). The data flow was been separated to 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 unstructured data flow.

4.4 Work complete

After program work stop all program settings will be saved in Windows registry. Opened for reading/ writing data sources will be automatically closed and will be available for other applications.

4.5 Useful advices

1. Look through hint helps on all window elements - this will 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. Or 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 - analogues to click on "Start/Pause" button on toolbar.
- Ctrl+C - analogues to click on "Clear" button on toolbar.
- Ctrl+P - call options window with configuration settings.
- Ctrl+L - call options window with log file settings.
- With Ctrl+W hot key You can configure window view.
- Ctrl+R - show window with program's restart settings.
- Ctrl+E - Windows NT/2000/XP service settings is available here.
- Ctrl+M - here you can configure queries, parsers and other modules.

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 last 10 message. 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 communicate 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 in the same time (up to 255 serial ports).

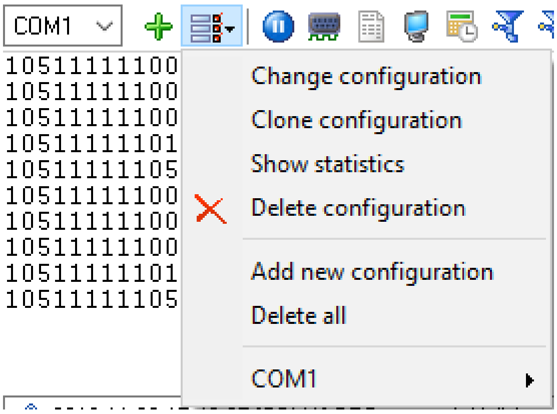
You can open serial ports in Advanced NMEA Data Logger software in two modes:

1. **Spy mode**. In this mode the program monitor data flow on ports selected. In this mode Advanced NMEA Data Logger intercept 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 port 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). But, before you should configure serial port parameters. For minimization of configuration we combined serial ports with same settings to the "Configuration". 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. But, if you want to use serial port with different settings, then you should create more than one configurations.

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.

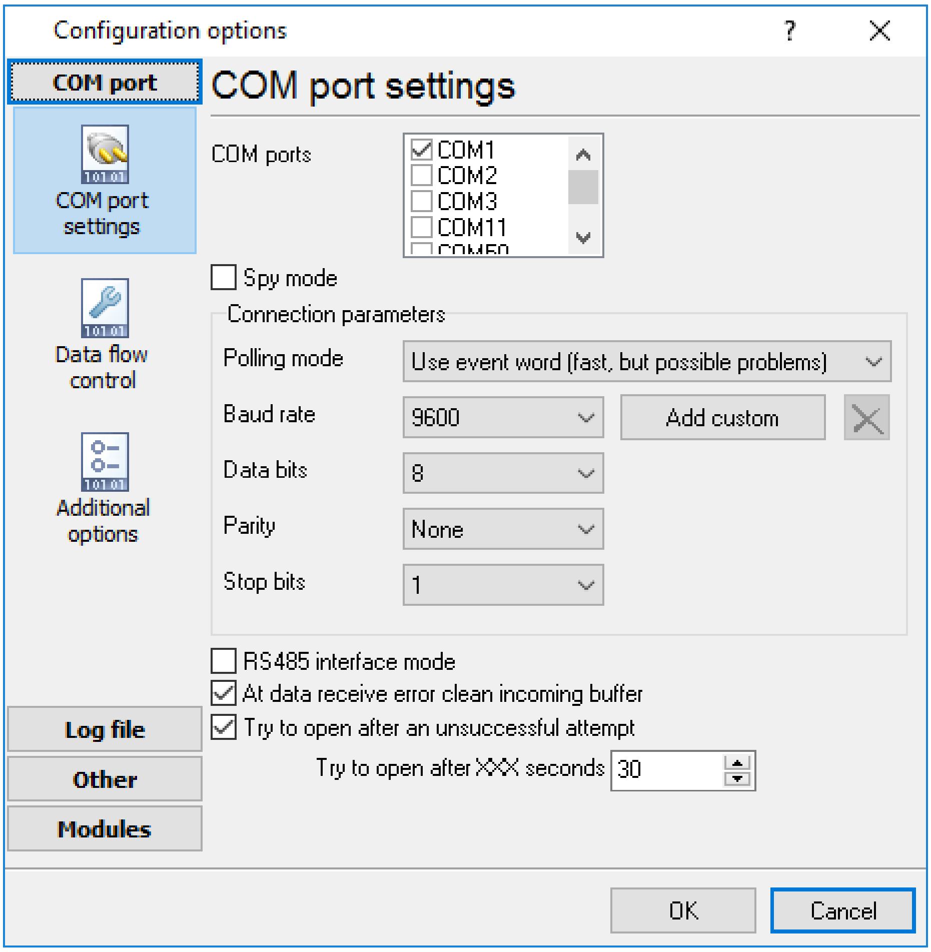
You can manage the configuration created with a drop down menu near the "Plus" button (fig. 2.1.1).



```
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 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 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 successful.

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 other mode before Advanced NMEA Data Logger will receive data.

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 setup 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.

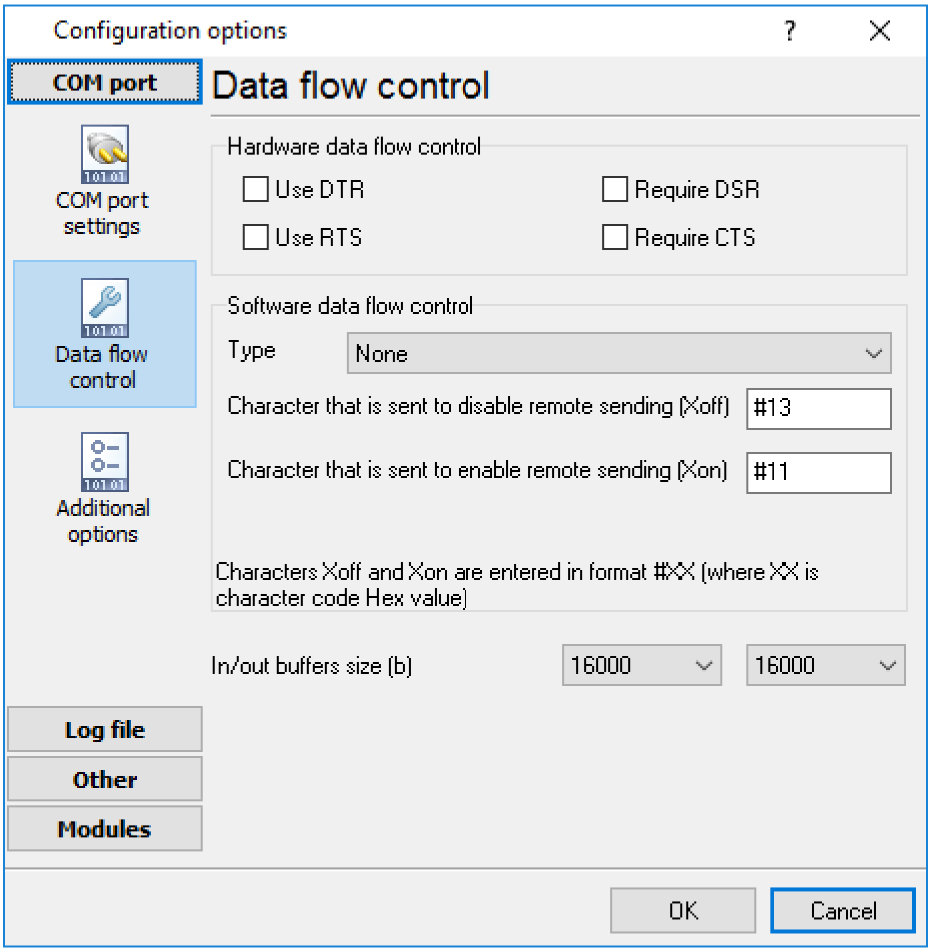
"Receive flow control" stops a remote device from transmitting while the local receive buffer is too full. "Transmit flow control" stops the local device from transmitting while the remote receive buffer is too full.

Receive flow control is enabled by assigning "On receiving" or "Both" to the "Type" property. When enabled, an XOff character is sent when the input buffer reaches the level 10% size of the buffer. 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 level 10% of the buffer. At that point, an 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 an XOff character. The driver does not start transmitting again until it receives an XOn character or the user sets software flow control to "None'.

Software data flow control can be setup on receive, transmit or both modes, but so as the great number of device doesn't need data sending, select only control mode "On receive". In case of activation of data transmit control remote object (in our case 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 receive from 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 data exchange, made by other programs.
To spy received and sent data open COM port before running the given program. If the given program receives data over COM port, the data exchange process will be displayed in data receive window. Don't forget to set up check box "Spy mode" to spy data receive by the given program (if necessary).

To exit Advanced NMEA Data Logger close the given program or stop data exchange over COM port in it.

you must close, which data exchange you spies, *before* closing Advanced NMEA Data Logger.

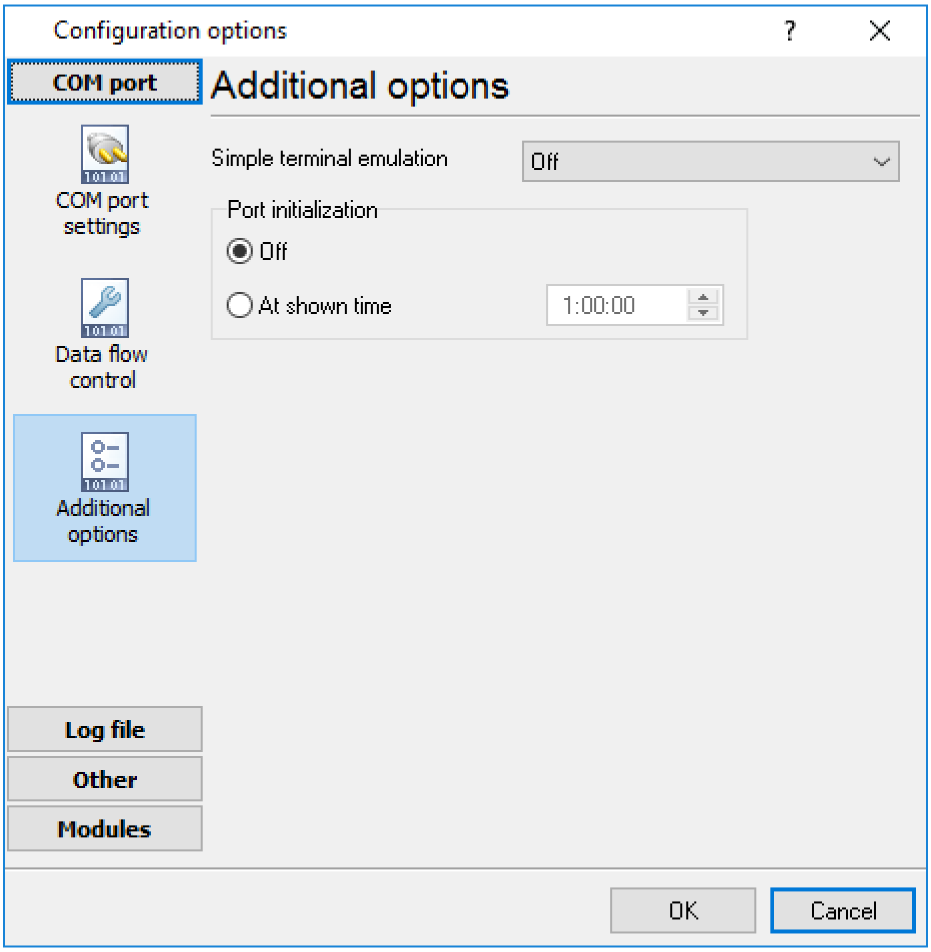
Serial data transfer errors

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 invalid parity type;
UART receiver overrun,
UART receiver framing error - occurs if you configured 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 remote device;
break condition 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)



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 actually 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 PC. The program uses a multi configurations. 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:

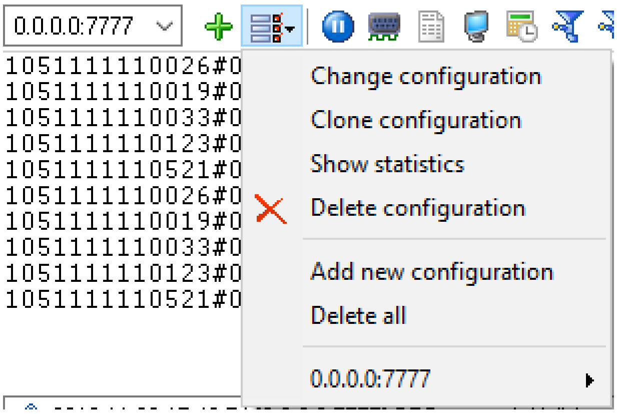
1. **Client**. You will need to specify the remote host IP address and the port number for the TCP/IP server that you want to connect to. The IP address that you specify in Advanced NMEA Data Logger when configuring it as a client may also be either a URL or the name of a computer located on your network. 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 individual workstation, then you may need to use the name of the PC that you want to connect to instead of an actual IP address in order to guarantee a connection;
2. **Server**. In this mode you should specify the IP address of the local PC will be used and you only need to specify the port number that you would like to use. If your PC 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 PC 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. This means that your PC 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 PC 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 the specified port until a client establishes a connection to it.

If one or more port 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). But, 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.

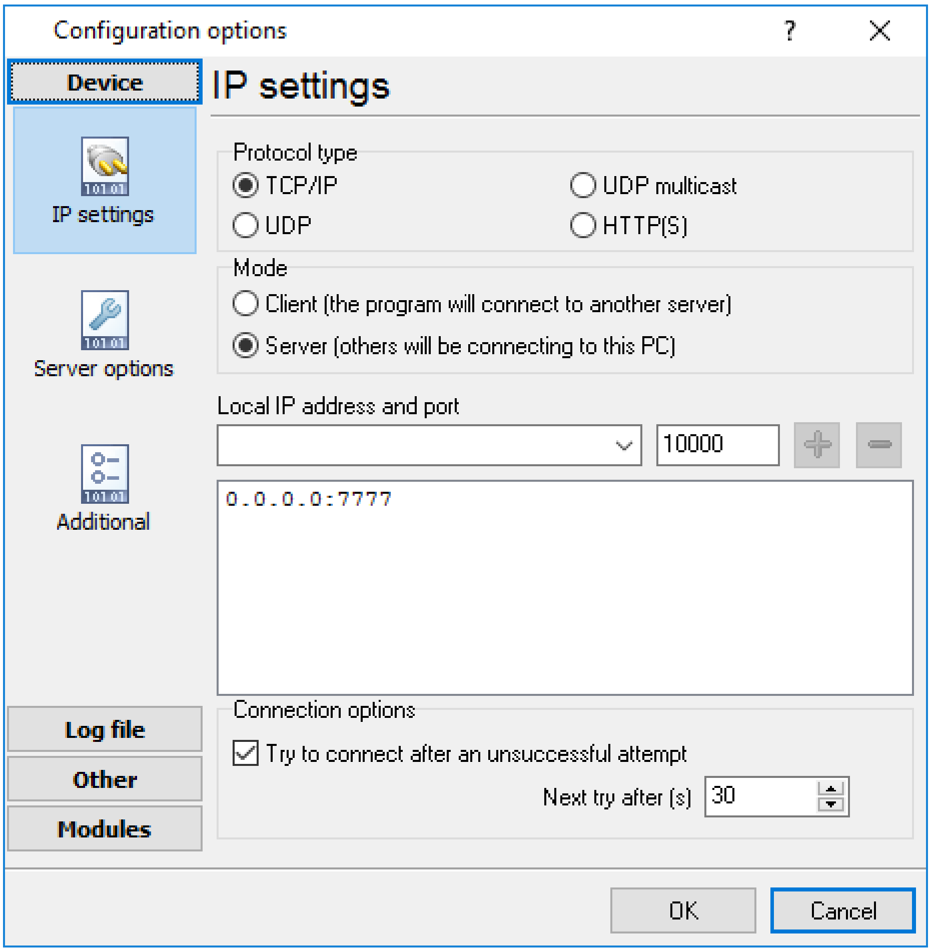
To log data from more than one TCP/IP connection you would create and configure multiple port configurations. You can manage the configuration created with a drop down menu near the "Plus" button (fig. 2.2.1).



