



Advanced PBX Data Logger

Trust in Confidence!

PRINTED MANUAL

PBX Report

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1 License, registration, and technical support

1.1 License

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

1.2 Limitations

The unlicensed program works in the trial mode. The program allows testing all features, but it limits the time or amount of processed data. The license key removes all limitations from the trial version. You may purchase a license key [here](#)²¹.

The trial version of our software has the following limitations:

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

1.3 How to acquire a license

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

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

You may find more information about our policies, payment terms, payment methods, and frequently asked questions on our [website](#).

1.4 Support

Technical questions Common questions Sales questions	https://www.aggsoft.com/support/
--	---

2 Installation

2.1 System requirements

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

2.2 Installation process

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

Quit of the working PBX Report on installation time.

Run an installation file.

By default, the installation wizard installs PBX Report in the "C:\Programs Files\PBX Report" or "C:\Programs Files (x86)\PBX Report" directory of your system disk, but you can change this path.

In the standard distributive of PBX Report are no additional modules files, which you can download from our [site](#).

3 Administration and reports

3.1 First launch

The PBX Report program consists of two parts:

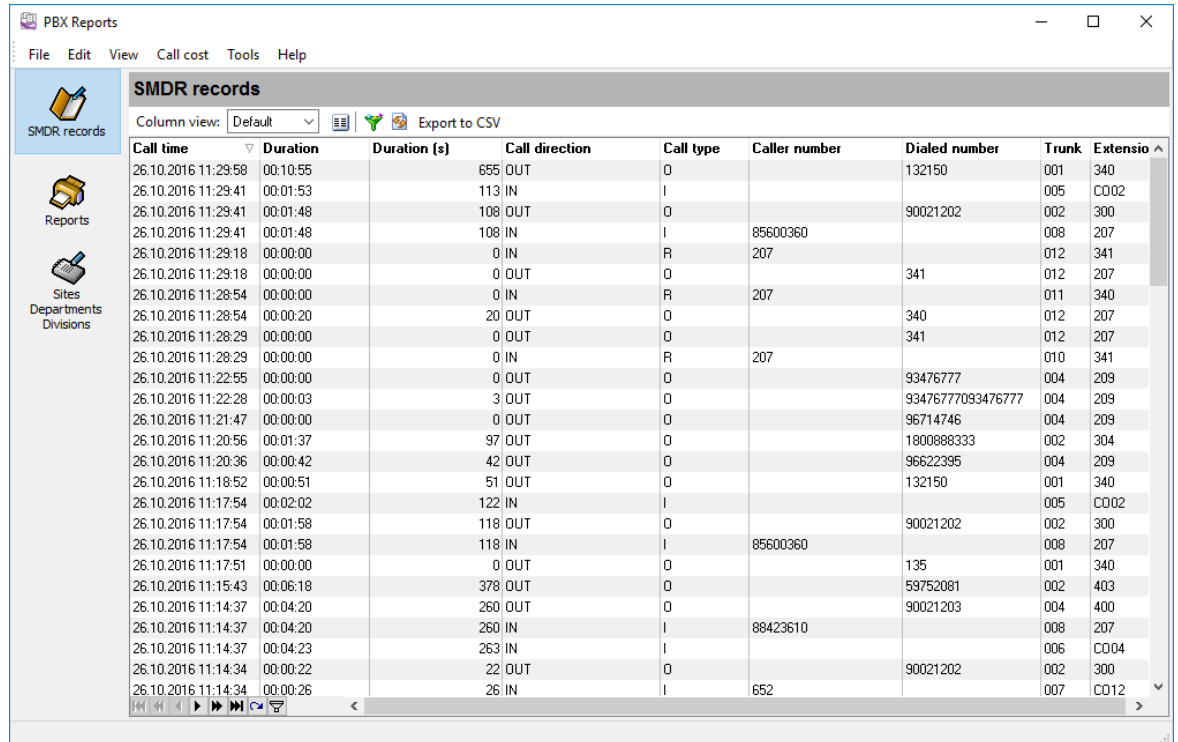
- **Logger** – this part of the program controls all events and adds them to the database. This part of the program runs completely automatically. It can run as a service and be completely invisible for the user;
- **Reporting program** – this part of the program is used to generate reports and perform other service functions.

This part of help describes the administration program.

After you successfully install PBX Report, you should configure the program.

Start the administration program (hereinafter the program) from the "Start" menu.

After you start the program, you will see its main window (fig.1) whose main elements are the main menu, the toolbar, the data output area, the status bar and the navigation bar. You will see data about events from the database in the data output area. The status bar shows a hint for many interface elements, information about operations in progress, etc. You can access the preferences of the program from the main menu of the program ("Edit/Preferences...").



Call time	Duration	Duration (s)	Call direction	Call type	Caller number	Dialed number	Trunk	Extension
26.10.2016 11:29:58	00:10:55	655	OUT	0		132150	001	340
26.10.2016 11:29:41	00:01:53	113	IN	I			005	CO02
26.10.2016 11:29:41	00:01:48	108	OUT	0		90021202	002	300
26.10.2016 11:29:41	00:01:48	108	IN	I	85600360		008	207
26.10.2016 11:29:18	00:00:00	0	IN	R	207		012	341
26.10.2016 11:29:18	00:00:00	0	OUT	0		341	012	207
26.10.2016 11:28:54	00:00:00	0	IN	R	207		011	340
26.10.2016 11:28:54	00:00:20	20	OUT	0		340	012	207
26.10.2016 11:28:29	00:00:00	0	OUT	0		341	012	207
26.10.2016 11:28:29	00:00:00	0	IN	R	207		010	341
26.10.2016 11:22:55	00:00:00	0	OUT	0		93476777	004	209
26.10.2016 11:22:28	00:00:03	3	OUT	0		93476777093476777	004	209
26.10.2016 11:21:47	00:00:00	0	OUT	0		96714746	004	209
26.10.2016 11:20:56	00:01:37	97	OUT	0		1800888333	002	304
26.10.2016 11:20:36	00:00:42	42	OUT	0		96622395	004	209
26.10.2016 11:18:52	00:00:51	51	OUT	0		132150	001	340
26.10.2016 11:17:54	00:02:02	122	IN	I			005	CO02
26.10.2016 11:17:54	00:01:58	118	OUT	0		90021202	002	300
26.10.2016 11:17:54	00:01:58	118	IN	I	85600360		008	207
26.10.2016 11:17:51	00:00:00	0	OUT	0		135	001	340
26.10.2016 11:15:43	00:06:18	378	OUT	0		59752081	002	403
26.10.2016 11:14:37	00:04:20	260	OUT	0		90021203	004	400
26.10.2016 11:14:37	00:04:20	260	IN	I	88423610		008	207
26.10.2016 11:14:37	00:04:23	263	IN	I			006	CO04
26.10.2016 11:14:34	00:00:22	22	OUT	0		90021202	002	300
26.10.2016 11:14:34	00:00:26	26	IN	I	652		007	CO12

Fig.1 Main window

By default, the program is configured to be used on one computer with the logger. Microsoft Access is used as a database. If you plan to use the administration program on another computer, you should install and configure an MSSQL or MySQL database.

It is as easy to get to know the program as 1-2-3-4-5

Step 1. Configure the logger that will collect and log SMDR data to the database.

Step 2. Make the [list of PBX sites, departments and divisions](#)^[9] you will control.

Step 3. Make the [list of stations \(extensions\)](#)^[10] your organization has.

Step 4. Create the list of your favorite reports on the "[Reports](#)"^[12] tab.

Step 5. Customize the program options. Particularly, enable the [built-in HTTP server](#)^[18] to be able to remotely view the reports or make the list of scheduled reports.

Now you can view, print and save reports about printers that are monitored by the logger to files on the "[Reports](#)" tab.

3.2 General information

All source data are presented as a table in the program. You can find out how to work with these tables below.

Call time	Duration	Duration (s)	Call direction	Call type	Caller number	Dialed number	Trunk	Extensio
26.10.2016 11:29:58	00:10:55	655	OUT	O		132150	001	340
26.10.2016 11:29:41	00:01:53	113	IN	I			005	CO02
26.10.2016 11:29:41	00:01:48	108	OUT	O		90021202	002	300
26.10.2016 11:29:41	00:01:48	108	IN	I	85600360		008	207
26.10.2016 11:29:18	00:00:00	0	IN	R	207		012	341
26.10.2016 11:29:18	00:00:00	0	OUT	O		341	012	207
26.10.2016 11:28:54	00:00:00	0	IN	R	207		011	340
26.10.2016 11:28:54	00:00:20	20	OUT	O		340	012	207
26.10.2016 11:28:29	00:00:00	0	OUT	O		341	012	207
26.10.2016 11:28:29	00:00:00	0	IN	R	207		010	341
26.10.2016 11:22:55	00:00:00	0	OUT	O		93476777	004	209
26.10.2016 11:22:28	00:00:03	3	OUT	O		93476777093476777	004	209
26.10.2016 11:21:47	00:00:00	0	OUT	O		96714746	004	209
26.10.2016 11:20:56	00:01:37	97	OUT	O		1800888333	002	304
26.10.2016 11:20:36	00:00:42	42	OUT	O		96622395	004	209
26.10.2016 11:18:52	00:00:51	51	OUT	O		132150	001	340
26.10.2016 11:17:54	00:02:02	122	IN	I			005	CO02
26.10.2016 11:17:54	00:01:58	118	OUT	O		90021202	002	300
26.10.2016 11:17:54	00:01:58	118	IN	I	85600360		008	207
26.10.2016 11:17:51	00:00:00	0	OUT	O		135	001	340
26.10.2016 11:15:43	00:06:18	378	OUT	O		59752081	002	403
26.10.2016 11:14:37	00:04:20	260	OUT	O		90021203	004	400
26.10.2016 11:14:37	00:04:20	260	IN	I	88423610		008	207
26.10.2016 11:14:37	00:04:23	263	IN	I			006	CO04
26.10.2016 11:14:34	00:00:22	22	OUT	O		90021202	002	300
26.10.2016 11:14:34	00:00:26	26	IN	I	652		007	CO12

Fig.2 Table with data

Each table has navigation buttons at the bottom (fig.2).

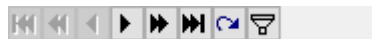


Fig.2 Navigation bar

Navigation buttons

Buttons (left to right):

1. **First** – move to the first record in the table;
2. **Page Up** – move to the record one page up;
3. **Previous** – move to the previous record;
4. **Next** – move to the next record;
5. **Page Down** – move to the record one page down;
6. **Last** – move to the last record in the table;
7. **Insert** – insert a new record into the table next to the current one;
8. **Add** – add a new record to the end of the table. After you save the record, it will be sorted according to the sorting rules;
9. **Delete** - delete the selected records. You can also delete records by pressing the "Delete" key on the keyboard;

10. **Edit** – edit the current record. You can edit a record by clicking the current cell in the table;
11. **Save** – save the changes in the current row;
12. **Cancel** – cancel changes in the current row in the table;
13. **Refresh** – refresh the current row;
14. **Filter** – open the dialog box where you can configure filtering the data (fig.3)

Some navigation buttons can be unavailable. It depends on the data shown in the table.

New filter

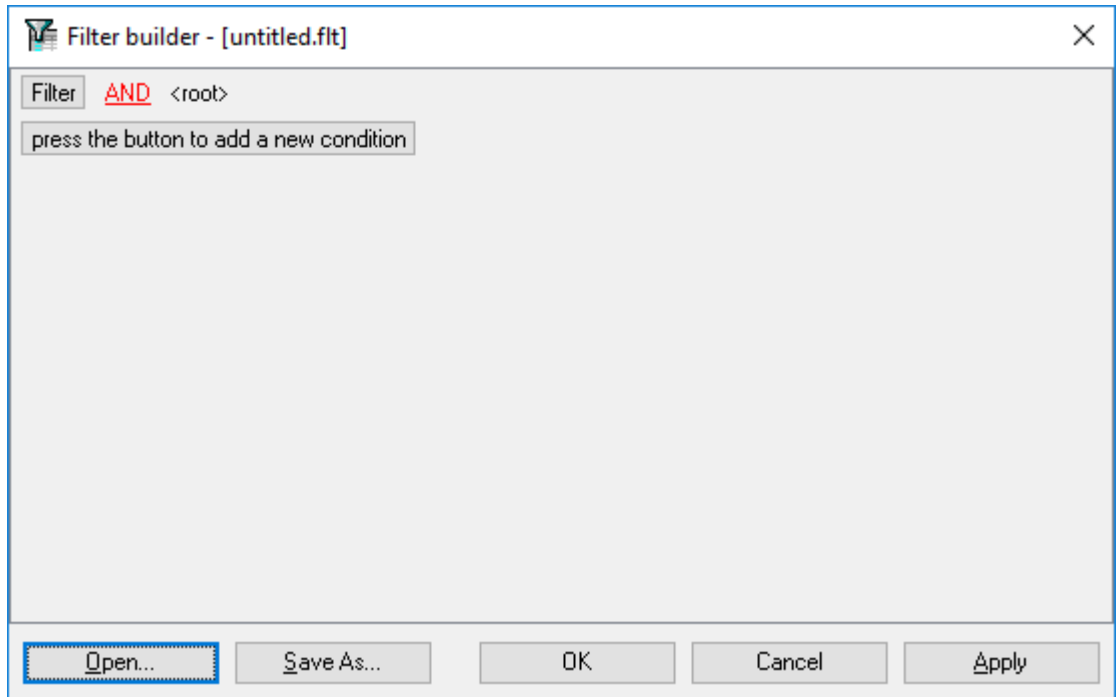


Fig.3 Filter

This dialog box allows you to configure the filter you can use to filter data in the table by the condition you specify. You can select the condition each column will be checked by. You can specify complex rules by adding several conditions.

You can save the filter to a file and load it later using the corresponding button.

Click "OK" after you finish editing the filter.

Quick filter

You can access the quick filter if you move the mouse pointer to the right edge of the column header (fig.4). If you click the button, you can open a drop-down list where you can select the value for the filter. This filter is limited in the "Events" table not to slow down the program.

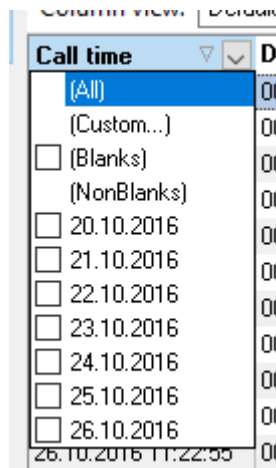


Fig.4 Quick filter

Column customization

The program allows you to flexible customize columns. You can:

Change the order of columns – just click the column header and move the column to the necessary position holding down the mouse button.

Quickly sort data in the table – click the column header. If you need to sort data by two or more columns, hold down the "Shift" key when you click the column header.

Hide columns in the table – open the "Columns editor" dialog box (fig.6) using either the toolbar (fig.5) or the popup menu.



Fig.5 Toolbar

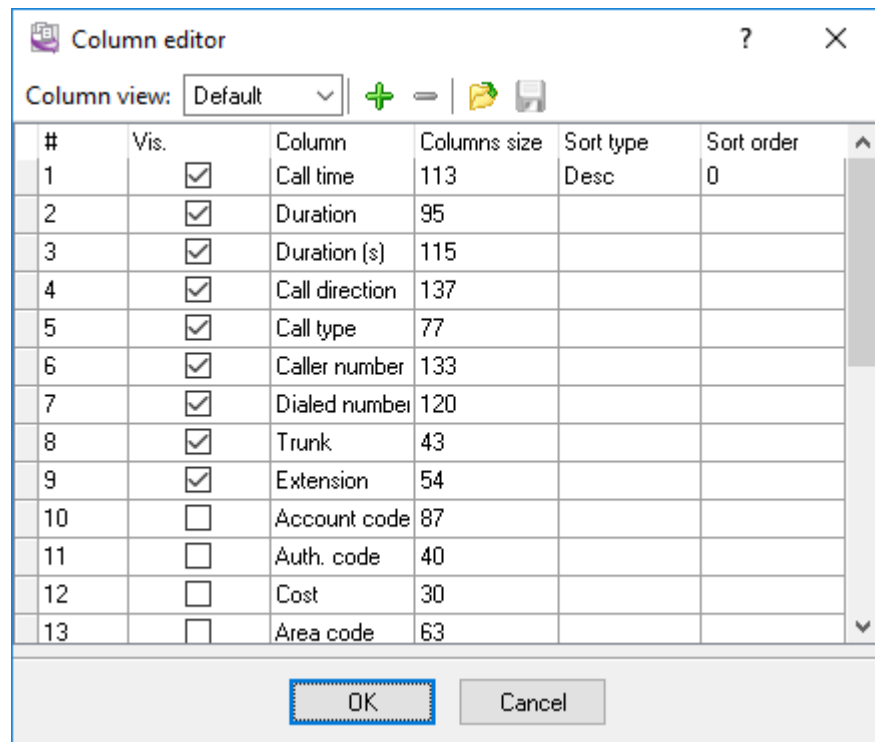


Fig.6 "Column editor" dialog box

You can customize the order and the set of columns in the table in this dialog box. The program allows you to create several **Column views**, which will allow you to filter data by the necessary condition and quickly switch between column views.

Select the checkbox of the column name for the column to be shown in the table. You can change the position of a column by dragging it to the necessary position (hold down the mouse button on the column number). After you change the settings, you should save them with a click on the toolbar.

You can create new data types and delete existing ones with clicks on the "+" and "-" buttons.

When you exit the program, the current view will be saved and restored when you start the program next time.

After you exit this dialog box, all new column views will be displayed in the drop-down list on the toolbar (fig.5).

You can use the following items on the popup menu of the table to customize the column size.

Adjust columns – the program will calculate the column width depending to the value in it. The column width will correspond to the width of the cell with the longest value.

Proportional column width – the column width will be automatically calculated depending on the table width.

3.3 Creating the PBX list

The PBX list is necessary for the program to assign logged SMDR records to a PBX, site, department and division.

To create the list of PBX, select the "Site Department Division" page on the navigation bar (fig.7) and then click necessary button on the toolbar.

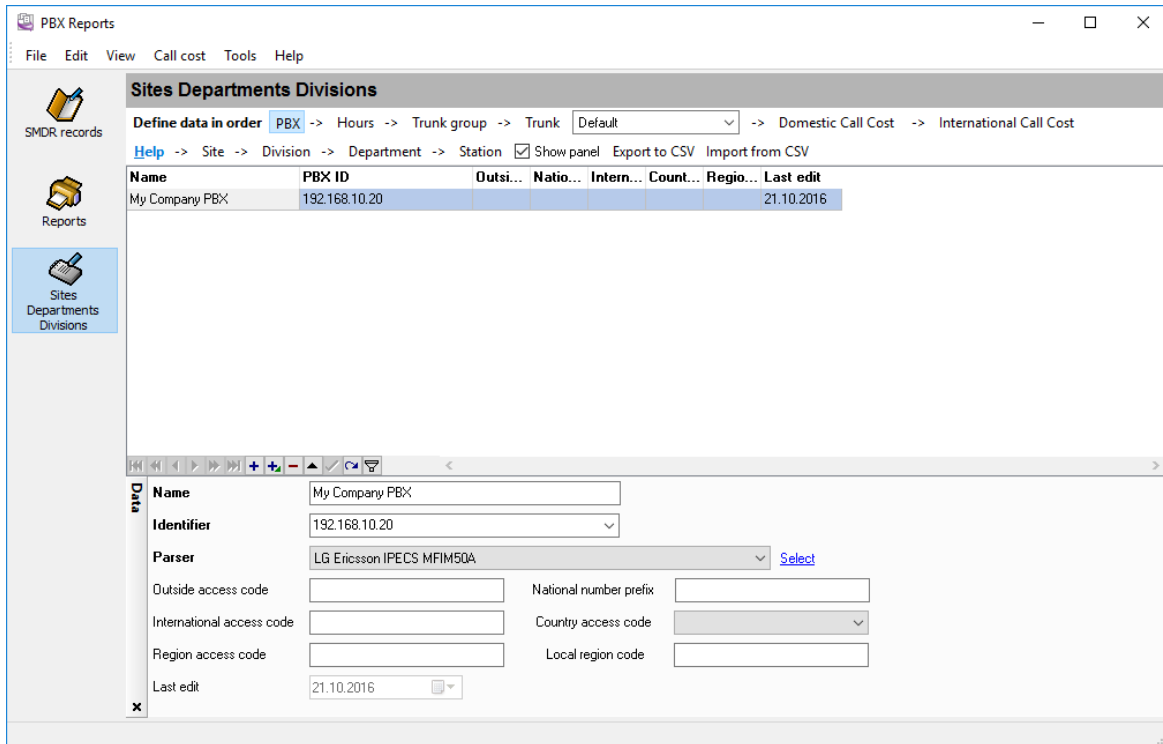


Fig.7 PBX list

You should create lists for all your PBX, sites, departments, divisions. All required fields are marked by bold labels. If your organization does not have departments and divisions then you can add only one row in these table with you company name.

