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1 Introduction

1.1 About Accurate Printer Monitor

Printer monitoring is indeed a lot of companies all over the world should invest in. But why is this so? Why is there an imminent need to monitor printing activity? Let us say that you operate a medium-sized enterprise and you have dozens of computers connected to three or four computer networks. With this many computers, your office would inevitably need a lot of working printers at hand, so many that keeping tabs as to printing activity would become fairly difficult to achieve. The task to printer monitor is not really hard if you have software to back you up. This is why you need to have print monitor software in your office.

Another great feature that comes with print monitoring software is that it points out the employees using the printers most often, as well as the number of pages they have been printing off the printers. Now, this goes without saying that there are employees who are just a little bit abusive when it comes to using office equipment and when it comes to printing, there really is no way of knowing who is using what printer for personal use. That is, if you do not have the software. With the software, this is easily carried out because it keeps track of all documents printed as well as the employee who printed them respectively. These reports are then stored inside a built-in database that you can easily access to monitor abusive users.

Our printer monitor also comes with built-in notification capabilities. That is, in the case that anything remarkable is found in any of the printers work that the program is currently monitoring, it could simply send off an email to the human administrator. This saves administrators a lot of tedious labor in looking through many printers, and frees their time for more important and complex administration tasks.

Key features of Accurate Printer Monitor:
- Capability to monitor multiple printers at the same time. Each printer may have fully different monitoring and exporting settings;
- Allows monitor local, remote or network printers;
- Real-time optimized monitoring;
- The program automatically detects when the printer or print server goes offline, and restores monitoring when the printer is online;
- Supports color and monochrome printers;
- Can send notification via email and several other methods;
- Can save printer events to databases MSSQL, MySQL, MS Access, Oracle, Interbase, etc;
- Many modules allow you to filter events and process printer events;
- You can calculate printing cost for each printer, domain or user, paper size or print quality;
- Many reports, which you may save to Adobe PDF or MS Word files;
- The printer monitor can send scheduled reports to administrators;
- Built-in HTTP server allows administrators or users display company or individual reports from remote computers;
- Simple, menu-driven step by step set-up - programming is not required to configure the software to collect data;
- Supporting various operating systems. It runs under all versions starting from Windows 2000, including 32 and 64-bit systems..

Unlike most other printer monitoring applications, Accurate Printer Monitor 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 user logon and logoff the workstation.
It is extremely easy to use! The configuration process is fully menu driven and has complete, context sensitive, on-line help. You can easily customize all input to your exact specifications. Once you see how easy it is to use Accurate Printer Monitor, you will never again take data readings by hand!

**Typical usage**

This software is mainly used in a centralized supervising system of all you printers. With this software, you can monitor printing activity more efficiently, thus preventing the personal use of your printers by your employees. It just cannot be helped; there are times when your own employees would use your printers to print some documents that are not related to work at all.

**Applications examples**

- Printer accounting;
- printer monitoring;
- Printer logging.


### 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).

**PC** - abbreviation for a Personal Computer.

**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.
2 License, Registration and technical support

2.1 License

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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 Accurate Printer Monitor without written permission from the copyright holder.

Licensed Version

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

Registered 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 Accurate Printer Monitor 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.

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.

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

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3 Installation

3.1 System requirements

Windows 2000 Professional - Windows 8.1, including x64 and x86 OS, Workstation and Server OS.

3.2 Installation process

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

Quit of the working Accurate Printer Monitor on installation time.

Run an installation file.

By default, Accurate Printer Monitor will be installed to the directory "/Program Files/Accurate Printer Monitor" of your system disk, but you can change this path.

In the standard distributive of Accurate Printer Monitor are no additional modules files, which you can download from our site.

4 Program use

4.1 Getting started

After you have successfully installed Accurate Printer Monitor, use the following simple steps to configure and run it.

Open the Accurate Printer Monitor 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 [7] (“Options/Program settings...”) and from the menu “File” (fig. 1.1.2) can open an current log-file or clean the data window.

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 printers. The
"Printers" 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 printers data to be parsed and translated.

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 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

Accurate Printer Monitor 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" chapter.

You can watch the data in the data window (fig. 1.1.1). 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" chapter and how to customize program view you can read in the "Window view" 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 Accurate Printer Monitor. Accurate Printer Monitor has many additional modules (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" chapter.

The program and their plug-ins generates many messages and writes they to the list in the main window (fig. 1.1.1) 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" 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.

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\Accurate Printer Monitor

   on Windows x32
   HKEY_LOCAL_MACHINE\SOFTWARE\AGG Software\Accurate Printer Monitor

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 Printer monitor settings
4.6.1.1 Printer monitoring configuration

Creating a list of printers for monitoring

You can create a new configuration with a click on the button with the "+" sign on the toolbar in the main window of the program (fig. 2.7.1) or in the "Options" menu. After you click this button you will see a new dialog box (fig. 2.7.2). This dialog box has several tabs with options. The "Printers" tab is described in this section. The installation software could create the default configuration during the installation of the program. In this case, you can modify the existing configuration by opening it with the help of the corresponding menu.

To be able to monitor several printers at a time, you need to add these printers to the list. If you need to specify different modes for monitoring the printers, you should create several configurations. To do it, repeat the above operation for each configuration. Later you will be able to access every configuration with the help of the drop-down menu next to the "+" button (fig. 2.7.1).

The "Monitor printers" page allows you to define the list of printers to monitor. You should specify the name of your group of printers in the "Printer group name" field on this page. This name will be displayed in the main window of the program.

To add a printer to the list, type the name of the printer in the field and click the "+" button. You can select a printer from the list that contains all local printers.

To add a remote printer, you should specify the name of the remote computer before the name of the printer: \COMPUTER_NAME\PRINTER_NAME, where

COMPUTER_NAME is the name of the remote computer on the local area network. If the printer is not available by its name, you can specify the IP address of the computer instead of COMPUTER_NAME.

PRINTER_NAME is the full printer name. In case of a network printer, you can specify the network...
name specified for this printer instead of its full name.

**Note 1:** to monitor network printers, you need the program to be run as an administrator account. If the remote computer is not located in the domain, an account with administrator permissions, username and password must be added on the remote computer. The program will be run as this account.

**Note 2:** to monitor network printers, you need Windows NT-like operating system to be installed on the remote computer. If Windows 9x is installed on the remote computer, you need to install the program on the remote computer and configure it so that it writes data to the centralized database (for example, MSSQL or MySQL).