```
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 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 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

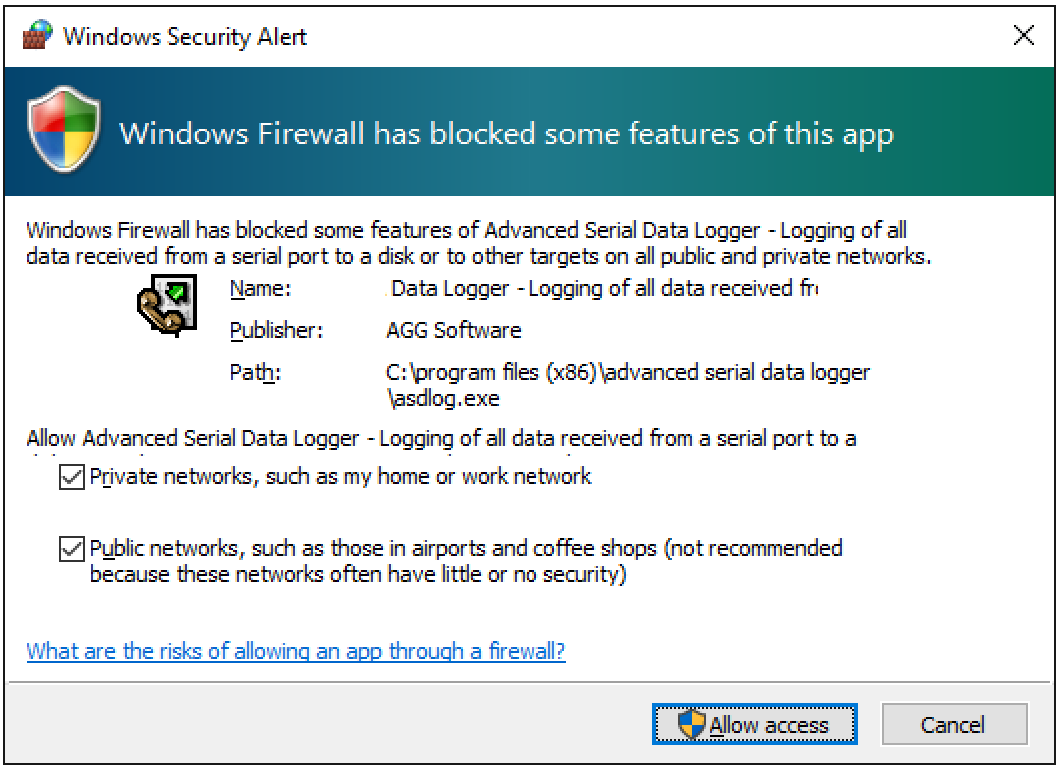
If the remote server (in the client mode) or local network interface (in the server mode) is not available and the "**Try to connect after unsuccessful attempt**" options is True, then Advanced NMEA Data Logger will continually try to establish the connection until it is successful. The program will try to establish the connection each 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. IP addresses that are not listed in this fields will be refused by the server. This options is very useful if you transfer your data over Internet connection or your server PC is connected to a big corporate network. You can specify multiple addresses - one per row. If you'll 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.

In order 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 to bypass 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, 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 to create multiple configuration 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 to decrease an influence of Windows limitations.

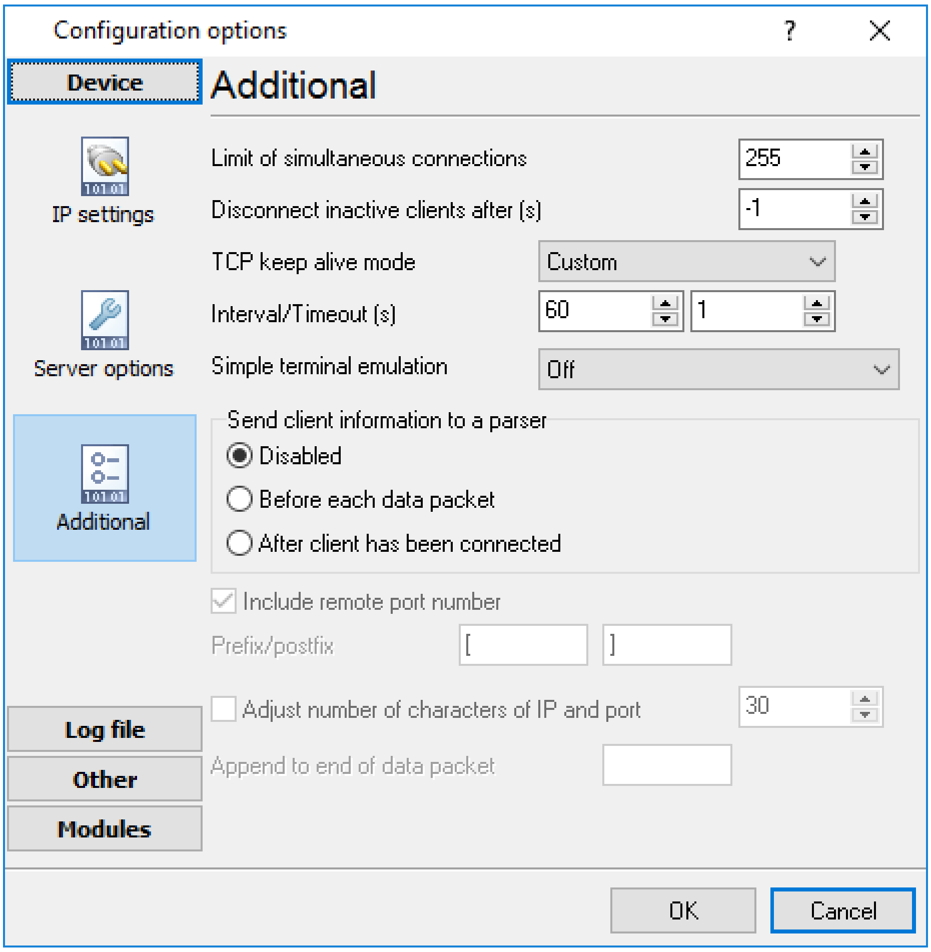
Additional parameters

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

Simple terminal emulation - the program realizes 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 number of clients that can connect to the server at the same time. It allows to optimize a server load with 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.



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

Send client information to a parser

● Disabled

○ Before each data packet

○ After client has been connected

☑ Include remote port number

Prefix/postfix [ ]

□ Adjust number of characters of IP and port 30

Append to end of data packet

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 stay 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-alives can be sent once every KeepAliveTime (defaults to 7,200,000 milliseconds or two hours) if no other data or higher-level keep-alives 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 keep alive at all. You can disable keep alive if your network is very stable or your routers doesn't support it.

2. **System** - the program will use keep alive, 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.

Following options are effective only in the server mode (TCP/IP or UDP):

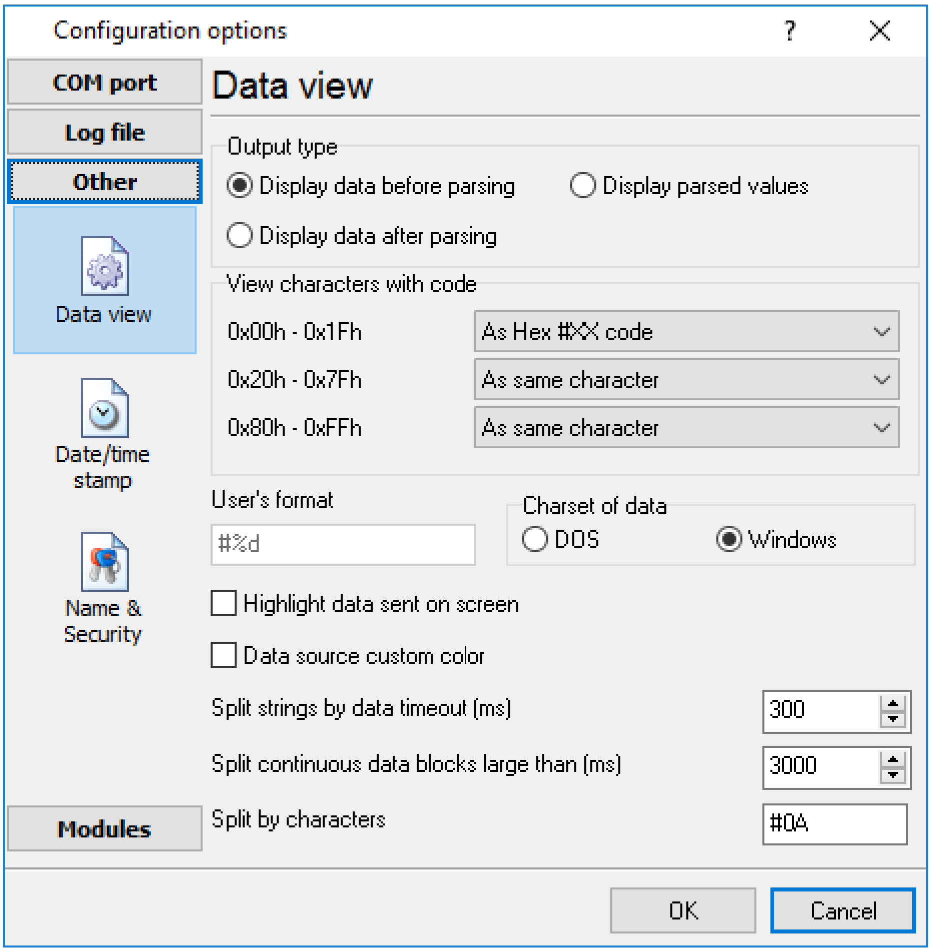
Send client information to the a parser - if this option is activated then program will append a system header to a data packet about the remote client. It allows the parser to separate data packets from several clients that send data simultaneously.