PBX identifier

If you plan to use this reporting tool with several PBX then you should

1. Configure the PBX logger to write a data source ID to the "PBX_IDENTIFIER" field to the database. It can be a PBX IP address, a COM port number or user-defined data source name. It will allow to distinguish data from different PBX.
2. Specify this unique ID and the "Identifier" in the PBX list above.

Parser

The PBX logger can extract custom data for several PBX. If you'll select a parser, then it will allow to use these custom columns in reports.

Sites, Departments, Divisions

These tables are used to maintain the site, department and division information for your company. By splitting your extensions into sites, departments, divisions you are able to print specialized reports so that you can analyze site, department and division usage.

Site, department and division options are available in the station file as well as most of the reports on the "Reports" page. Using these filter options, you can easily run reports for a single site, department or division.

Specifying stations (extensions)

This table allow to link an extension from logger SMDR records to your site, department and division.

Name - name of your extension. It can be an employee name, room number or something else.

PBX ID - PBX identifier from the PBX list.

Extension - an extension number. It should be specified exactly as it appears in the SMDR log.

Active - this extensions is currently active.

Site, Department, Division - allows to link an extension to your organization.

Sites Departments Divisions

Define data in order PBX -> Hours -> Trunk group -> Trunk Default -> Domestic Call Cost
-> International Call Cost

[Help](#) -> [Site](#) -> [Division](#) -> [Department](#) -> [Station](#) Show panel [Export to CSV](#) [Import from CSV](#)

Name	PBX ID	Extension	Record ID	Port	Active	Installed
Ext #300	192.168.10.20	300			<input checked="" type="checkbox"/>	01.01.1900
Ext #303	192.168.10.20	303			<input checked="" type="checkbox"/>	01.01.1900
Ext #304	192.168.10.20	304			<input checked="" type="checkbox"/>	01.01.1900
Ext #305	192.168.10.20	305			<input checked="" type="checkbox"/>	01.01.1900
Ext #310	192.168.10.20	310			<input checked="" type="checkbox"/>	01.01.1900
Ext #340	192.168.10.20	340			<input checked="" type="checkbox"/>	01.01.1900
Ext #341	192.168.10.20	341			<input checked="" type="checkbox"/>	01.01.1900
Ext #620	192.168.10.20	620			<input checked="" type="checkbox"/>	01.01.1900
Ext (CO01)	192.168.10.20	CO01			<input checked="" type="checkbox"/>	01.01.1900
Ext (CO02)	192.168.10.20	CO02			<input checked="" type="checkbox"/>	01.01.1900

Data Main Directory

Name	<input type="text" value="Ext #300"/>	Site	<input type="text" value="My Company"/>
PBX ID	<input type="text" value="192.168.10.20"/>	Division	<input type="text"/>
Extension	<input type="text" value="300"/>	Department	<input type="text" value="Admin LW"/>
Record ID	<input type="text"/>	Installed	<input type="text" value="01.01.1900"/>
Port	<input type="text"/>	Removed	<input type="text" value="Undefined"/>
<input checked="" type="checkbox"/> Active		Last edit	<input type="text" value="21.10.2016"/>

Fig.8 Station list

All other settings are optional and can be used for your information.

3.4 SMDR log

The SMDR log table contains all data the logger has saved to the database. Reports are based on this data. You can view and delete data, but you can neither edit nor add it.

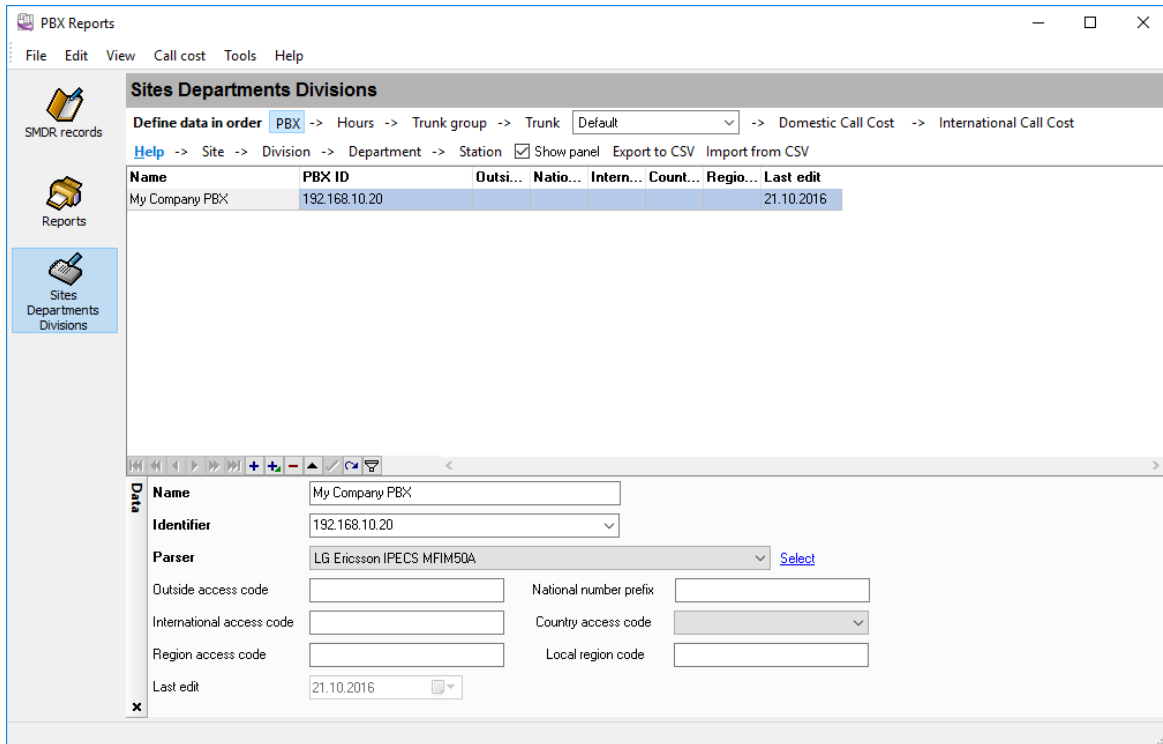


Fig.9 SMDR log

The table contains more than 20 columns with parameters characterizing this or that event. You will find it comfortable if you create several [column sets](#) [7].

The column caption is descriptive and allows to understand its purpose. The program shows columns that are defined in a parser. If you want you can move, resize, show and hide columns.

Deleting old events

The program can delete old events both automatically and on the user's request.

You can specify the deletion options in the program preferences (fig.10). Select the "Edit - Preferences..." in the main menu and switch to the **"Database"** page to open this dialog box.

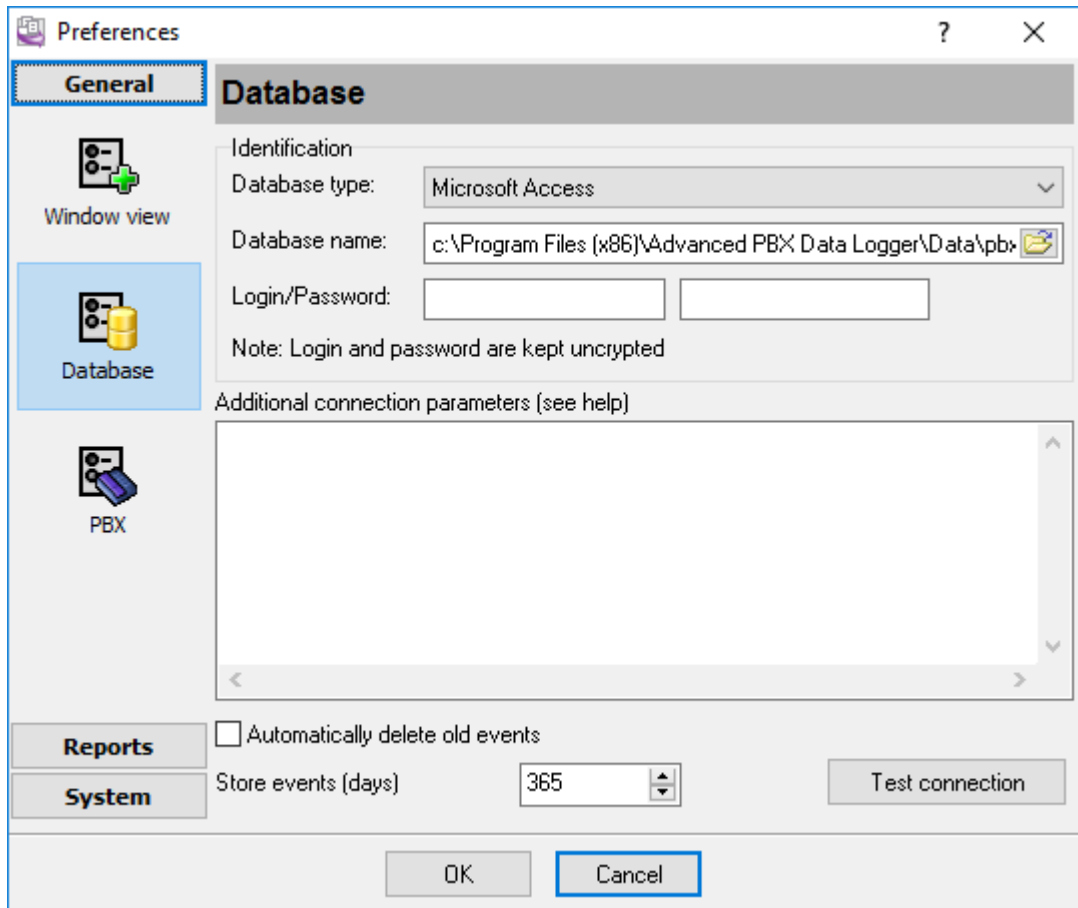


Fig.10 Database settings

You should specify the number of days to keep the event log for in the "**Store events**" field.

To delete data on the user's request, select the "**Tools - Delete old events**" menu item in the main window of the program.

For the program to delete old events automatically, enable the "**Automatically delete old events**" option. Old events will be deleted at the program startup in this case.

3.5 Reports

The program contains as a set of predefined reports as allows you to create them on your request. You can configure the report parameters and add it to your favorites, thus creating your list of reports with individual parameters.

The screenshot shows the PBX Reports application window. The title bar reads "PBX Reports". The menu bar includes "File", "Edit", "View", "Call cost", "Tools", and "Help". The main interface has a sidebar with icons for "SMDR records", "Reports", "Sites", "Departments", and "Divisions". The "Reports" section is active, showing a "Traffic reports: Day of month" report for the date range "From 31.12.1899 To 02.12.2016". The report is displayed in a table format with the following data:

Day of month	Site	Division	Department	# of calls	Duration
20	My Company		Admin LW	276	21367
21	My Company		Admin LW	489	41754
22	My Company		Admin LW	239	16220
23				2	262
23	My Company		Admin LW	165	13946
24				6	675
24	My Company		Admin LW	649	56372
25				283	24312
25	My Company		Admin LW	578	47006
26				98	7561
26	My Company		Admin LW	202	18664
Total:				11	248139

Fig.11 Report page

Date range – allows you to select a preset data range for the report. If you need to build a report for a certain interval, you should specify it in the "From" and "To" fields.

Report type - the standard report type. The content of the report depends on the report type. For the "Call history" report columns are copied from the "SMDR data" page. So, if you need customize this report type then you should change the column set on the "SMDR data" page.

Group by - here you can select one or several fields for grouping the data.

Show as - allows you to select the report view.


- Table – table view;
- Graph – graph view;
- Histogram – histogram view;
- Pie – pie chart view;
- Linear – linear graph view;
- Dot – dot graph view;
- Region – a graph by regions.


Sort by – allows you to sort data by the necessary column. Columns the data is grouped by come first in the list.

Options

- 3D view – 3D graphs;
- Colored – color graphs;
- Show legend – show the legend on graphs;

- Show axis – show the axes on graphs;
- Single – show one graph for all values;
- Top 10 only – show only the first 10 values;
- Ascendant sorting – sort in the descending or ascending order;
- Marks – enable marks for each value on the graph that can contain a value or mark.


A change in most report parameters will trigger a 10-second timer and the report will be automatically updated after that. You can also update the report with a click on the  toolbar button.

You can print the generated report with a click on the  toolbar button or export to a file using the "Export" menu.

You can get any report by combining the above parameters.

Report preferences

If the generated report does not fit on one page, you can:

1. Change the size and format of the page with a click on the  toolbar button;
2. Change the font that is used in the report and its size. To do it, select "Options - Additional..." and specify the necessary parameters in the new dialog box (fig. 12).

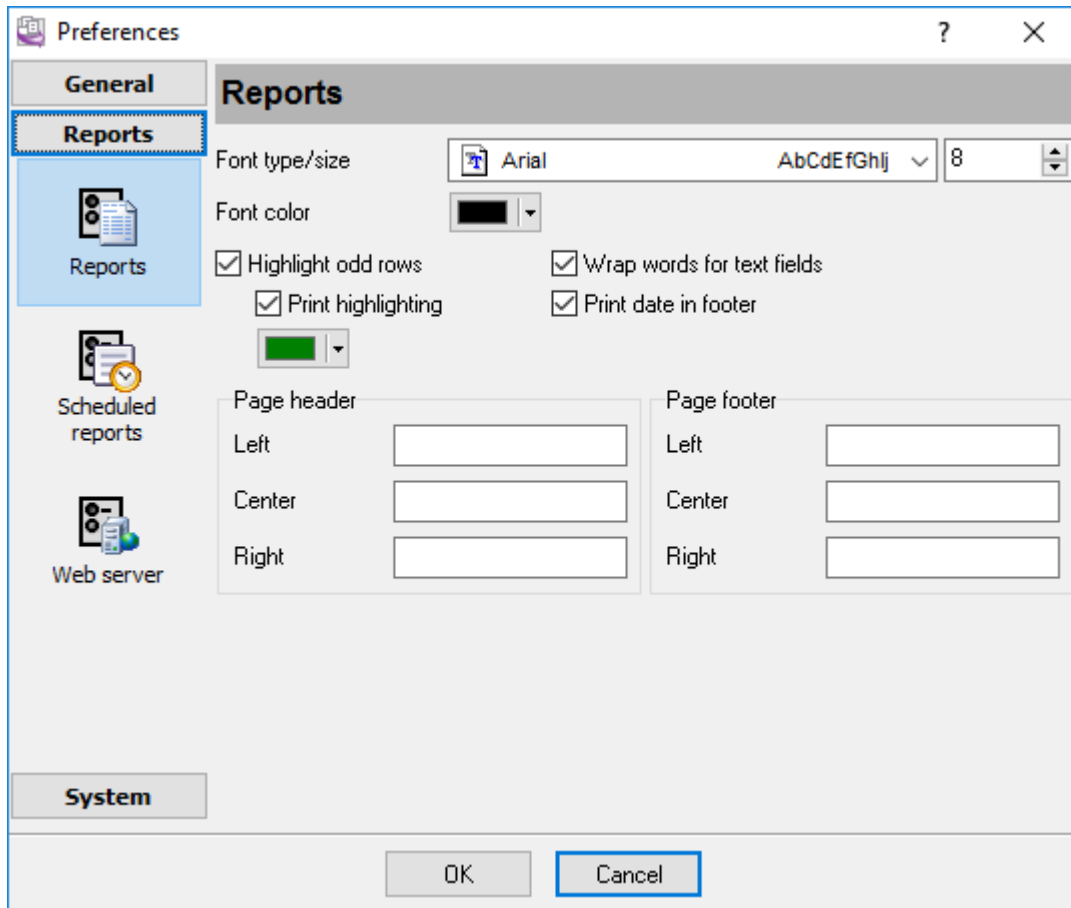



Fig.12 Report page


- **Font type** – font type to be used in the report;
- **Font size** – font size;
- **Font color** – font color;
- **Highlight odd rows** – enable/disable highlighting odd rows in the report. If it is enabled, odd rows will be shown with the background color specified below;
- **Print highlighting** – if this option is enabled, the printed report will be highlighted, otherwise only the preview will be highlighted;
- **Wrap words for text fields** – if the value of a column in the report larger than its width and this option is enabled, the height of the row will increase and part of its value will be moved to the next line. Otherwise the value will be trimmed according to the column width.
- **Print date in footer** – if this option is enabled, the program will print the page number and the current data in the footer of each page.
- **Page header, Page footer** - these groups of controls allows to specify an additional text that will be added to a header and footer on every page.

Creating the list of favorite reports

To add a report to your favorites:

1. Configure the report as described above;
2. Generate the report;
3. If you are satisfied with the generated report, click the  button next to the list of favorite reports;

4. The program will offer you to specify the report name. You can specify any name.
5. Click OK after you type the report name and the report will be added to the list of favorite reports.

To remove a report from the list, you should click the button: 

3.6 Scheduled reports

This feature allows you to receive reports the program will automatically generate according to the schedule by e-mail at the specified time. To activate and configure this feature, select "Edit - Preferences..." and switch to the "Scheduled reports" page (fig. 13).

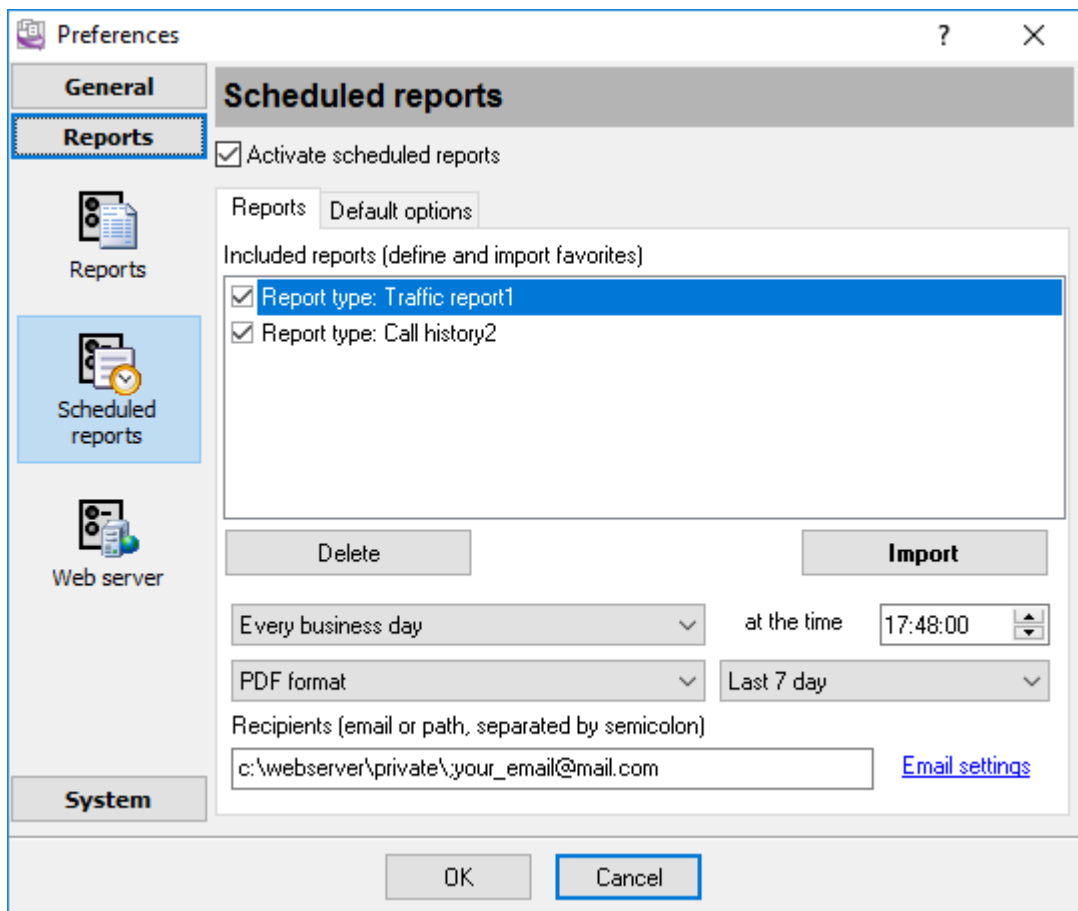


Fig.13 Scheduled reports configuration

Activate scheduled reports – enable/disable scheduled reports.

