



# **Communication Program**

User Manual

2019

**ABSTRACT**

The present User Manual is a guideline for Communication Program, version 7.x (hereinafter referred to as the Program).

The Manual describes Program operation with IRZ drives' log archives.

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## 1. PURPOSE AND EXECUTION ENVIRONMENT

### 1.1. Purpose

The program has been developed to preview log files recorded by IRZ series drive controllers (hereinafter referred to as controllers) on USB flash drive. The program enables previewing the logs as tables or graphs, printing the logs, as well as converting log files to Microsoft Excel format with subsequent processing.

### 1.2. Execution Environment

To run the program the following hardware configuration is recommended:

- PC or laptop with minimum 4 GB RAM (hereinafter referred to as computer);
- 1 Tb hard disk drive;
- 17" SVGA monitor;
- USB port;

The program operates on Windows XP/7/10 OS.

## 2. PROGRAM INSTALLATION

Install the program as follows:

- insert USB drive with program installation file into PC disk drive;
- run the installation file and follow setup instructions;
- upon completion, the program shortcut shall appear on the display;
- the program is ready to run.

## 3. PROGRAM OPERATION

### 3.1. General

You can use the program for operation with IRZ series drive's logs: open, preview (as tables or graphs), save and print information related to drive operation events.

### 3.2. Program Run

Two ways of program start are possible: direct start via execution file, or using log files recorded by the drive.

#### 3.2.1 Direct Start

Program direct start is realized by means of execution file run using program shortcut created during installation. Figure 1 indicates program start dialog. At the program run, the **Select a file** tab is active by default.

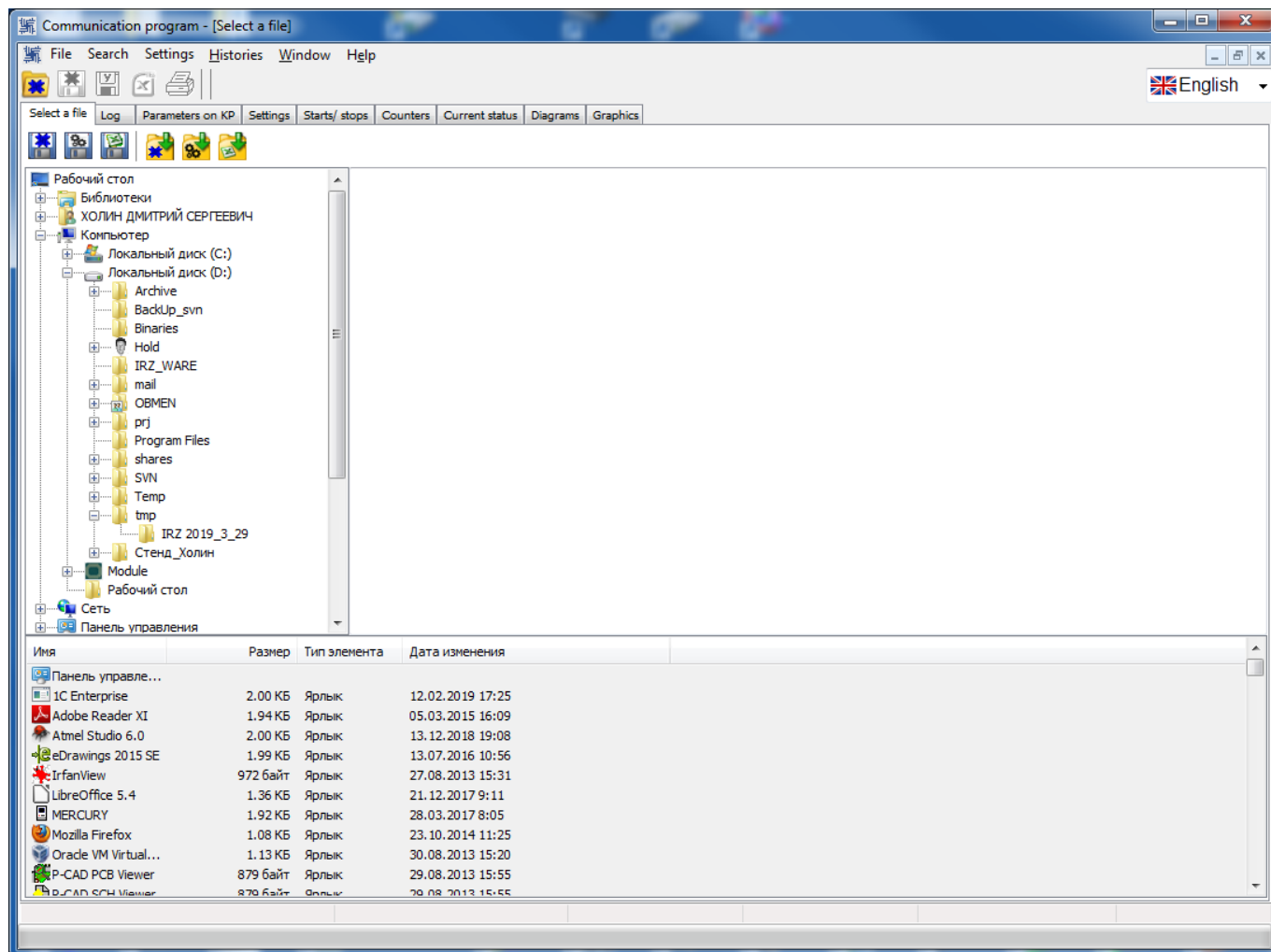


Fig. 1

### 3.2.2 Run Through Archive Files

User can read out drive logs using USB flash drive. When downloaded, the logs are saved to <IRZ> \ <IRZ> <log date> file, where "log date" is a day, month and year of the log saved to USB flash drive in YYYY\_MM\_DD format (where YYYY is a year, MM – month, and DD – day respectively). This directory contains drive log files.

Log file recorded by controller has (\*.irz) extension. In the file name the following information is contained:

- Field ID number ("Field"), wellpad ID number ("Well pad"), well ID number ("Well") where a certain drive is installed;
- Drive type (IRZ-500, IRZ-200, IRZ-700, etc.);
- Drive serial number;
- Time of log saving onto USB flash drive in HHhMMmSSs format (where HH is an hour, MM – minutes, and SS – seconds).

To run the program, set the mouse pointer on (\*.)irz file in **Log** directory, or select it any other way and double-click or press **Enter** key on the keypad of your computer.

The dialog, as conditionally indicated in Figure 2, will be on the screen when the program runs through the log file. At the program run, the **Log** tab is active by default.

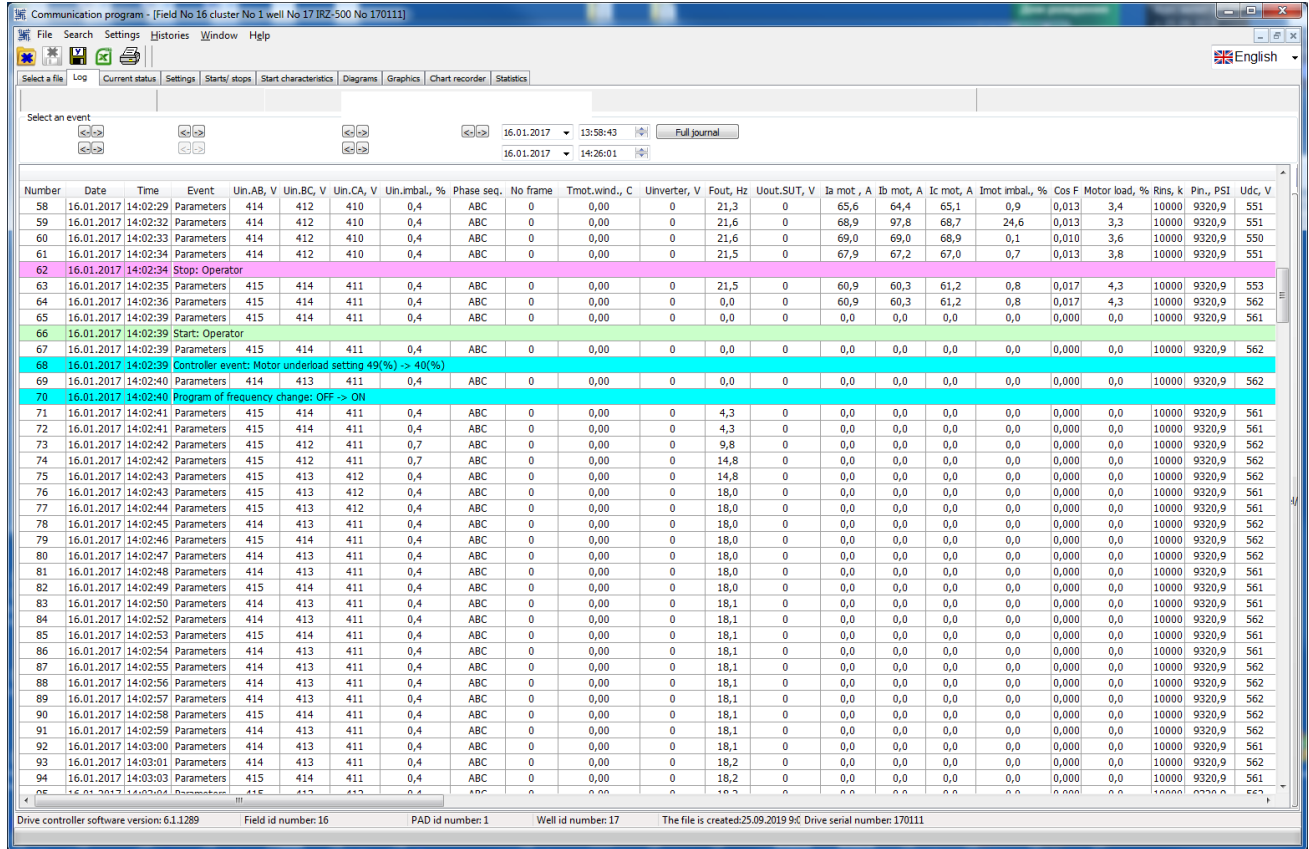


Fig. 2

### 3.3. Log Files Preview

There are two ways to open a file to preview:

- file opening through log files recorded by drive controller (in (\*.irz format);
- using program run in **Select a file** tab.

#### 3.3.1 Open Log Through Files

Logs opening through a file is performed similar to the program run through the log file (see item 3.2.2).

#### 3.3.2 Open Log from **Select a file** Tab

The **Select a file** tab overview is shown in Figure 3.