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

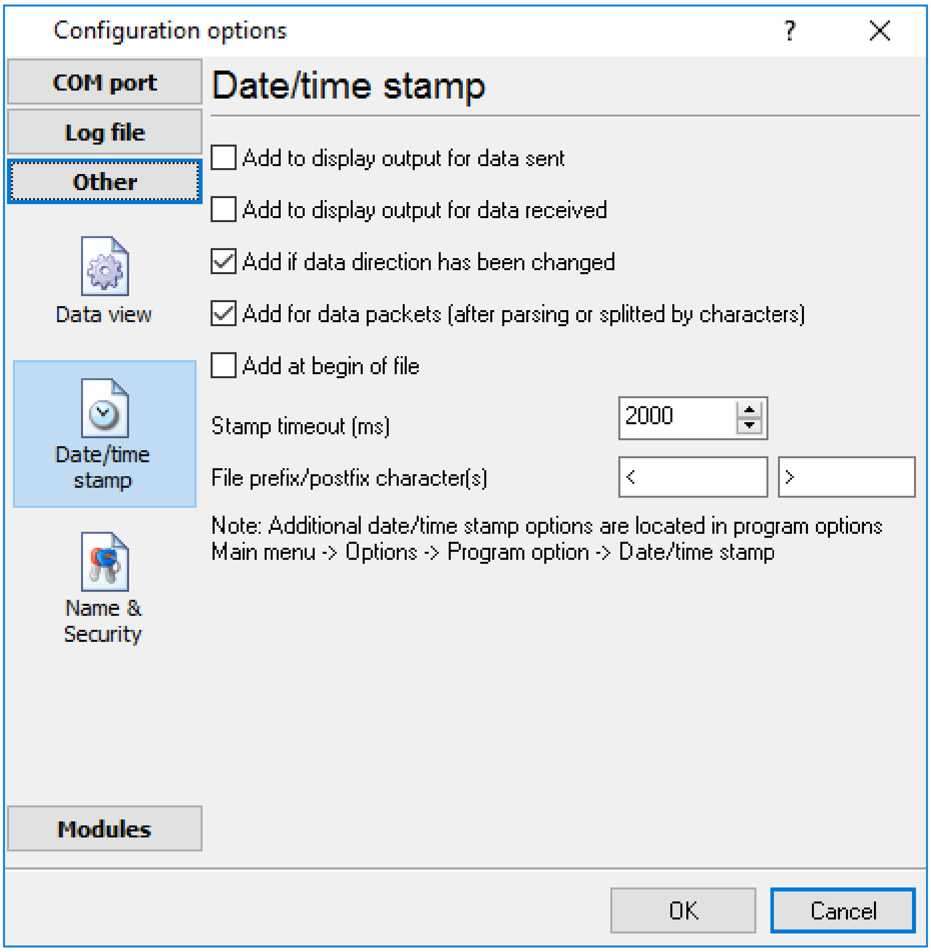
Data view settings, that can be configured on the "Data view" tab:

1. **View characters with code** - the program can interpret and decode bytes as characters. You can select decoding mode for each characters range. 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 data byte display **users format**. The directive %d shows to display an decimal code, the directive %x - hex code. You can set any framing characters before/after the user format.
3. **Highlight data sent on screen** - string with sent data will be highlighted by the set color.
4. **Character set** - allows 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 to distinguish data flows on the "All data" page in the main window.
6. **Split strings by data timeout** - this option allows to visually split data packets in the program window. A data packets that will be received after the specified interval will be showed on a new line. If this value is set to 0 then data packets will not split.
7. **Split continuous data blocks large than** - this option allows to visually split continuous data flow in the program window. The program will show data from a new line every specified interval.
8. **Split by characters** - this option allows to visually split 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 data and time stamps appear in the log file and on the screen. You can configure the stamp format in the program options 56.



Configuration options

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:

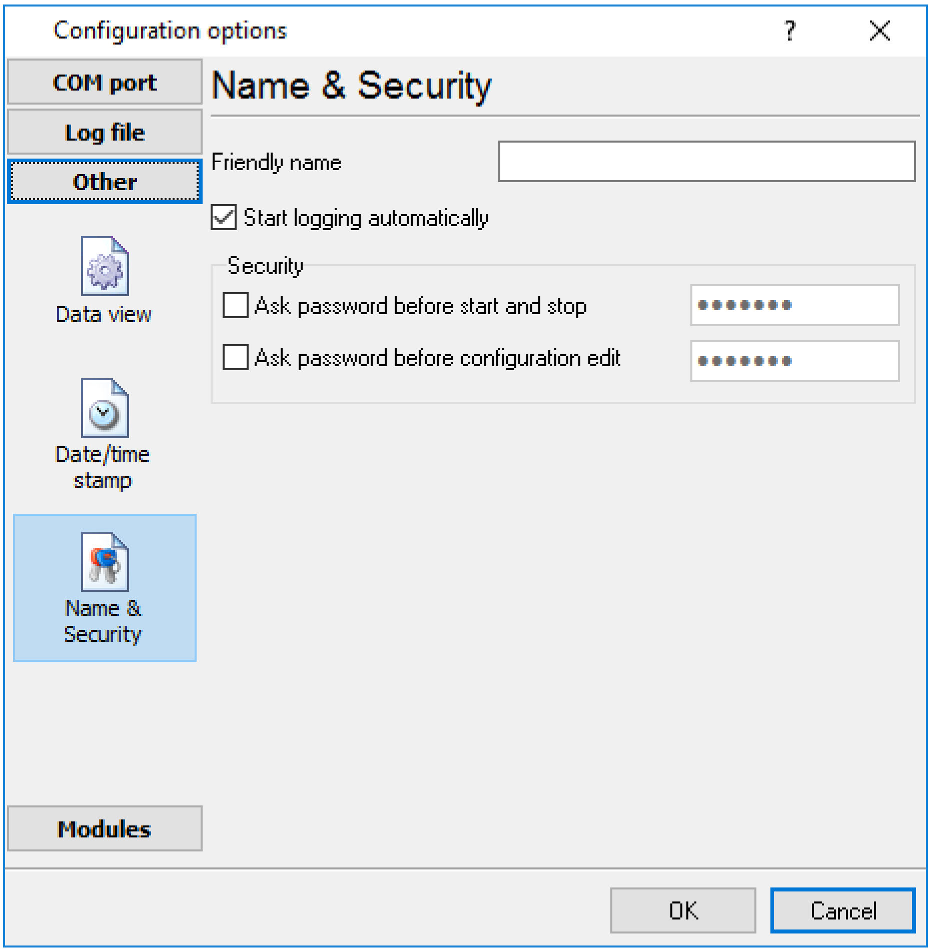
Friendly name - this name will be added before the port number or the data source in the drop-down list in the main window of the program. It allows you to describe the data source.

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.



Configuration options

Name & Security

Friendly name

☑ Start logging automatically

Security

□ Ask password before start and stop ●●●●●●●

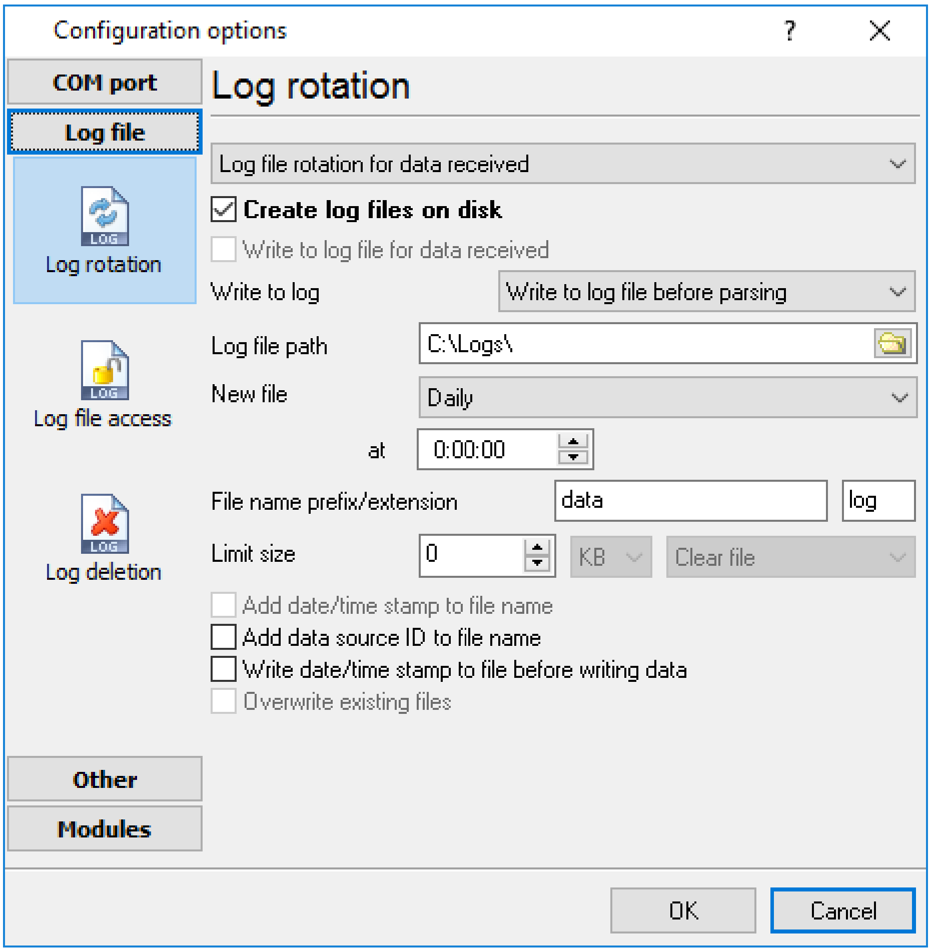
□ Ask password before configuration edit ●●●●●●●

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

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

Note: The program can work with network paths too, but in this mode, the program will increase data flow over a network and can be failed with exceptional errors.

A log file name can be stamped with date and time. In this case a new log file is created periodically. The time stamp format 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.

Log rotation mode is defined by the following key parameters:

- **File name prefix** - text string, which will be added at file name beginning;
- **File name extension** - text string, which will be a file extension (characters after dot);

Limit size - the "Limit size" field specify the maximum size in kilobytes of any log file. If you'll specify zero size, then the file size will 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 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 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 removed from the log file.

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

- **Daily** - file will be created with name containing 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 file name extension will be added at the end of file;
- **Monthly** - file will be created with name containing prefix, and date in MMYYYY format. The file name extension will be added at the end of 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 ms.
- **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 -** file will be created with name containing prefix and date in showed by you format (for example, DDMMYYYY). The file name extension will be added at the end of file. The file may not contain format signs, then file name will be constant. You should not use characters, that the OS doesn't allows in file name, such as "/,\.*,?" and some others;
- **Weekly** - create a new file every week. The file name will contains 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** - file will be created with name containing 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 file name extension will be added at the end of 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 data and time

stamp.

Date and time formatting codes:

d - day, not adding null(1-31).
dd - day ,adding null(01-31).
ddd - day of the week in text form(Mon-Sat) according to standard, set on this computer.
dddd - day of the week in full text form(Monday-Saturday) according to standard, set on this computer.
m - month, not adding null(1-12).
mm - month, adding null (01-12).
mmm - month in text form(Jan-Dec) according to standard, set on this computer.
mmmm - month in full text form (January- December) according to standard, set on this computer.
yy - year in the form of two last digits(00-99)
yyyy - year in the form of four last digits (0000-9999).
h - hours, not adding null (0-23).
hh - hours, adding null (00-23).
n - minutes, not adding null (0-59)
nn - minutes, adding null (00-59).
s - seconds, not adding null (0-59).
ss - seconds, adding null (00-59).

Example: you want to create 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 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 to add date and time to the file name.