The "**Send reports**" group allows you to specify when the reports will be generated, at what time and in what format they will be sent, data for which interval they will include.

Recipients – the field contains the list of addresses the email message with attached report files will be sent to. You can specify several addresses separating them with a semicolon. Also you can specify a path, then the report will be placed to the specified folder.

The "**Included reports**" list contains the list of reports that should be generated and sent. This list is based on the list of your favorite reports. So you need to [create the list of your favorite reports](#)^[15] first and then import it to the list of scheduled reports by clicking the "**Import**" button. Here you can leave only the ones you need in the list of scheduled reports. You can use the popup menu to delete a report from the list.

E-mail settings

For the report to be sent, you should specify the e-mail settings. To do it, open the "Email settings" page (fig. 14).

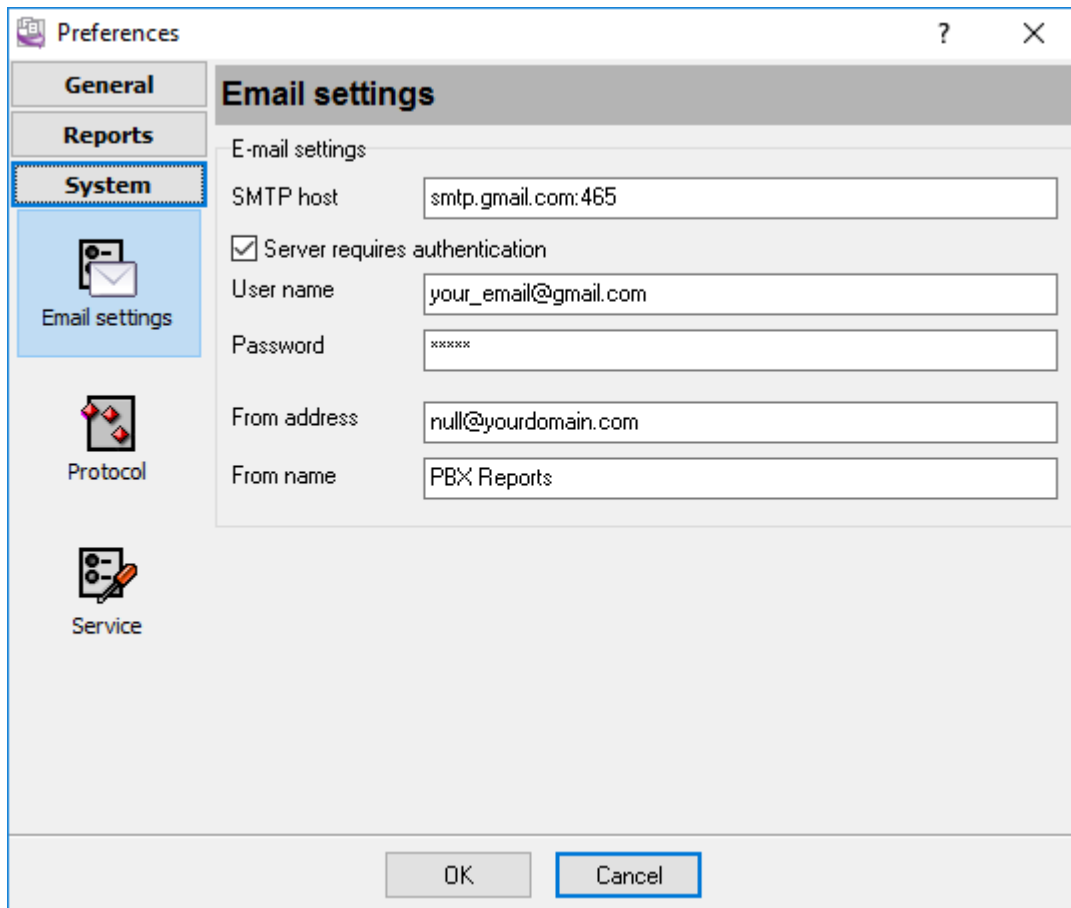


Fig.14 E-mail settings

Messages are sent via the SMTP protocol that is standard for sending e-mail. That is why you should open access for sending e-mail for the program in your firewall. The program sends all messages using the sender data that you can specify in the "**From address**" and "**From name**" fields.

Specify the mail server address in the "**SMTP host**" field. If the server uses a nonstandard port, specify it after a colon: www.aggsoft.com:2525

- **User name** – SMTP server username. Usually, it is the e-mail address of the following type: yourname@yourserver.com;

- **Password** – SMTP server password that usually coincides with the mailbox password.

If you'll specify a special port 465, then the program will establish a secure TLS connection with the SMTP server.

3.7 HTTP server

Our program has a built-in HTTP (web) server. The HTTP server allows you to view reports remotely using a regular browser. The program allows you to provide employees with access to personal reports.

To activate and configure this feature, select "Edit - Preferences..." and switch to the "**Web server**" page (fig. 15).

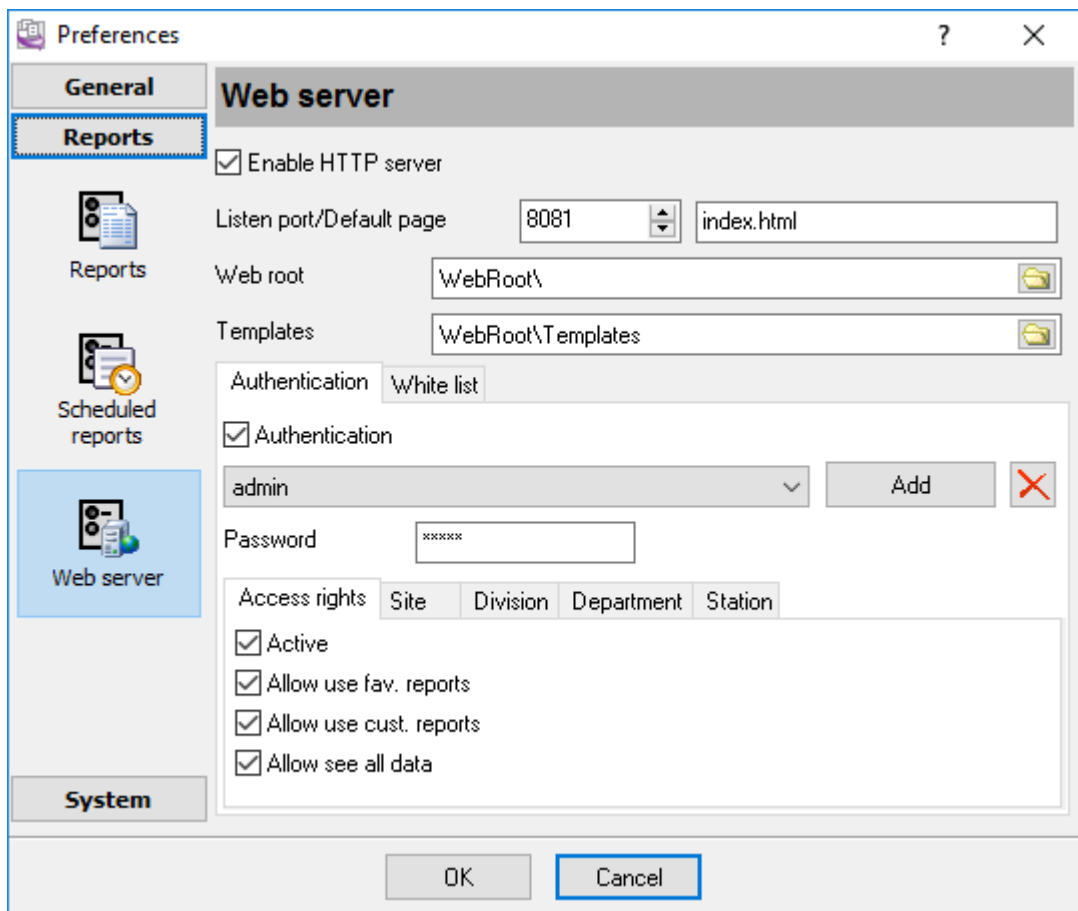


Fig.15 HTTP server settings

Listen port – the HTTP server will use this port to send data to the clients. The default value of this parameter is 80. If another server already uses this port, you can specify any suitable value.

To access the server from the same computer where the program is running, you should type the following in the browser address line: `http://127.0.0.1`. If you specify a nonstandard port, specify it after a colon. For example, in case of the above image:

http:\\127.0.0.1:8081

To access the web server:

1. Open the port specified in the settings in your firewall;
2. Instead of 127.0.0.1, specify the IP address of the computer in the network or its name if you access the server from the local area network.

Default page – this page will be opened by default when you access the address http:\\127.0.0.1:8081.

Web root – this folder will contain pages with reports the remote user will view. It must be possible to write to this folder.

You can use this folder to store your page that the web server can send to the remote client.

Templates – this folder contains page templates that the program will use to display pages in the browser. For an additional fee, the AGG Software company can develop a template in your corporate style or you can do it yourself using existing templates. You should keep the file names of templates completely changing their contents.

Authentication – enable/disable password-protected access. If this option is disabled, everyone can get access. Otherwise access parameters are specified in the table below.

You can specify several users with different rights in this table (fig.15).

There are two users shown in fig.15.

1. admin – the administrator with all rights and password-protected access to all reports and data.
2. The "*" character is specified as the second user, which means a user with any name. The user will have to enter the password once he accesses the web server. In this case, the password is empty so the user has to specify only his name. As a result, this user will be able to view only reports with event related to him.

If you are going to provide access to the web server via the Internet, it is recommended to specify the list of addresses access to the web server is permitted from in the "**Allowed IP addresses**" field. If this field is empty, access from any remote computer will be allowed.

3.8 Window view

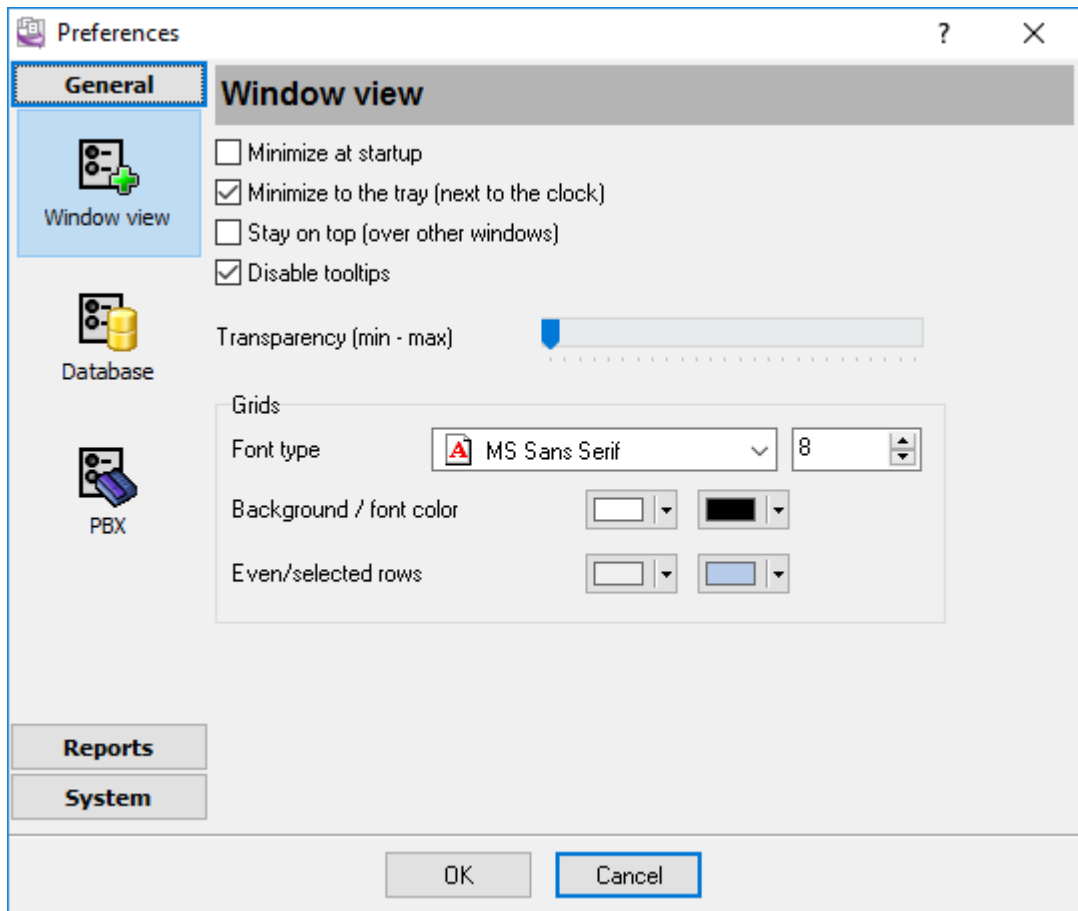


Fig.16 Window view settings

You can specify the following settings on the "Window view" tab (fig.16):

- **Minimize at startup** – once launched, the main window of PBX Report is automatically minimized into the taskbar or into the icon that is located next to the clock depending on other options;
- **Minimize to the tray (next to the clock)** – the main window of PBX Report will be automatically minimized and the icon will be automatically located next to the clock on the taskbar;
- **Stay on top** – the program will always stay on top of other windows on the desktop;
- **Grids** – this group of options allows you to customize the view of tables with data (type, background, font color);
- **Transparency** – you can customize the transparency of the main window in Windows 2000+. The leftmost position is the normal window view, the rightmost position is the maximal transparency.

3.9 Log and errors

While the program is running, errors and events that should be logged may occur. These may include database errors, web server messages and other events. You can select the types of message to include in the log on the "**Protocol**" tab (fig. 17). The log file is located in the Application Data folder, its name is the same as the program name + the .log extension.

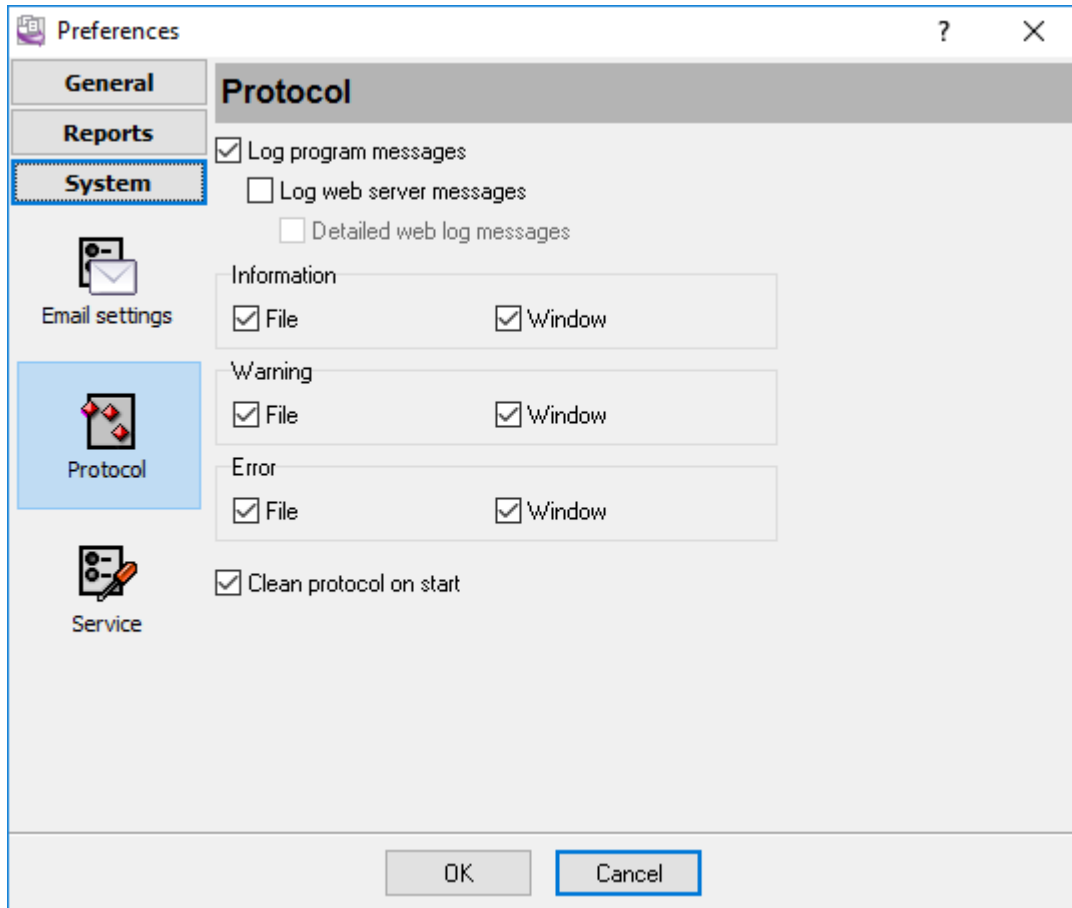


Fig.17 Protocol settings

PBX Report works with three types of messages:

- **Information** – messages of this type inform you about the operations executed at the moment;
- **Warning** – messages of this type warn you about possible failures or errors. No operations are required, but it is necessary to run a check;
- **Error** – the program has detected an error that the user will have to fix.

To prevent the log file from growing to large, you can enable the "**Clean protocol on start**" option.

You can open the current log file using the "**File - Open current log file**" menu item in the main window.

3.10 Database settings

The program can work with practically any database that has an ODBC driver. By default, the program is configured for the Microsoft Access database that comes with the program. You can change the connection type during the installation of the program or using the dialog box in the preferences of the program (fig.18). Select "Edit - Preferences..." and switch to the "**Database**" tab to configure the connection.

Note: These settings change the connection type only for the administration part. Data export to the logger is configured separately.

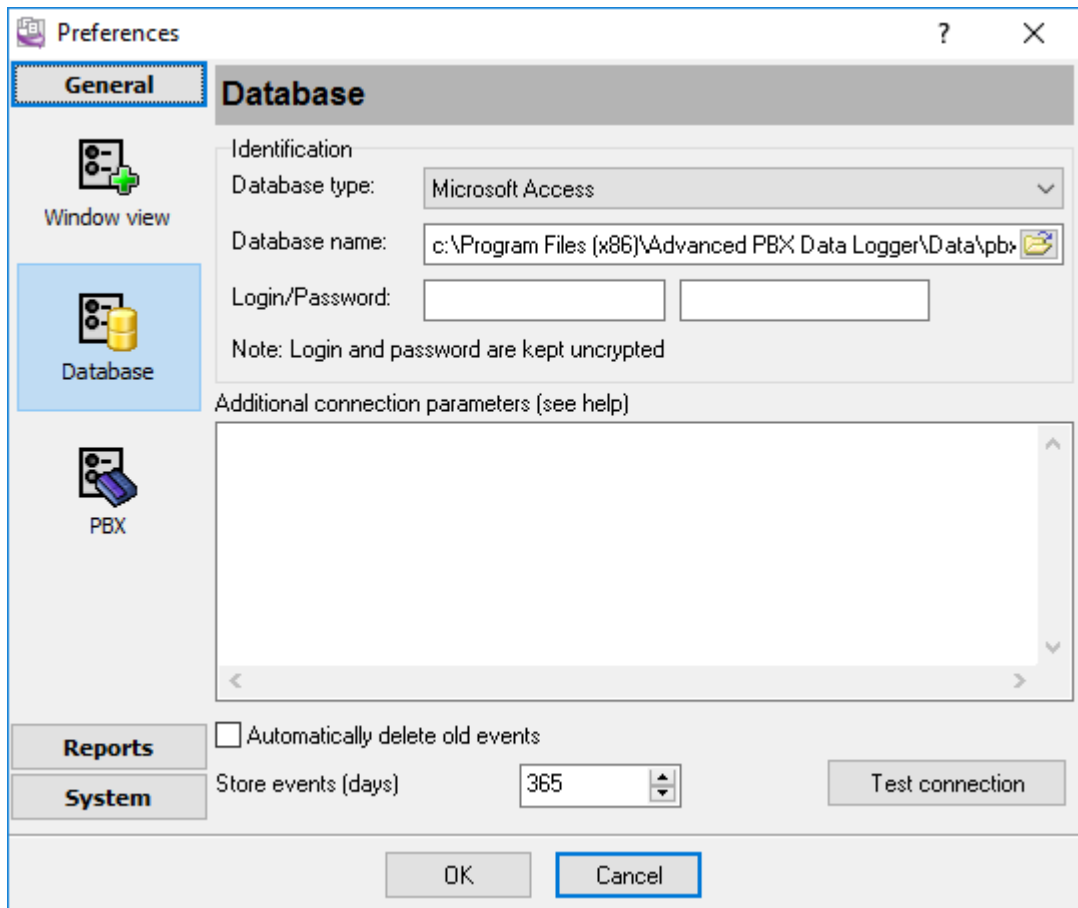


Fig.18 Database connection settings

Connection parameters are specified in the "**Identification**" group.