**Note 3:** to monitor network printers, you need to have shared printer access enabled. To allow shared printer access for the administrator only, you should add the "$" character to the end of the network printer name. In this case, it will be possible to access the printer only by specifying its name explicitly. This printer will not be seen in the network neighborhood.

The program has several options that ensure printers are constantly monitored:

**Try to reconnect after error** – this option allows you to try to connect the printer to the monitoring system in the specified number of seconds after a connection error occurs. A connection error often
occurs when the printer is disconnected from the computer or switched off.

**Ping remote PC** – this option allows you to check the connection to the remote computer where the network printer is installed by sending special network Ping packets (ICMP ECHO). In case the program does not receive a response from the remote computer after the number of attempts specified in the "Reconnect after failed attempts" field, the program will try to connect to the printer again after the time specified in the "Try to reconnect after error" field (if this option is enabled). A connection error occurs, when the print server is disconnected from the network, when it if switched off or when the connection to the remote computer is broken.

**Additional tools**

You can use the "Tools" button next to the "+" button and the drop-down menu that appears after a click on this button (fig. 2.7.3) to perform the following operations with the list:

![Fig. 2.7.3. Additional tools](image)

- **Load printer list from file** - this menu item allows you to load the list of printer from a text file. Every line in the text file must contain the name of one printer;
- **Append printer list from file** - this item allows you to add printers from a text file to the existing list;
- **Save printer list to file** - this item allows you to save all printers from the list to a text file;
- **Import data from text log files** - this item allows you to import log files created by the program earlier. The data is read from the log file and imported to the database according to the program settings.

**4.6.1.2 Remote client usage**

The remote client is a separate program that is installed on client computers and monitors all local printers on those computers.

**Advantages of using the remote client:**

1. The remote client automatically determines the list of printers on the local computer. It detects when a new printer is added and automatically starts to monitor it;
2. The central data collection server is loaded less because the client takes a large part of monitoring functions upon itself;
3. No need to create the list of all printers on the network;
4. No need to share access to the printer;
5. The network load is decreased because the client groups and compresses data before sending it to the server;
6. No need to create additional configurations in order to monitor printers loaded with work.

**Disadvantages:**

1. It is necessary to install additional software on client computers

For the monitoring program to be able to receive data from remote clients, it is necessary to enable the **"Enable TCP/IP server"** option. The received data will be also displayed in the main window of the program and processed according to the program settings.

If the **"Send monitor settings to remote clients"** option is enabled (fig. 2.7.5), all options from the "Monitor options" page will be automatically sent to remote clients as soon as they are modified on the server software. If this option is disabled, every client can use its own monitor options.

![Configuration options](image)

**Remote client installation**

The client installation software is distributed as a separate installation package in the MSI format. This installation file format makes its installation on client computers considerably easier. In particular, you can do it remotely with the help of the Active Directory services.

It is possible to install the client from the command line specifying the default parameters:
Example:

msiexec /i "C:\PrinterMonitorClient.msi" AGG_INSTALLDESKTOPSHORTCUT="" AGG_DONTINSTALLPROGRAMGROUP="1" /qn

Command line parameters:
/qb – quiet installation with the minimum interface
/qn – quiet installation without any requests
AGG_INSTALLDESKTOPSHORTCUT="1" - create a desktop shortcut
AGG_INSTALLDESKTOPSHORTCUT="" - do not create a desktop shortcut
AGG_DONTINSTALLPROGRAMGROUP="1" - do not create a program group in the "Start" menu
AGG_DONTINSTALLPROGRAMGROUP="" - create a program group in the "Start" menu
AGG_PROGRAMGROUP="Accurate Printer Monitor Client" - create a group in the "Start" menu
with the specified name
WIXUI_INSTALLDIR="C:\Custom Program Folder" - install the program in the specified folder
AGG_SERVER="192.168.0.1" - specify the address of the data collection server the monitoring data
will be sent to

Note: During the installation of the remote client, the installation program will automatically add
exceptions for port 4488 for the remote client in the standard Windows firewall. If some other firewall
is used on client computers, you should allow TCP connections via TCP port 4488.

Remote client configuration

To configure the remote client, you should prepare and apply the program settings on the client
computers. To do it:

1. Install the remote client on one of the computers;
2. Configure the remote client on this computer;
3. Save the client configuration to a file with the ".reg" extension using the "Save and Load - Save
   Settings" button in the remote client configuration window;
4. Copy this file to all client computers using the Active Directory services or other remote
   administration tools.

If you enable the "Send monitor options to remote clients" option (fig. 2.7.5) on the server and install
the client with the AGG_SERVER command line parameter, there is no need to configure the
remote client. You can complete the above steps in case of the detailed configuration of parameters
or if you change the address of the data collection server.

How the remote client works

The program is installed as a Windows service and is automatically run at Windows startup. While
running, the client monitors adding and removing printers. As soon as a new printer is added, the
program automatically starts to monitor events on this printer. When an event occurs on the printer,
the client sends it to the server. When the client receives a configuration update command from the
server, it sets the received settings and saves them to the registry. If the connection to the server is
unsuccessful, the client saves the events to the internal storage. The events saved to the storage will
be sent when the next event occurs, but not earlier than in 10 seconds. The storage can store 1000
events. When the storage is full, the oldest events are permanently deleted from the storage.

The process of how the program works is logged in the file c:\ProgramData\Accurate Printer
4.6.1.3 Remote client installation via Active Directory

You can use the Microsoft Active Directory service to install the remote Accurate Printer Monitor client on a group of computers automatically and remotely. To run the installation procedure, you need to have administrator permissions for the domain on the computers of which you want to install the remote client. Besides, you need to have a network shared folder it is possible to read data from.

1. Save the PrinterMonitorClient.msi package to the network shared folder. For example, \\
SERVER\Install\PrinterMonitorClient.msi.

2. Run the "Active Directory Users and Computers" snap-in. You can do it using the "Start - Programs – Administrative Tools".

3. Create a new Organizational Unit (OU) or select an existing one it is necessary to install the remote computer for. To create a new organizational unit, select the "New - Organizational Unit" item on the "Actions" menu of the snap-in.

4. Move the computer you want to install the remote client on to the selected organizational unit by selecting them and selecting the "Move" item on the "Actions" menu.

5. Open the properties of the selected organizational unit. To do it select the "Properties" item on the context menu of this unit opened with a right click.

6. Switch to the "Group Policy" tab of the organizational unit settings.

7. Create a new Group Policy Object (GPO) by clicking the "New" button. Give any appropriate name to the new object. For example, APMGPO.

8. Switch to editing the group policy object created in the previous step. To do it, select this object and click the "Edit" button.