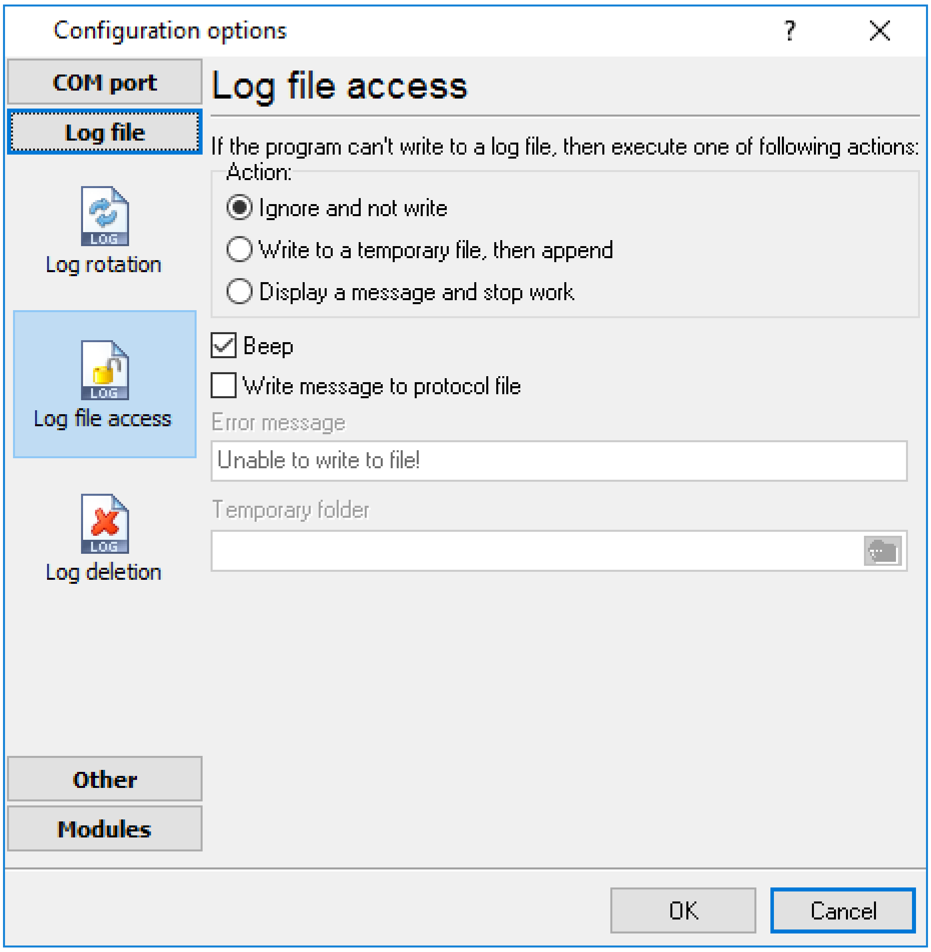
Add data source ID to file name - if this options is activated then then the program will append the data source name at the beginning of the file name. For example, COM1-sample20030321.log.

Write data/time stamp to file before writing data - if this options is activated then 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 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). But 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 to use a temporary file for data storage. It is most safe 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 following variants:

- **Ignore and not write** - with this mode, the 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 current file will be got, temporary file content will be added to the end of main file. But mind that if file is created in dependence of time, there can be a situation when at temporary file forming name of the main file will be changed. Then temporary file will be added to the end of newly created file.
- **Display a message and stop work** - data will be lost until dialog window is closed.

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

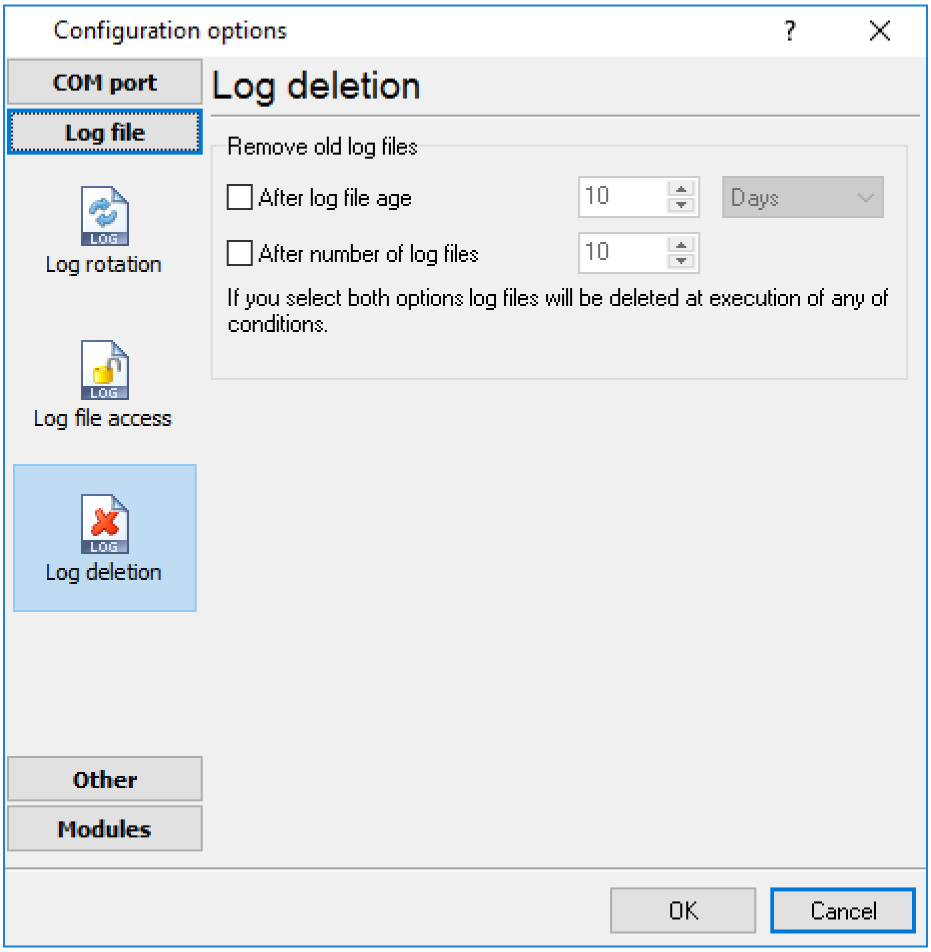
4.6.4.3 Log deletion

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

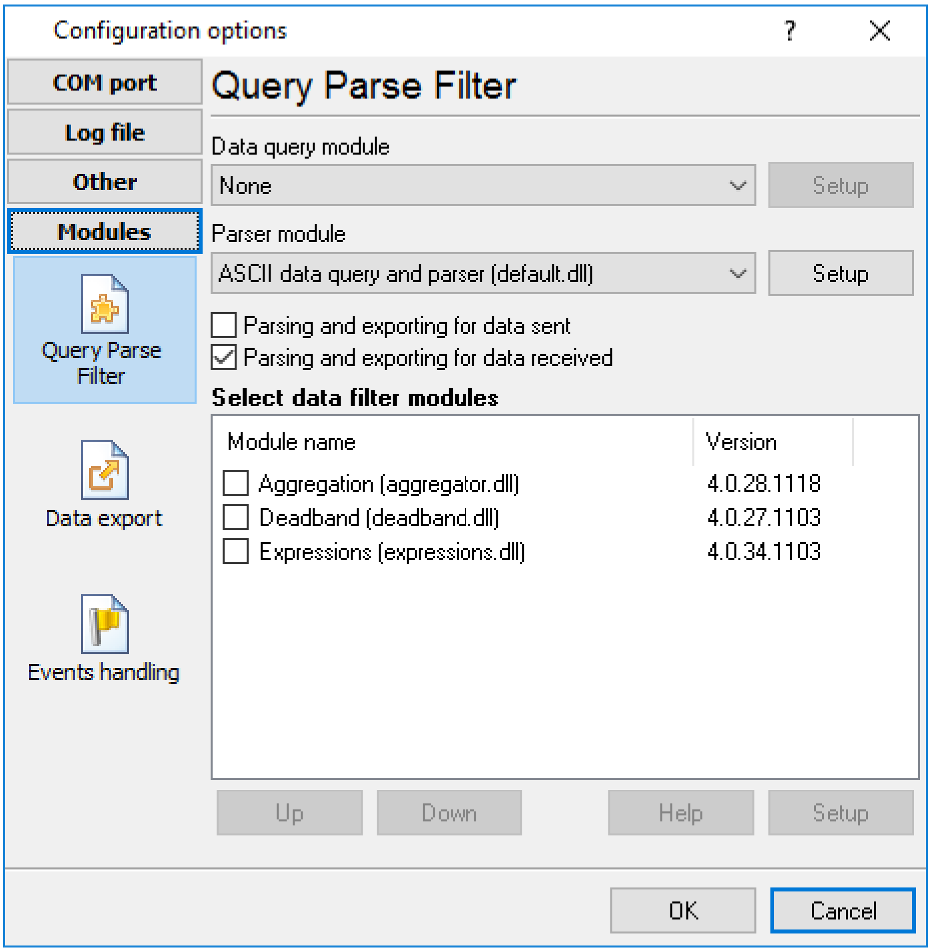
4.6.5.1 Introduction & setup

To extend program functionality we implemented plug-ins modules. Module structure lets reduce your program size and purchase costs (you pay only functionality, which you need), to low down program distributive download time, your computer processor load and reduce disk space.

Advanced NMEA Data Logger supports 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 instruments directly;

- **Data parser -** data parser that allows you to parse, filter and format more complex data from more sophisticated devices. 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 values of parser variables;
- **Data export** (fig.11) - Advanced NMEA Data Logger has many modules for passing serial data directly to other applications, such as as keystrokes where incoming data is passed to other programs as a sequence of keys, as DDE Server that passes data to other programs using Dynamic Data Exchange, ODBC for exporting data to a database and many others;
- **Events handling** (fig.12) - an external plug-ins 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 and sends a notification, do some actions, such as execute programs, scripts and etc. The form of the notification or actions depends on the plug-in settings.