Depending on the database type selected in the "**Database type**" list, the following is specified in the "**Database name**" field:

- Microsoft Access – the path to the database and its file name.
- DB2, Informix ODBC – DSN configured in the "ODBC administrator".
- Interbase – the path to the necessary database and the network protocol (see the table below).

Value	Protocol
<server_name>:<filename>	TCP
\\<server_name>\<filename>	NetBEUI
<server_name>@<filename>	SPX

- Oracle – host name/service name (for example, 127.0.0.1/xe)
- MySQL, or Sybase SQL Server – if you configure a connection to the remote server, specify the server name and the database name separated with a colon. For example, remsrv:dbname points to the DBNAME database located on the REMSRV server. You should specify local for a local database.
- MS SQL Server - host\service:database (for example, 127.0.0.1\SQLEXPRESS:demo)

Then specify the username and password for access to the database in the "**Login**" and "**Password**" fields respectively.

Specify the connection parameters specific for each server in the "**Additional connection parameters**" input field.

After you configure the database connection, you can test it immediately by clicking the "**Test connection**" button. The program will try to connect to the database. It may take quite a while (up to three minutes) depending on the database type. The test result will be shown as a message. In case of an error, the message will contain the server response that will help you determine what caused it.

Additional connection parameters

Value	Description	Note
AUTOCOMMIT	Use autocommit	
APPLICATION NAME	The name of the application that will be sent to the server	Only for MSSQL and Sybase
HOST NAME	The name of the workstation that will be sent to the server	Only for MSSQL and Sybase
COMMAND TIMEOUT	The number of seconds to wait until any operation is finished	Only for MSSQL, ODBC, SQLBase, Sybase
COMPRESSED PROTOCOL	Use compression while exchanging data between the client and the server. By default, the value is TRUE	Only for MySQL
ENABLE BCD	Change the NUMERIC data type into the BCD data type before sending data to the server	Only for Oracle, Interbase
ENABLE INTEGERS	Change the NUMERIC data type into the INTEGER data type before sending data to the server	Only for Oracle, Interbase
ENABLE MONEY	Change the NUMERIC data type into the CURRENCY data type with the precision (1-4) before sending data to the server	Only for MySQL

ENCRYPTION	Use encrypted passwords when accessing the database. By default, this value is FALSE	Only for Sybase
FIELD REQUIRED	Display an error message if any field has the NULL value when a query is executed	
FORCE OCI7	Use OCI7 (SQL*Net 2.x - Oracle7 interface) to access the Oracle server	Only for Oracle
LOCAL CHARSET	Set the encoding character set	Only for Interbase
LOGIN TIMEOUT	The number of seconds to wait for user authorisation	Only for DB2, Informix, ODBC, MSSQL, MySQL, Sybase
MAX CURSORS	The maximum number of simultaneously opened cursors	Only for MSSQL and Sybase
MAXCHARPARAM LEN	The maximum line length. By default, it is 255	
MAXFIELDNAME LEN	The maximum length of a field name. By default, it is 50	Only for Oracle
MAX STRING SIZE	Limit the size of strings to this value. Longer strings will be considered a blob	Only for Firebird, Interbase, ODBC
NEW PASSWORD	Use this value when the server returns the 'Password expired' message	Only for Oracle8
QUOTED IDENTIFIER	Use identifiers in quotes	Only for MSSQL and Sybase
PREFETCH ROWS	The number of rows to be prefetched in order to minimize network traffic (Oracle8: this option does not work if SELECT contains fields of the LONG type)	Only for DB2, Informix, ODBC, Oracle8
ROLE NAME	Specifies the role the server should assign to the client when it is connected	Only for Interbase and Oracle (SYSDBA/SYSOPER roles)
SERVER PORT	Specifies the server port for connecting via TCP/IP	Only for MySQL, PostgreSQL
SINGLE CONNECTION	Specified whether to use a single process/connection. By default, it is FALSE	Only for MSSQL and Sybase
SQL DIALECT	Installs SQL Dialect (1,2,3) for the client	Only for Interbase
TDS PACKET SIZE	Specifies the size for a TDS packet. If the server does not support this size, a "Login failed" error will occur in the process of connecting	Only for Sybase
TRANSACTION LOGGING	If it is FALSE, transaction logging will be disabled, so rollback will be unavailable	Only for SQLBase
RTRIM CHAR OUTPUT	Delete spaces on the right for fields of the CHAR type. By default, it is TRUE	Only for DB2, Informix, Interbase, Oracle, ODBC and Sybase

XA CONNECTION	Indicates that it is necessary to connect to the TM service with the name specified in the "Database name" field. By default, it is FALSE	Only for Oracle8i
XXX API LIBRARY	Specifies the interface library type to use for connecting, where XXX stands for server type. For example, Oracle, SQLServer, Interbase, etc.	

3.11 Billing settings

For the application to calculate call costs, you need to fill in a few additional tables:

1. **Hours:** The business hours of a company, division, or department that uses the PBX.
2. **Trunk groups:** If the PBX has several trunks (incoming lines) with the same call rates, combine these trunks into a group. For any trunk, you can also create a separate group with its own call rates. You can also combine a few trunks used for free calls only into a trunk group.
3. **Trunk:** A table that contains a description of incoming lines.
4. **Local call rates:** Use this table for defining call rates for each direction. You can also define call rates by distance or by city/region code.
5. **International call rates:** Use this table for defining call rates by country code.

Hours

You can define time intervals (day time, evening, night time) for different weekdays. Later, you can define call rates separately for each of these time intervals. If you want to, you can define only day time; if evening or night time is not defined, the call rates for the day time interval will be used.

You can define different time intervals for different trunks.

Sites Departments Divisions

Define data in order PBX -> **Hours** -> Trunk group -> Trunk -> Domestic Call Cost
-> International Call Cost

[Help](#) -> Site -> Division -> Department -> Station Show panel Export to CSV Import from CSV

Name	Day time ...	Day time ...	Evening t...	Evening t...	Night tim...	Night tim...	Last edit
Standard work hours	08:00:00	18:00:00	18:00:00	21:00:00	22:00:00	08:00:00	02.12.2016
Saturday	09:00:00	18:00:00	18:00:01			08:59:00	21.10.2016
Sunday	10:00:00	14:00:59	14:00:00			09:59:00	21.10.2016

Data

Name

Day time

Evening time

Night time

Days of week
 Mon. Tue. Wed. Thu. Fri. Sat. Sun.

Last edit

Figure 19: List of work hours

Trunk group

A trunk group combines multiple trunks with the same billing parameters (time intervals, call rates, etc.). In the group properties, use the "PBX ID" field to enter the ID of the PBX that "owns" the trunks in the group, and also bind the earlier-defined work hours.

If a trunk group is used for free calls only, uncheck the "Calculate the cost" checkbox. In this case, the application will omit these trunks when calculating the cost of calls.

Note: When defining work hours, make sure that there is only one "work hours" version for each weekday.

Sites Departments Divisions

Define data in order PBX -> Hours -> **Trunk group** -> Trunk -> Domestic Call Cost
-> International Call Cost

[Help](#) -> Site -> Division -> Department -> Station Show panel Export to CSV Import from CSV

Name	PBX ID	Type	Vendor	Calculate cost	Last edit
Default	COM1	T1	Telecom	<input checked="" type="checkbox"/>	26.05.2014
Local	COM1	Analog	Telecom	<input checked="" type="checkbox"/>	28.05.2014
Default	192.168.10.20			<input checked="" type="checkbox"/>	21.10.2016

Data

Name Calculate cost

PBX ID

Type Vendor

Hours

Standard work hours
 Saturday
 Sunday

Last edit

Figure 20: List of trunk groups

Trunk

This table should list all trunks that may appear in the SMDR data. If the application, when calculating the cost of calls, stumbles upon a trunk that is not present in the list, a warning message will be displayed.

Important: If there is only one incoming line, and it doesn't have a unique number in the SMDR data, you need to add the trunk number 0000 to the list. These trunk's billing settings will be used by default when calculating the cost of calls.

Trunk name: Any trunk name.

Code: A trunk number from the SMDR data. Use a number that exactly matches the value in the "Trunk" column ([see fig. 9](#) ↑).

Group: Select an earlier-created trunk group from the list.

Sites Departments Divisions

Define data in order PBX -> Hours -> Trunk group -> **Trunk** Default -> Domestic Call Cost
-> International Call Cost

[Help](#) -> Site -> Division -> Department -> Station Show panel Export to CSV Import from CSV

Name	Code	Group	Last edit
0000	0000	Default	21.10.2016
001	001	Default	21.10.2016
002	002	Default	21.10.2016
005	005	Default	21.10.2016
006	006	Default	21.10.2016
009	009	Default	21.10.2016
010	010	Default	21.10.2016
011	011	Default	21.10.2016
012	012	Default	21.10.2016

Trunk name
 Code Specify 0000 if SMDR data do not contain information about trunks
 Group
 Last edit

Figure 21: List of trunks

Local call billing

You can add billing parameters for each direction.

Calculate by: Call cost can be calculated by distance or by region/city code. Depending on the selected option, a distance (in kilometers) or a region/city code should be provided. When specifying a region/city code, you can use the following wildcard characters:

- ? — one digit.
- * — one or more digits.

For each time of day, you can define a call rate for the first minute and a call rate for each of the following minutes.

If you don't define any call rate for the "following" minutes, the first minute's call rate will be applied.

If you don't define any call rate for evening or night time, the day time's call rate will be applied.

Sites Departments Divisions

Define data in order PBX -> Hours -> Trunk group -> Trunk -> **Domestic Call Cost**

-> International Call Cost

[Help](#) -> Site -> Division -> Department -> Station Show panel [Export to CSV](#) [Import from CSV](#)

Calc by	Value	Name	Day (1st ...	Day (addi...	Evening (...	Evening (...	Night (1s...
Area code	800	Toll free	12,00	12,00	0,00	0,00	0,00

Cost Additional

Calc by

You may specify the area code using mask characters * and ?, e.g.: 91?

	First minute	Additional minute(s)		
Day time (default)	<input type="text" value="12,00"/>	<input type="text" value="12,00"/>	Installed	<input type="text" value="02.12.2016"/>
Evening time	<input type="text" value="0"/>	<input type="text" value="0"/>	Removed	<input type="text" value="Undefined"/>
Night time	<input type="text" value="0"/>	<input type="text" value="0"/>	Last edit	<input type="text" value="02.12.2016"/>

Figure 22: Local call billing

Additional billing parameters for local calls

Billing period in seconds: The cost of the first minute and the cost of the following minutes will be calculated in multiples of the specified time intervals.

Example 1: If you have defined a time period of 60 seconds (one minute), a 10-second call will cost as much as a one-minute call.

Example 2: Suppose you have defined a time period of 5 seconds, and a call lasted for 13 seconds. In this case, the cost of one minute will be divided by 12 (because one minute contains 12 five-second intervals). The cost of the call will be 3/12 of the cost of one minute: The call duration will be counted as two full (five-second) intervals and one partial interval.

Free seconds: Billing is not applied to this time interval. The first paid minute is counted from the moment when the free seconds end.

Min. call cost: A call cannot cost less than this amount, even if it lasted less than the free seconds.

Sites Departments Divisions

Define data in order PBX -> Hours -> Trunk group -> Trunk -> Domestic Call Cost
-> **International Call Cost**

[Help](#) -> Site -> Division -> Department -> Station Show panel Export to CSV Import from CSV

Country c...	Name	Day (1st ...	Day (addi...	Evening (...	Evening (...	Night (1s...	Night (ad...	Ins ^
AC	Ascension Island (247)	1,00	1,00	0,50	0,50	0,50	0,50	14,1
AD	Andorra (376)	1,00	1,00	0,50	0,50	0,50	0,50	
AE	United Arab Emirates (971)	1,00	1,00	0,50	0,50	0,50	0,50	
AF	Afghanistan (93)	1,00	1,00	0,50	0,50	0,50	0,50	
AG	Antigua and Barbuda (1)	1,00	1,00	0,50	0,50	0,50	0,50	
AI	Anguilla (1)	1,00	1,00	0,50	0,50	0,50	0,50	
AL	Albania (355)	1,00	1,00	0,50	0,50	0,50	0,50	
AM	Armenia (374)	1,00	1,00	0,50	0,50	0,50	0,50	
AN	Netherlands Antilles (0)	1,00	1,00	0,50	0,50	0,50	0,50	
AO	Angola (244)	1,00	1,00	0,50	0,50	0,50	0,50	
AQ	Antarctica (0)	1,00	1,00	0,50	0,50	0,50	0,50	
AR	Argentina (54)	1,00	1,00	0,50	0,50	0,50	0,50	
AS	American Samoa (1)	1,00	1,00	0,50	0,50	0,50	0,50	

Cost Additional

Country code

	First minute	Additional minute(s)		
Day time (default)	<input type="text" value="1,00"/>	<input type="text" value="1,00"/>	Installed	<input type="text" value="14.04.2011"/>
Evening time	<input type="text" value="0,50"/>	<input type="text" value="0,50"/>	Removed	<input type="text" value="07.04.2011"/>
Night time	<input type="text" value="0,50"/>	<input type="text" value="0,50"/>	Last edit	<input type="text" value="02.12.2016"/>

Figure 24. International call billing

3.12 Billing

For the application to calculate the cost of calls, you need to [set up billing](#)^[25] in advance.

After configuring billing, you can force the application to calculate the cost of calls for a given time period. To run a calculation, select "Call cost — Calculate the cost for a period" in the menu and specify a time period. If any errors are detected or no billing parameters are found for some phone number, an error message will be displayed (Figure 25). In this case, you can fix the errors and run the calculation again.

```
Unable to find the appropriate call cost.
PBX: 192.168.2.101; Trunk: 9001; Type: domestic; Dialed number: 8034086167
PBX: 192.168.2.101; Trunk: 9001; Type: domestic; Dialed number: 8034086167
```

Figure 25: Error message

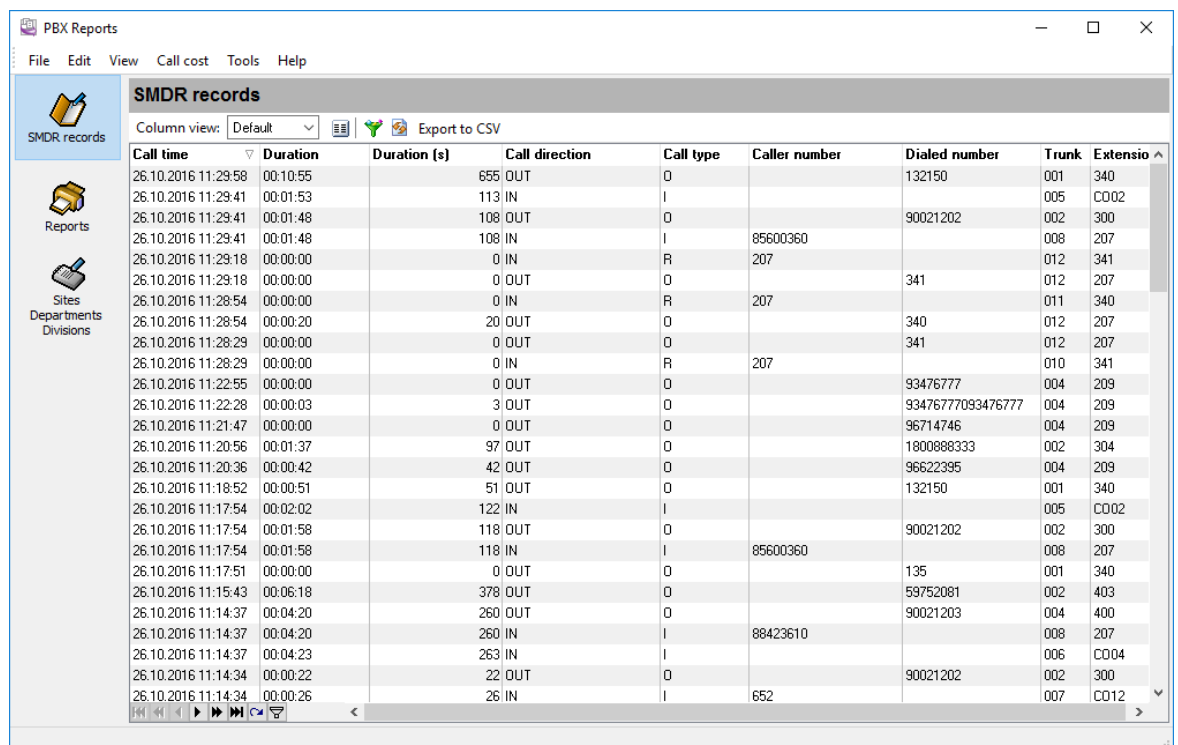
If you check the "Call cost — Calculate the cost automatically for applicable reports" checkbox, the application will calculate the cost before generating reports that contain a cost column. The calculation will be done only if the "Cost" field is empty or if the cost has not been calculated yet.

Note: The application does not track any changes in billing parameters, trunk settings, work hours, etc. Therefore, it will not recalculate the cost of calls automatically if any of these parameters change. If you have modified any parameters related to call billing, you need to force the application to recalculate the cost of calls for the necessary time period.

3.13 How to configure call cost calculation

Preliminary requirements

1. You need to configure Advanced PBX Data Logger so that it writes data to a database, because PBX Reports will use that database as a data source. If you have not configured the logger yet, please refer to the appropriate section.
2. Make sure that the logger has parsed the data correctly: Check if the "SDMR records" tab contains rows with data. The values in each column should be appropriate for its header. The fields with phone numbers should not be truncated, and the date field should contain valid values (Figure 1).



The screenshot shows the PBX Reports application window. The 'SMDR records' tab is active, displaying a table of call data. The table has columns for Call time, Duration, Duration (s), Call direction, Call type, Caller number, Dialed number, Trunk, and Extension. The data rows show various call records with timestamps, durations, directions (IN/OUT), types (I, R, O), caller numbers, dialed numbers, and trunk/extension identifiers.