10. Add the PrinterMonitorClient.msi installation package to the installation software list. To do it, select the "Actions - New - Package:" menu item and type the network path to the PrinterMonitorClient.msi package in the "File name" field of the "Open File" dialog box. For example, \\
SERVER\Install\PrinterMonitorClient.msi. Then you should select the software deployment method. Select "Assigned".

Note: If you need to install the package with parameters, you should create a BAT file and save it together with PrinterMonitorClient.msi in the shared folder. You should specify the necessary command line parameters in the BAT file and add the BAT file to the installation software list instead of the MSI package.

11. Switch to the "Administrative Templates" tab of the group policy object. Select the "Add" item on the template context menu and specify the APMClient.adm file (they are distributed together with Accurate Printer Monitor and are installed in the program folder). The "Accurate Printer Monitor
Accurate Printer Monitor

Client" tab will appear in administrative templates.

Note: Depending on the platform where the client will be installed (x86 or x64), you should install the template APMClientx86.adm or APMClientx64.adm. You can install both templates simultaneously for different groups of clients.

12. Switch to the "Accurate Printer Monitor Client" tab created in the previous step. Disable filtering in the list (the "View / Filtering" item on the context menu). The "Notify servers" option will appear in the list after that.

13. Select the "Notify servers" option. Select the IP address of the server where the Accurate Printer Monitor server is installed in the new dialog box. You can also edit additional options specified in the template. You should at least configure the server address. The client can get all other settings from the server automatically if the corresponding option is enabled.

If you do everything correctly, the next time you restart the computers added to the organizational unit, the Accurate Printer Monitor client will be installed and configured on them.

4.6.1.4 Monitor options

The "Monitor options" page (fig. 2.7.6) allows you to customize the mode the program runs in. By default, the options are configured so that the program logs all events to the database that comes with the program.
Monitor printer events - the program will monitor all events related to the printer: "new job", "task deletion", "no paper", etc.

Monitor print job events - the program will monitor all events related to each print job: "sending to the printer", "printing", "printed", etc.

Error correction

Sometimes, due to the drawbacks in the printer driver or firmware (because the printer is supposed to give information about printed pages), the program receives notifications with invalid data. For example, the number of pages in the document turns out to be less than the number of printed pages. For you to be able to fix these problems, the program has a group of options called "Error correction":

**Add the "Printed" status for finished jobs** - sometimes the program may fail to receive the notification that the print job has been finished. In this case, the data from the printer will not be included in the report that will be generated in the administrative part of the program. If this option is enabled, the program will monitor the status of the print queue and automatically set the "Printed" parameter for finished jobs.

**Total pages < Printed pages** - if an event contains data where the "Total pages" information field
has a value that is less than the one in the "Printed pages" field, the program will automatically set "Total pages" = "Printed pages".

Total pages > Printed pages - the same as previous but the reverse ratio is checked.

4.6.1.5  Connection types

4.6.1.5.1  With print servers

All users in your network neighborhood print on shared printers (printers with shared access) on one print server (\printserver\printer). For example, the following network printers are installed on the John's computer:

Example 1: Accurate Printer Monitor is installed on the central computer or server that is not the print server. For example, \central_computer

Example 2: Accurate Printer Monitor is installed on the print server. For example, \printserver1

Example 1

Install the program on \central_computer as it is described in the "Installation Process" section.

Three print servers on the network are used in this example: printserver1, printserver2 and printserver3. You should add all printers with shared access on all three print servers to the central computer \central_computer where our program is installed.

To do it:

1. Open the Printer Control Panel (Start --> Printers and Faxes or Start --> Control Panel --> Printers and Faxes)

2. Click the "Add a printer" item
3. Select "Network printer"

4. Select "Connect to this printer..." and then click "Next". You will see the list of printers on your network.
5. Printers from two print server ("CHAMPION" and "SERVER") are added in the picture below. Note that the printers in the list have the icon of a network printer.

6. After that, add the newly added printers to the list of monitored printers as it is described in the "Printer monitoring configuration" section. In this case, the names of all printers should be specified without the name of the print server they are located on because they are registered on the central computer.
Example 2

Three print servers on the network are used in this example: printserver1, printserver2 and printserver3. But Accurate Printer Monitor will be installed on the print server computer \printserver1.

1. Install the program on \printserver1 as it is described in the "Installation Process" section.

2. Add the printers with shared access from printserver2 and printserver3 to \printserver1 where the program is installed. To do it, repeat steps 1-5 from "Example 1". In this case, the printers located on printserver2 and printserver3 will have the icon of a network printer, while the printers from \printserver1 will have the icon of a local printer.

3. After that, add the newly added printers to the list of monitored printers as it is described in the "Printer monitoring configuration" section. In this case, the names of all printers should be specified without the name of the print server they are located on because they are registered on the \printserver1 computer.

4.6.1.5.2 Without print servers

You use no print servers in your network neighborhood. Users send print job to printers directly by their IP addresses or to printers that are connected locally to workstations via USB, LPT, etc. instead of printing on the print server (for example, \printserver\shared_printer).

Suppose, there are two printers connected to the John's workstation: a network one that is accessed by its IP address (for example, HP LaserJet 8150 Series PCL6) and a local one (Epson FX-1180) that is connected via a USB cable (fig. 2.7.7). Note that both printers have the icon of a locally connected printer.

![Fig. 2.7.7. Local printers](image)

Suppose Accurate Printer Monitor is installed on the central computer named \centralcomputer.
1. Enable the TCP server mode in Accurate Printer Monitor as it is described in the “Remote client usage” section for the program to be able to receive data from remote clients.

2. Install the remote client on the John’s computer as it is described in the “Remote client usage” section. Configure the remote client on the John’s computer to send data to the central computer \centralcomputer by specifying its IP address.

3. Once started, the remote client automatically gets the list of all local printers and monitors them. If new local printers are added while the client is running, the client will automatically add them to the list of monitored printers. By default, the remote client is installed as a Windows service and runs in the background mode.

4. If printers on John’s computer have shared access and other users who have no locally connected printers print on these printers, there is no need to install the remote client on those computers. The client on John’s computer will monitor the names of the users who print on the printers and their location.

4.6.1.5.3 Network printers

It is necessary to differentiate between two types of network printers:

1. Users access the printer directly by its IP address. If you have no central print server, you should install the remote client on all computers it is possible to print on this printer from. To make it easier to configure and maintain the system, it is recommended to:

   1. Register this printer on the central computer where Accurate Printer Monitor is installed or on the user computer where the remote client is installed.
   2. Enable shared access to it.
   3. All users must print via the printer shared access is enabled for.