Query Parse Filter

Data query module: None

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

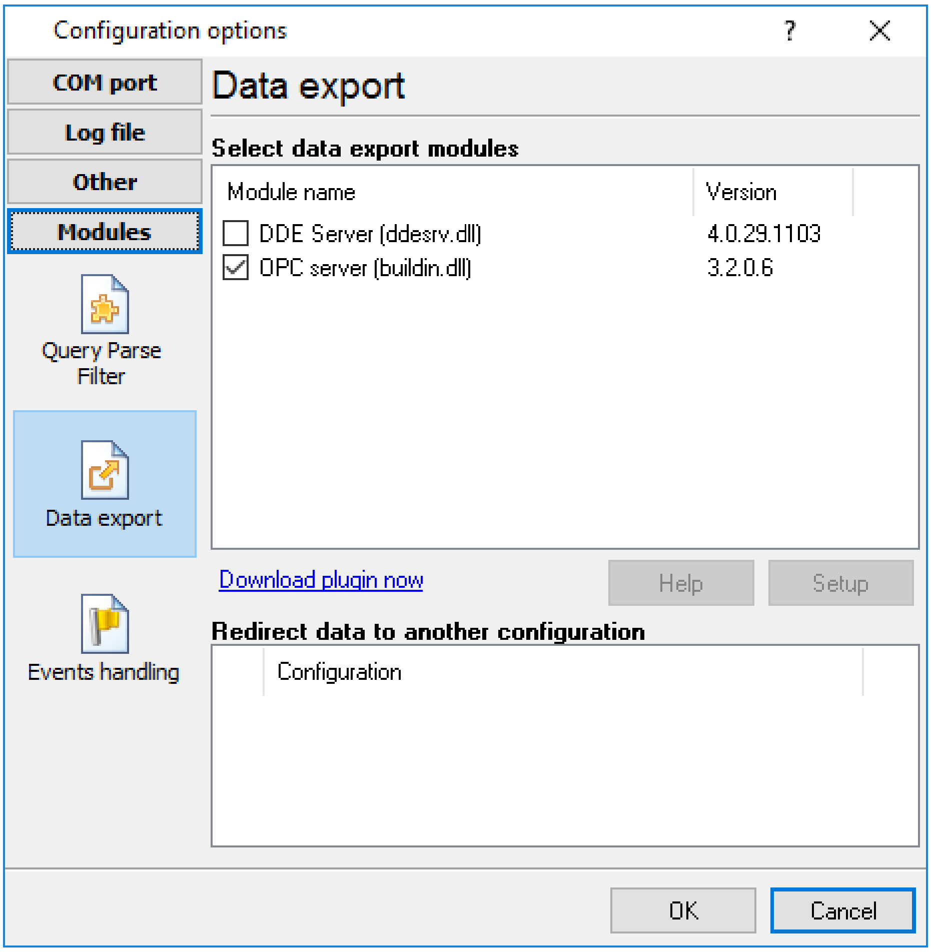
□ Parsing and exporting for data sent

☑ 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



Data export

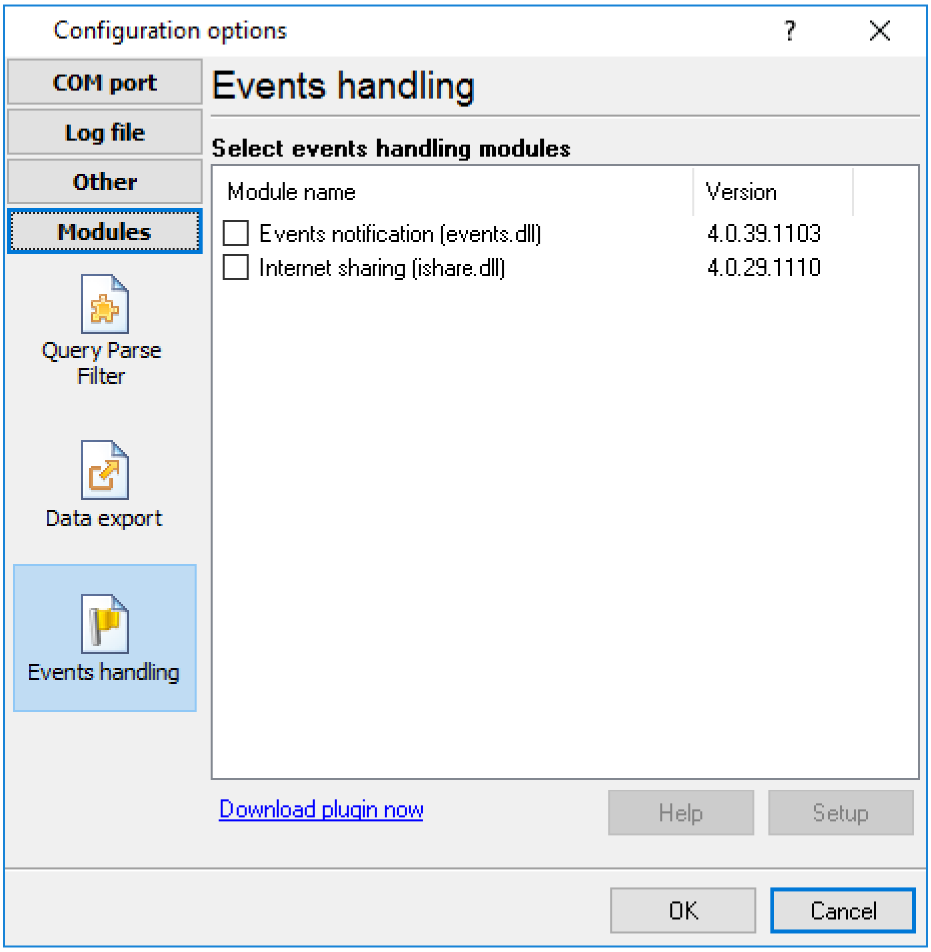
Select data export modules

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

Redirect data to another configuration

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

Configuration steps

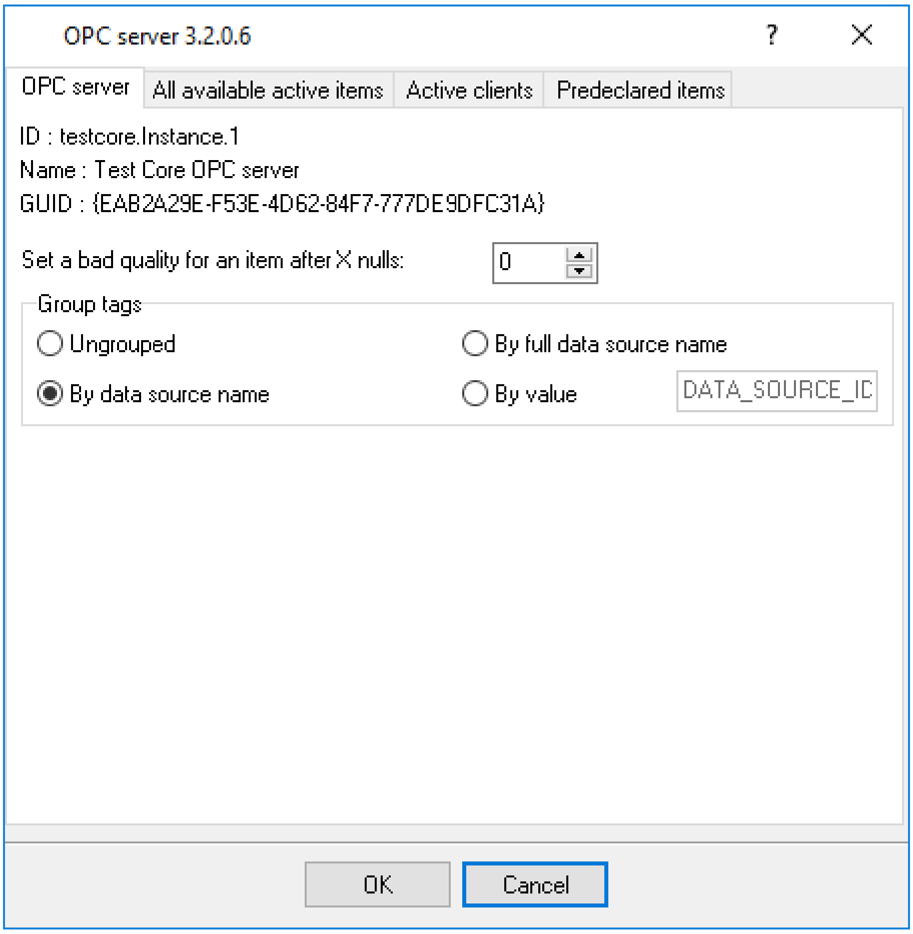
1. Select and configure a query module. You may use a module of this type if you need to send

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. For connecting to the OPC server our OPC server has an unique attributes (Fig. 5.2.1). Before using the OPC server on your PC 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}

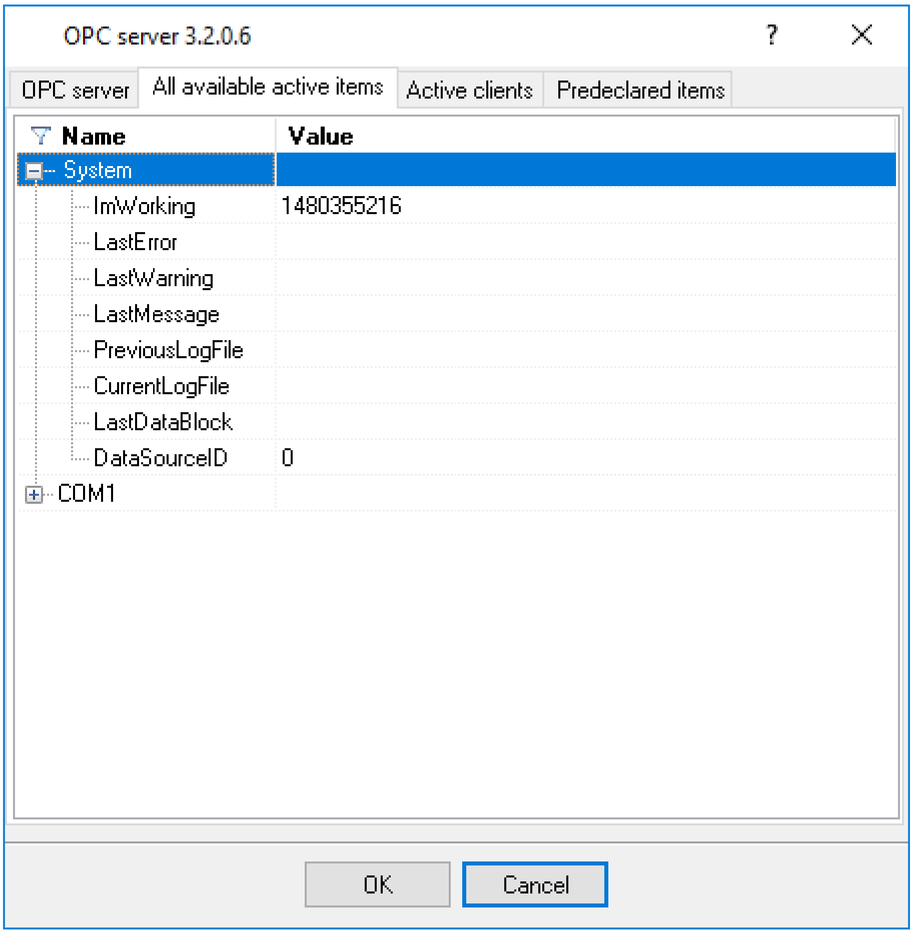
Set a bad quality for an item after X nulls: 0

Group tags

○ Ungrouped
○ By full data source name
● By data source name
○ By value DATA_SOURCE_ID

Fig. 5.2.1 OPC server parameters

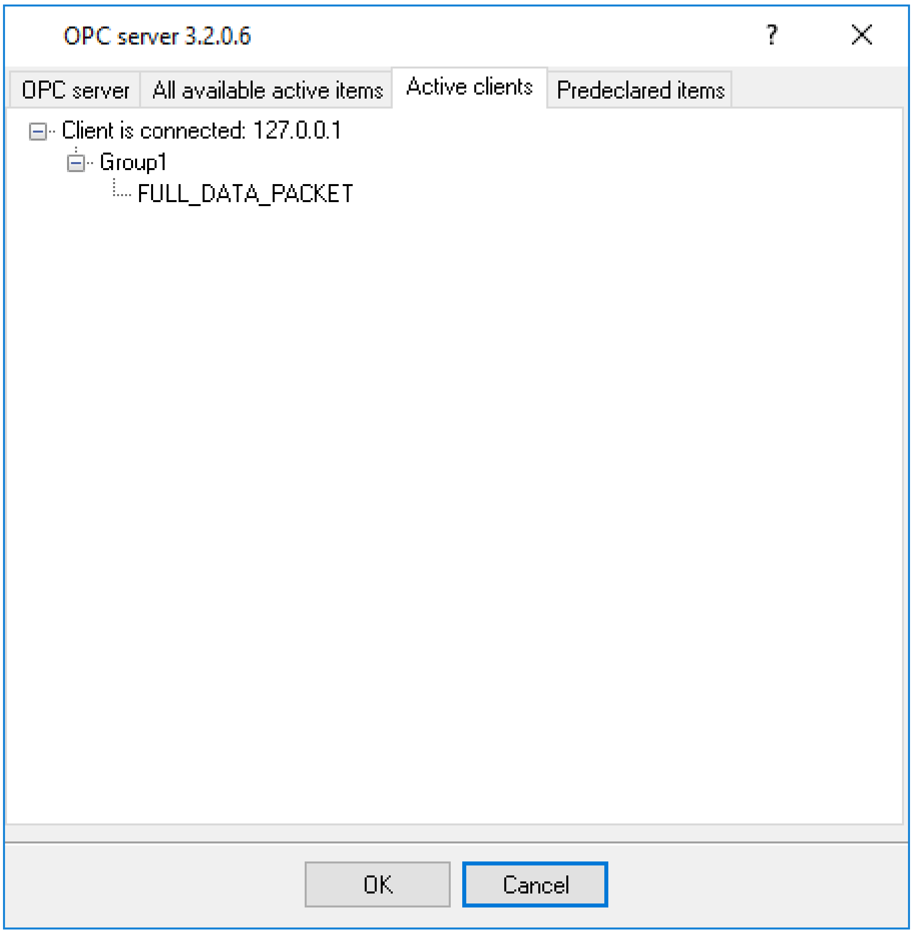
Advanced NMEA Data Logger are parsing all incoming data to one or more variables and OPC client are getting it (fig. 5.2.2). After connecting to the OPC server you will get list of all variables.