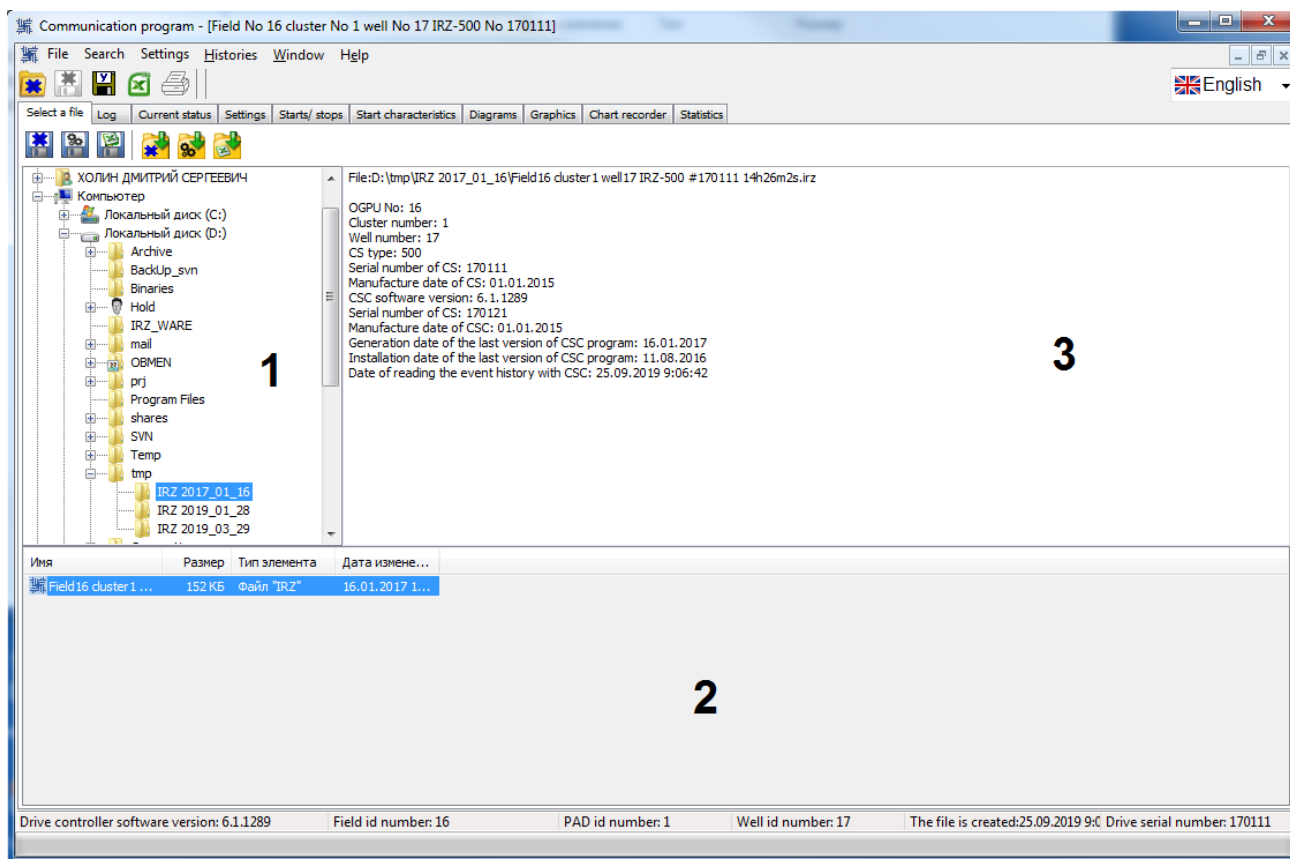




Fig. 3




The **Select a file** tab may be conditionally divided into three windows: 1, 2, and 3 (see Fig. 3).

Window 1 indicates directory structure including Network and External Drives. In Window 1, select a directory where drive's log files in (\*.irz format) are located. The directory may be located in the directory of remote computer or in Network / External Drive. Here, in Window 1, you can set default directories for archive storage, set point files, and log files converted into Microsoft Excel format. To do this, select required directory in Window 1 and press one of the buttons in **Select a file** tab top:

-  to set default directory to store drive's log files;

-  to set default directory to store drive's set point files;
-  to set default directory to store drive's log files converted to Microsoft Excel format.

To get a quick link to the required default directory, press one of the buttons in **Select a file** tab:

-  to get to default directory where drive's log files are stored;
-  to get to default directory where drive's set point files are stored;
-  to get to default directory where drive's log files converted to Microsoft Excel format are stored.

Window 2 of **Select a file** tab indicates the content of directory selected in Window 1.

Window 3 of **Select a file** tab indicates brief information on the drive, log file of which is in the directory selected in Window 1 with name shown in Window 2. To display information about the drive in Window 3, required archive file shall be selected in Window 2. The following information on the drive is displayed in Window 3:

- oil and gas production unit (field) number, where the drive is operating;
- well pad number where the drive is installed;
- well number where the drive is installed;
- drive type;
- drive serial number;
- manufacturing date of the drive;
- controller program version;
- controller serial number;
- date of controller manufacturing;
- date of the last generation of controller program version;
- date of installation (programming) of controller program last version;
- date and time of logs readout from controller.

To open archive, select directory with log files in Window 1 of **Select a file** tab, then select required file in Window 2 and double press it or press **Enter** key from the keypad. Archive opening process will be initiated. In process status display, opening progress state is indicated.

### 3.4. Drive's Log Management

#### 3.4.1 General

Figure 2 indicates a dialog which appears when drive's log archive is opened. For convenience in operation, all the archive data are classified as follows:

- **Log** tab is the main tab. **Log** tab displays the archive of current parameters and events of the drive with date/time for each entry;
- **Current status** tab. **Current status** tab displays parameter values for the drive of entry (line) selected in **Log** tab;
- **Settings** tab. This tab displays controller set points actual at the time of log archive recording or at desired date/time;
- **Starts / stops** tab. This tab indicates all registered start/stop logs of the drive with date/time and reason for such start/stop. In case of emergency shutting in, the value of parameter caused safety trip will be indicated additionally;



- **Start characteristics** tab. This tab displays the list of drive start logs with date/time and reason for start indicated. For each start log, trends of drive's main parameters change during the start are provided;
- **Diagrams** tab. **Diagram** tab graphically displays the ratio between operation and stop time as well as various reasons for drive stop;
- **Graphics** tab. This tab graphically displays values of drive's current parameters throughout the entire period of logging.
- **Statistics** tab. This tab displays statistics counter values and drive operation hours.

### 3.4.2 All Tabs Generic Information

#### 3.4.2.1 Menu Bar


Top of the Window displays **Menu bar** and contains the following items:


- **File** provides commands to work with log archive files;
- **Search** is used to search data in current tab with certain filters;
- **Settings** has options **Setting of TMS display** (stands for Downhole Monitoring System) and **Filters**. Using these menu options, you can set units of remote measurements and create/edit filters for information processing at the current tab;
- Using **Window**, several windows may be displayed simultaneously provided that several log archives are opened;
- **Help** displays program information.




**File** menu has the following options:

- **Load the history**. With this option, you can open file for log archive preview;
- **Save the history**. This option saves currently opened log archive to a single file of (\*.hst) format. File name is generated automatically based on field, well pad, and well number where drive is installed, drive type and its serial number;
- **Import IRZ-500 archive**. This option displays the path to the directory of log archive files of (\*.irz) format and opens that archive for preview;
- **Export to OIS**. This option opens **Settings** window to convert currently opened archive data to special format with further transfer to OIS system;
- **Create a log file**. If this function is activated, log file will be created automatically whenever log archive is opened. Log file registers any problems occurred at log file opening;
- **Data export to Excel**. This option initiates the process of data conversion from currently open archive to Microsoft Excel format;
- **Print**. This option prints out information from the current tab;
- **Preview**. Using this option, you can preview information before printing;
- **Exit**. When this option is enabled, user exits the program.

#### 3.4.2.2 Toolbar

Toolbar  is in the upper area of the window below Menu bar. It contains the following buttons:

-  to open drive's log archive for preview;

-  to save set point file from currently open archive to another file. File name is generated automatically based on field, well pad, and well number where drive is installed, drive type and its serial number;
-  to print information from currently active tab;
-  to initiate the process of data conversion from the open archive to Microsoft Excel format.

### 3.4.2.3 Status Bar

Status bar is in the window bottom and contains the following information on currently opened archive:

- “Drive controller software version.” This option displays actual drive software version at the moment of archive recording by the drive controller;
- “Field id number.” This option displays field number where the drive is operated;
- “PAD id number.” This option displays well pad number where the drive is installed;
- “Well id number.” This option displays well number where the drive is operated;
- “The file is created.” This option displays date and time of log archive file creation, i.e. date and time when log archive was recorded by the drive controller;
- “Drive serial number.” This option displays drive serial number.

### 3.4.3 Log Tab

#### 3.4.3.1 Overview

In the **Log** tab actual drive parameters and logs are displayed in real time mode. Figure 4 indicates **Log** tab dialog.

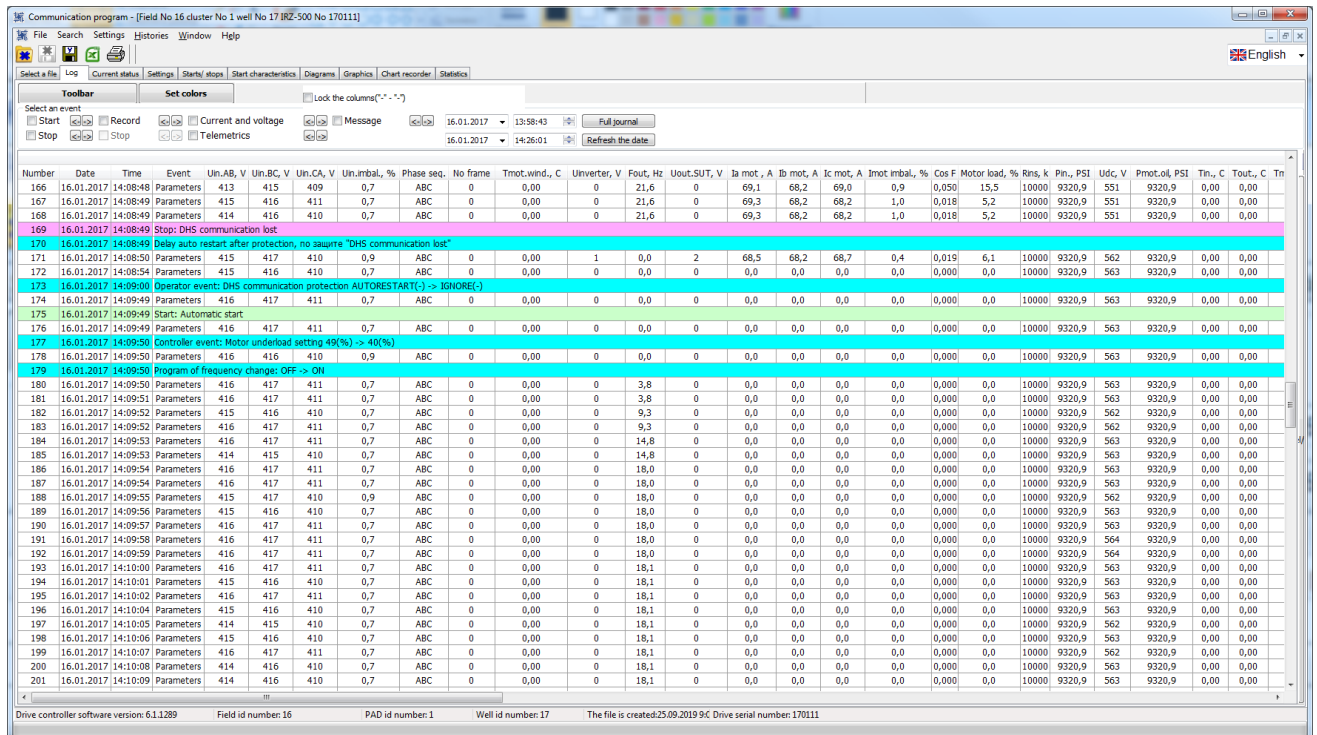


Fig. 4

Log tab's parameters table has the following columns:

- "Number." This column displays line numbers of the table;
- "Date." This column displays the date of log archive entry. The format is "date.month.year";
- "Time." This column displays the time of log archive entry. The format is "hour:minute:seconds";
- "Event." This column displays the drive event for current archive entry;
- Other columns are for the events like "Parameters". They display the values of actual drive parameters (current, voltage, etc.) Other logs are displayed as a single column (combined) with log name and supplementary information (if any);
- column "Record type" for "Parameters" logs displays the mode of log recording, normal or fast;
- column "Record reason" for "Parameters" logs displays the reason for current log entry recording: "period of time", "working mode" (change of drive operation mode), "U" (change of drive input voltage), "Isem" (change of motor current), "P" (change of pressure as per DMS data), "T" (change of temperature as per DMS data), "Fout" (change of output frequency), "Rin" (change of insulation resistance). In case if several reasons for recording exist, they are separated by comma.