2. The printer is locally connected to one of the network computers and shared access to it is enabled. In this case, you should install the remote client on the computer this printer is locally connected to. It will be enough to monitor all print jobs from all users. The program will log who and from which workstation prints.

4.6.1.5.4 Mixed connection type

Users in your network neighborhood can print both on printers with shared access enabled on the print server (for example, \printserver\printer) and on local printers connected directly to a workstation via such interfaces as IP, USB, LPT, etc.

This case is the combination of the cases “With print servers” and “Without print servers”. In this case, Accurate Printer Monitor must be installed on the central computer or print server while the remote client must be installed on other print servers and also on computers local printers are connected to.
Problem: The flag (1) appears in the “Color” field when the black-and-white printer is monitored.

Solution: It is possible to select color or black-and-white printing in the properties of some printers even though they are black-and-white. If the black-and-white printing is selected, black-and-white data is sent to the printer and the program logs it. If the default value is used, it is necessary to check the printer properties.

Problem: Everything is okay with one printer. It processes ten printers alright. When I add printers, the program stops logging after I add some printer. Maybe it is somehow related to the network load?

Solution: The program fails to monitor events for all printers due to the high frequency of events. It is necessary to divide printers into groups and create several configurations (the button with the green plus sign in the main window of the program). One configuration for one group. In this case, the program will create a separate thread for monitoring events occurring in each group of printers, which will speed up the program in case there are a lot of printers. You can clone the existing configuration using the drop-down menu next to the button for adding a new configuration to quickly copy the data export settings. You can also install the remote client on every workstation.

Problem: The program is installed on the server, it writes everything to the database. Printers that have shared access on a dedicated print server are monitored. It is necessary to monitor printers connected locally to an employee's computer and having no shared access. How to do it?

Solution: It is necessary to share the printer anyway, but you should specify the "$" character at the end of the network name. In this case, the printer will not be seen for other users, but the program will be able to monitor it. Or you can install the remote client on this computer.

Problem: The program is configured as a service and there is no program window on the desktop. When I try to run the program using the desktop shortcut, I get the message that the instance of the program is already running. How do I change the program settings?

Solution: Stop the Accurate Printer Monitor service from the Control Panel. Run the program using the desktop shortcut. Change the necessary settings. Close the program and start the service again.

Problem: It is impossible to get the contents of print jobs for viewing in the PDF format.

Solution: The following two situations are possible:

1. Make sure that the file ####.spl appears during printing. Where #### is a number (for example, 00002.spl) in the print job content folder you created in the program settings. The default folder is C:\Users\All Users\Accurate Printer Monitor\spool\. If there are files that look like FP####, follow the instruction below to disable “Spool File Pooling” on the print server and try printing again.
The “Spool file pooling” option is disabled by default on a print server running under Windows 2000.

On a print server running under Windows XP / Windows Vista / Windows 7:

- Click the "Start" button, then click "Run", type regedit in the input field and click OK.
- Find the following registry key where <printername> is the name of your printer:
  
  HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Print\Printers\<printername>
  
- Right-click the SpoolDirectory value in the right panel and select "Edit".
- Copy the DefaultSpoolDirectory value from HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Print\Printers to the input field (for example, c:\windows\system32\spool\printers)
- Repeat steps 2 to 4 for other printers.
- Close the registry editor.
- Restart the "Print Spooler" service in the Control Panel (Control Panel --> Administrative Tools --> Services)

On a print server running under Windows 2003 / Windows 2008:

- Click the "Start" button, then click "Run", type regedit in the input field and click OK.
- Find the following registry key where <printername> is the name of your printer:
  
  HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\Print
  
- Select "New" on the "Edit" menu and then select "DWORD parameter".
- Type "DisableServerFilePooling" in the first input field and press ENTER.
- Right-click the DisableServerFilePooling value in the right panel and select "Edit".
- Type 1 in the value input field to disable ”spool file pooling” and then click OK.
- Close the registry editor.
- Restart the "Print Spooler" service in the Control Panel (Control Panel --> Administrative Tools --> Services)

2. The program does not support the format of the current printer driver

In this case, the program cannot convert the print job image file into the readable PDF format. To solve this problem, try one of the following options:

2.1. Disable the "Enable Advanced Printing" option on the "Advanced" tab in the printer properties.
2.2. If variant 2.1 does not help, enable the "Enable Advanced Printing" option, but change the data type from RAW into NT EMF 1.008 in the "Print Processor" properties.
2.3. If variant 2.2. does not work, try using another printer driver (for example, the Postscript printer driver or the PCL printer driver), and then repeat 2.1 and 2.2.

4.6.1.7 Database structure

You can select the option of preparing a database during the installation of the program. A database with the following structure is created in this case (a MySQL sample database). Anyway, scripts for creating a database are added to the data folder in the program folder (one file for every database type).

**PM_EVENTS**

This table contains all data by received events. Reports will be based on this data.