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

Fig. 5.2.2 OPC server active items

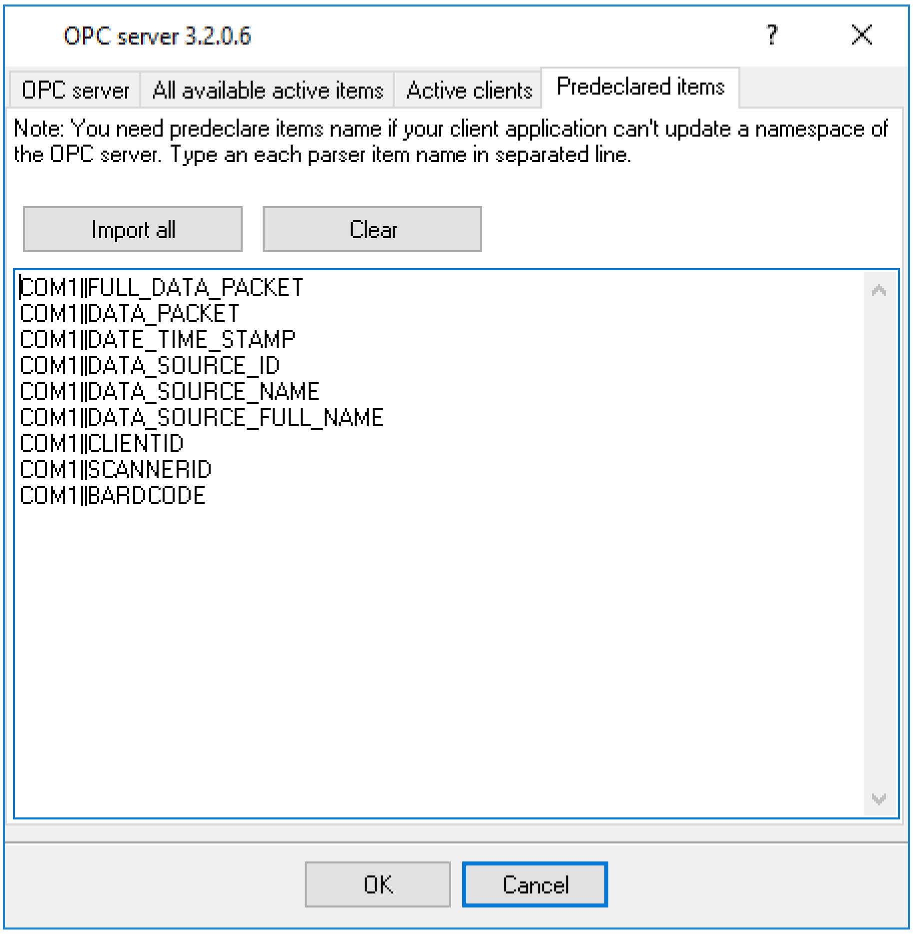
Clients activity is showed on the "Active clients" tab. The top node is client, below is group of items and connected items. By double-clicking, you can get a detailed information about each node.



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 get 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 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 your 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.

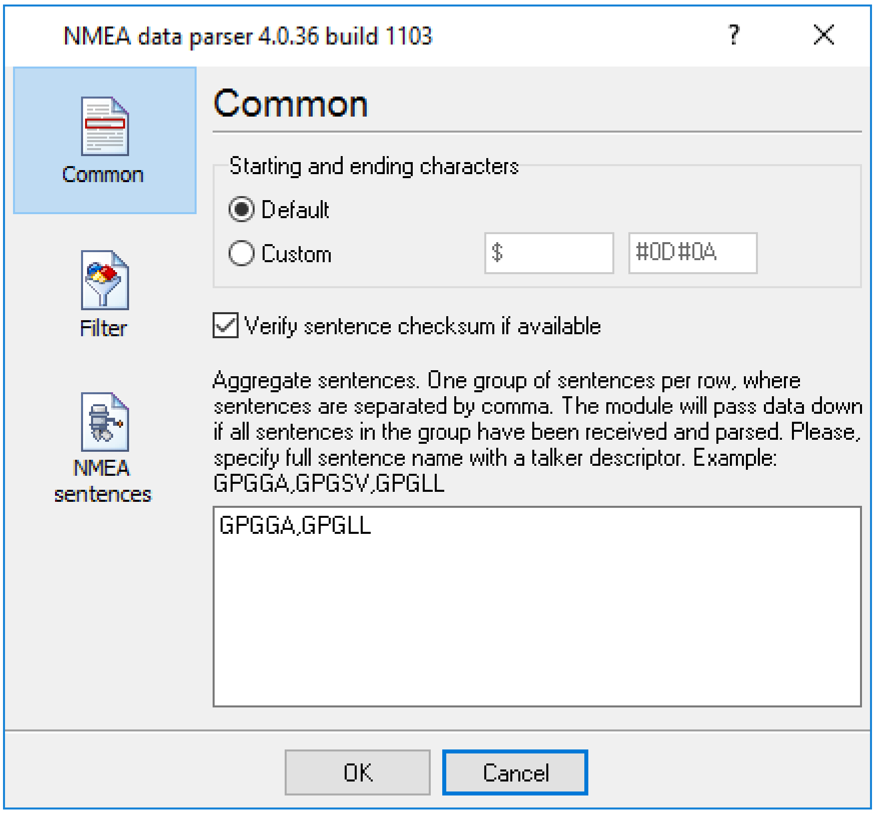
Our parser module splits all data to variables and this variables can be used in data export modules.

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

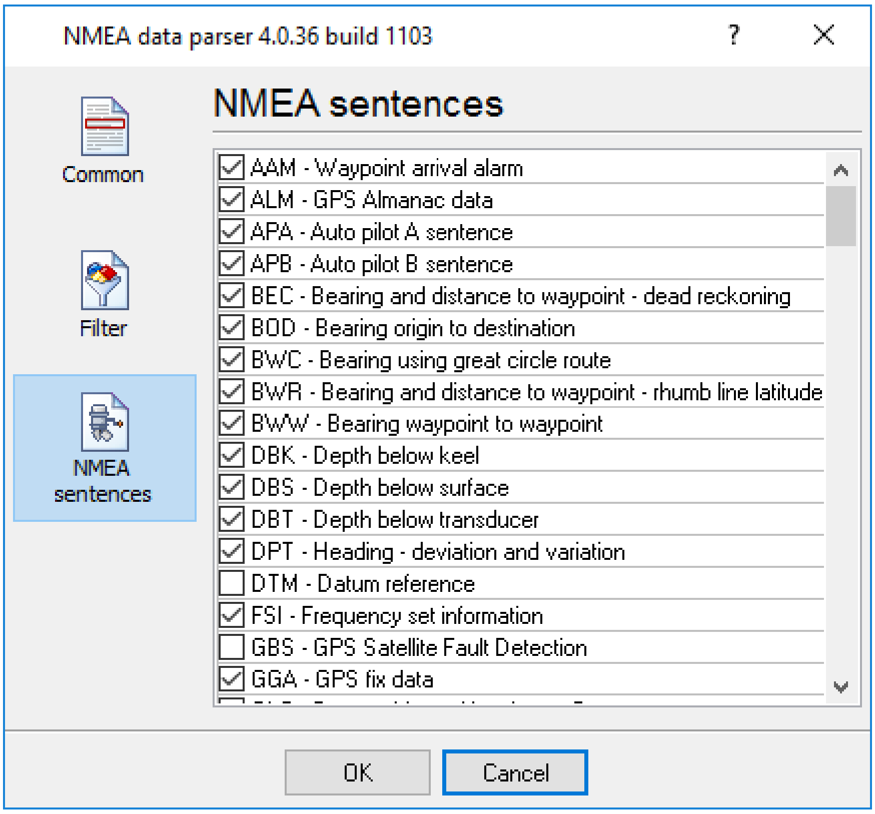
Aggregate sentences

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 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

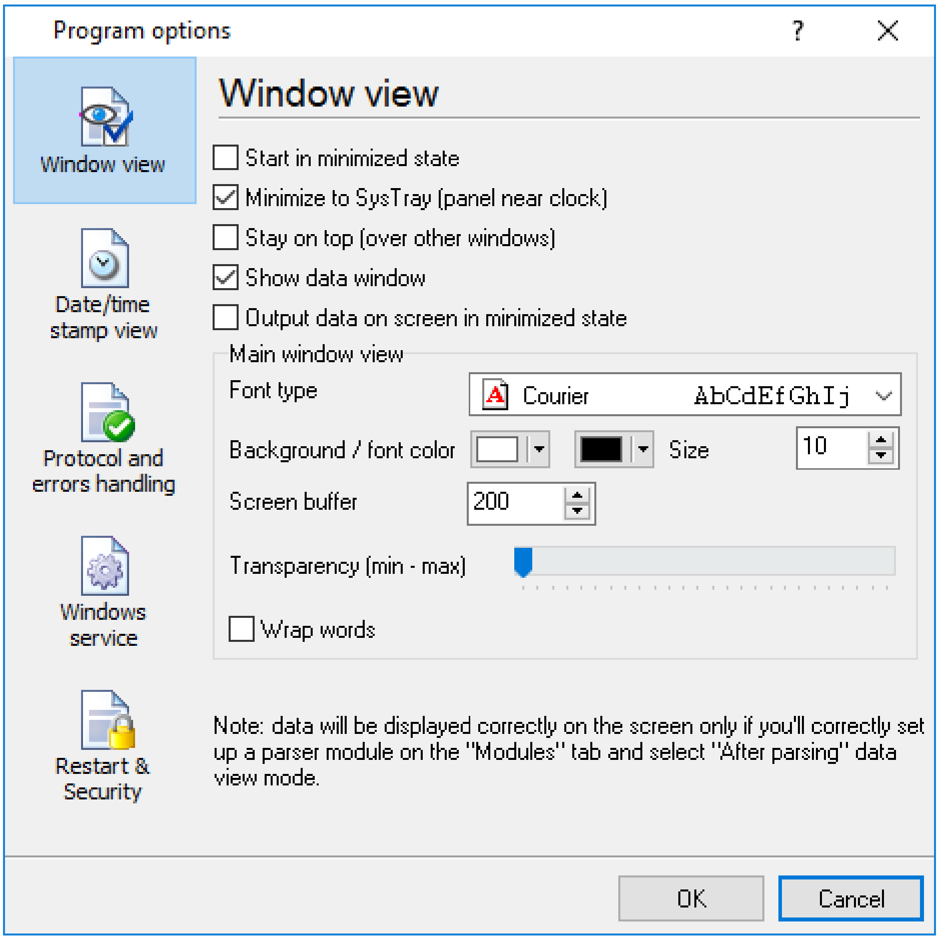
SRF161 - OK to send

- **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 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 following parameters:

- **Start in minimized state** - at start Advanced NMEA Data Logger will automatically put its icon on panel near clock (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 panel near clock;
- **Show data window** - if you specify this option, then the program will display all data in the main window. If you are logging many ports on slow PC, then you can computer CPU load rate with disabling of this option;
- **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 slow PC, 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 only. We recommend to use mono-spaced fonts in this field, such as: Terminal, Courier etc.;
- **Screen buffer** - at exceeding of value specified the data window will be cleaned;
- **Window view** - will let you setup data window view (font color, font type, background color).
- **Transparency** - in Windows 2000 and later will let you set transparency of the main window. The most left position is normal window view and 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.