### 3.4.3.2 Add / Delete Parameters

For logs of "Parameters" class, it is possible to configure the number of current parameters of the drive displayed in the table. To add or remove current parameters from the table, use **Display Settings** panel (hereinafter – **Display Settings**). Turn on/off the **Display Settings** using

**Toolbar** located at the top of the **Log** tab.

The window of the **Log** tab with **Display Settings** panel is shown in Figure 5.

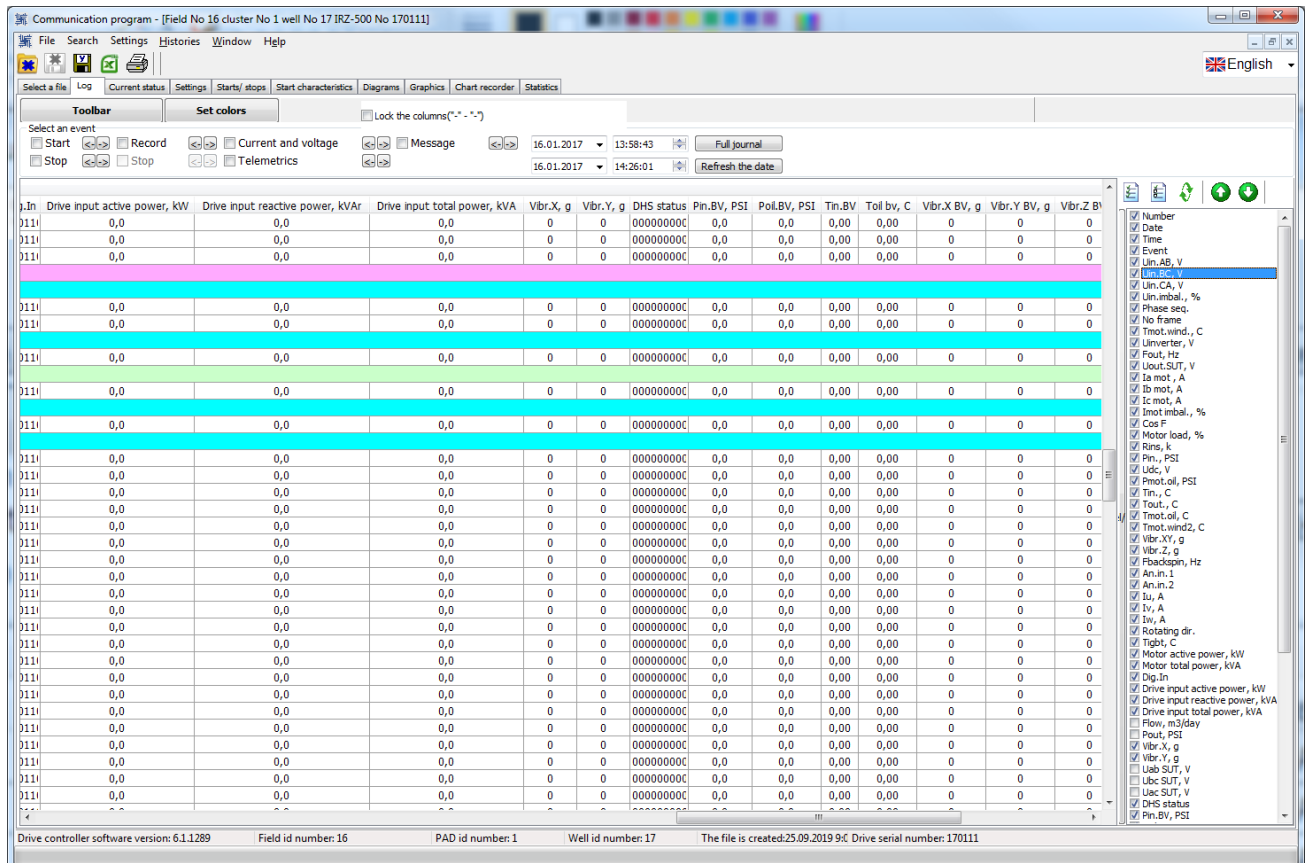






Fig. 5

**Display Settings** panel provides complete list of parameters recorded in drive log archive. Parameters marked with  are displayed in the table; not checked parameters with  are not displayed in the table. By placing  or removing check mark , user can select options to display and to hide. It is also possible to configure the sequence of displaying parameters in the table (sequence of displaying columns). To do this, select the required parameter in **Display Settings** panel and use   at the top of the panel to set the desired display position for the parameter (i.e., after which column and before which column to display the selected parameter). After choosing number and sequence of displayed parameters (setting / removing ticks), it is NECESSARY to press  in the upper part of **Display Settings** panel for the changes to take effect.

#### 3.4.3.3 Set Color Highlighting for Different Types of Logs

For the convenience of working with the table of current parameters and logs, it is possible to highlight table rows with different colors in the **Log** tab. Colors are determined based on log type. The following colors are set by default:

- Text color for all logs is black;
- Background color for parameter record is white;
- Background color for fast parameter record is white;
- Background color for stop is pink;
- Background color for start is pale green;
- Background color for manual parameter change is turquoise;
- Background color for the automatic parameter change is turquoise;
- Background color for the remote parameter change is turquoise;
- Background color for system events messages is turquoise.

Colors matching archive logs are edited in the **Color Setting** window. The **Color Setting** window is called up by pressing  at the top of the **Log** tab. The **Color Setting** window is shown in Figure 6.

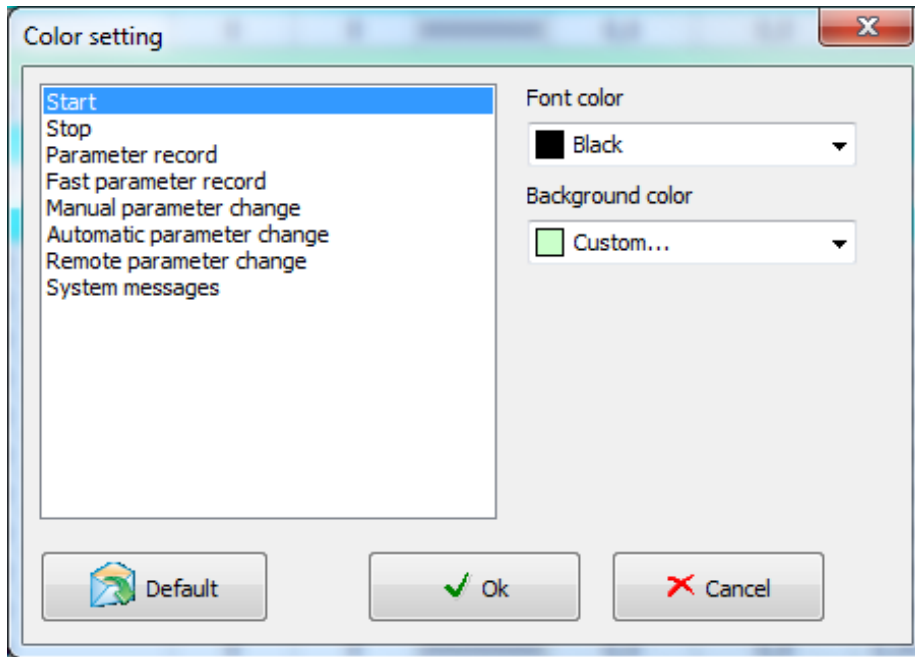
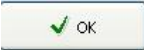




Fig. 6



For editing, it is necessary to select type of event in the left part of the window and then use the two drop-down menus to set colors in the right part of the window to display the text and the background of the selected event. To accept the changes, press  at the bottom of the **Color Setting** window. To cancel the changes, press . Pressing  will set the default colors pattern (see above).

#### 3.4.3.4 Freeze Table Columns

For the convenience of viewing the table with large amount of displayed data, the column freezing function is provided. When using this function, the display of the number of columns of the table specified by the user is frozen and subsequently, when the table is scrolled horizontally, the frozen columns do not scroll.

To enable the function, user must press on any row in the column next to the last frozen column (for example, when freezing columns 1 to 3, you must press on any row in column 4), and then check the box  Lock the columns("Number" - "Event") located at the top of the **Log** tab (see Figure 5). The range of frozen columns is given in parentheses. The range changes automatically, when selecting a different number of frozen columns. To unfreeze the columns, remove the tick in the box.



### 3.4.3.5 Sort Table Values

The program can sort the table values both one by one or in several columns of the table of parameters and logs. To sort the value of a column, press on the column heading. After that an icon  will appear, which corresponds to sorting the table in the ascending order of values of the selected column. After repeated pressing on the cell with the number, an icon  will appear, which corresponds to sorting the table in the descending order of values of the selected column.

To sort the table of parameters and events by values of several columns, you must first configure the sorting of the most important column (according to the above method), then press and hold **Shift** on the PC keyboard to configure the sorting of the second most important column, etc. As a result, the table will be sorted first by the values of the most important column, then within this sorting the table will be sorted by the values of the second most important column, etc.

### 3.4.3.6 Filter Table Values

The program is able to create, save, load and apply various filters to find the required entries in the table.

To filter the table entries of the **Log** tab by the type of entries (i.e. events) check the boxes in one or more of the **Select an event** fields at the top of the table (see Figure 7). With checked  or unchecked  "All fields", the table will display all data without filtering. With checked field  **Start**, only entries containing motor start events will be displayed in the table. With checked field  **Stop**, only entries containing motor shutdown events (by operator or when the protection is activated) will be displayed in the table. With checked field  **Message**, only entries containing the drive system logs will be displayed in the table. With checked field  **Current and voltage**, only columns containing parameter values associated with currents and voltages will be displayed in the table. Similarly, with checked field  **Telemetrics**, only columns containing downhole monitoring system parameters will be displayed in the table. By pressing   against the log name ("Start", "Stop", "Record", etc.) at the top of the table, it is possible to move fast through the lines containing information about these events.