<table>
<thead>
<tr>
<th>Column name</th>
<th>Data type</th>
<th>Size</th>
<th>Can not be empty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE_ID</td>
<td>INTEGER</td>
<td>10</td>
<td>✓</td>
<td>Unique event identifier</td>
</tr>
<tr>
<td>PE_DATE1</td>
<td>DATE</td>
<td>0</td>
<td>✓</td>
<td>Event date and time</td>
</tr>
<tr>
<td>PE_CLASS</td>
<td>VARCHAR</td>
<td>20</td>
<td>✓</td>
<td>Event class: JOB – print job, PRINTER - printer</td>
</tr>
<tr>
<td>PE_PRINTER</td>
<td>VARCHAR</td>
<td>80</td>
<td>✓</td>
<td>Printer name (network printer name)</td>
</tr>
<tr>
<td>PE_PRINTER_NAME</td>
<td>VARCHAR</td>
<td>80</td>
<td></td>
<td>Full printer name (network printer name)</td>
</tr>
<tr>
<td>Field</td>
<td>Type</td>
<td>Length</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-----------</td>
<td>--------</td>
<td>------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>PE_MACHINE_NAME</td>
<td>VARCHAR</td>
<td>50</td>
<td>The name of the computer where the printer is located</td>
<td></td>
</tr>
<tr>
<td>PE_PRINTER_ID</td>
<td>INTEGER</td>
<td>11</td>
<td>Printer identifier from the PM_PRINTERS table. Updated when reports are printed.</td>
<td></td>
</tr>
<tr>
<td>PE_USER_NAME</td>
<td>VARCHAR</td>
<td>50</td>
<td>The name of the user who added the print job</td>
<td></td>
</tr>
<tr>
<td>PE_STATUS_FLAGS</td>
<td>INTEGER</td>
<td>11</td>
<td>Print job flags. The number is a bitwise mask</td>
<td></td>
</tr>
<tr>
<td>PE_STATUS</td>
<td>VARCHAR</td>
<td>80</td>
<td>The PE_STATUS_FLAGS field translated into a string</td>
<td></td>
</tr>
<tr>
<td>PE_DOCUMENT</td>
<td>VARCHAR</td>
<td>12</td>
<td>Printed document name</td>
<td></td>
</tr>
<tr>
<td>PE_SUBMITTED_DATE</td>
<td>DATE_TIME</td>
<td>0</td>
<td>Date and time when the document was sent to the printer</td>
<td></td>
</tr>
<tr>
<td>PE_TOTAL_PAGES</td>
<td>INTEGER</td>
<td>11</td>
<td>Total number of pages in the document</td>
<td></td>
</tr>
<tr>
<td>PE_PAGES_PRINTED</td>
<td>INTEGER</td>
<td>11</td>
<td>Printed pages</td>
<td></td>
</tr>
<tr>
<td>PE_SERVER_NAME</td>
<td>VARCHAR</td>
<td>50</td>
<td>Contains the name of the computer where the printer is located for events of the &quot;PRINTER&quot; type</td>
<td></td>
</tr>
<tr>
<td>PE_SHARE_NAME</td>
<td>VARCHAR</td>
<td>50</td>
<td>Contains the network printer name for events of the &quot;PRINTER&quot; type</td>
<td></td>
</tr>
<tr>
<td>PE_COMMENT</td>
<td>VARCHAR</td>
<td>50</td>
<td>Comments</td>
<td></td>
</tr>
<tr>
<td>PE_LOCATION</td>
<td>VARCHAR</td>
<td>50</td>
<td>Printer location</td>
<td></td>
</tr>
<tr>
<td>PE_SEPFILE</td>
<td>VARCHAR</td>
<td>50</td>
<td>The name of the file that was used to create a page separating print jobs</td>
<td></td>
</tr>
<tr>
<td>PE_PRINT_PROCESSOR</td>
<td>VARCHAR</td>
<td>50</td>
<td>Print processor type: EMF, RAW or TEXT</td>
<td></td>
</tr>
<tr>
<td>PE_PARAMETERS</td>
<td>VARCHAR</td>
<td>50</td>
<td>Print processor parameters</td>
<td></td>
</tr>
<tr>
<td>PE_DATATYPE</td>
<td>VARCHAR</td>
<td>50</td>
<td>Data type used to write print jobs</td>
<td></td>
</tr>
<tr>
<td>PE_ATTRIBUTES</td>
<td>VARCHAR</td>
<td>12</td>
<td>Printer properties</td>
<td></td>
</tr>
<tr>
<td>PE_PRIORITY</td>
<td>VARCHAR</td>
<td>15</td>
<td>Print job priority in the queue</td>
<td></td>
</tr>
<tr>
<td>PE_DEFAULT_PRIORITY</td>
<td>VARCHAR</td>
<td>15</td>
<td>Default priority</td>
<td></td>
</tr>
<tr>
<td>PE_START_TIME</td>
<td>DATE_TIME</td>
<td>0</td>
<td>Date and time the print job must not be printed earlier</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Type</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_UNTIL_TIME</td>
<td>DATE</td>
<td>Date and time the print job must not be printed later</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_STATUS_STRING</td>
<td>VARCHAR</td>
<td>Print job status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_CJOBS</td>
<td>INTEGER</td>
<td>Number of print jobs at the printer at the moment when the event occurred</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_AVERAGE_E_PPM</td>
<td>INTEGER</td>
<td>Average number of pages per minute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_NOTIFY_NAME</td>
<td>VARCHAR</td>
<td>The name of the user who must be notified when a job is finished or an error occurs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_DRIVER_NAME</td>
<td>VARCHAR</td>
<td>Printer driver name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_POSITION</td>
<td>INTEGER</td>
<td>Print job position in the queue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_TIME</td>
<td>INTEGER</td>
<td>Seconds after the moment the printing was started</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_TOTAL_BYTES</td>
<td>INTEGER</td>
<td>Bytes sent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_BYTES_PRINTED</td>
<td>INTEGER</td>
<td>Bytes printed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_PAPERSIZE_TYPE</td>
<td>INTEGER</td>
<td>Paper type amount</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_PAPERSIZE</td>
<td>VARCHAR</td>
<td>Paper type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_PAPERLENGTH</td>
<td>INTEGER</td>
<td>Paper length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_PAPERWIDTH</td>
<td>INTEGER</td>
<td>Paper width</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_COPIES</td>
<td>INTEGER</td>
<td>Copies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_PRINTQUALITY</td>
<td>VARCHAR</td>
<td>Print quality (DPI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_COLOR</td>
<td>INTEGER</td>
<td>Color printing flag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_ORIENTATION</td>
<td>VARCHAR</td>
<td>Page orientation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_DUPLEX</td>
<td>INTEGER</td>
<td>Duplex printing flag</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_MEDIA_TYPE</td>
<td>VARCHAR</td>
<td>Paper type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PE_SHEETS_PRINTED</td>
<td>INTEGER</td>
<td>Sheets printed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**PM_PRICES**

The table contains the description of print cost for printers

<table>
<thead>
<tr>
<th>Column name</th>
<th>Data type</th>
<th>Size</th>
<th>Cannot be empty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPR_ID</td>
<td>INTEGRER</td>
<td>10</td>
<td>✓</td>
<td>Unique price identifier</td>
</tr>
<tr>
<td>PPR_PRINT_ID</td>
<td>INTEGRER</td>
<td>11</td>
<td>✓</td>
<td>Unique printer identifier</td>
</tr>
<tr>
<td>PPR_DATE1</td>
<td>DATE TIME</td>
<td>0</td>
<td>✓</td>
<td>Price activation date</td>
</tr>
<tr>
<td>PPR_DATE2</td>
<td>DATE TIME</td>
<td>0</td>
<td></td>
<td>Price expiration date</td>
</tr>
<tr>
<td>PPR_PAPER_SIZE</td>
<td>INTEGRER</td>
<td>11</td>
<td></td>
<td>Paper size</td>
</tr>
<tr>
<td>PPR_PRINT_QUALITY</td>
<td>VARCHAR</td>
<td>20</td>
<td></td>
<td>Print quality</td>
</tr>
<tr>
<td>PPR_COST_BW</td>
<td>FLOAT</td>
<td>0</td>
<td></td>
<td>Black-and-white printing price</td>
</tr>
<tr>
<td>PPR_COST_COLOR</td>
<td>FLOAT</td>
<td>0</td>
<td></td>
<td>Color printing price</td>
</tr>
<tr>
<td>PPR_CURR</td>
<td>VARCHAR</td>
<td>20</td>
<td></td>
<td>Currency</td>
</tr>
</tbody>
</table>