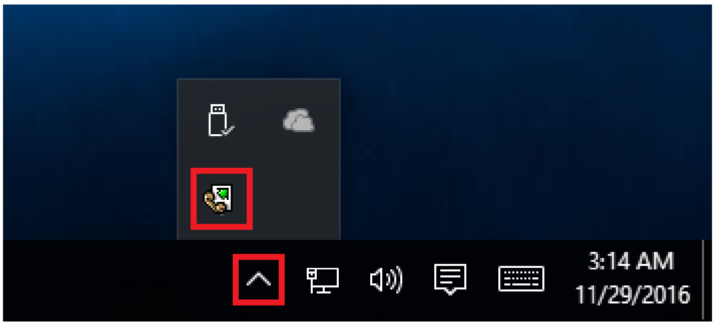
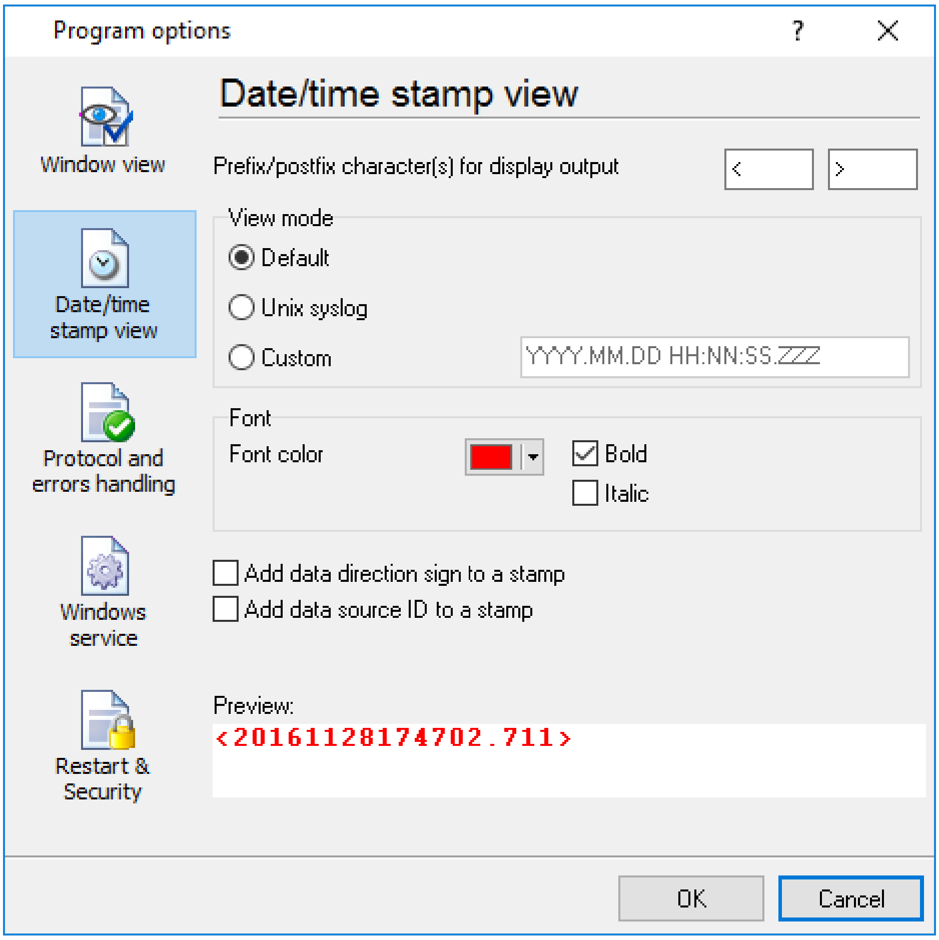


Fig. 6.1.2 Systray - panel near clock

4.7.2 Date/time stamp view

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



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 to define beginning and ending characters of a date/time stamp that will be showed in the program window. When outputting data to a log file the program uses individual characters 28 for each configuration.

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

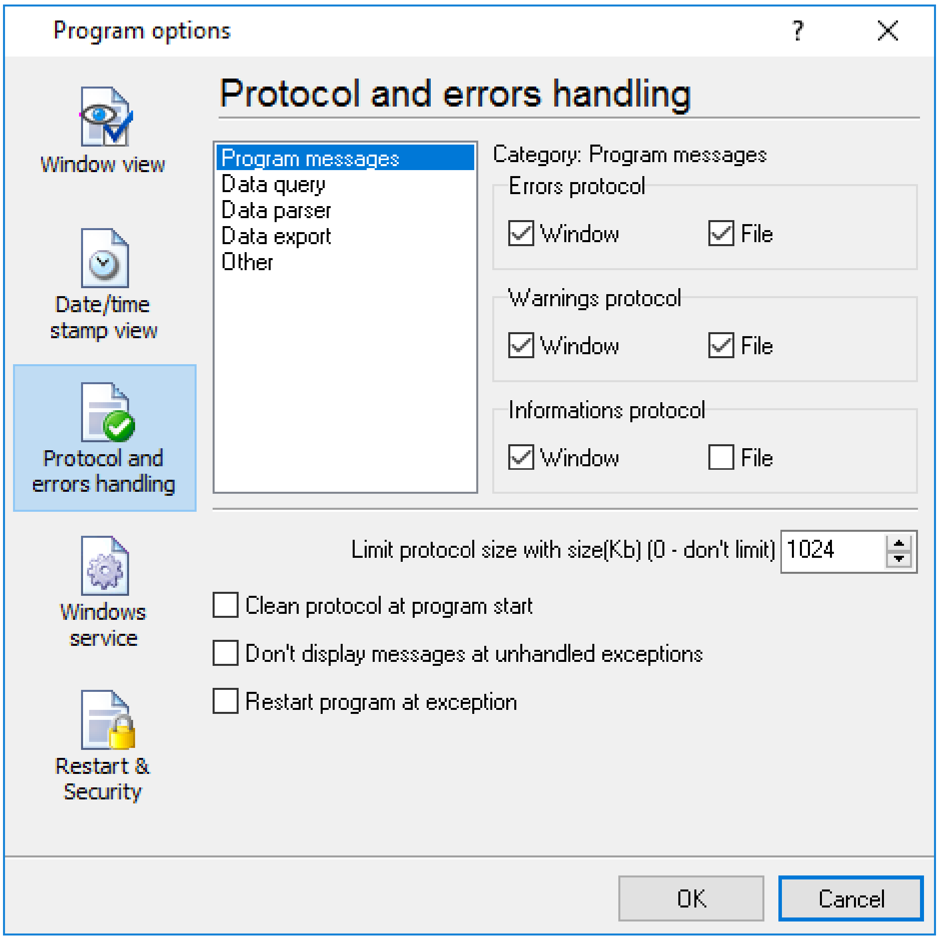
Font - this group allows to define the color and font of date/time stamp.

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 execute, she generates many messages about errors and events. All these messages are being registered in a protocol file. This can be start or stop of the program, some messages from plug-in modules etc. 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 maximum protocol file size and a formatting mode. Usually, the protocol file is in a program folder and has the name of the program with the 'log' extension.



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 on operations which are fulfilled in the current time;
- **Warnings** - warns you of possible failures or possible errors. Interference of the user is not required, but check is required;
- **Errors** - the program has detected an error which elimination needs involvement of the user.

There is the possibility to log 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 which are generated in a data parser module;
- **Data export** - messages which are generated in a data export module;
- **Other** - messages that can not be associated with types above.

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 to grow 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 messages can occur while the program execute. In most cases these messages crash the program and the most safe way is to restart the program. Please, specify the "Restart program at exception" option and the program will be restarted automatically.

If you want look all program messages, then you can disable the "Don't display messages at unhandled exceptions" check box 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

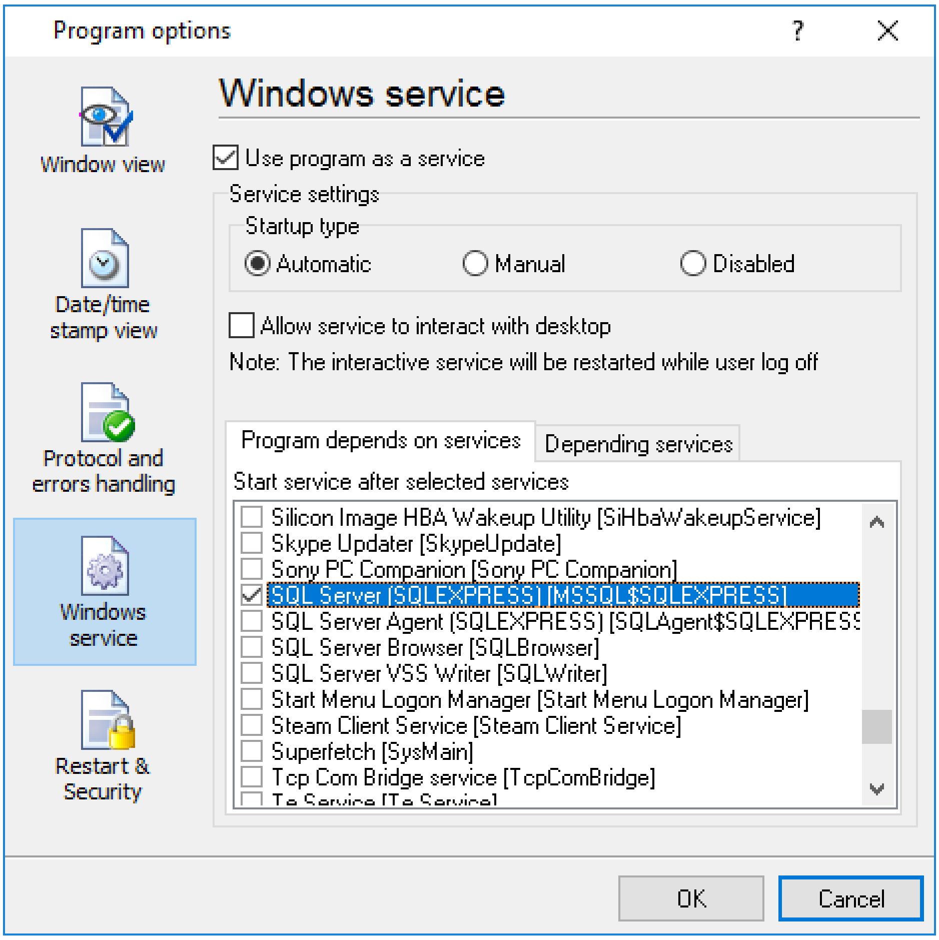
Windows NT+ services use will let you:

- control service on local and remote computers, including remote computers with Windows NT 4.0 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 setup on automatic start after operation system load.

Note 1: you must be logged in as an administrator in order 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" check box. Later, please, specify the startup type of the service. There can be following variants:



Program options ? ×

Window view

Date/time stamp view

Protocol and errors handling

Windows service

Restart & Security

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$SQLEXPRESS]
☐ SQL Server Agent [SQLEXPRESS] [SQLAgent$SQLEXPRESS
☐ 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]

OK Cancel

Fig. 6.4.1 Service settings

1. **Automatic** - service will be started automatically at every Windows start, before user login;
2. **Manual** - you can start the service application in the "Services" window in the Control panel (fig. 6.4.2);
3. **Disabled** - service can't be started.

If you want to change program settings while service mode, then enable the "Allow service to interact with desktop" option. In this case, the program will put the icon to the SysTray (fig. 6.4.2). But then your interactive service will be restarted while user log off.

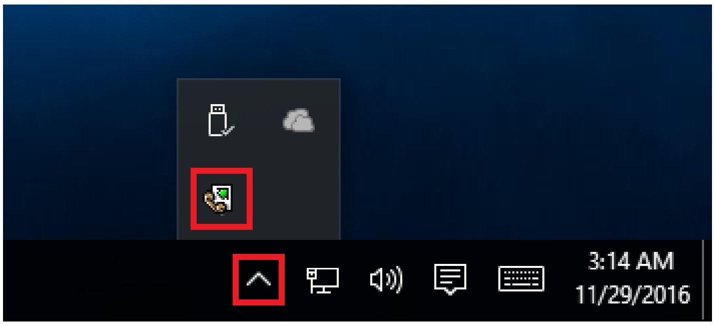
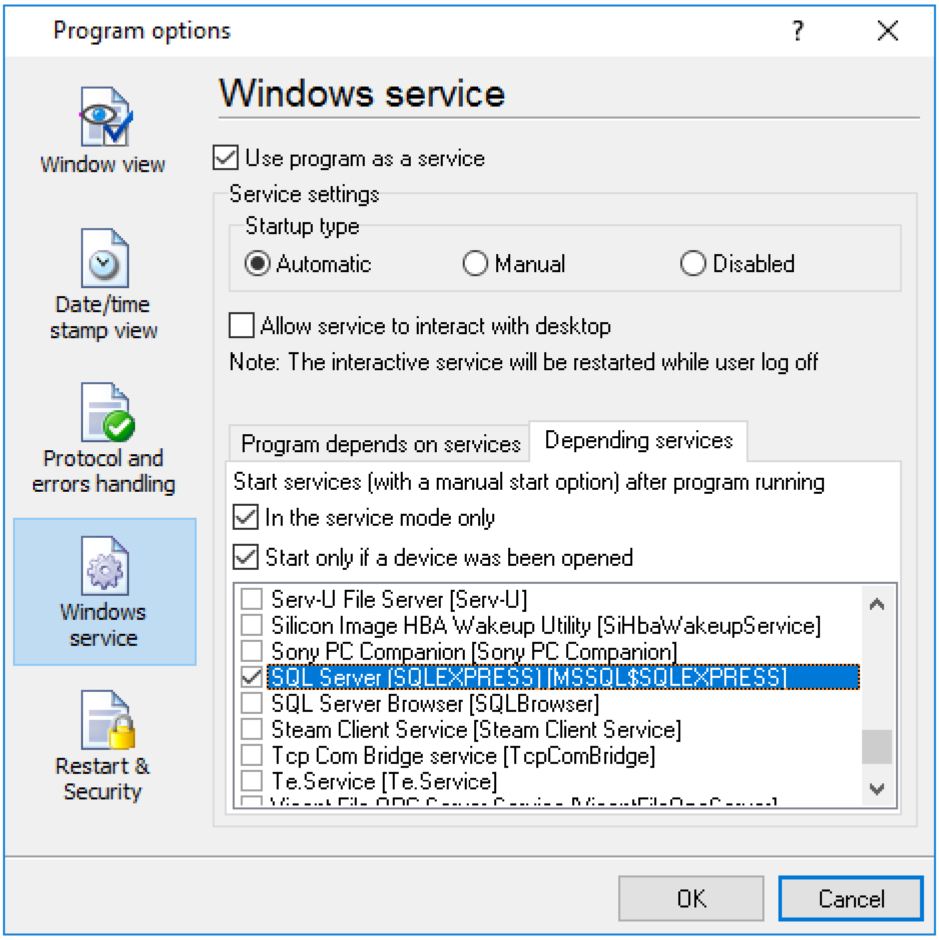


Fig. 6.4.2 Service icon in Systray

If you use data bases or special drivers, before service run, these applications must be run. You can specify what services should be started before Advanced NMEA Data Logger in the "Program depends on services" window (fig. 6.4.3).