Call time	Duration	Duration (s)	Call direction	Call type	Caller number	Dialed number	Trunk	Extension
26.10.2016 11:29:58	00:10:55	655	OUT	O		132150	001	340
26.10.2016 11:29:41	00:01:53	113	IN	I			005	CO02
26.10.2016 11:29:41	00:01:48	108	OUT	O		90021202	002	300
26.10.2016 11:29:41	00:01:48	108	IN	I	85600360		008	207
26.10.2016 11:29:18	00:00:00	0	IN	R	207		012	341
26.10.2016 11:29:18	00:00:00	0	OUT	O		341	012	207
26.10.2016 11:28:54	00:00:00	0	IN	R	207		011	340
26.10.2016 11:28:54	00:00:20	20	OUT	O		340	012	207
26.10.2016 11:28:29	00:00:00	0	OUT	O		341	012	207
26.10.2016 11:28:29	00:00:00	0	IN	R	207		010	341
26.10.2016 11:22:55	00:00:00	0	OUT	O		93476777	004	209
26.10.2016 11:22:28	00:00:03	3	OUT	O		93476777093476777	004	209
26.10.2016 11:21:47	00:00:00	0	OUT	O		96714746	004	209
26.10.2016 11:20:56	00:01:37	97	OUT	O		1800888333	002	304
26.10.2016 11:20:36	00:00:42	42	OUT	O		96622395	004	209
26.10.2016 11:18:52	00:00:51	51	OUT	O		132150	001	340
26.10.2016 11:17:54	00:02:02	122	IN	I			005	CO02
26.10.2016 11:17:54	00:01:58	118	OUT	O		90021202	002	300
26.10.2016 11:17:54	00:01:58	118	IN	I	85600360		008	207
26.10.2016 11:17:51	00:00:00	0	OUT	O		135	001	340
26.10.2016 11:15:43	00:06:18	378	OUT	O		59752081	002	403
26.10.2016 11:14:37	00:04:20	260	OUT	O		90021203	004	400
26.10.2016 11:14:37	00:04:20	260	IN	I	88423610		008	207
26.10.2016 11:14:37	00:04:23	263	IN	I			006	CO04
26.10.2016 11:14:34	00:00:22	22	OUT	O		90021202	002	300
26.10.2016 11:14:34	00:00:26	26	IN	I	652		007	CO12

Figure 1: Parsed data

Step 1

Let the logger run for several hours, so that it collects a large enough amount of data. This will minimize the amount of data to be entered manually.

Step 2

Execute the “Call cost -> Import PBXs, trunks, and stations from SMDR records” command in the main menu.

The application will scan the collected data and automatically add descriptions for PBXs, trunks, and stations. You will only need to correct the descriptions.

Step 3

Switch to the “Sites Departments Divisions -> PBX” tab.

The screenshot shows the 'Sites Departments Divisions' interface. At the top, there is a navigation bar with 'Define data in order' followed by a breadcrumb trail: PBX -> Hours -> Trunk group -> Trunk (Default) -> Domestic Call Cost -> International Call Cost. Below this is a 'Help' link and another breadcrumb trail: Site -> Division -> Department -> Station, along with checkboxes for 'Show panel', 'Export to CSV', and 'Import from CSV'. A table below shows a single entry for 'My Company PBX' with columns for Name, PBX ID (192.168.10.20), Outsi..., Natio..., Intern..., Count..., Regio..., and Last edit (21.10.2016). Below the table is a 'Data' section with a form for editing the PBX parameters. The form includes fields for Name (My Company PBX), Identifier (192.168.10.20), Parser (LG Ericsson IPECS MFIM50A), Outside access code, National number prefix, International access code, Country access code, Region access code, Local region code, and Last edit (21.10.2016). A 'Select' button is next to the Parser field.

Figure 2: PBX parameters

1. Enter an arbitrary name for your PBX.
2. Check the PBX's identifier: It should match the name of the interface used by the logger to get data from the PBX. In the example shown in Figure 2, the data are received via TCP/IP from the PBX with the IP address 192.168.1.198. For a PBX connected via a COM port, you should see a value like COM1, COM2, etc.
3. In the “Parser” field, select the type of your PBX.

4. Select the code of the country where your PBX is located from the list.
5. If your PBX requires dialing a special prefix to make an international call, enter that prefix in the “International access code” field.
6. If your PBX requires dialing special codes for outside calls, local calls, or national calls, enter them in the appropriate fields.

Step 4

Switch to the “Sites Departments Divisions -> Hours” tab. Make sure that you have specified at least one time interval. If you have specified several time intervals, they should be adjacent or overlap.

Sites Departments Divisions

Define data in order PBX -> **Hours** -> Trunk group -> Trunk Default -> Domestic Call Cost
-> International Call Cost

[Help](#) -> Site -> Division -> Department -> Station Show panel Export to CSV Import from CSV

Name	Day time ...	Day time ...	Evening t...	Evening t...	Night tim...	Night tim...	Last edit
Standard work hours	08:00:00	18:00:00	18:00:00	21:00:00	22:00:00	08:00:00	02.12.2016
Saturday	09:00:00	18:00:00	18:00:01			08:59:00	21.10.2016
Sunday	10:00:00	14:00:59	14:00:00			09:59:00	21.10.2016

Data

Name Standard work hours

Day time 8:00:00 18:00:00

Evening time 18:00:00 21:00:00

Night time 22:00:00 8:00:00

Days of week
 Mon. Tue. Wed. Thu. Fri. Sat. Sun.

Last edit 02.12.2016

Figure 3: Work hours

Step 5

Switch to the “Sites Departments Divisions -> Trunk group” tab. Make sure that you have specified at least one trunk group.

Sites Departments Divisions

Define data in order PBX -> Hours -> **Trunk group** -> Trunk -> Domestic Call Cost
-> International Call Cost

[Help](#) -> [Site](#) -> [Division](#) -> [Department](#) -> [Station](#) Show panel [Export to CSV](#) [Import from CSV](#)

Name	PBX ID	Type	Vendor	Calculate cost	Last edit
Default	COM1	T1	Telecom	<input checked="" type="checkbox"/>	26.05.2014
Local	COM1	Analog	Telecom	<input checked="" type="checkbox"/>	28.05.2014
Default	192.168.10.20			<input checked="" type="checkbox"/>	21.10.2016

Data

Name Calculate cost

PBX ID

Type Vendor

Hours

Standard work hours
 Saturday
 Sunday

Last edit

Figure 4: Trunk groups

1. Enter an arbitrary name for the trunk group.
2. Check the PBX's identifier: It should match the identifier from Step 3.
3. Select work hours from the list.
4. Check the "Calculate cost" checkmark.

Step 6

Switch to the "Sites Departments Divisions -> Trunk" tab. Make sure that the list contains at least one trunk.

Sites Departments Divisions

Define data in order PBX -> Hours -> Trunk group -> **Trunk** Default -> Domestic Call Cost
-> International Call Cost

[Help](#) -> [Site](#) -> [Division](#) -> [Department](#) -> [Station](#) Show panel [Export to CSV](#) [Import from CSV](#)

Name	Code	Group	Last edit
0000	0000	Default	21.10.2016
001	001	Default	21.10.2016
002	002	Default	21.10.2016
005	005	Default	21.10.2016
006	006	Default	21.10.2016
009	009	Default	21.10.2016
010	010	Default	21.10.2016
011	011	Default	21.10.2016
012	012	Default	21.10.2016

Data

Trunk name

Code Specify 0000 if SMDR data do not contain information about trunks

Group

Last edit

Figure 5: Trunks

1. If your PBX has only one trunk, enter "0000" in the "Code" field for that trunk.
2. If the list does not contain the trunk, add a new trunk by clicking the green-plus button under the table, and enter the "0000" code for that trunk.
3. Select the trunk group from Step 5 for your trunk.

Step 7

On the "Site," "Division," and "Department" tabs, specify your organizational structure. In the simplest case, you can have only one site, one division, and one department.

Sites Departments Divisions

Define data in order PBX -> Hours -> Trunk group -> Trunk -> Domestic Call Cost
-> International Call Cost

[Help](#) -> [Site](#) -> Division -> Department -> Station Show panel [Export to CSV](#) [Import from CSV](#)

Name
My Company

Name

Figure 6: Organizational structure

1. Enter an arbitrary name for each unit. You can filter data in reports by that name.
2. For a division or a department, you need to select a superior unit from the list (a site or a division, respectively).

Step 8

Switch to the "Sites Departments Divisions -> Station" tab.

Sites Departments Divisions

Define data in order PBX -> Hours -> Trunk group -> Trunk -> Domestic Call Cost
-> International Call Cost

[Help](#) -> [Site](#) -> [Division](#) -> [Department](#) -> [Station](#) Show panel [Export to CSV](#) [Import from CSV](#)

Name	PBX ID	Extension	Record ID	Port	Active	Installed
Ext #300	192.168.10.20	300			<input checked="" type="checkbox"/>	01.01.1900
Ext #303	192.168.10.20	303			<input checked="" type="checkbox"/>	01.01.1900
Ext #304	192.168.10.20	304			<input checked="" type="checkbox"/>	01.01.1900
Ext #305	192.168.10.20	305			<input checked="" type="checkbox"/>	01.01.1900
Ext #310	192.168.10.20	310			<input checked="" type="checkbox"/>	01.01.1900
Ext #340	192.168.10.20	340			<input checked="" type="checkbox"/>	01.01.1900
Ext #341	192.168.10.20	341			<input checked="" type="checkbox"/>	01.01.1900
Ext #620	192.168.10.20	620			<input checked="" type="checkbox"/>	01.01.1900
Ext (CO01)	192.168.10.20	CO01			<input checked="" type="checkbox"/>	01.01.1900
Ext (CO02)	192.168.10.20	CO02			<input checked="" type="checkbox"/>	01.01.1900

Main **Directory**

Name **Site**

PBX ID **Division**

Extension **Department**

Record ID Installed

Port Removed

Active Last edit

Figure 7: Stations

3. If some stations have not been imported from the collected data, add them manually. To add a new station, click the green-plus button under the table.
4. For each station, you need to specify a PBX identifier and a station code (which will be forwarded by the PBX via a port). You also need to select a site, a division, and a department from Step 7 in the list.
5. Enter an arbitrary name for the station in the "Name" field.

Step 9

To configure domestic call cost (within your region or nationwide), switch to the "Sites Departments Divisions -> Domestic Call Cost" tab.

Sites Departments Divisions

Define data in order PBX -> Hours -> Trunk group -> Trunk -> **Domestic Call Cost**

-> International Call Cost

[Help](#) -> [Site](#) -> [Division](#) -> [Department](#) -> [Station](#) Show panel [Export to CSV](#) [Import from CSV](#)

Calc by	Value	Name	Day (1st ...	Day (addi...	Evening (...	Evening (...	Night (1s...
Area code	800	Toll free	12,00	12,00	0,00	0,00	0,00

Data

Cost Additional

Calc by

You may specify the area code using mask characters * and ?, e.g.: 91?

	First minute	Additional minute(s)		
Day time (default)	<input type="text" value="12,00"/>	<input type="text" value="12,00"/>	Installed	<input type="text" value="02.12.2016"/>
Evening time	<input type="text" value="0"/>	<input type="text" value="0"/>	Removed	<input type="text" value="Undefined"/>
Night time	<input type="text" value="0"/>	<input type="text" value="0"/>	Last edit	<input type="text" value="02.12.2016"/>

Figure 8: Domestic call cost


To add a new row to the cost table, click the green-plus button.

1. On the "Cost" tab, select "Region access code" from the "Cost calculation" list. Enter the region code and its description in the appropriate fields.
2. If you need to specify the same cost for several regions whose names begin with the same characters, you can use the wildcard characters * or ?. For example, 91? means any region codes that begin with 910, 911, 912, 913, etc.

For more details about each field on the "Cost" tab, please consult the help file for PBX Reports.

Step 10

You can view and check call cost calculation on the "SMDR records" tab as follows.

1. If the cost column is hidden, unhide it. You can configure columns by clicking the button shown below (Figure 9).
2. Turn on the "Call cost -> Calculate cost automatically" option in the main menu.
3. For newly incoming data, click the "Update" button  to make the application show the new data and do a calculation based on them.
4. If you have calculated the cost earlier, but then changed the cost parameters, do the following:
 - Execute the "Call cost -> Calculate cost for period" command;
 - In the dialog box, specify a time interval;

- Wait for the calculation to complete.

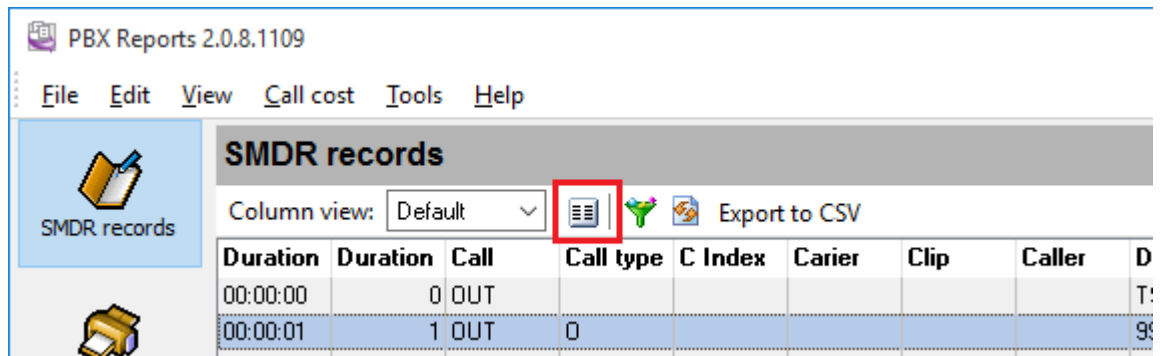


Figure 9: Columns configuration button

4 Having problems?

4.1 Problems and their solutions

Problem

The "SMDR data" tab doesn't show the data that are displayed in the logger's window.

Solution

Check the logger's settings:

1. On the "Modules — Parser" tab, select a parser for your PBX.
2. Make sure that the ODBC Database or SQL Database Pro data export module is enabled and configured.

We recommend to reinstall the application, selecting the "Write to a database — Microsoft Access" option in the installation wizard. If you do it, the application will configure everything automatically.

Problem

PBX Reports displays an error message saying that database settings are identical.

Solution

Check the logger's settings. Possibly it writes data to a different database. If the settings are identical, check the "Don't show again" checkbox in the error dialog box.

Problem

When generating a "Call history" report, a "small page size" message is shown.

Solution

Change the set of columns on the "SMDR data" page and remove some unnecessary columns, because the application uses this set of columns when generating the report. You can also change the page properties: select a different page orientation or a different page size.

4.2 How to configure logging to the database using the ODBC Database module

4.2.1 Preliminary requirements

If you are going to use an MS SQL Server, MySQL, or Oracle database, first create a database with tables for storing data.

For MySQL or Oracle, you need to install the latest **32-bit version of** ODBC drivers.

Download links:

MySQL: <https://dev.mysql.com/downloads/connector/odbc/>

Oracle: <https://www.oracle.com/technetwork/database/windows/downloads/index-096177.html>

Windows XP or higher already contains ODBC drivers for MS SQL Server.

4.2.2 Option 1

The simplest solution is to install or reinstall the program, and then select the respective option in the installation wizard (Figure 1):

- Select "Create a configuration."
- Select a parser for your PBX.
- Select "Write to database" and your database type. If you have 2000 calls per day on your PBX, select the MS Access database. It is free and easy to set up and maintain.

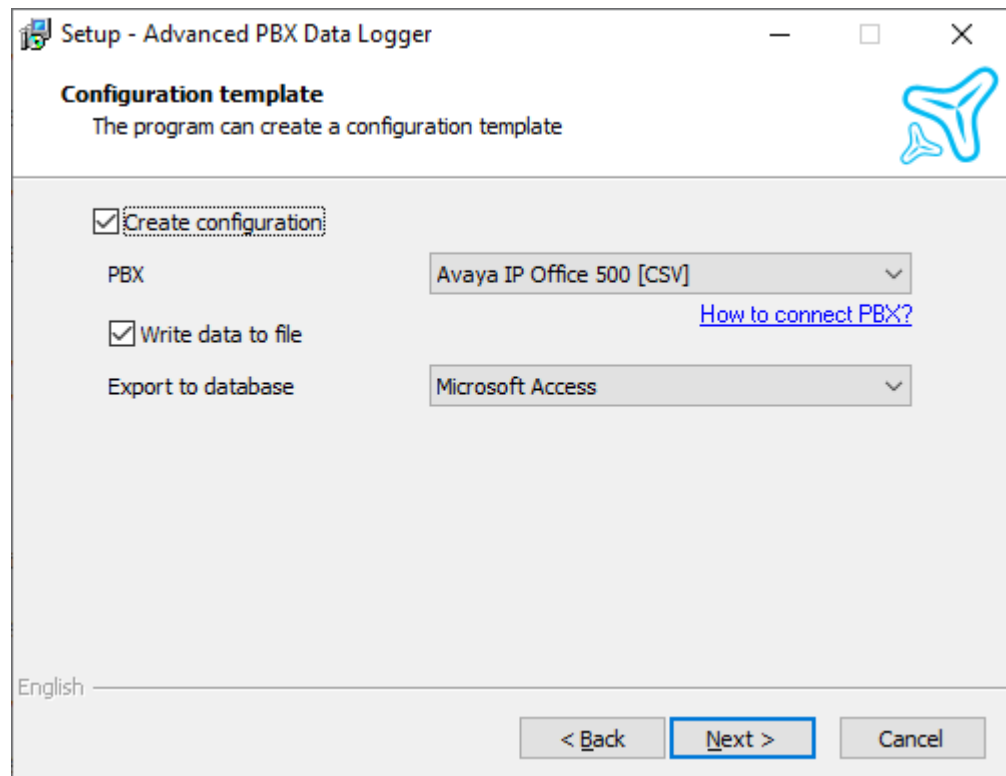


Figure 1. Creating a configuration

If you are using an MS SQL Server, MySQL, or Oracle database, you must specify a connection string and the credentials (login and password) of an administrator/user who has the privileges to create objects in the database.

Setup - Advanced PBX Data Logger

Configuration template
The program can create a configuration template

Create configuration

PBX Avaya IP Office 500 [CSV] [How to connect PBX?](#)

Write data to file

Export to database MySQL

Database host 192.168.1.3

Database name pbxlogger

Administrator's login and password

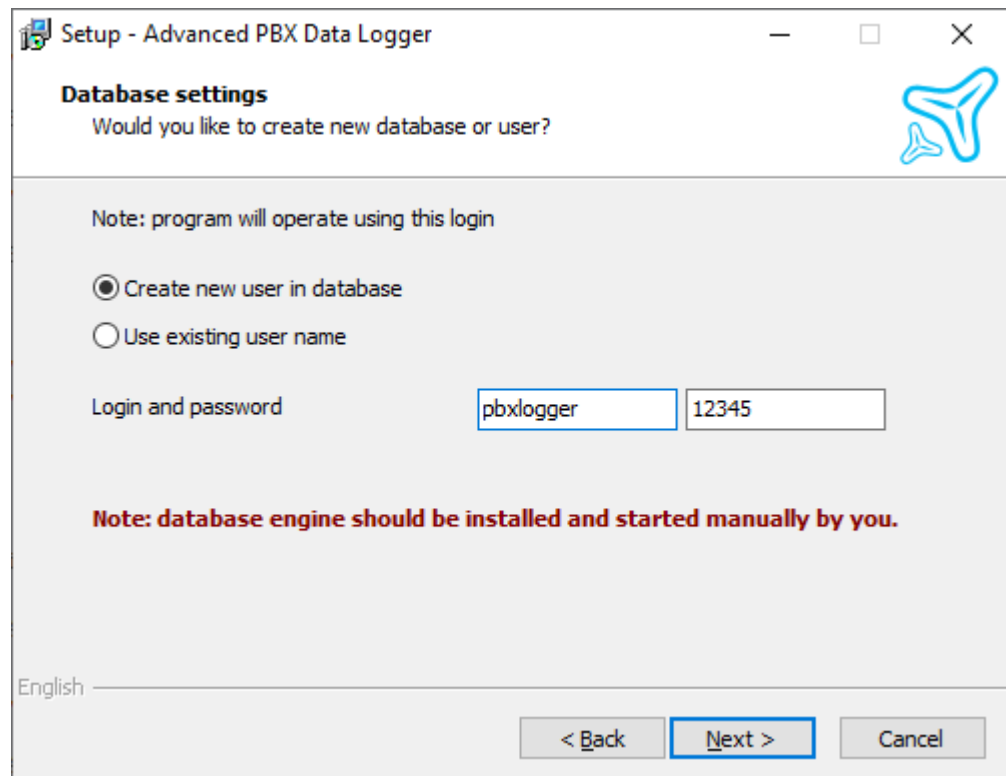
root ***

English

< Back Next > Cancel

Figure 2. Creating a configuration

At the next step, you can choose whether to create any objects in the database.. You can copy the object creation script and pass it to your database administrator, who will create objects for you. If you prefer to do that, just skip this step.



Setup - Advanced PBX Data Logger

Database settings

Would you like to create new database or user?