**PM_PRINTERS**

The table contains printer descriptions

<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Size</th>
<th>Cannot be empty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP_ID</td>
<td>INTEGRER</td>
<td>10</td>
<td>✓</td>
<td>Unique printer identifier</td>
</tr>
<tr>
<td>PP_HOST</td>
<td>VARCHAR</td>
<td>80</td>
<td></td>
<td>Computer name</td>
</tr>
<tr>
<td>PP_NAME</td>
<td>VARCHAR</td>
<td>80</td>
<td></td>
<td>Printer name</td>
</tr>
<tr>
<td>PP_DESC</td>
<td>VARCHAR</td>
<td>12</td>
<td>8</td>
<td>Printer description</td>
</tr>
<tr>
<td>PP_DATE</td>
<td>DATE TIME</td>
<td>0</td>
<td></td>
<td>Printer addition date</td>
</tr>
</tbody>
</table>
### PM_USERS

The table contains the description of built-in web server users

<table>
<thead>
<tr>
<th>Name</th>
<th>Data type</th>
<th>Size</th>
<th>Cannot be empty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU_ID</td>
<td>INTEGER</td>
<td>10</td>
<td>✓</td>
<td>Unique user identifier</td>
</tr>
<tr>
<td>PU_LOGIN</td>
<td>VARCHAR</td>
<td>50</td>
<td>✓</td>
<td>Username</td>
</tr>
<tr>
<td>PU_PASS</td>
<td>VARCHAR</td>
<td>50</td>
<td></td>
<td>Password</td>
</tr>
<tr>
<td>PU_DATE</td>
<td>DATE_TIME</td>
<td>0</td>
<td></td>
<td>Updated user date</td>
</tr>
<tr>
<td>PU_ALLOW_LOGIN</td>
<td>BIT</td>
<td>1</td>
<td>✓</td>
<td>Allow authentication</td>
</tr>
<tr>
<td>PU_ALLOW_FAV</td>
<td>BIT</td>
<td>1</td>
<td>✓</td>
<td>Allow favorite reports</td>
</tr>
<tr>
<td>PU_ALLOW_CUST</td>
<td>BIT</td>
<td>1</td>
<td>✓</td>
<td>Allow random reports</td>
</tr>
<tr>
<td>PU_ALL_DATA</td>
<td>BIT</td>
<td>1</td>
<td>✓</td>
<td>Access to data for all users</td>
</tr>
</tbody>
</table>
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.


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.

4.6.2.2 **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.

**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 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

### 4.6.2.3 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.

**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.
Fig. 3.3.1. Name and security
4.6.3 Log files

4.6.3.1 Log rotation

The main function of Accurate Printer Monitor 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).

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
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](#) 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.

### 4.6.3.2 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 Accurate Printer Monitor 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).
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.

### 4.6.3.3 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.

![Configuration options](Fig. 4.3.1 Log deletion)

4.6.4 Modules

4.6.4.1 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.

Accurate Printer Monitor supports few types of modules (fig. 5.1.1 - 5.1.3):

- **Data filter** - data filters allow you to filter your data and modify values of parser variables;
- **Data export** (fig.11) - Accurate Printer Monitor 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 Accurate Printer Monitor 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.

![Fig. 5.1.1. Activating plug-ins](image-url)
### Fig. 5.1.2 Activating data export plug-ins

#### Data export

**Select data export modules**

<table>
<thead>
<tr>
<th>Module name</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDE Server (ddevsrv.dll)</td>
<td>4.0.29.1103</td>
</tr>
<tr>
<td>CPC server (builtin.dll)</td>
<td>3.2.0.6</td>
</tr>
</tbody>
</table>

**Download plugin now**

**Redirect data to another configuration**

<table>
<thead>
<tr>
<th>Configuration</th>
</tr>
</thead>
</table>

**Buttons:**
- OK
- Cancel
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 Accurate Printer Monitor 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\Accurate Printer Monitor\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't 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.

4.6.4.2  OPC server

Since the version 2.1.1 Accurate Printer Monitor has an internal OPC server. It means, that any
OPC compatible client application can get data from Accurate Printer Monitor 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).

![Fig. 5.2.1 OPC server parameters](image1)

Accurate Printer Monitor 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.
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.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>InWorking</td>
<td>1480355216</td>
</tr>
<tr>
<td>LastError</td>
<td></td>
</tr>
<tr>
<td>LastWarning</td>
<td></td>
</tr>
<tr>
<td>LastMessage</td>
<td></td>
</tr>
<tr>
<td>PreviousLogFile</td>
<td></td>
</tr>
<tr>
<td>CurrentLogFile</td>
<td></td>
</tr>
<tr>
<td>LastDataBlock</td>
<td></td>
</tr>
<tr>
<td>DataSourceID</td>
<td>0</td>
</tr>
</tbody>
</table>

Fig. 5.2.2 OPC server active items
Fig. 5.2.3 OPC server clients

Accurate Printer Monitor creates new variables at "on-the-fly" mode. The Accurate Printer Monitor 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 you can pre-define all variables (fig.5.2.4). In this case the OPC server will create these variables with empty values, immediate after starting and your OPC client will get these names while connecting.
### 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). You can access this tab through the "Options -> Program options" menu item in the main window.
You can set following parameters:

- **Start in minimized state** - at start Accurate Printer Monitor will automatically put its icon on panel near clock (SysTray fig. 6.1.2);
- **Minimize to SysTray** - while the main window of Accurate Printer Monitor 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 decrease 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.
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.

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 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 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.
Accurate Printer Monitor 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 rights.*
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:

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.
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 Accurate Printer Monitor in the "Program depends on services" window (fig. 6.4.3).

In some case you need to start Accurate Printer Monitor before starting other services. In this case you should:

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

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).

![Services Window](image)

**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: `printermonsrv.exe` and `printemon.exe` (fig. 6.4.5). The `printermonsrv.exe` application makes interface between the service manager and the Accurate Printer Monitor software. Unlike `srvany.exe` utility, our service stops safely.
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 printermonsrv.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
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.
5 Administration and reports

5.1 First launch

The Accurate Printer Monitor 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;
- **Administration 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 Accurate Printer Monitor, 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...").