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

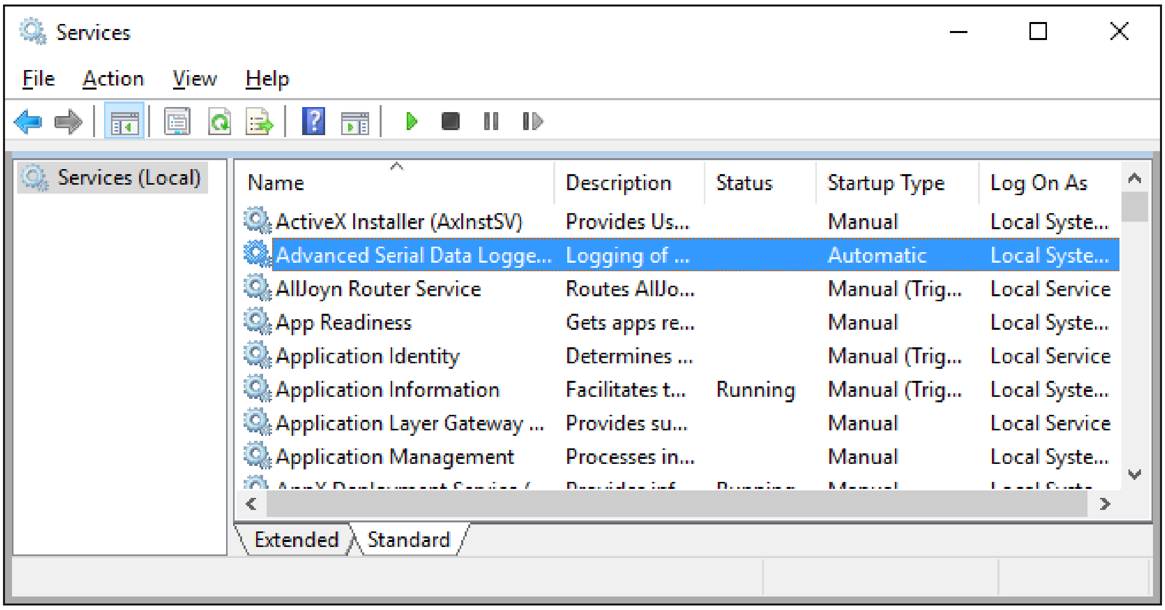
□ Serv-U File Server [Serv-U]
□ Silicon Image HBA Wakeup Utility [SiHbaWakeupService]
□ Sony PC Companion [Sony PC Companion]
☑ SQL Server (SQLEXPRESS) [MSSQL$SQLEXPRESS]
□ SQL Server Browser [SQLBrowser]
□ Steam Client Service [Steam Client Service]
□ Tcp Com Bridge service [TcpComBridge]
□ Te.Service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

Fig. 6.4.3 Service settings #2

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

- Switch a start mode of a target service to "Manual";
- Start Advanced NMEA Data Logger;
- Set on the target service at the "Services depend on ASDL" tab;
- Select mode when you need start these service;
- Restart Advanced NMEA Data Logger.

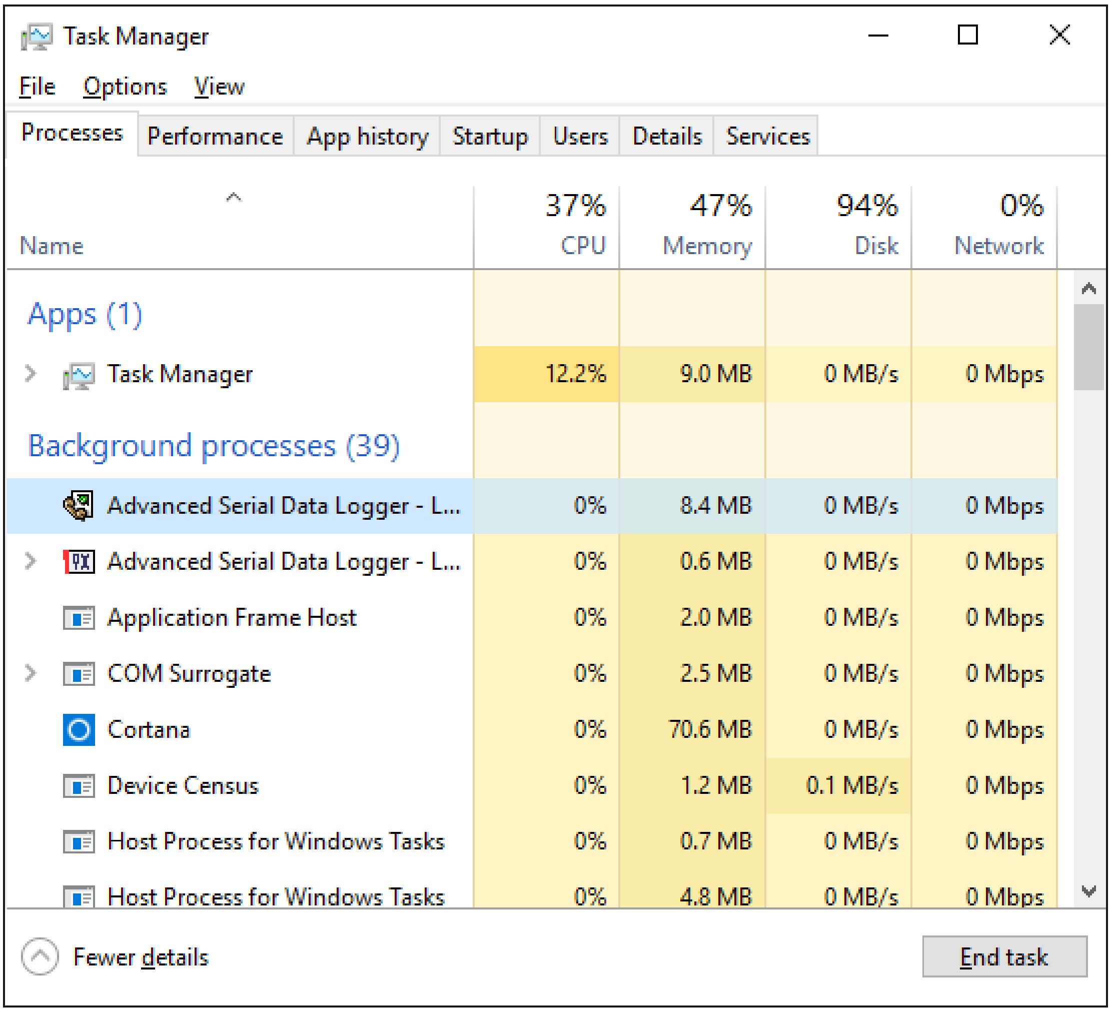
After you installed the service mode of the program, restart a computer or run the service manually from the "Services" window in the Control panel (fig. 6.4.4)



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)

After start of the service, the service processes names will be displayed in a process list: nmealoggersrv.exe and nmealogger.exe (fig. 6.4.5). The 'nmealoggersrv.exe' application makes 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 help of a command line string. Run nmealoggersrv.exe with following parameters:

- /? - short help;
- /I - install service for start in manual mode;
- /A - install service for start in automatic mode;
- /D - install service in off state;
- /R - remove service from computer.

4.7.4.2 Windows Vista+ notes

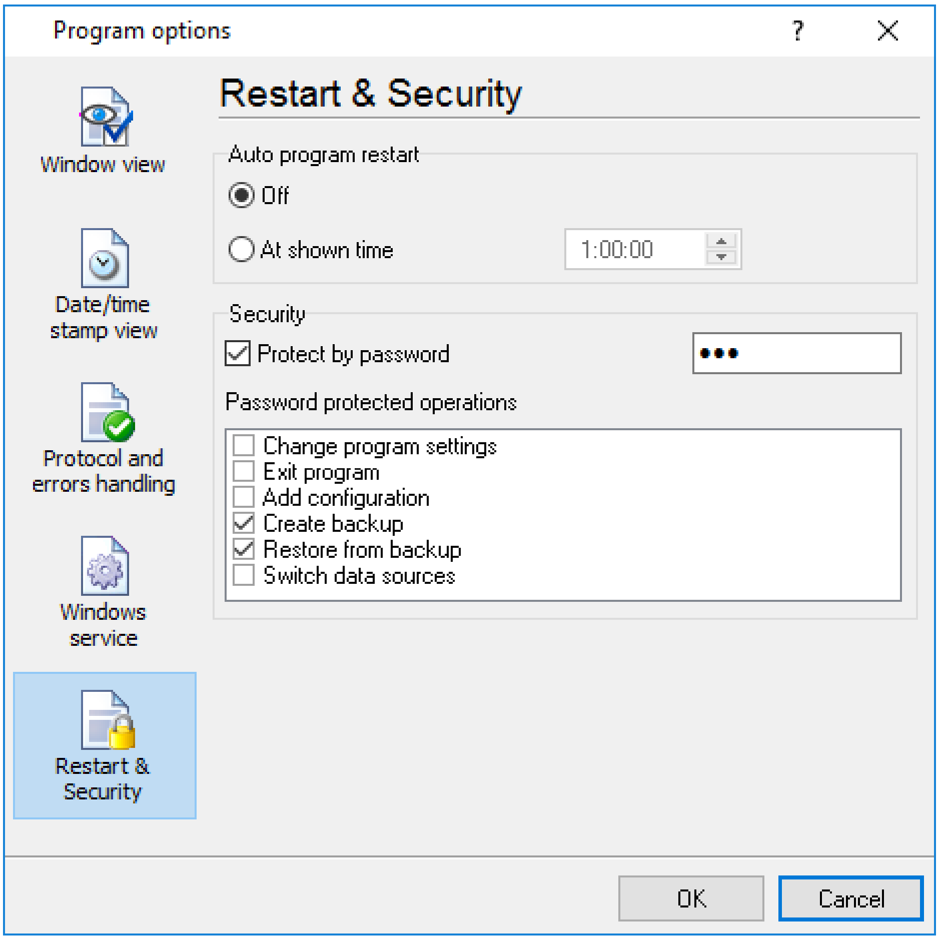
One of the ways Vista's security was improved was by separating system services and user applications into separate 'sessions'. Keeping the system services isolated helps to better secure them, but also makes any interactive interface unavailable to the user. That's where the Interactive Services Detection 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 Startup**:
  * 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 program won't work, if you started SoftIce application debug environment or some other. In any other case, please, inform our developers about your problems, our address support@aggsoft.com.

6.2 FAQ

Question: Why COM port doesn't open?
Answer: Probably, some other program already uses it (COM port). This can be DOS application, for example.

Question: What to do?
Answer: Close application, using this communicative port (for DOS application close also DOS session window). Or use other communicative port. Probably, at start or some program stop was made some fatal error and COM port wasn't properly closed.

Question: Is it possible to set variable data transmit rate or transmit 9 data bits?
Answer: No, Windows operation system doesn't let such liberties.

Question: What cutoff point type to use: DB25 or DB 9?
Answer: It makes no difference, select only in program corresponding COM-port. USUALLY DB25 - COM2, DB9 - COM1

Question: Is cable connection direct or null-modem?
Answer: Everything depends on your device cutoff point. Usually it is necessary to use null-modem cable, in which signals are moved apart in this way:

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

if device uses special signals DTR and others and you don't want to use hardware data transmit control, at device side connect 7 and 8 contacts of DB9 cutoff point or analogous DB25 cutoff point signals.

More hardware tips and articles you can found on our site http://www.aggsoft.com.

Question: Is data receive becomes at once after program start or data receive must be started?
Answer: Everything depends on your device type, usually in device settings is selected to echo view data to COM port. If your device doesn't support this mode, write what initialization string must be sent to read out data, and we add this possibility to the program.