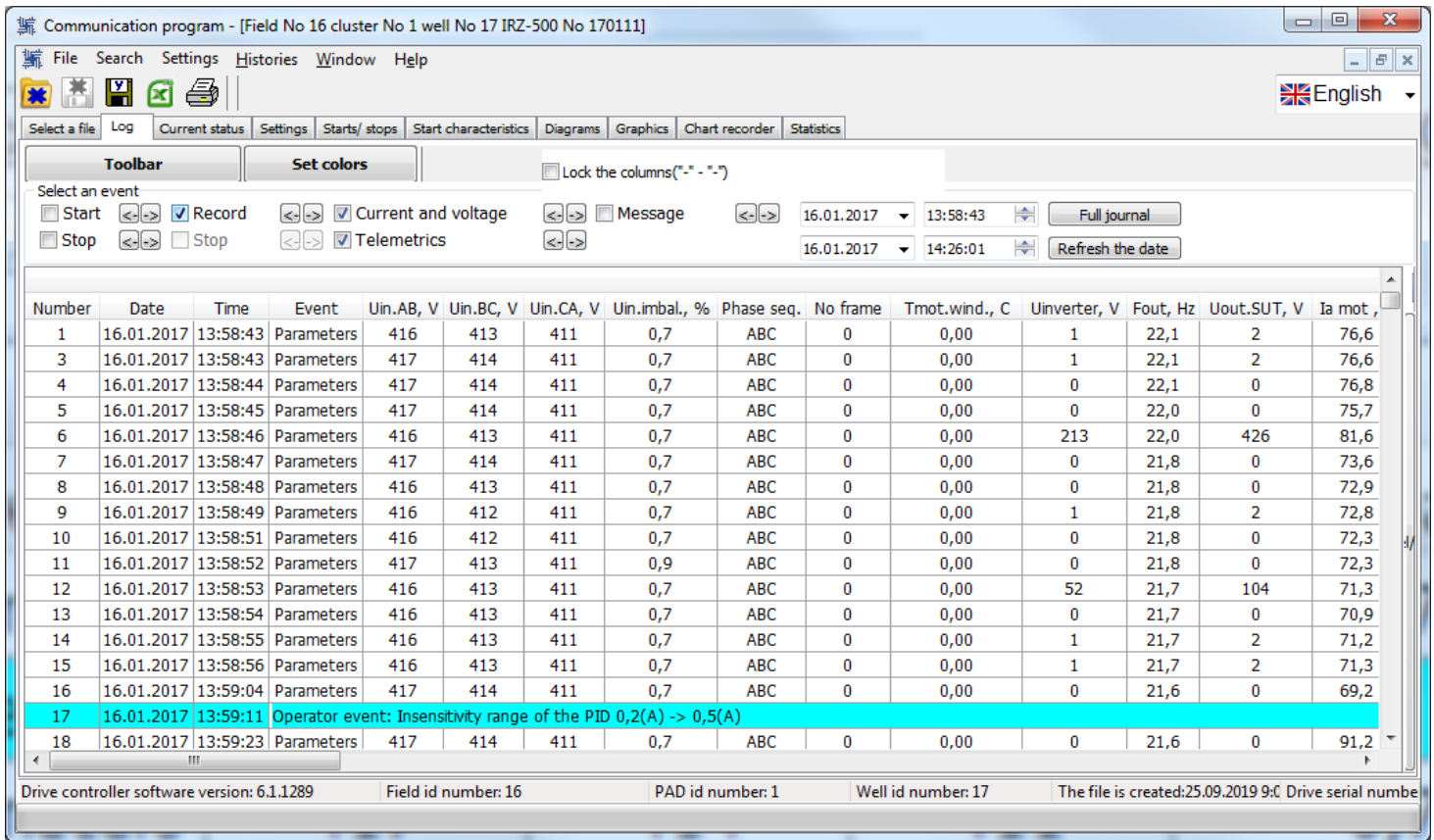


Fig. 7

For example, Figure 8 demonstrates table with only rows showing entries of motor starts and stops.

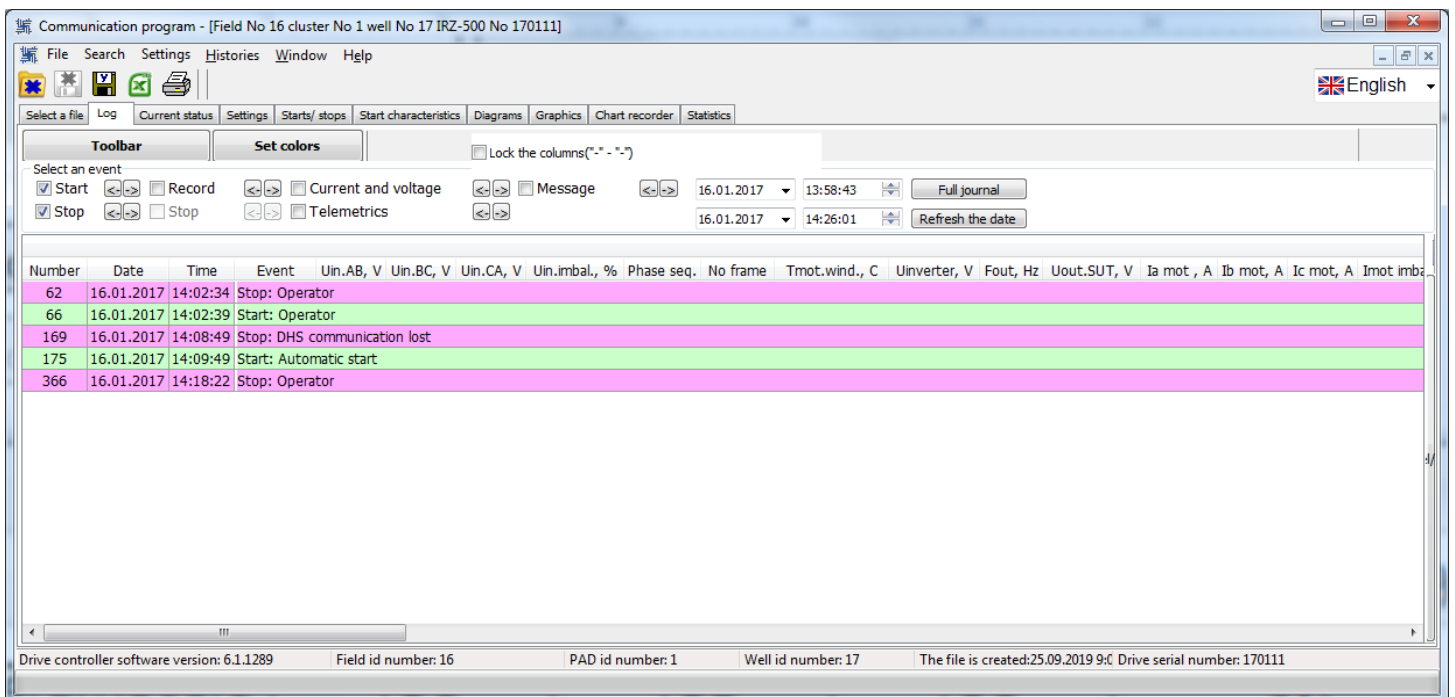


Fig. 8



To configure the filter according to values of a column, it is necessary to move the mouse pointer to the heading of this column as shown in Figure 9.

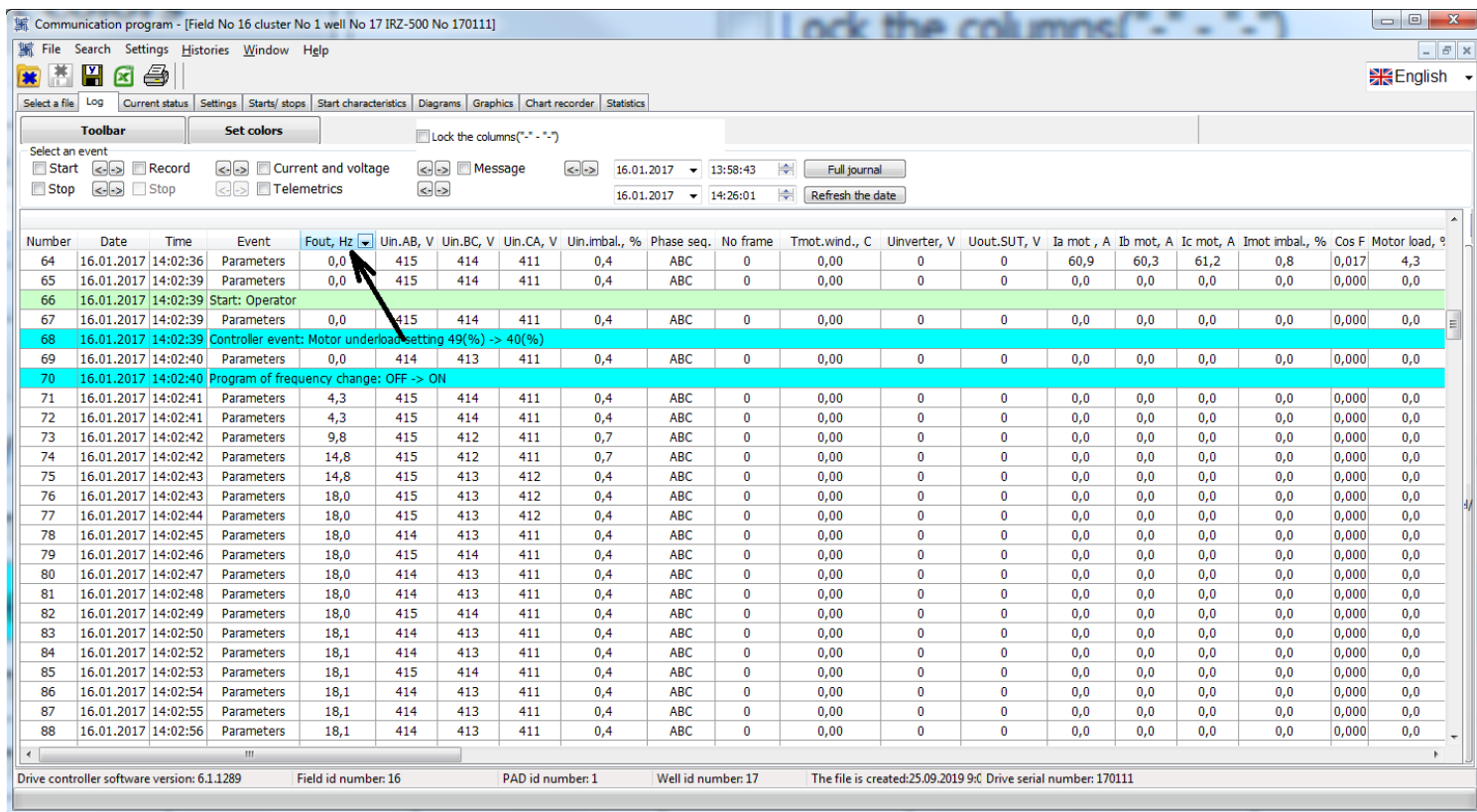






Fig. 9.

Then you must press  and Filter menu for the selected column will appear (see Figure 9). The Filter menu lists all data values of the selected column present in the table. By checking  in the boxes next to the required values (see Figure 10), you can configure a filter to display only those table entries in which the selected values from the filtered column are present. The filter is applied immediately after checking  or unchecking  required column value.



Number	Date	Time	Event	Fout, Hz	Uin.AB, V	Uin.BC, V	Uin.CA, V	Uin.imbal., %	Phase seq.	No frame	Tmot.wind., C	Uinverter, V	Uout.SUT, V	Ia mot, A
71	16.01.2017	14:02:41	Parameter	(All)	415	414	411	0,4	ABC	0	0,00	0	0	0,0
72	16.01.2017	14:02:41	Parameter	(Custom...)	415	414	411	0,4	ABC	0	0,00	0	0	0,0
74	16.01.2017	14:02:42	Parameter	0,0	415	412	411	0,7	ABC	0	0,00	0	0	0,0
75	16.01.2017	14:02:43	Parameter	3,8	415	413	412	0,4	ABC	0	0,00	0	0	0,0
180	16.01.2017	14:09:50	Parameter	4,3	416	417	411	0,7	ABC	0	0,00	0	0	0,0
181	16.01.2017	14:09:51	Parameter	9,3	416	417	411	0,7	ABC	0	0,00	0	0	0,0
184	16.01.2017	14:09:53	Parameter	9,8	416	417	411	0,7	ABC	0	0,00	0	0	0,0
185	16.01.2017	14:09:53	Parameter	14,8	414	415	410	0,7	ABC	0	0,00	0	0	0,0
256	16.01.2017	14:13:23	Parameter	15,0	414	415	410	0,7	ABC	15	99,99	0	0	0,0
257	16.01.2017	14:13:25	Parameter	15,3	412	413	408	0,7	ABC	16	99,99	0	0	0,3
260	16.01.2017	14:13:31	Parameter	15,8	414	415	410	0,7	ABC	17	99,99	0	0	0,0
264	16.01.2017	14:13:37	Parameter	16,3	413	414	410	0,4	ABC	18	99,99	0	0	0,0
265	16.01.2017	14:13:40	Parameter	17,1	415	415	410	0,7	ABC	18	99,99	0	0	0,0
281	16.01.2017	14:14:24	Parameters	15,0	413	415	410	0,7	ABC	27	99,99	0	0	0,0
282	16.01.2017	14:14:26	Parameters	17,9	411	412	407	0,7	ABC	28	99,99	0	0	0,0
284	16.01.2017	14:14:30	Parameters	15,0	412	414	409	0,7	ABC	29	99,99	0	0	0,0
289	16.01.2017	14:14:38	Parameters	15,0	413	415	410	0,7	ABC	30	99,99	0	0	0,0
290	16.01.2017	14:14:39	Parameters	15,0	413	415	410	0,7	ABC	30	99,99	0	0	0,0
304	16.01.2017	14:15:23	Parameters	15,0	412	415	410	0,7	ABC	39	99,99	0	0	0,0

Fig. 10

You can disable filtering by selecting “All” in the list of values in the filtering menu (see Figure 10).