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 data to the database.

**Step 2.** Make the list of printers you will monitor.

**Step 3.** Specify the print costs for the printers if you want to calculate it.

**Step 4.** Create the list of your favorite reports on the "Reports" tab.

**Step 5.** Customize the program options. Particularly, enable the built-in HTTP server 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
5.2 General information

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

<table>
<thead>
<tr>
<th>Host or IP</th>
<th>Printer name</th>
<th>Printer description</th>
<th>Added date/time</th>
<th>Active</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*</td>
<td>Any printer</td>
<td>30.12.2001 14:58:37</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>*</td>
<td>EPSON Stylus Photo RX680</td>
<td>31.12.2002 10:30:26</td>
<td>✔️</td>
</tr>
<tr>
<td></td>
<td>*</td>
<td>Adobe PDF</td>
<td>03.01.2003 12:30:25</td>
<td>✔️</td>
</tr>
</tbody>
</table>

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

**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**
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.

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.

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
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.

5.3 Creating the printer list

The printer list is necessary for the program to follow expenses on printing and to calculate its cost.

To create the list of printer for monitoring, select the "Printers" page on the navigation bar (fig.7).

You should create your printer list in the upper table and specify the cost of printing for each of them in the lower table. The program can offer you several ways to speed up the process of creating the list.

Printer list

If the logger configured earlier has already been collecting data for some time, you can create the printer list by importing this information from the event table. To do it, click the button on the toolbar. Select the printers you want to add in the new dialog box (fig.8). The printers already added...
If you are going to take the cost of printing into account, it is recommended to specify the default cost for the selected printers. To do it, click the link in the hint and specify the cost of printing color and black-and-white pages in the new dialog box (fig.9). It will rid you of the routine compiling a large list of printers. The default cost will be used for any page size and print type until you specify additional conditions. You will be able to add and change the cost of printing for each printer later.
After you select printers in the list, you should click the "Add" button. The selected printers will be added to the table and the default cost will be added for each printer.

**Printer list optimization**

If you have several printers of one type installed on several print servers and the print cost is the same on all of them, you can considerably reduce the printer list using the special mask character "*".

**Example**: The "Adobe PDF" virtual printer is installed on all office computers. Printing on it does not cost anything. To avoid specifying this printer for each computer, just set the value in the "Host or IP" field to "*" and set the cost of printing for this printer to 0 (fig.7). Now the program will automatically use this value for the Adobe PDF printer on every computer.

**Example 2**: The printers "Epson Stylus Photo RX600" and "Epson Stylus Photo RX500" are installed on the print server PRN1 and PRN2. They can print only A4 pages. The cost of printing is the same on both computers. So it is enough to add an entry to the printer list where:

1. Host or IP is set to PRN*
2. Printer name is set to Epson Stylus Photo RX*

**Specifying the print cost**

If the printer is used to print only black-and-white documents on paper of one format, you can use
the default cost. If the printer can print various documents like most inkjet printer, it is recommended to specify the cost for various types of documents in order to calculate the cost of printing more precisely.

To specify the cost of printing, select the necessary printer in the upper table (fig. 7) and specify one or more costs for different print options (fig. 10)

<table>
<thead>
<tr>
<th>Start date</th>
<th>End date</th>
<th>Paper size</th>
<th>Print</th>
<th>Price for BW</th>
<th>Price for color</th>
<th>Currency</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.01.2000</td>
<td>Any</td>
<td>Any</td>
<td>&lt;2000 dpi</td>
<td>0.01</td>
<td>0.11 USD</td>
<td>0.02 USD</td>
</tr>
<tr>
<td>01.01.2000</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>0.011</td>
<td>0.022 USD</td>
<td></td>
</tr>
</tbody>
</table>

Fig.10 Print cost

1. The start date when the cost becomes active is specified in the “Start date” field;
2. The end date when the cost becomes inactive is specified in the “End date” field; If the terms are not defined for this cost, you can leave this field empty;
3. Select the paper type from the list in the “Paper size” field;
4. Select the print quality in the “Print quality” field. Quality > 2000 dpi corresponds to photo-quality printing;
5. Specify the cost of one black-and-white page in the “Price for BW” field;
6. Specify the cost of one color page in the “Price for color” field;
7. Specify the currency in the “Currency” field.

The program searches through all active costs. It selects the most appropriate print cost for each separate print job.

If you need to specify a print cost for several printers in the list, the program offers you a comfortable way to do it. Select the necessary printers in the table and click the toolbar button. You will see the “Add cost” dialog box (fig. 11).
You should specify the same print parameters as in the table above. After you click the "Add" button, the program will add the specified print cost for all selected printer.

If there is already the print cost with the same parameters (page size and print quality), the program will automatically set the end date for the old cost.

If you enable the "Update existing cost" option, the program will just replace the old print cost with the same parameters. It may be useful if you do not want to keep the history of changes in the print cost.
5.4 Event log

The event 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.

The table contains more than 40 columns with parameters characterizing this or that event. You will find it comfortable if you create several column sets.

The "Event class" column shows the event type.

**JOB** – if the row in the table is of this type, it describes the status of a print job. The table may contain several rows for one job that are generated when one or several job parameters change (for example, its status).

**PRINTER** – if the row in the table is of this type, it describes the status of a printer. A new row is generated in the log when one or several parameters change, for example, the printer status.

The purpose of the rest of the rows is clear from their headers.

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. 13). Select the "Edit - Preferences..." in the main menu and switch to the "Database" page to open this dialog box.
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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.

5.5 Reports

The program does not contain preset reports and 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.
**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**

1. Detailed – a detailed report by events. It contains the main information about events. If you select this report type, the other options are disabled;
2. Detailed (columns from Events page) – the same as the previous report, but the report contains the data that are currently displayed in the table on the "Events" page. This way you can include only the data that you want to view in the report;
3. Bytes printed – the report with data about the number of bytes sent to the printer;
4. Pages printed – the report about the printed pages;
5. Bytes and pages printed – this report contains the number of both printed bytes and printed pages;
6. Pages printed + cost – the same as #4, but the print cost is calculated. The print cost calculation considerably influences how fast the report is built;
7. Bytes and pages printed + cost – the same as #5, but the print cost is calculated.

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

**Show as** - allows you to select the report view.
Accurate Printer Monitor

- 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. 15).
Administration and reports

Fig. 15 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.

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: 

5.6 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. 16).

![Scheduled reports configuration](image)

**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 message with attached report files will be sent to. You can specify several addresses separating them with a semicolon.