Note: program will operate using this login

Create new user in database

Use existing user name

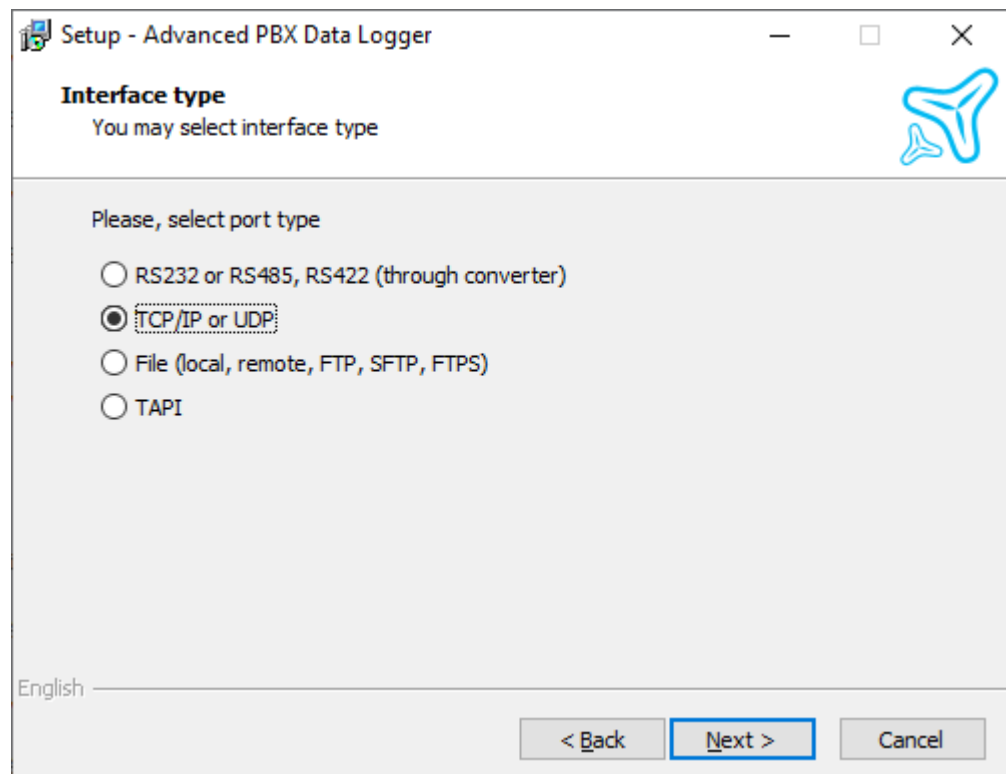
Login and password

Note: database engine should be installed and started manually by you.

English

< Back Next > Cancel

Figure 3. Creating objects in the database



Setup - Advanced PBX Data Logger

Interface type

You may select interface type

Please, select port type

RS232 or RS485, RS422 (through converter)

TCP/IP or UDP

File (local, remote, FTP, SFTP, FTPS)

TAPI

English

< Back Next > Cancel

Figure 4. Selecting a data source type

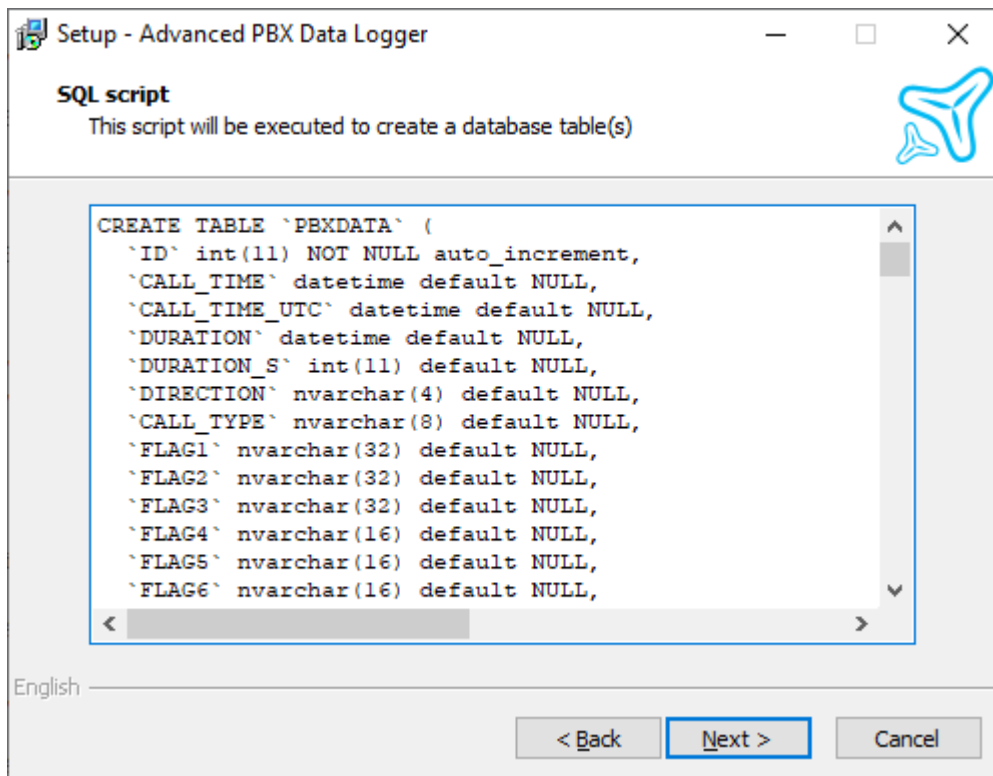


Figure 5. DDL script

If the installation is successful, Call logging to a database will be configured to write data to the database. You only need to configure the connection to your PBX. PBX Reports will also be configured to read data from the same database.

Now each time new data are received, the program will write them to the database in real-time. If you use the "PBX Reports" utility, you need to click the "Refresh" button on the "SMDR data" tab. Reports use real-time data without clicking the "Refresh" button.

4.2.3 Option 2

You need a database you want to use our PBX Reports utility. The logger writes all incoming data to a database in real-time, and PBX Reports works with the prepared data.

If you have already installed our software, the following tutorial describes how to configure a connection with a database.

1. Create a new configuration (if you haven't done it yet)

If you do not have any configurations yet, you may click the "Green Plus" button in the program's main window and configure everything manually. But please consider to re-install the program from scratch and select the necessary options. The installation wizard will prepare all the required settings.

If you have a working configuration already, then clone the working configuration "Main menu → Options → Manage configuration → Clone."

2. Configure a [connection to your PBX](#).
3. Switch to the "Modules → Query Parse Filter" tab and select a parser for your PBX (Figure 1).

Note: A lack or incorrect operation of the parser may prevent data from being written to the database. The [next section](#) ^[51] describes how to check the parser's operation.

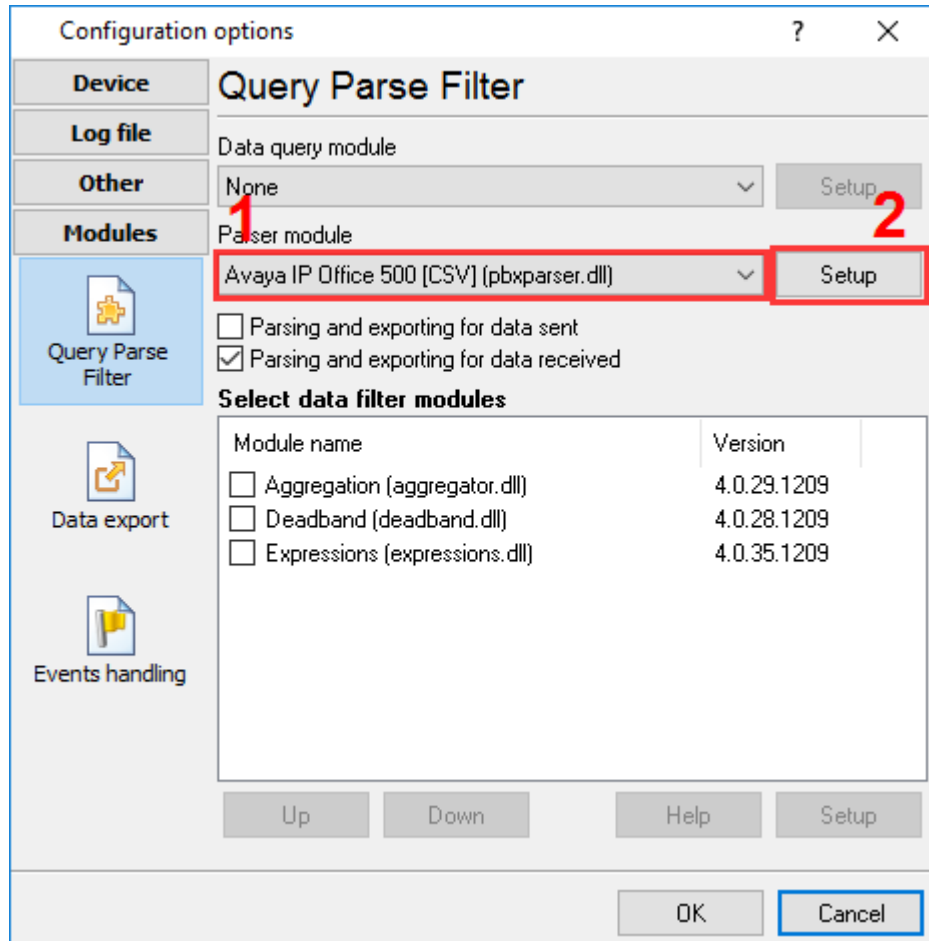


Figure 1. Selecting a parser

4. Switch to the "Modules — Data export" tab and check the "ODBC database" checkbox (Figure 2).

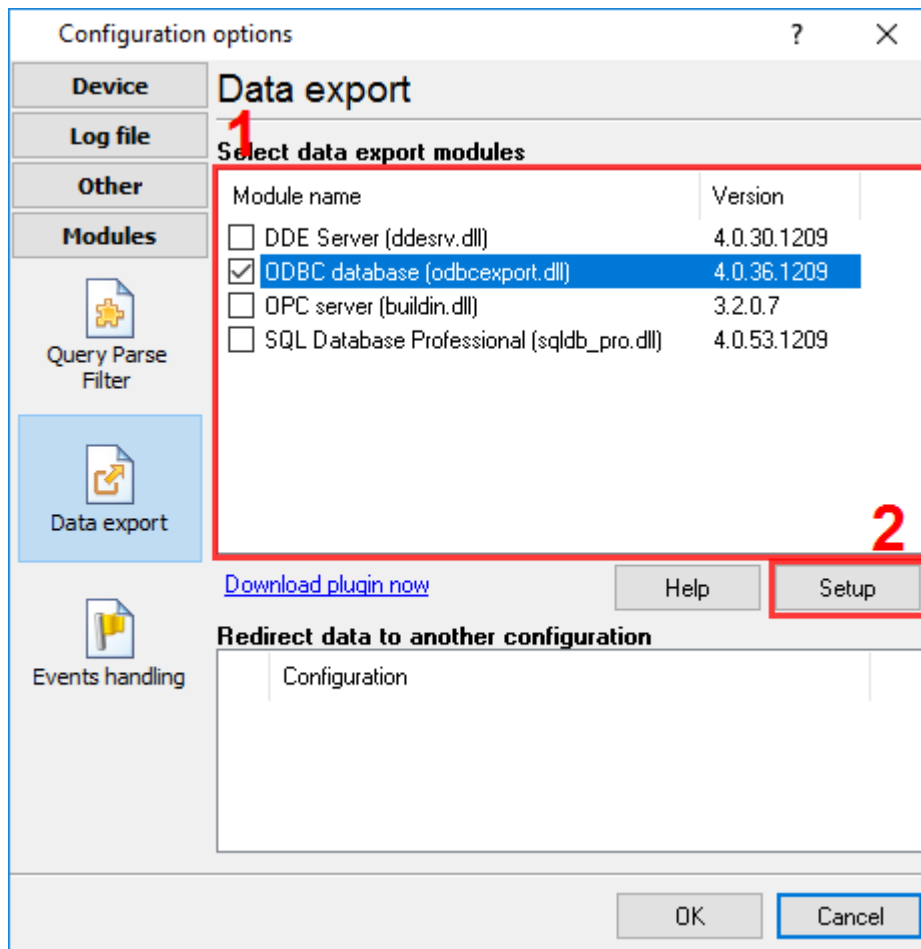


Figure 2. Selecting a data export module

5. Open the data export module's settings by double-clicking the module's name.
6. Click the "Load & Save" button (Figure 3), and select:
 - "PBX-Logger-ODBC-Items" — if you are going to write data to a MySQL, MS SQL Server, or Oracle database.
 - "PBX-Logger-ODBC-Access" — if you are going to write data to an MS Access database.
7. Switch to the "Common" tab (Figure 3) and enable data logging to the database.

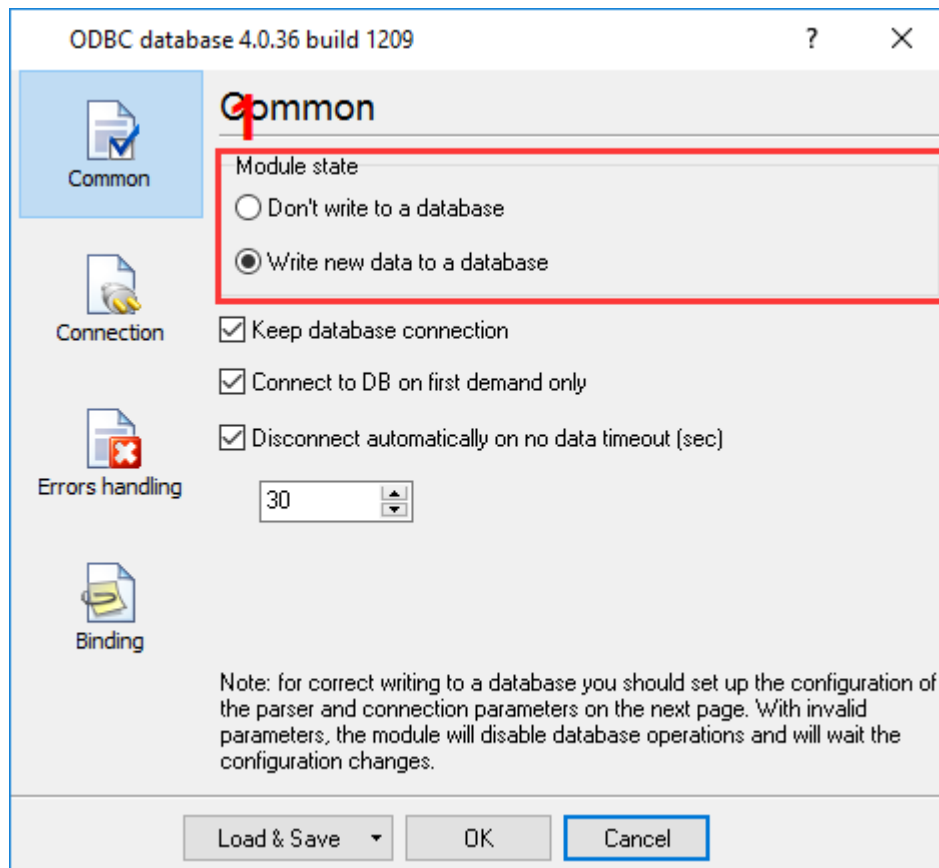


Figure 3. Enabling logging to the database

8. Switch to the "Connection" tab.

8.1. If you already have an ODBC data source, select it from the list (Figure 4).

8.2. If you do *not* have any ODBC data source yet, click the "Setup" button and create a **system ODBC data source**. For more details, see the [next section](#)^[49]. After creating the data source, click the Refresh button and select the newly created data source in the list.

8.3. If you use the MS Access database, you should specify or select the database file (*.mdb) in the "Database file" field. You may find the database file in "program folder\data\."

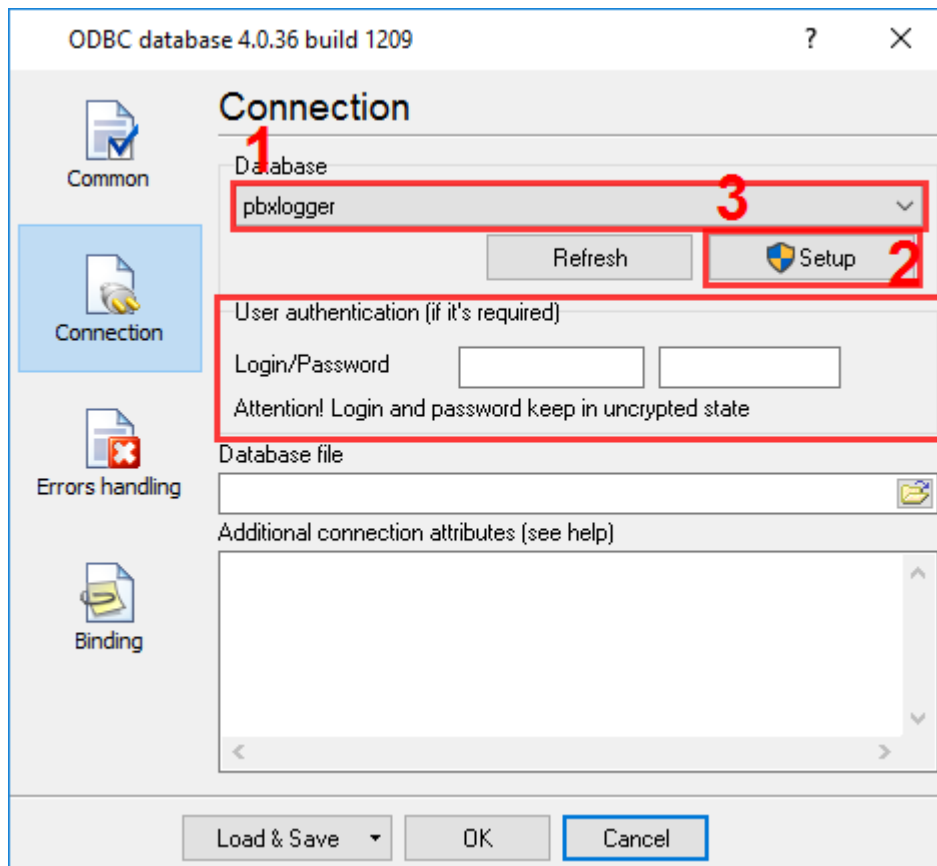


Figure 4. Selecting an ODBC data source

9. Switch to the "Binding" tab and check that the list contains a description of database columns. If the item list on that tab is empty, go to step 6.

10. Click "OK" and save all changes both in the ODBC database settings window and in the module selection window.

Now each time new data are received, the program will write them to the database in real-time. If you use the "PBX Reports" utility, you need to click the "Refresh" button on the "SMDR data" tab. Reports use real-time data without clicking the "Refresh" button.

4.3 Creating an ODBC data source

Note: In 64-bit editions of Windows, there are separate lists of data sources for the 32-bit and 64-bit modes. You need to configure a data source for the 32-bit mode. To access the respective version of ODBC data source administrator, click the "Setup" button in the "ODBC database" module.

Note: The system ODBC data source lets you run the program as an application or as a **service**.