User can create a complex custom filter according to the required column by selecting “Custom Filter” in the filter menu (see Figure 10), then filter settings window will appear (see Figure 11).

Custom Filter

Show rows where:

Fout, Hz

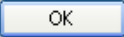

equals 22

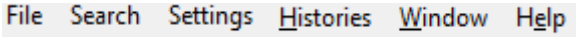

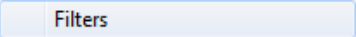
AND  OR

equals 20

Ok Cancel

Fig. 11

The filtering window indicates name of the column, the values of which will be filtered (in Figure 11, this is the “Fout” column). To configure the filter, select the filter criterion using drop-down menus (one or two) (in Figure 11 these are the criteria “equals” and “equals”), then you must specify parameter values from the filtered column to which the selected criteria will apply (values 22 and 20 in the Figure 11), then it is necessary to set the connection type (“AND” or “OR”) between the two selected conditions. As a result of the above settings, the following filter is obtained: “Display in the table all rows for which the data value in the “Fout” column is 22 or 20”. To apply a filter, press  at the bottom of the filter settings window. To exit the filter settings menu without applying a filter press .

The program is able to create complex custom filters across multiple columns with possibility to save and load. To create such filter, go to the **Settings** for complex filters by selecting the item in the menu bar  of the program  and press . This will open the setup window for complex filters, shown in Figure 12.

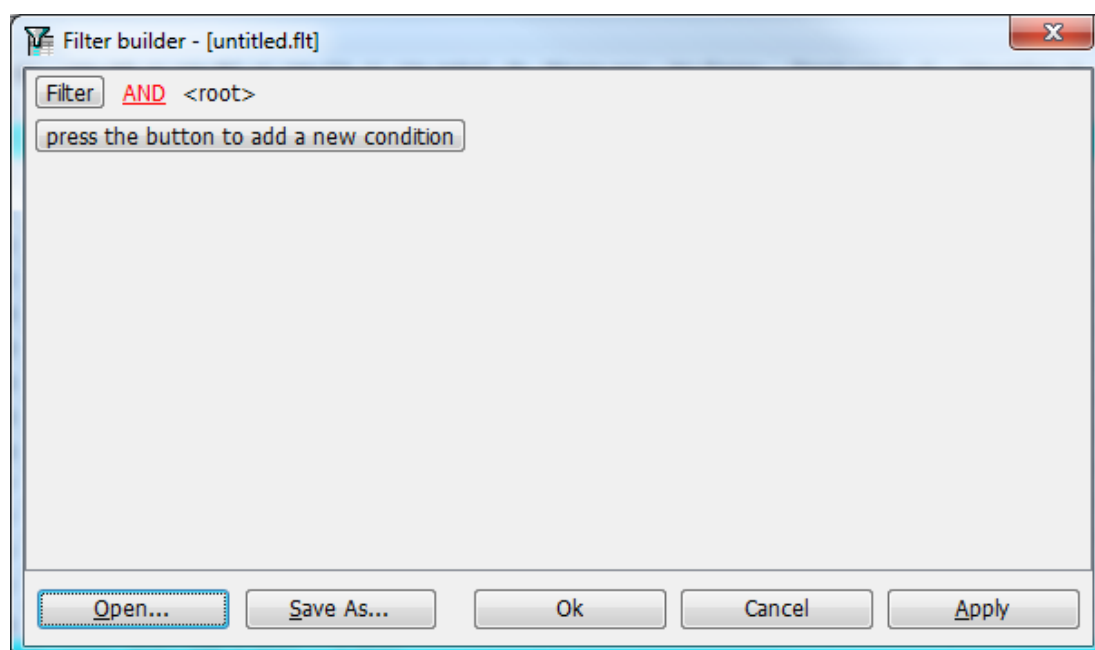
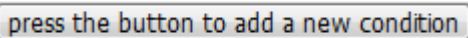







Fig. 12

The filter includes one or several groups of conditions.

To add condition within a group, press  or  and then select the “Add Condition” item from the drop-down menu (see Figure 12).

To add group of conditions, press  or  with the subsequent selection of the “Add Group” item from the drop-down menu (see Figure 13).

User can delete group of conditions or individual condition by pressing  against the corresponding group or condition with the subsequent selection of the “Remove” item from the drop-down menu (see Figure 13). You can delete all conditions and groups by pressing  and selecting “Clear All” from the drop-down menu.

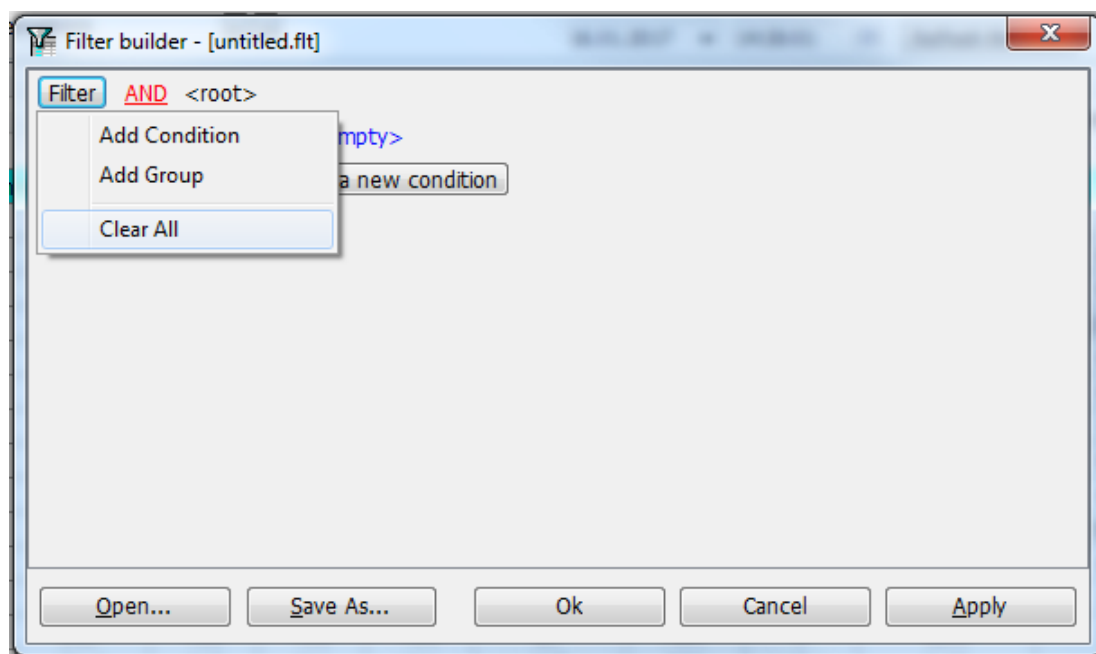


Fig. 13

When creating condition, user must:

1. Set the column name (see Figure 13, green text) by pressing on the green digit and then selecting the required number from the drop-down menu.
2. Set the desired condition (see Figure 13, brown text) by pressing on the brown text and then selecting the desired condition from the drop-down menu.
3. Set the parameter value for comparison (see Figure 13, blue text) by pressing on the blue text "<empty>" and then entering the desired parameter value.

To establish relation for groups of conditions, press on the red letter **“AND”** (see Figure 13) and select the required type of relations from the drop-down list.

Example in Figure 14 indicates the settings for the following filter: “Select from the table all the rows in which the value of the “Fout” column is not 50, the value of the “la motor” column is not 10.1 and the value of the “Date” column is between May 5, 2018 and Aug 12, 2018.

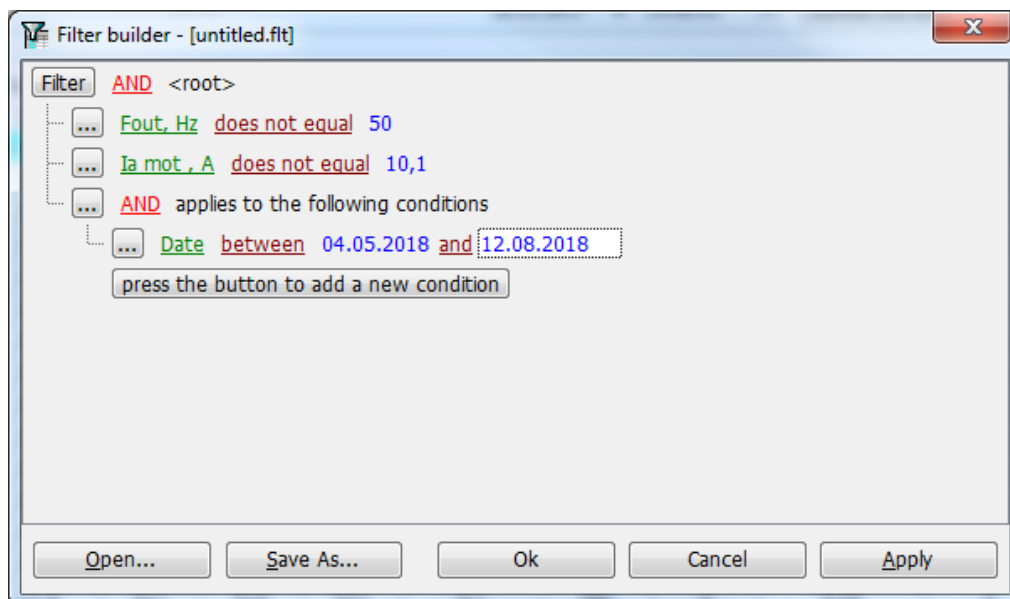
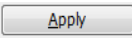
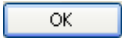

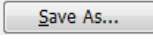
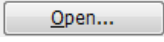


Fig. 14

To apply the filter without closing the “Filter Settings”, press . To start the filter and close the “Filter Settings”, press . To exit the “Filter Settings” without applying, press .

You can save created filters for further loading and use. To save the configured filter, press  and in the opened window specify the path to save the filter to, and the filter file name.

To load the previously saved filter, press  and in the opened window set the path to the filter file and select the filter file required for loading. After loading, you can run, edit and change the filter.

When working with filters, the indicator of filter applying to the table is at the bottom of the table (see Figure 15).