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](#) 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. 17).

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: youname@yourserver.com;
- **Password** – SMTP server password that usually coincides with the mailbox password.
5.7 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. 16).

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.18).

There are two users shown in fig.18.

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.
5.8 Window view

You can specify the following settings on the "Window view" tab (fig.19):

- **Minimize at startup** – once launched, the main window of Accurate Printer Monitor 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 Accurate Printer Monitor 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 or Windows XP. The leftmost position is the normal window view, the rightmost position is the maximal transparency.
5.9 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.20). The log file is located in the Application Data folder, its name is the same as the program name + the .log extension.

Accurate Printer Monitor 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.
5.10 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.21). 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.21 Database connection settings

![Database Connection Settings](image)

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 и ODBC – DSN configured in the “ODBC administrator” or the complete description of the data source with parameters supported by the selected server. Below you can see a sample record for the Informix server:
  
  SERVICE=ids_srv;HOST=yourhost;PROTOCOL=OLSOCTCP;SERVER=ids_srv;
  DATABASE=sysmaster;UID=informix;PWD=informix.

- Interbase – the path to the necessary database and the network protocol (see the table below).
Oracle – host name/service name.
MySQL, MS SQL Server 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.

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

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTOCOMMIT</td>
<td>Use autocommit</td>
<td></td>
</tr>
<tr>
<td>APPLICATION NAME</td>
<td>The name of the application that will be sent to the server</td>
<td>Only for MSSQL and Sybase</td>
</tr>
<tr>
<td>HOST NAME</td>
<td>The name of the workstation that will be sent to the server</td>
<td>Only for MSSQL and Sybase</td>
</tr>
<tr>
<td>COMMAND TIMEOUT</td>
<td>The number of seconds to wait until any operation is finished</td>
<td>Only for MSSQL, ODBC, SQLBase, Sybase</td>
</tr>
<tr>
<td>COMPRESSED PROTOCOL</td>
<td>Use compression while exchanging data between the client and the server. By default, the value is TRUE</td>
<td>Only for MySQL</td>
</tr>
<tr>
<td>ENABLE BCD</td>
<td>Change the NUMERIC data type into the BCD data type before sending data to the server</td>
<td>Only for Oracle, Interbase</td>
</tr>
<tr>
<td>ENABLE INTEGERS</td>
<td>Change the NUMERIC data type into the INTEGER data type before sending data to the server</td>
<td>Only for Oracle, Interbase</td>
</tr>
<tr>
<td>ENABLE MONEY</td>
<td>Change the NUMERIC data type into the CURRENCY data type with the precision</td>
<td>Only for MySQL</td>
</tr>
<tr>
<td>Configuration Item</td>
<td>Description</td>
<td>Compatibility</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------</td>
<td>---------------</td>
</tr>
<tr>
<td>** ENCRYPTION **</td>
<td>Use encrypted passwords when accessing the database. By default, this value is FALSE.</td>
<td>Only for Sybase</td>
</tr>
<tr>
<td>** FIELD REQUIRED **</td>
<td>Display an error message if any field has the NULL value when a query is executed.</td>
<td></td>
</tr>
<tr>
<td>** FORCE OCI7 **</td>
<td>Use OCI7 (SQL*Net 2.x - Oracle7 interface) to access the Oracle server.</td>
<td>Only for Oracle</td>
</tr>
<tr>
<td>** LOCAL CHARSET **</td>
<td>Set the encoding character set.</td>
<td>Only for Interbase</td>
</tr>
<tr>
<td>** LOGIN TIMEOUT **</td>
<td>The number of seconds to wait for user authorisation.</td>
<td>Only for DB2, Informix, ODBC, MSSQL, MySQL, Sybase</td>
</tr>
<tr>
<td>** MAX CURSORS **</td>
<td>The maximum number of simultaneously opened cursors.</td>
<td>Only for MSSQL and Sybase</td>
</tr>
<tr>
<td>** MAXCHARPARAM LEN **</td>
<td>The maximum line length. By default, it is 255.</td>
<td></td>
</tr>
<tr>
<td>** MAXFIELDNAMELEN **</td>
<td>The maximum length of a field name. By default, it is 50.</td>
<td>Only for Oracle</td>
</tr>
<tr>
<td>** MAX STRING SIZE **</td>
<td>Limit the size of strings to this value. Longer strings will be considered a blob.</td>
<td>Only for Firebird, Interbase, ODBC</td>
</tr>
<tr>
<td>** NEW PASSWORD **</td>
<td>Use this value when the server returns the 'Password expired' message.</td>
<td>Only for Oracle8</td>
</tr>
<tr>
<td>** QUOTED IDENTIFIER **</td>
<td>Use identifiers in quotes.</td>
<td>Only for MSSQL and Sybase</td>
</tr>
<tr>
<td>** PREFETCH ROWS **</td>
<td>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).</td>
<td>Only for DB2, Informix, ODBC, Oracle8</td>
</tr>
<tr>
<td>** ROLE NAME **</td>
<td>Specifies the role the server should assign to the client when it is connected.</td>
<td>Only for Interbase and Oracle (SYSDBA/SYSOPER roles)</td>
</tr>
<tr>
<td>** SERVER PORT **</td>
<td>Specifies the server port for connecting via TCP/IP.</td>
<td>Only for MySQL, PostgreSQL</td>
</tr>
<tr>
<td>** SINGLE CONNECTION **</td>
<td>Specified whether to use a single process/connection. By default, it is FALSE.</td>
<td>Only for MSSQL and Sybase</td>
</tr>
<tr>
<td>** SQL DIALECT **</td>
<td>Installs SQL Dialect (1,2,3) for the client.</td>
<td>Only for Interbase</td>
</tr>
<tr>
<td>** TDS PACKET SIZE **</td>
<td>Specifies the size for a TDS packet. If the server does not support this size, a &quot;Login failed&quot; error will occur in the process of connecting.</td>
<td>Only for Sybase</td>
</tr>
<tr>
<td>** TRANSACTION LOGGING **</td>
<td>If it is FALSE, transaction logging will be disabled, so rollback will be unavailable.</td>
<td>Only for SQLBase</td>
</tr>
<tr>
<td>** RTRIM CHAR OUTPUT **</td>
<td>Delete spaces on the right for fields of the CHAR type. By default, it is TRUE.</td>
<td>Only for DB2, Informix, Interbase, Oracle, ODBC and Sybase</td>
</tr>
</tbody>
</table>
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 Softlce application debug environment or some other. In any other case, please, inform our developers about your problems, our address support@aggsoft.com.