1. Switch to the "System DSN" tab and click the "Add" button (Figure 1).

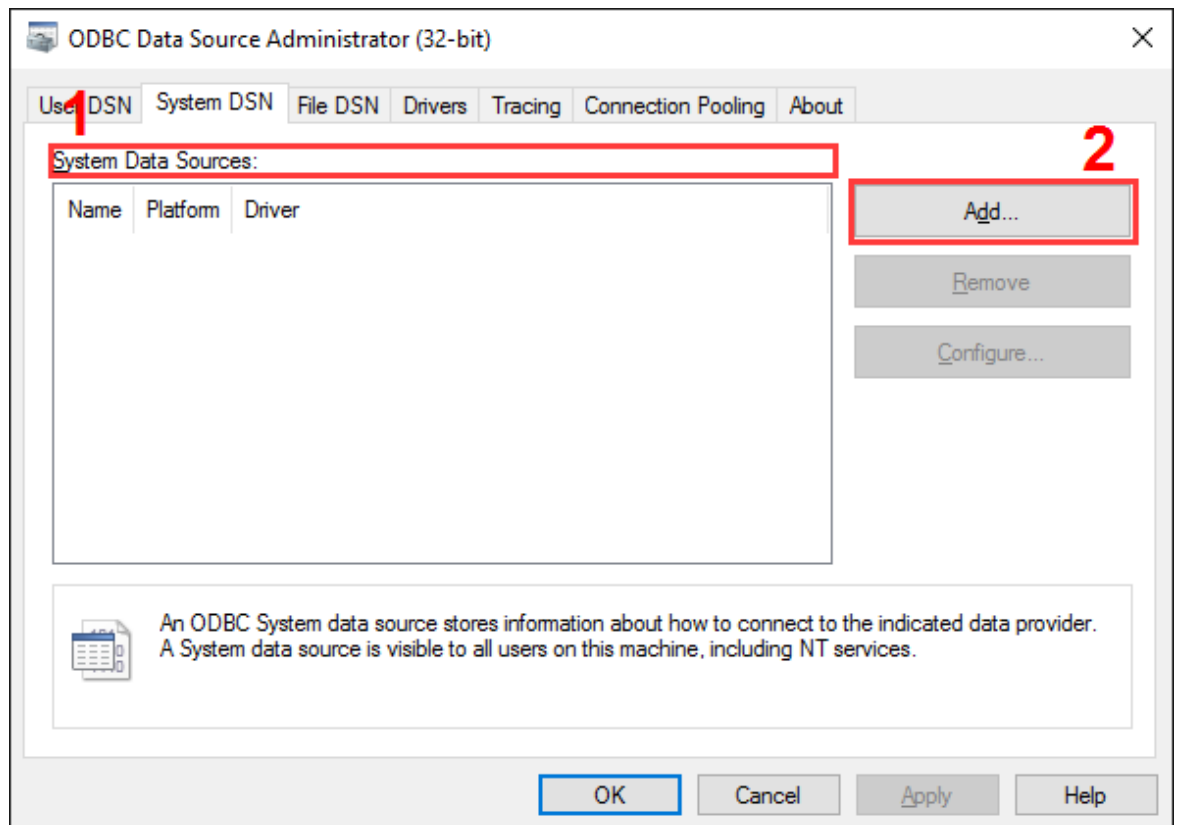


Figure 1. Data source administrator

2. In the window that opens, select a driver for your database (Figure 2).

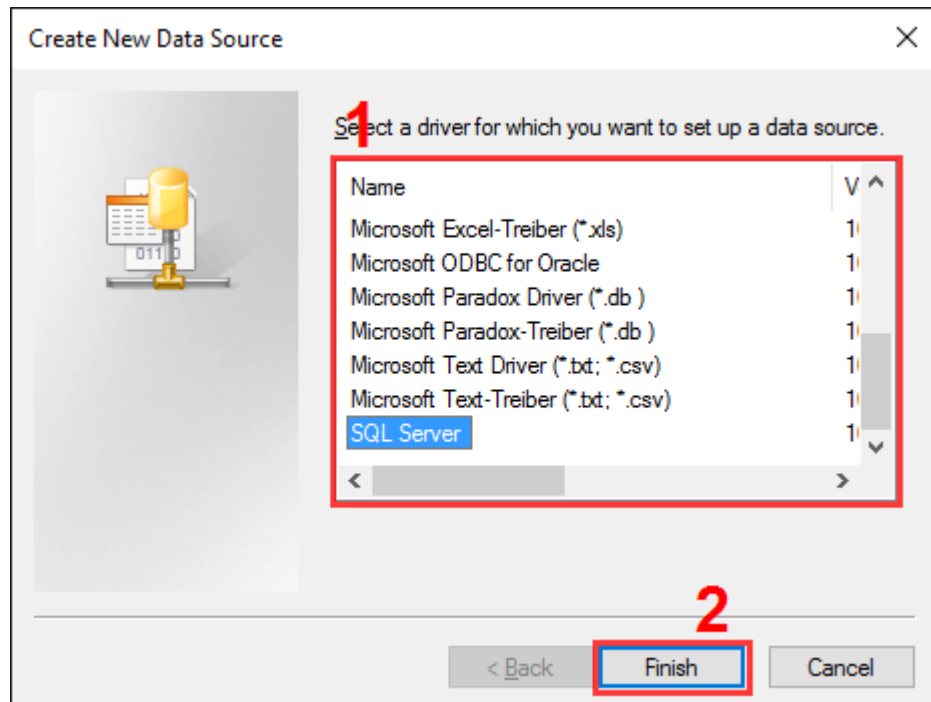


Figure 2. Selecting a driver

3. The following steps depend on the driver selected. Usually you should configure a connection to the database.

4.4 Checking the parser's operation

If you can see the data in the program's main window but not in the database, you may need to check the parser. Possibly, the parser works incorrectly. That usually happens if the parser expects data in a different format than that sent by the PBX.

1. Select the "DDE server" data export module (Figure 1).

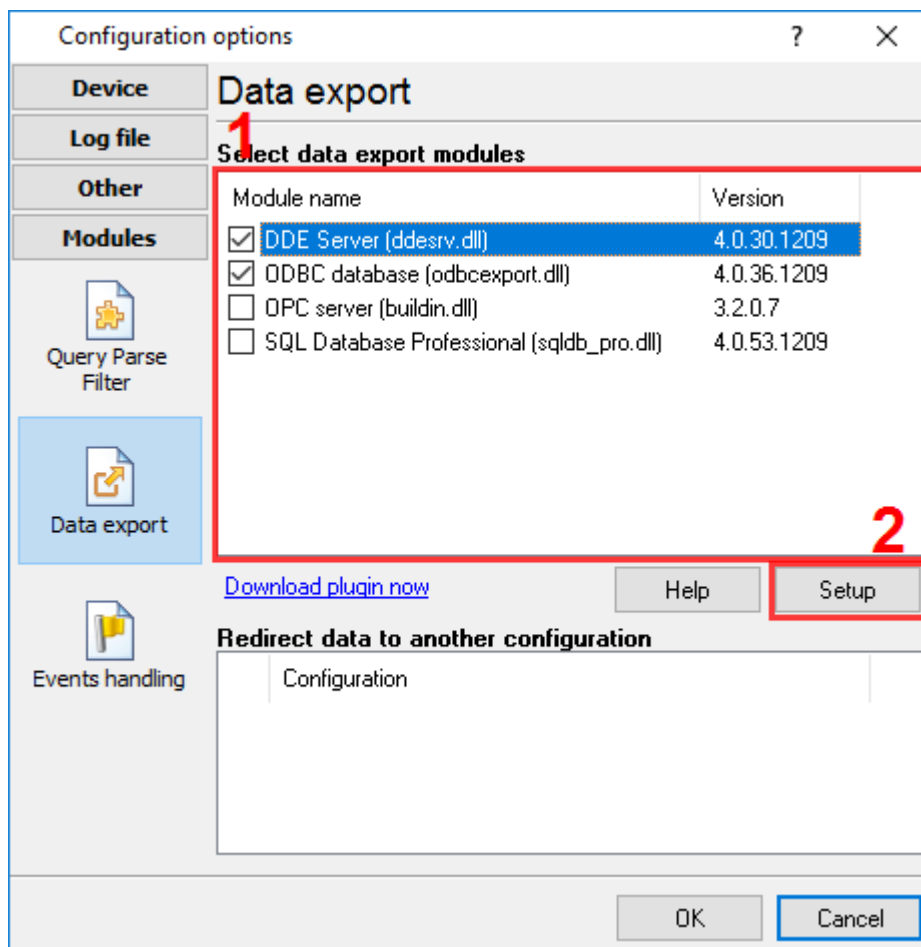


Figure 1. Selecting a data export module

2. Click "OK" to save changes.

3. Wait for new data.

4. Open the list of data export modules (Figure 1) and double-click "DDE server."

5. In the module's settings window, switch to the "All active items" tab. If you can see the parsed data from your PBX and everything looks fine, the parser works correctly. If you do not see the "sviCALL_TIME" item in the list, the parser works incorrectly. First of all, check the [SMDR settings on your PBX](#). Maybe, the PBX sends data using the unexpected format. Also, check the format of date and time. Contact our support team if nothing helps.

6. After checking the parser, you can disable the "DDE server" module.

4.5 How to configure logging to the database using the SQL Database Pro module

4.5.1 Why the SQL Database Pro module is better than ODBC Database

SQL Database Pro has the following key advantages:

1. It can keep a backup copy of data while the main database is offline or unavailable, so you can build a robust system.
2. It can access stored procedures on the server.
3. It can execute a queue of SQL queries.

When to use SQL Database Pro

1. If the database is hosted on another computer, especially on a remote server accessed over the Internet.
2. If you need to write data to two databases or two tables in parallel.
3. If the data is going to be written to the database in a special way (for example, using a stored procedure).

4.5.2 Preliminary requirements

Oracle: You need to install Oracle Client on the computer where you are going to install the program.

4.5.3 Setup

1. Create a configuration (if you haven't done it yet) by clicking the "green plus" button in the program's main window.
2. Configure a connection to your PBX.
3. Switch to the "Modules — Query Parse Filter" tab and select a parser for your PBX (Figure 1).

Note: A lack or incorrect operation of the parser may prevent data from being written to the database. The [next section](#)^[51] describes how to check the parser's operation.

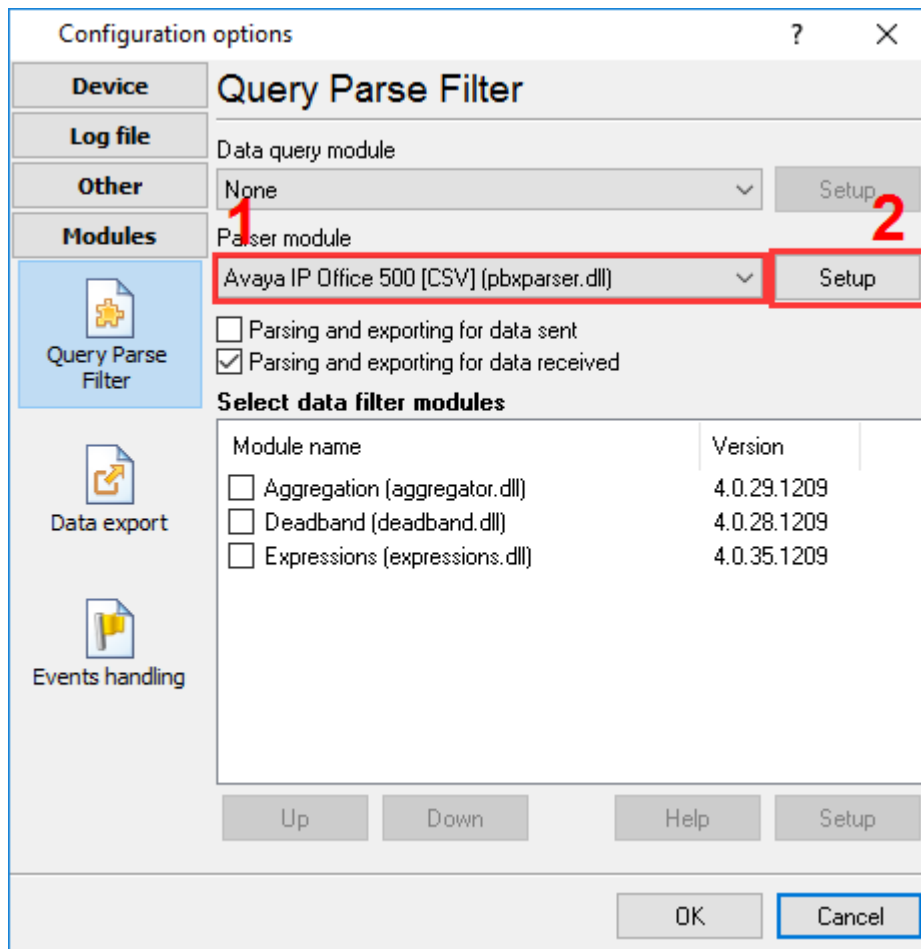


Figure 1. Selecting a parser

4. Switch to the “Modules — Data export” tab and check the “SQL Database Pro” checkbox (Figure 2).

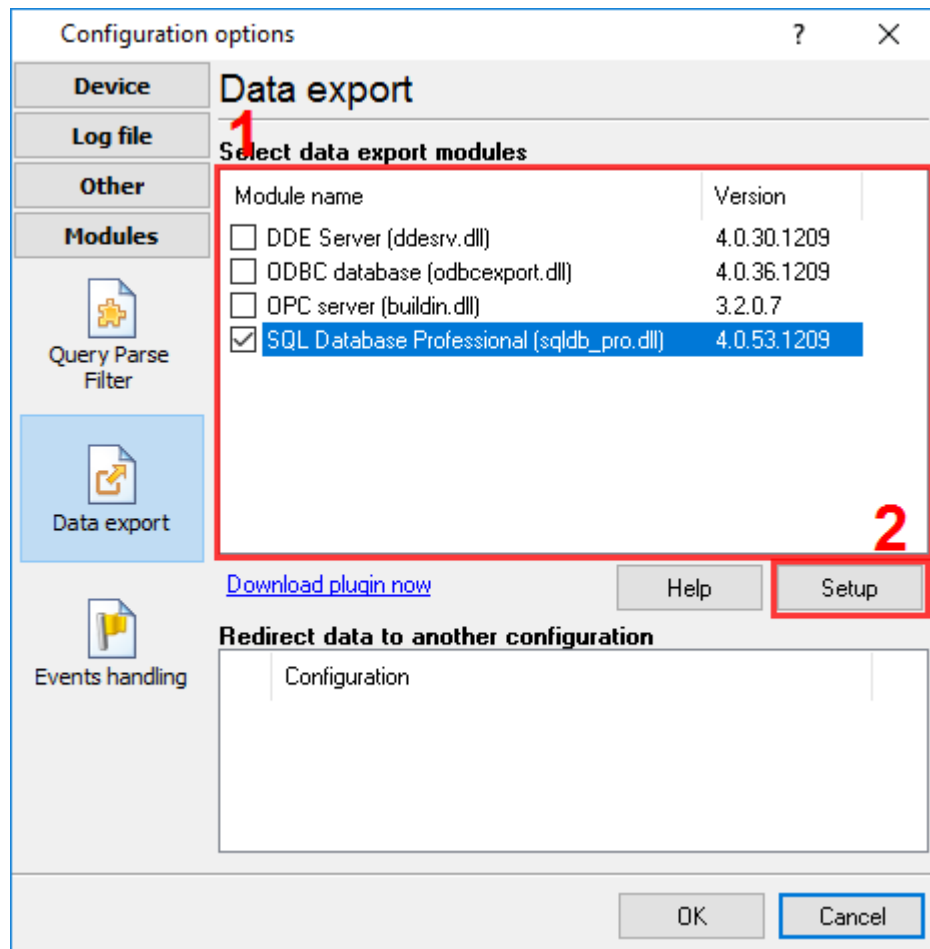


Figure 2. Data export module

5. Open the data export module's settings by double-clicking the module's name.
6. Switch to the "Connection mode" tab and make sure that the "Temporarily disable" checkbox is unchecked (Figure 3).

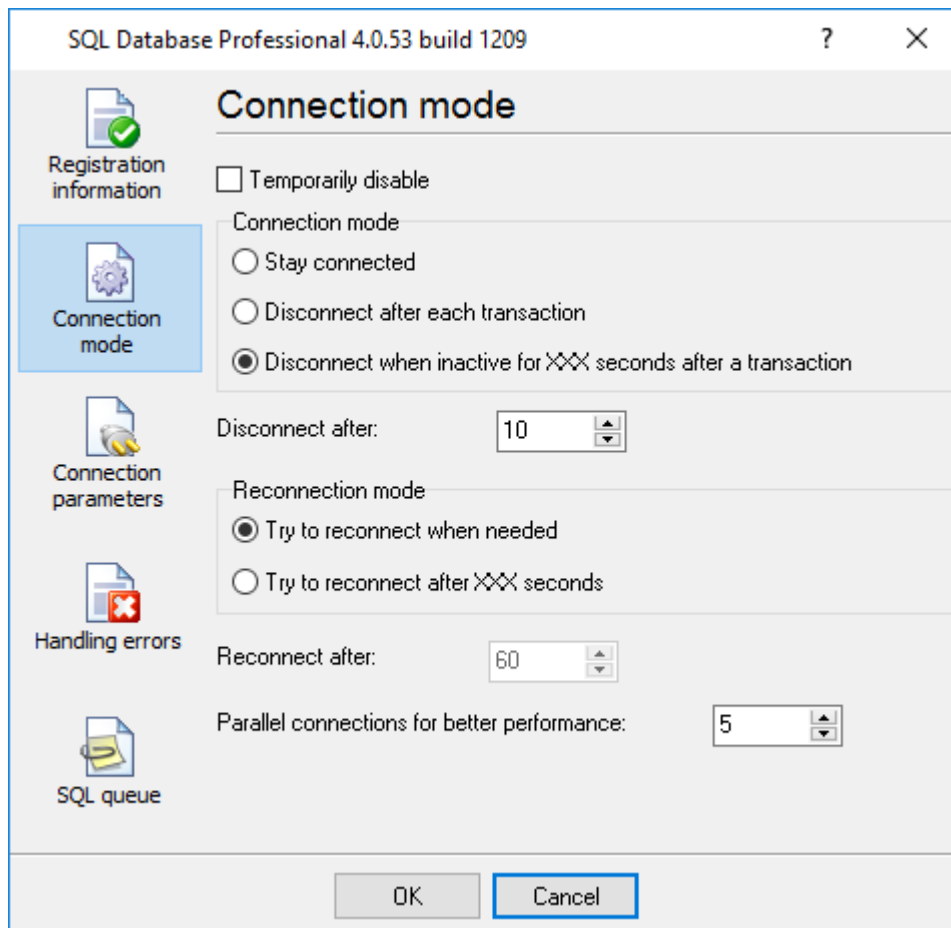


Figure 3. Connection mode

7. Switch to the “Connection parameters” tab and configure the connection:

- Connection string, which consists of the database server’s IP address and the database name.
- Login and password.
- Additional connection parameters.

For more details on connection parameters, see the module’s help file. To open it, click the question mark in the window title bar, and then click the “Database name” field.