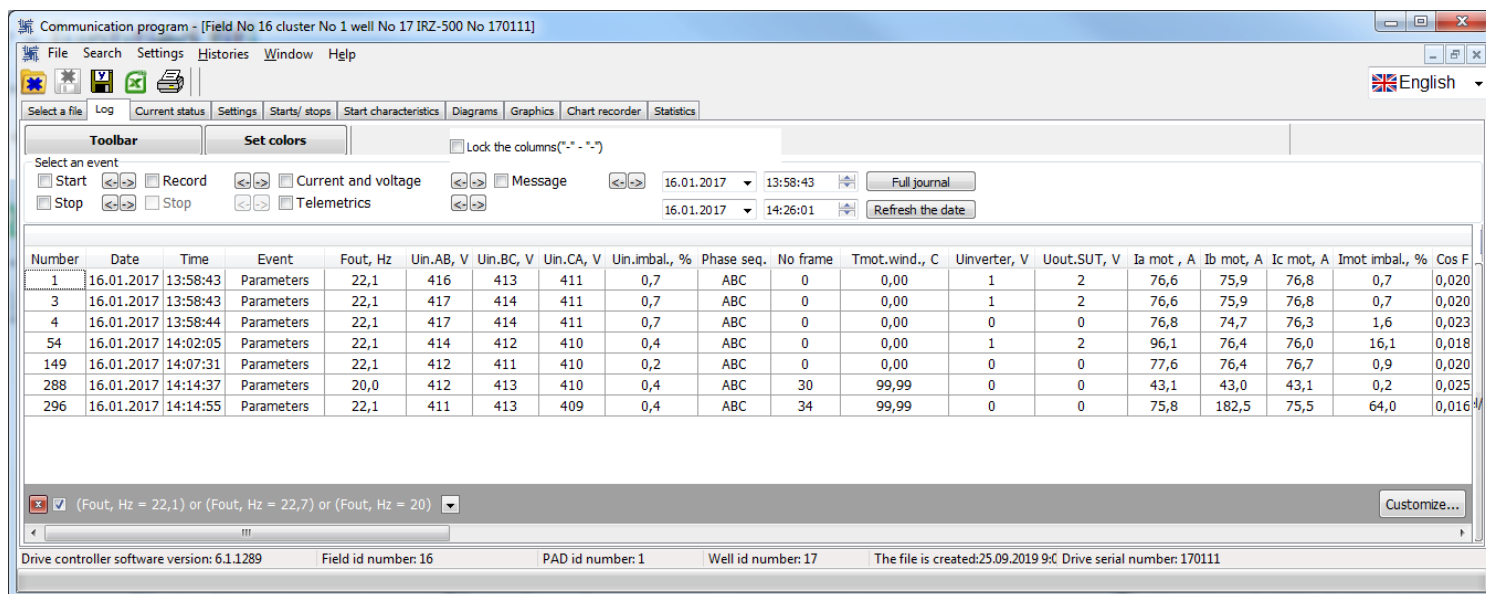


Fig. 15

Figure 15 indicates the table to which the filter is applied with precondition: “Display all rows for which the "Fout" column has a value of 22.1 OR 22.7 OR 20.0.” The filter indicator line shows the filter condition, as well as the icons , and . When is pressed, the current “Filter Settings” appear (see Figure 13), where you can edit the filter and save it for loading and applying in the future. Unchecking disables table filtering without deleting the filter, i.e. the next time it is checked, you can enable filtering again. Pressing turns off the filter and closes the line of the filter indicator, i.e. to reuse a filter you must recreate it or load it from a file (if it was previously saved).

### 3.4.3.7 Select Table Element

In the table of parameters and events of the **Log** tab, user can select individual table elements with possibility to copy them to clipboard of the PC operating system and then paste into a text document. To copy a table element, move the mouse pointer to the desired table cell (to copy a single cell) or select group of cells, then without removing the mouse pointer from the selected cell or group of cells, press the right mouse button and select **Copy** in the drop-down list (see Figure 16), after which you can switch to the “Text Editor” and execute the "Paste from clipboard" command.

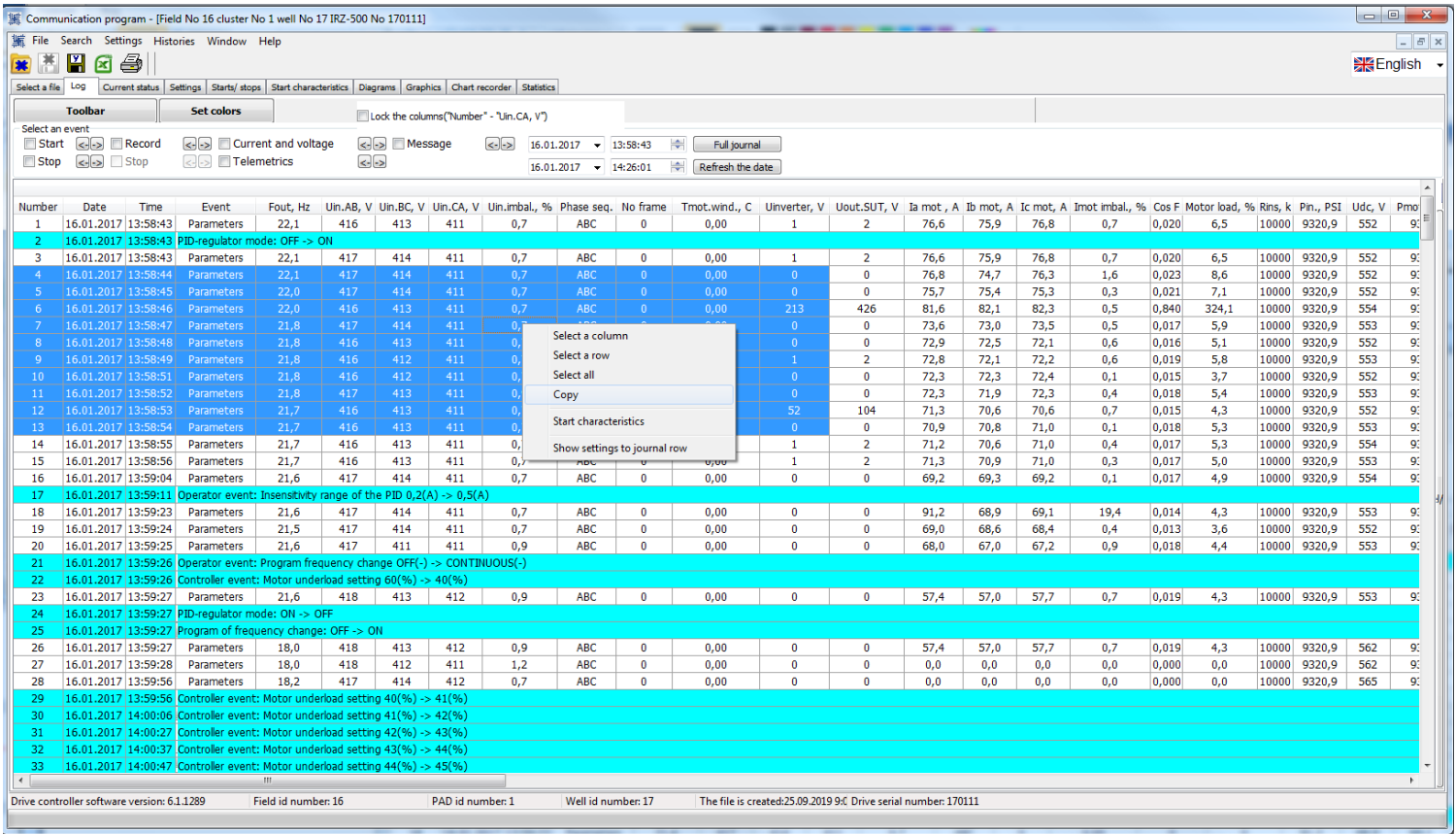
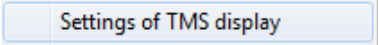
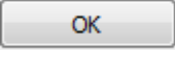
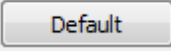


Fig. 16

To select and copy the entire row or column of a table to the buffer, press on any cell of the column or row required to highlight the table and press the right mouse button, then select "Select a column" or "Select a row" in the drop-down menu. After selecting a row or column, you can copy it to the clipboard as described above.

### 3.4.3.8 Set Units for TMS (i.e. Downhole Monitoring System)

In the parameters table of the **Log** tab, it is possible to select the units to display TMS parameters. To configure the units of measure, it is necessary to select  item in the program menu **File Search Settings Histories Window Help** (see Figure 17) and in the opened window set the required units of measurement and display accuracy for TMS parameters (see Figure 18). To apply the specified settings, you must press , after which "Settings" window will close and specified parameters will be applied to the archive opened in the program. To return to the unit settings by default press .

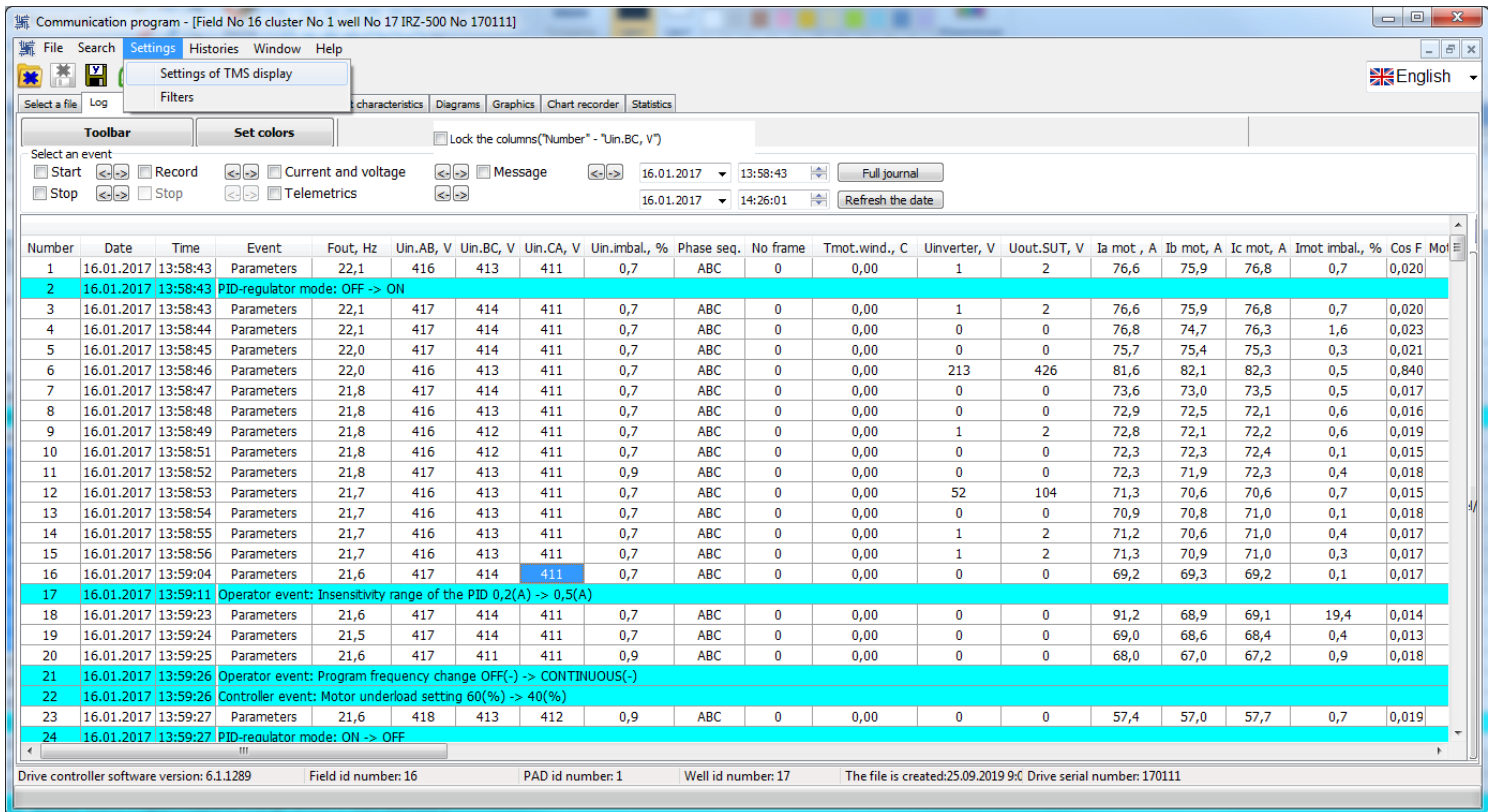


Fig. 17

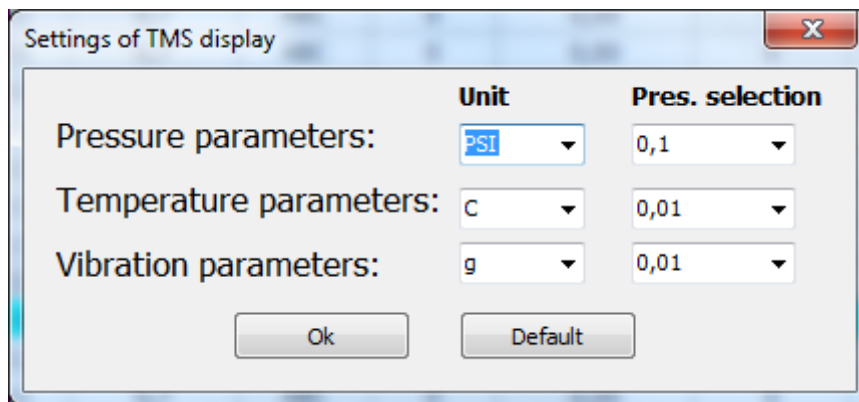


Fig. 18

### 3.4.4 Current Status Tab

#### 3.4.4.1 Appearance

The **Current status** tab displays drive's main active parameters for the entry selected in the **Log** tab. The values of the active parameters are displayed for the time of that line of the **Log** tab, on which the mouse pointer was set at the time of switching to the **Current status** tab. It is also possible to automatically switch to view the current state (switching to the **Current status** tab) by double-clicking on the desired line of the **Log** tab. The appearance of the **Current status** tab is shown in Figure 19.

The tab demonstrates current parameters in the form of a table with the following columns:

- "Parameter." The column contains name of drive parameters,
- "Parameter value." This column shows values of drive parameters for the time of the selected line of the "Log" tab;
- "Parameter measurement unit." The column contains units of measure for the parameters specified in "Parameter value" column.

#### 3.4.4.2 Add / Remove Displayed Columns

In the **Current status** tab, you can configure the number of displayed table columns. The columns to be displayed are added or deleted as described in item 3.4.3.2.

#### 3.4.4.3 Sort Table Values

Sorting table values in the **Current status** tab is configured similarly to sorting in the **Log** tab (see item 3.4.3.4).

#### 3.4.4.4 Filter Table Values

User can create, configure and use filters in the **Current status** tab similarly to working with filters in the **Log** tab (see clause 3.4.3.5).

#### 3.4.4.5 Select Table Element

You can select and copy table elements in the **Current status** tab similarly to selecting and copying table elements in the **Log** tab (see 3.4.3.6).



Parameter	Parameter value	Parameter measurement unit
Record time	16.01.2017 13:58:43	
Drive status	Start	
Output active power	0,3	kW
Current Ia	76,6	A
Current Ib	75,9	A
Current Ic	76,8	A
Insulation resistance Rins	10000	k
COS(F)	0,020	
Voltage Uab	416	V
Voltage Ubc	413	V
Voltage Uac	411	V
ESP intake pressure	9320,9	PSI
ESP intake temperature	0,00	C
Motor oil temperature	0,00	C
ESP discharge temperature	0,00	C
Vibration X+Y	0	g
Motor oil temperature 2	0,00	C
Vibration Z	0	g
Motor load	6,5	%
Current imbalance	0,7	%
Voltage imbalance	0,7	%
Backspin	0,0	Hz
Phase sequence	ABC	
FLPT signal	NO	
Analogue input 1 signal value	0	units
Analogue input 2 signal value	0	units
Output frequency	22,1	Hz
Rotating direction	Direct	
Inverter output current (phase U)	88,1	A
Inverter output current (phase V)	88,6	A
Inverter output current (phase W)	88,5	A
FC DC voltage	552	V
Inverter radiator temperature	35	C
Digital inputs status	100110	
Vibration X	0	g
Vibration Y	0	g
DHS status	000000000000011	
BV intake pressure	0,0	PSI

Drive controller software version: 6.1.1289    Field id number: 16    PAD id number: 1    Well id number: 17    The file is created: 25.09.2019 9:00 Drive ser

Fig. 19

### 3.4.5 Settings Tab

#### 3.4.5.1 Overview

**Settings** tab contains values of drive settings. Settings can be displayed in two ways:

- in the form of a tree duplicating structure of the drive settings menu (see Fig. 20),
- in the form of a table (see Fig. 23).

To configure the setting view, check the box  **Setting tree**     **Setting table**

at the top of the **Settings**. By default, settings are represented in the form of a tree.

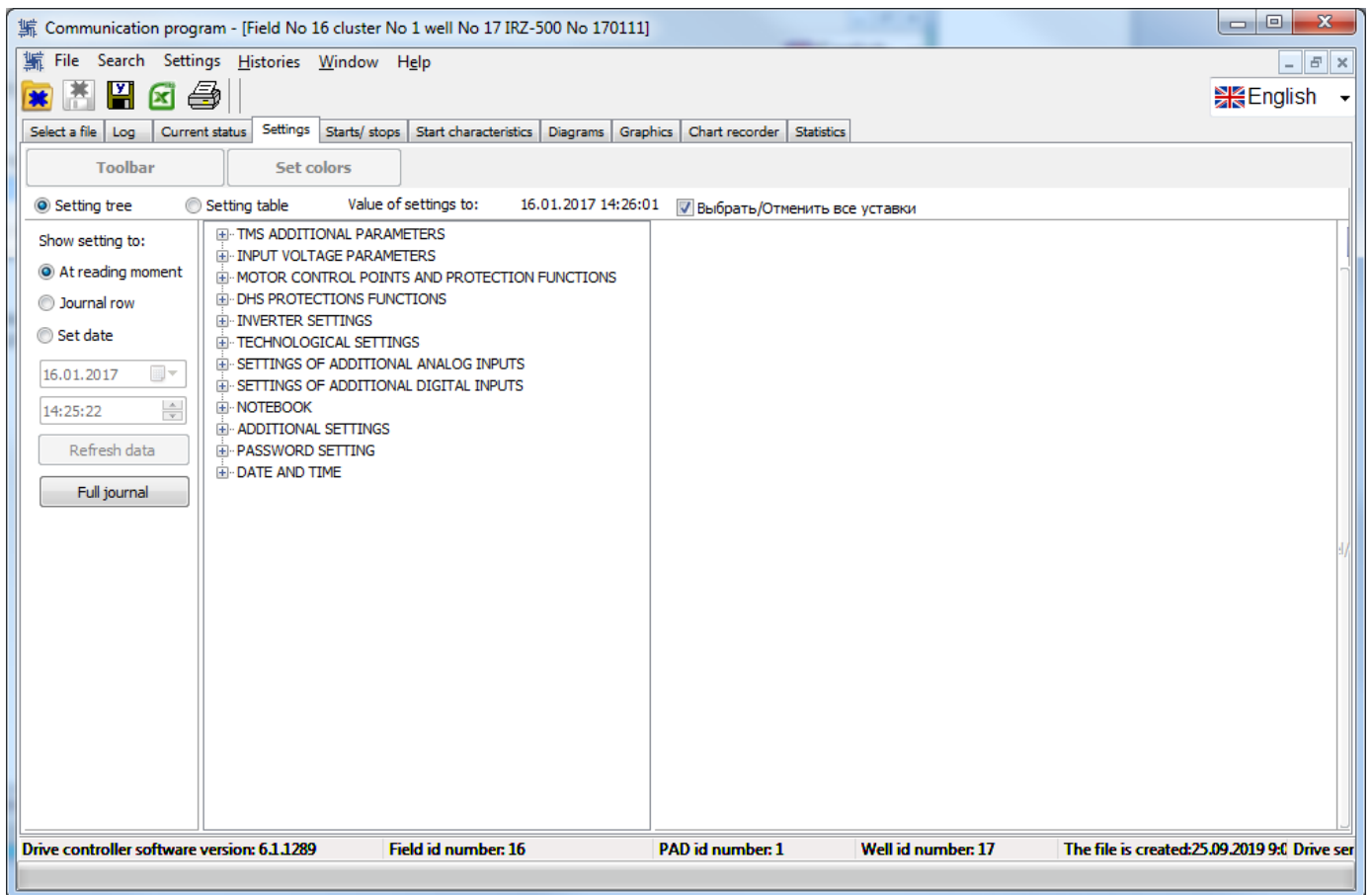


Fig. 20

All settings are grouped by sections for convenience (same as in "Controller menu"). The groups are as follows (see Fig. 20, 21):

- "Input voltage parameters,"
- "Motor control points and protection function,"
- "DHS protections functions,"
- "Inverter settings,"
- "Technological settings,"
- "Settings of additional analog inputs,"
- "Settings of additional digital inputs,"
- "Notebook,"
- "Additional settings,"
- "Password settings," and

- "Date and time."