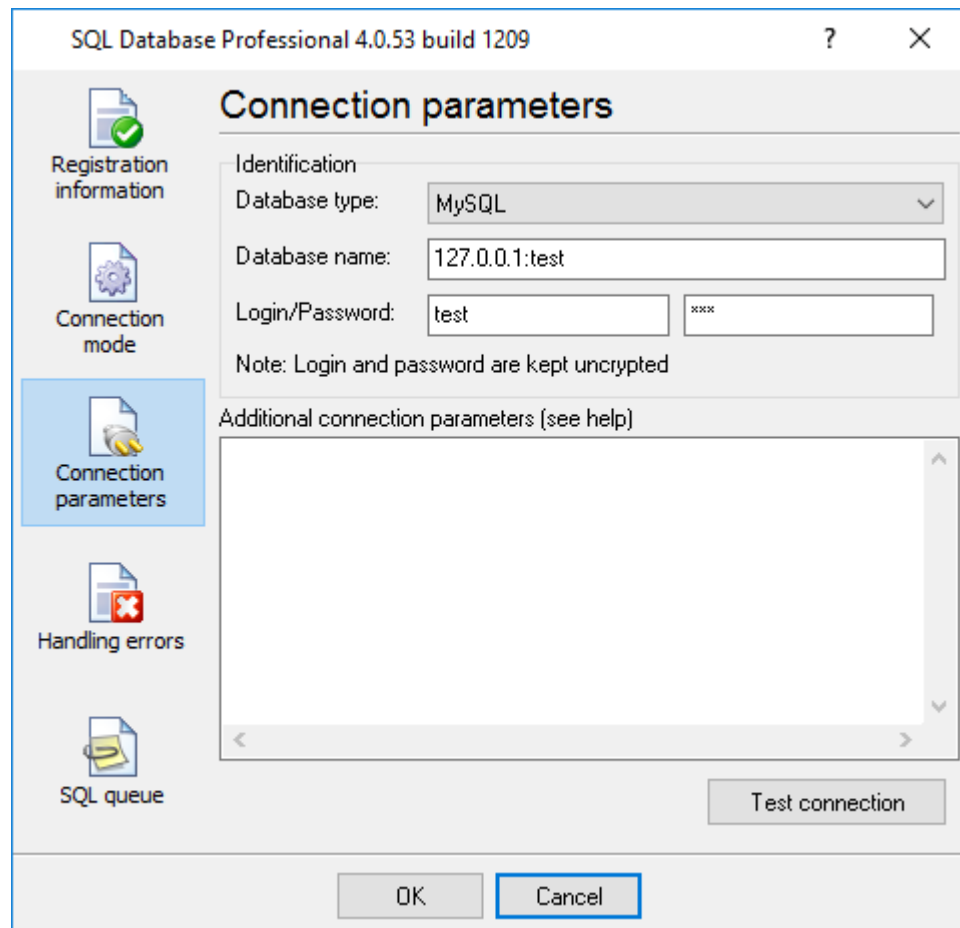


Figure 4. Connection parameters

8. Switch to the "SQL queue" tab (Figure 5).

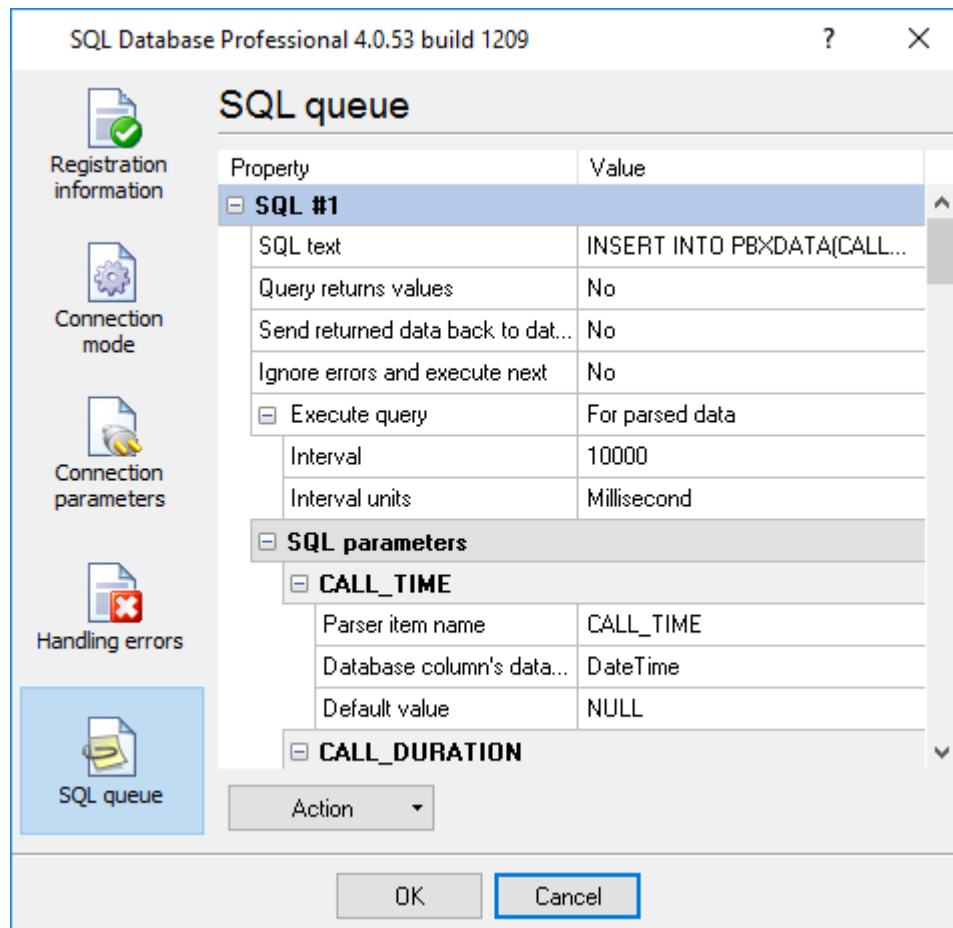


Figure 5. SQL queue

9. Click the “Action” button, and then select “Load SQL queue from a file” in the drop-down menu. You can find a text file named “pbxlogger-sql-queue.txt” with all necessary SQL queue parameters in the module’s folder [the program’s folder]\plugins\sqldb_pro\

10. Click “OK” and save all changes both in the SQL Database Pro settings window and in the module selection window.

Now each time new data are received, the program will write them to the database.

4.6 Logging additional data from your PBX

PBX Report is a universal solution that supports a wide range of PBX models. By default, the program logs only a limited set of the most necessary data. However, some PBXs can generate a lot more data. For a full list of parser variables for each PBX, please follow this link: <https://www.aggsoft.com/pbx/>.

If you need to log additional data to the database, you can modify the bindings between certain columns and parser variables. Our program creates a table named “PBXDATA” in the database. There are columns FLAG1 ... FLAG7, which may contain different values depending on your PBX model.

In the example below, you can see how to log the additional value “CALL_ID” for Avaya IP Office 500.

ODBC Database

1. Open the module's settings window and switch to the “Binding” tab.
2. Find the column named “FLAG1” in the binding tree.
3. Click the “Parser item name” item and bind it to a different parser variable, “CALL_ID” (Figure 1). If the drop-down list does not contain the variable name, enter that name manually.

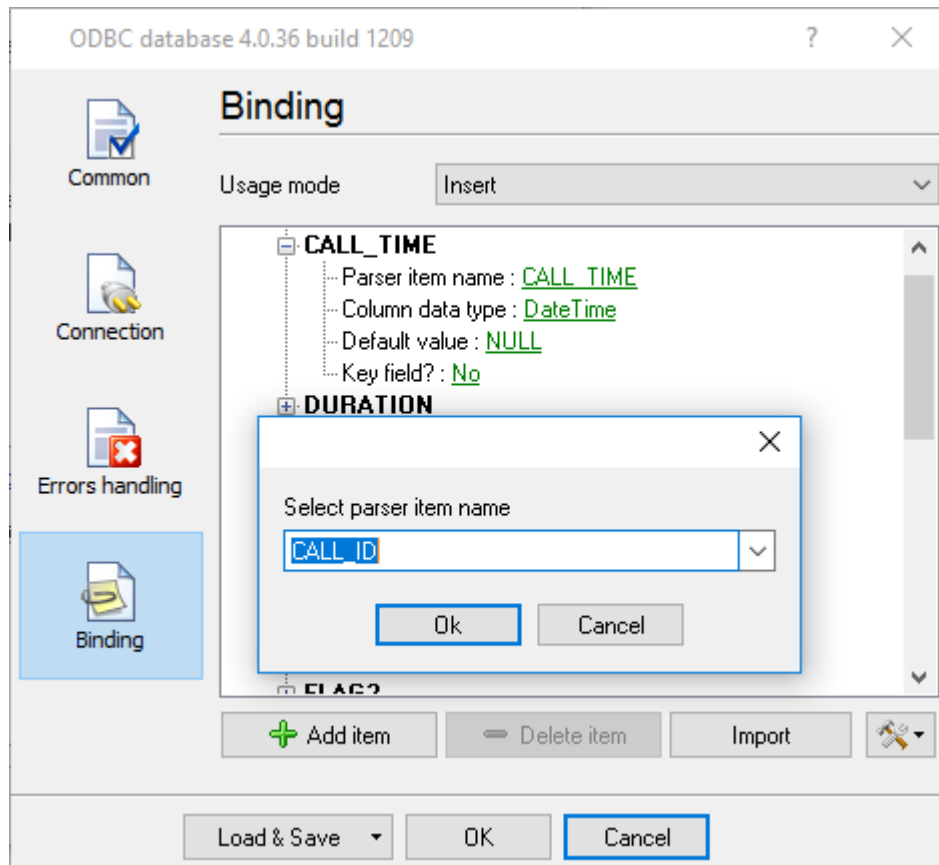


Figure 1. Binding in ODBC Database

SQL Database Pro

You can configure SQL Database Pro in the same way.

1. Open the module's settings window and switch to the “SQL queue” tab.
2. Find the column named “FLAG1” in the binding tree.
3. Click the “Parser item name” value and bind it to a different parser variable, “CALL_ID” (Figure 2). If the drop-down list does not contain the variable name, enter that name manually.

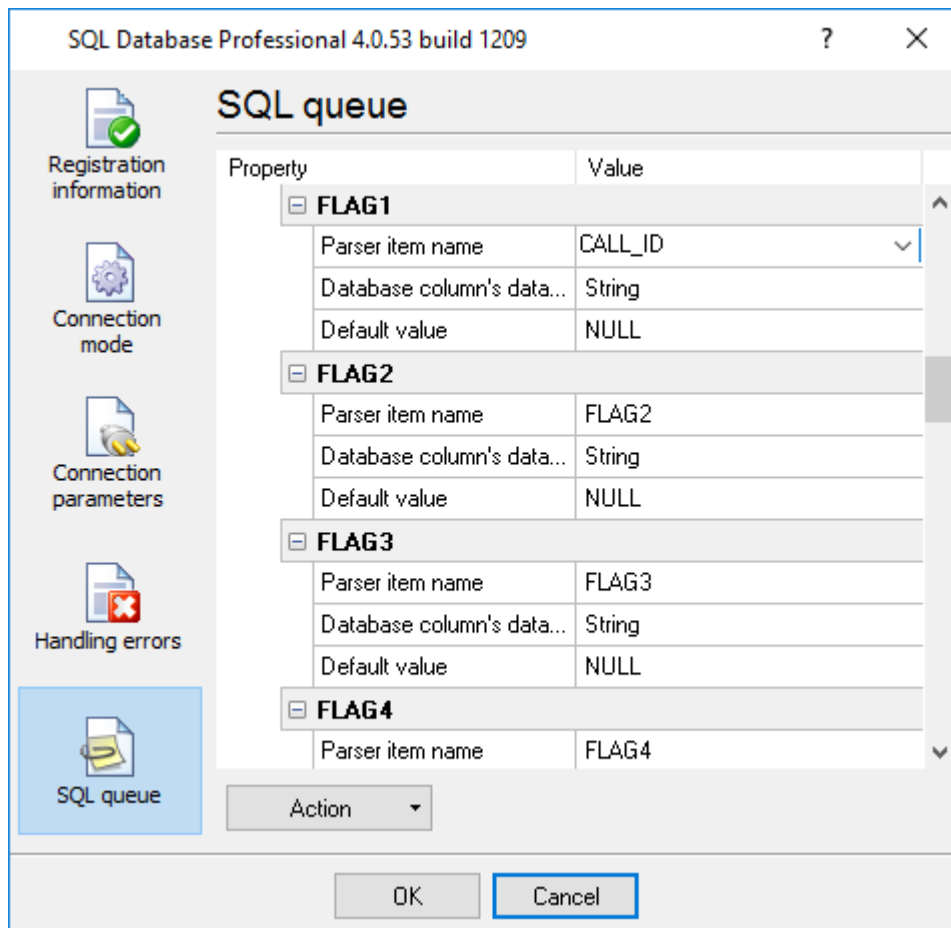


Figure 2. Binding in SQL Database Pro

Note: If the parser does not have the variable you specified, an empty value will be written to the column.

4.7 Possible problems when the program is running as a service

Service does not write data to a database

In Windows Vista or higher, logging to the database works fine if the program runs as an application, but fails if the program runs as a service.

Solution:

The Windows security policy causes such behavior. The service runs with the administrator's full privileges, but an application may be launched with the administrator's limited rights.

1. Run the program with the administrator's full privileges by right-clicking the program's icon and selecting "Run as administrator."
2. Check the program's settings. Possibly, they are different in this mode.

3. Make sure that the program writes data to the database.
 - 3.1 Database authentication may not allow a connection with such privileges.
 - 3.2 The firewall may block the connection to the database.
4. Select the "Main menu → Options → Save settings to INI" option. Then restart the "AdvPBXDataLogger" service in the "Services" control panel.
5. If everything looks fine, but still no data are written to the database, do the following:
 - 5.1. Enable logging of all messages to the program's log file (Figure 1).
 - 5.2. Launch the service.
 - 5.3. Check the log file in the folder "C:\Users\All Users\Advanced PBX Data Logger\pbxlogger.log". The log file may contain error messages, that help to diagnose the problem.

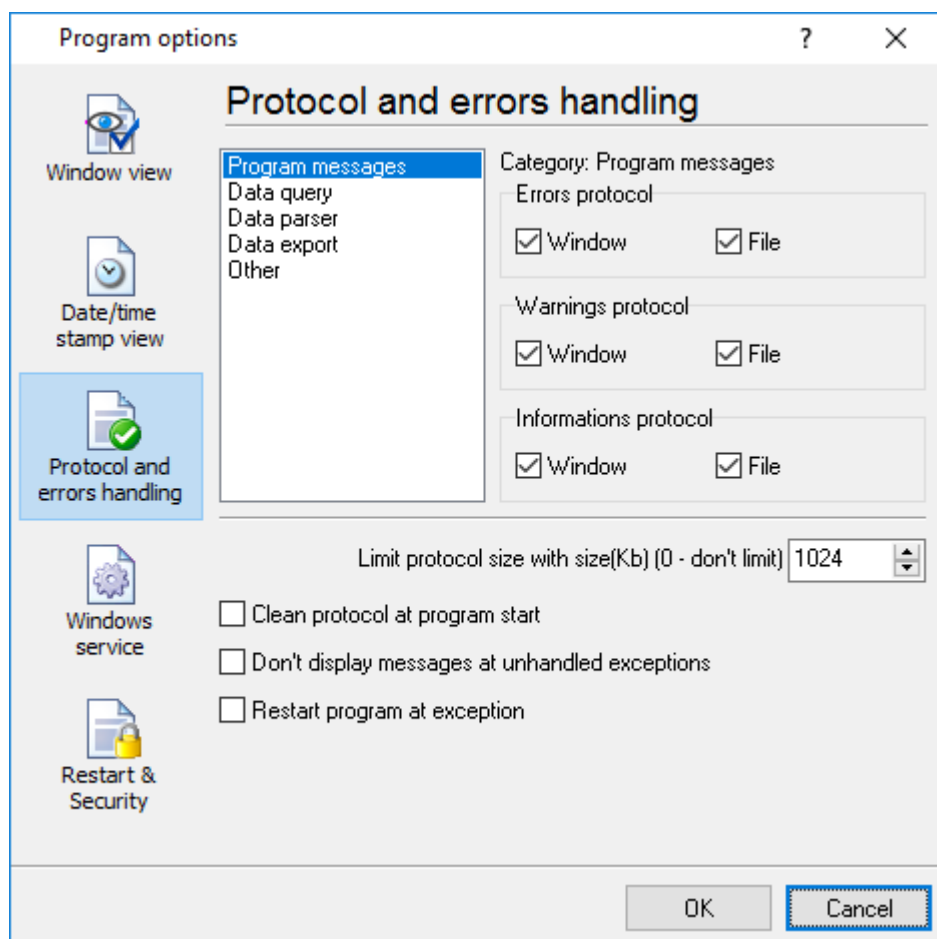


Figure 1. Configuring the program's log file

- 5.4. If you use the "MS Access" database, and you placed a database file (*.mdb) on a network drive, you should move it to a local drive (for example, C:\Logs). That problem occurs because the service does not have access to your network.

5.5. Try to configure the "AdvPBXDataLogger" service to start with your account name in the "Services" control panel.

Service does not write data to a log file

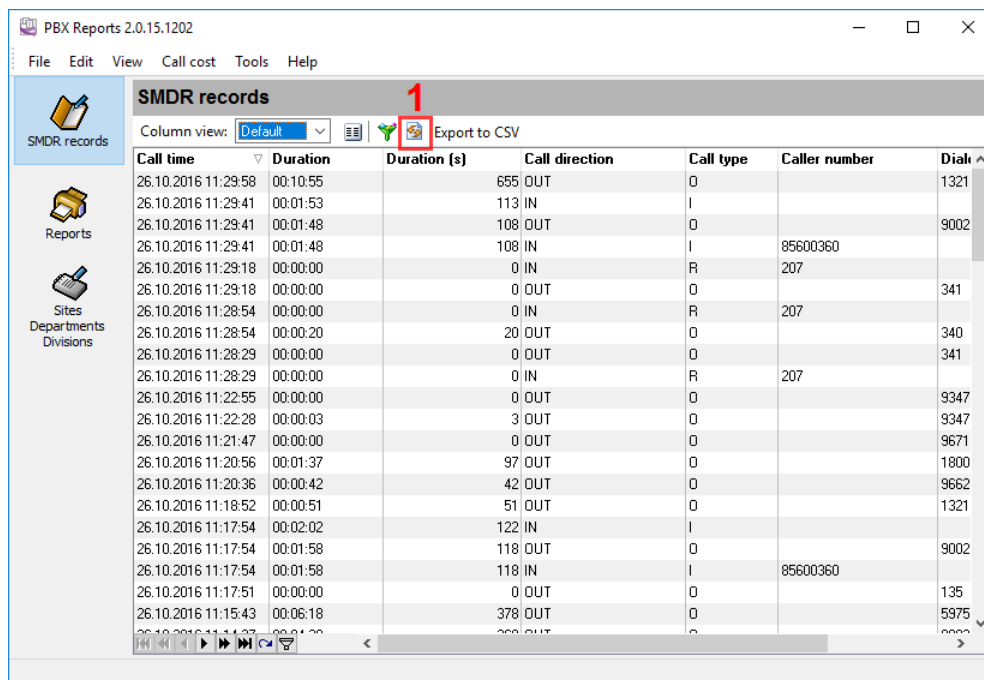
In Windows Vista or higher, logging to a file works fine if the program runs as an application, but fails if the program runs as a service.

Solution:

1. The logger cannot write data to a system, a user's folder or network. That is the system security limitation. You need to select another folder. For example, C:\Logs.
2. You may try the workaround #5.5 above.

4.8 How to view data in PBX Reports

PBX Reports uses the data written to the database by PBX Report. PBX Reports can work only with a MySQL, MS SQL Server, Oracle, or MS Access database. So PBX Report must be configured to write data to a database that is supported. If any data are successfully written, they should appear on the "SMDR records" tab (Figure 1).



Call time	Duration	Duration (s)	Call direction	Call type	Caller number	Dial
26.10.2016 11:29:58	00:10:55		655 OUT	0		1321
26.10.2016 11:29:41	00:01:53		113 IN	I		
26.10.2016 11:29:41	00:01:48		108 OUT	0		9002
26.10.2016 11:29:41	00:01:48		108 IN	I	85600360	
26.10.2016 11:29:18	00:00:00		0 IN	R	207	
26.10.2016 11:29:18	00:00:00		0 OUT	0		341
26.10.2016 11:28:54	00:00:00		0 IN	R	207	
26.10.2016 11:28:54	00:00:20		20 OUT	0		340
26.10.2016 11:28:29	00:00:00		0 OUT	0		341
26.10.2016 11:28:29	00:00:00		0 IN	R	207	
26.10.2016 11:22:55	00:00:00		0 OUT	0		9347
26.10.2016 11:22:28	00:00:03		3 OUT	0		9347
26.10.2016 11:21:47	00:00:00		0 OUT	0		9671
26.10.2016 11:20:56	00:01:37		97 OUT	0		1800
26.10.2016 11:20:36	00:00:42		42 OUT	0		9662
26.10.2016 11:18:52	00:00:51		51 OUT	0		1321
26.10.2016 11:17:54	00:02:02		122 IN	I		
26.10.2016 11:17:54	00:01:58		118 OUT	0		9002
26.10.2016 11:17:54	00:01:58		118 IN	I	85600360	
26.10.2016 11:17:51	00:00:00		0 OUT	0		135
26.10.2016 11:15:43	00:06:18		378 OUT	0		5975
26.10.2016 11:14:23	00:01:20		200 OUT	0		9002

Figure 1. PBX Reports window

PBX Report writes data to the database in real time. To display new data on the "SMDR records" tab, click the Refresh button (see Figure 1).

What to do if I cannot see any data in PBX Reports?

Make sure that PBX Reports connects to the same database as used by PBX Report. To do that, compare the database connection parameters in any data export module of PBX Report (see the previous sections) and in the PBX Reports settings:

1. Select "Edit → Options" in the main menu.
2. Switch to the "Common — Database" tab.
3. Check the connection parameters.