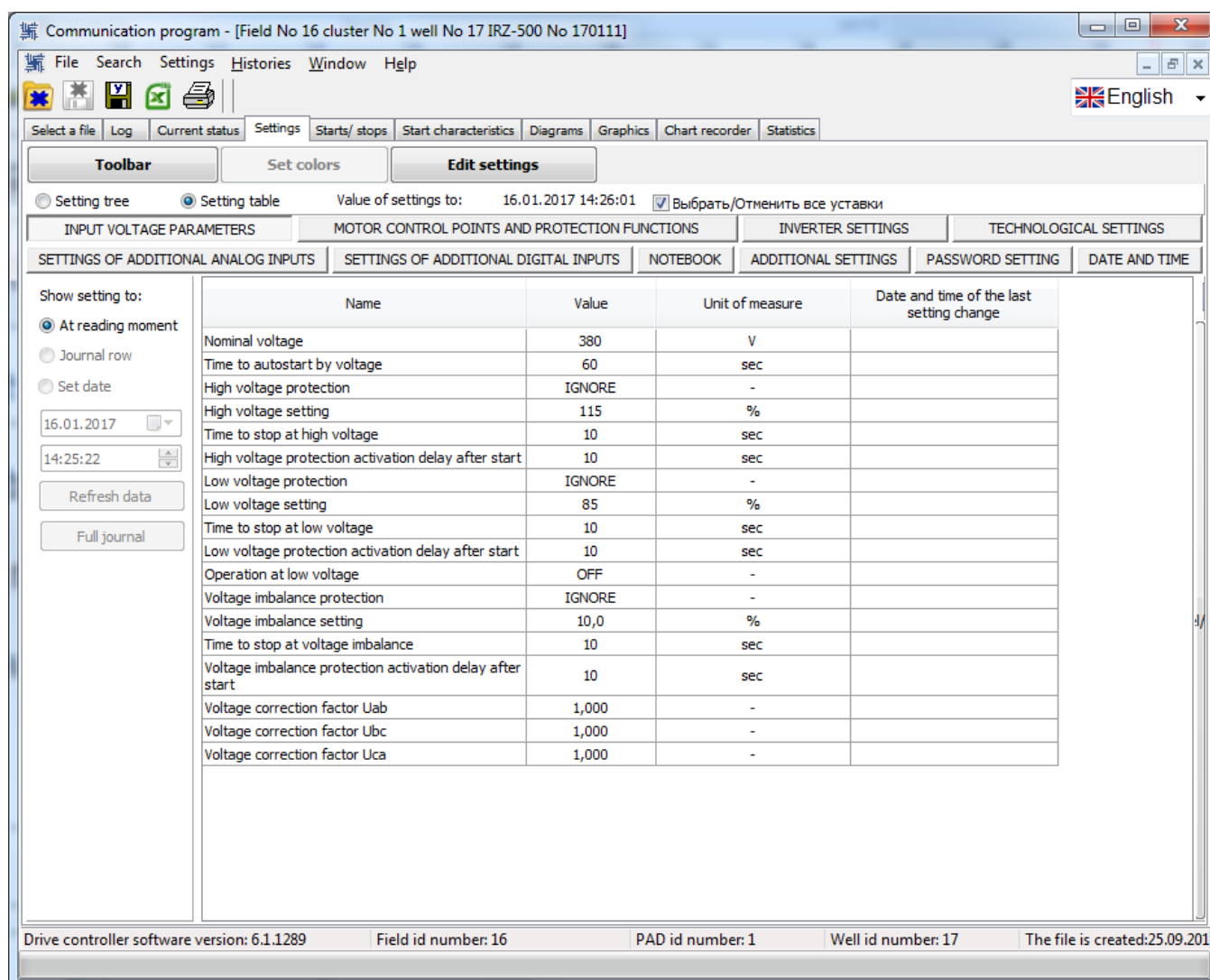


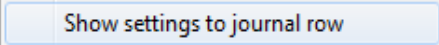
Fig. 21

Figure 22 demonstrates the window displaying the information regarding an individual setting in the form of a tree. To view the information, select the required setting on the tree to the left, whereas the information as follows will be displayed to the right:

- "Setting name,"
- "Unit of measure" (if any),
- "Current value,"
- "Default (factory) value,"
- "Acceptable range," and
- "Brief description" (service and features).

In addition, when settings are represented in the form of a tree, you can view their actual values at different moments in time. To select the required time, check the relevant box to the left of **Settings** tab.

There are three options of the point in time available:

- actual at the time of log reading  **At reading moment** . This option is set by default,
- actual at date and time specified by user. To select the required date and time to the left, check the box  **Set date** and specify the date and time to view the settings value,
- user's specified log line in **Log** tab. To do so, select any field in the relevant line of **Log** tab to view the settings value, right-click and select appeared  (see Fig. 23). **Settings** tab will automatically appear with the setting values actual at the date and time specified in **Log** tab.

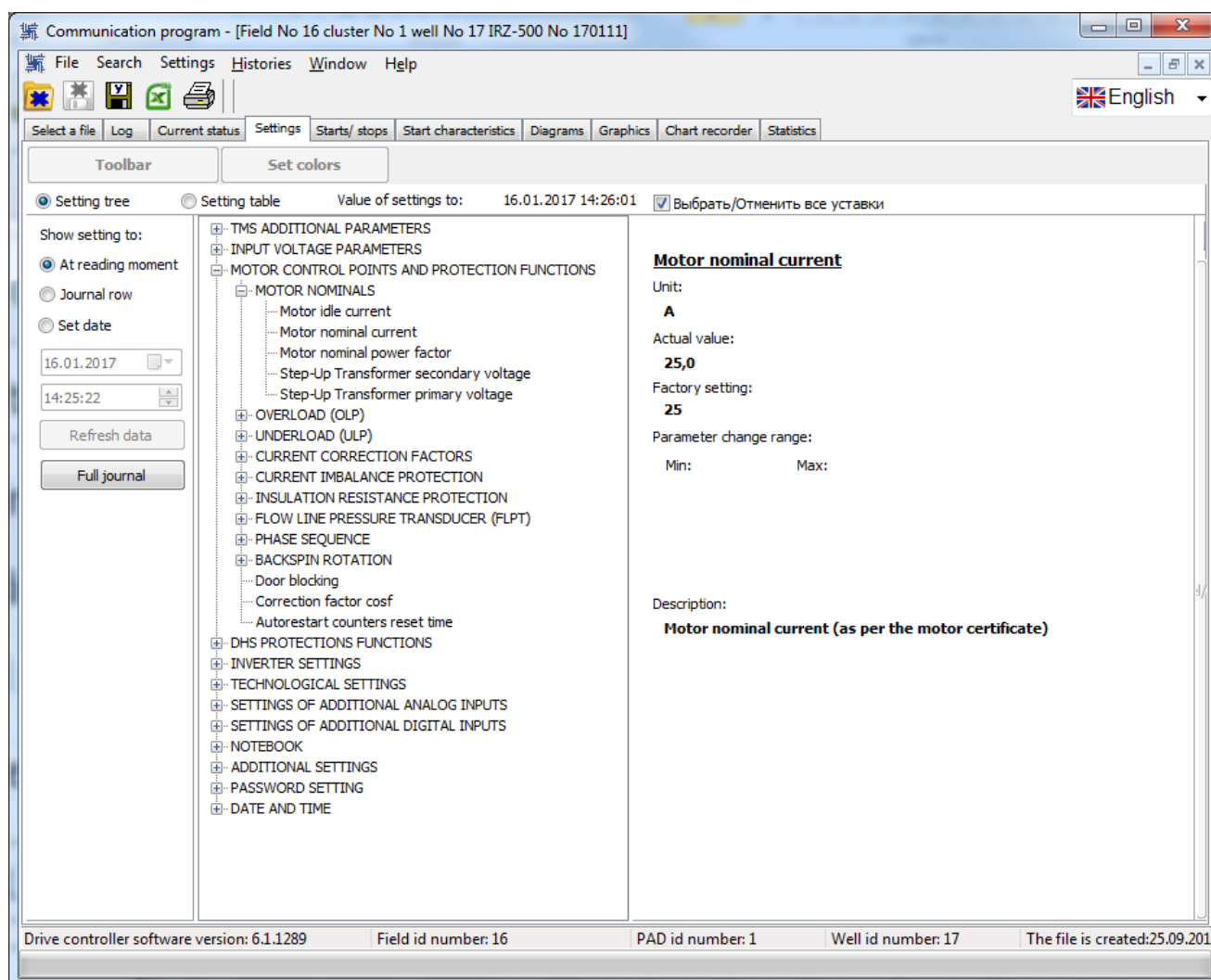


Fig. 22

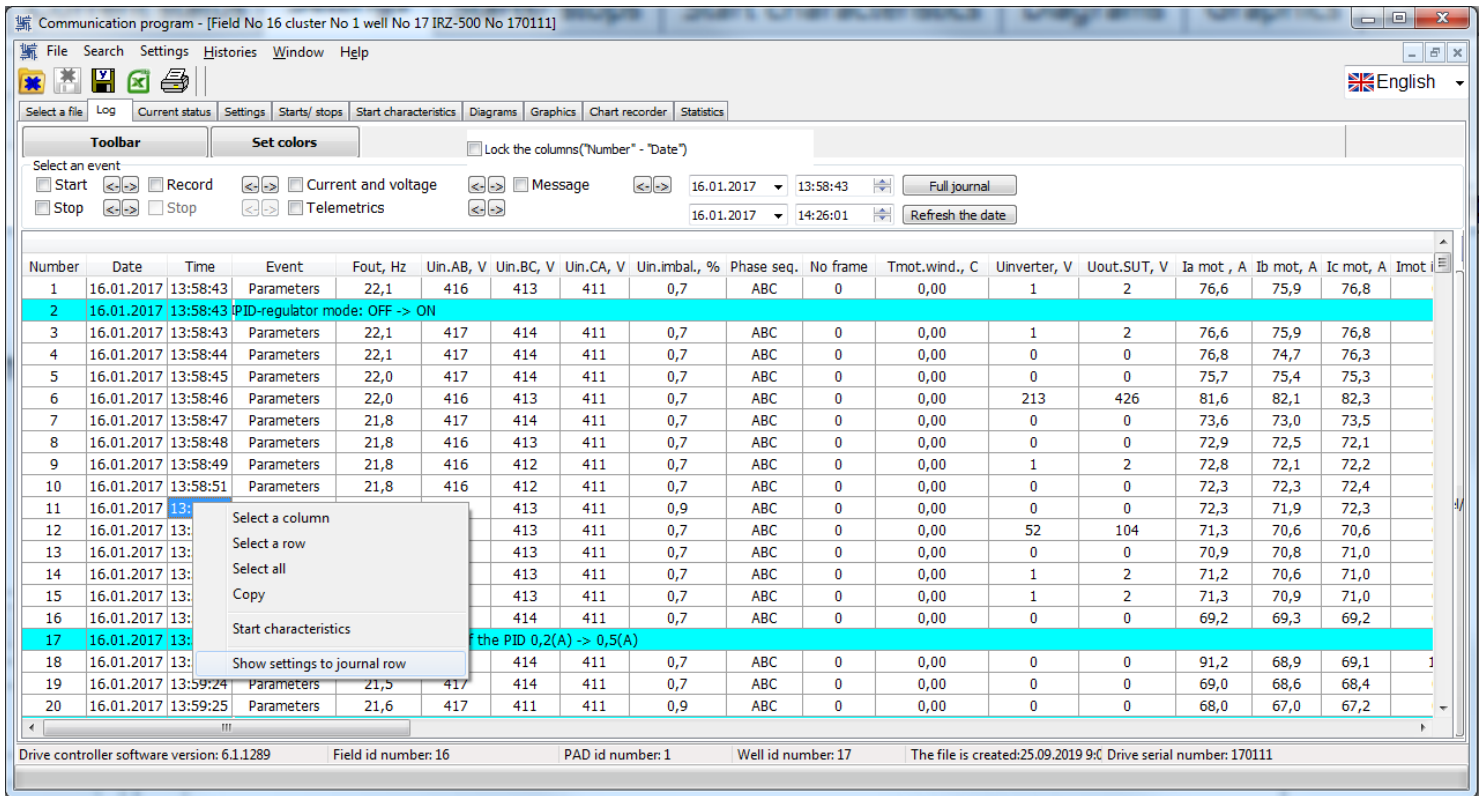


Fig. 23

When in the form of a table, settings of each group are represented in the form of a table with the columns as follows:

- "Name." The column contains name of the setting,
- "Value." The column contains value of the setting,
- "Units of measure." The column contains unit of measure of the setting, and
- "Date and time of the last setting change." The column contains the date and time of the last change in the setting value from the time when log is started to record.

You can view only the settings values actual at the time of the archive readout from the drive.

### 3.4.5.2 Add and Delete Displayed Columns

In **Settings** tab, you can set the number of the table columns to be displayed. User can add or delete columns to be displayed as described in item 3.4.3.2.

### 3.4.5.3 Sort Table Values

In **Settings** tab you can sort criteria for the table values according to the same procedure as in **Log** tab (see item 3.4.3.4).

#### 3.4.5.4 Filter Table Values

User can create, configure and use filters for the table values in **Settings** tab according to the same procedure as in **Log** tab (see item 3.4.3.5).

#### 3.4.5.5 Select Table Entry

**Settings** tab allows for selecting and copying the entries as per the same procedure as in **Log** tab (see item 3.4.3.6).

### 3.4.6 Starts / Stops Tab

#### 3.4.6.1 Overview

**Starts / stops** tab contains a list of all registered logs of the drive, related to motor start and stop, with the stop date/time, reason for stop, and values of the parameters resulting in motor stop (for protection-related shutdowns). Fig. 24 indicates **Starts / stops** tab.

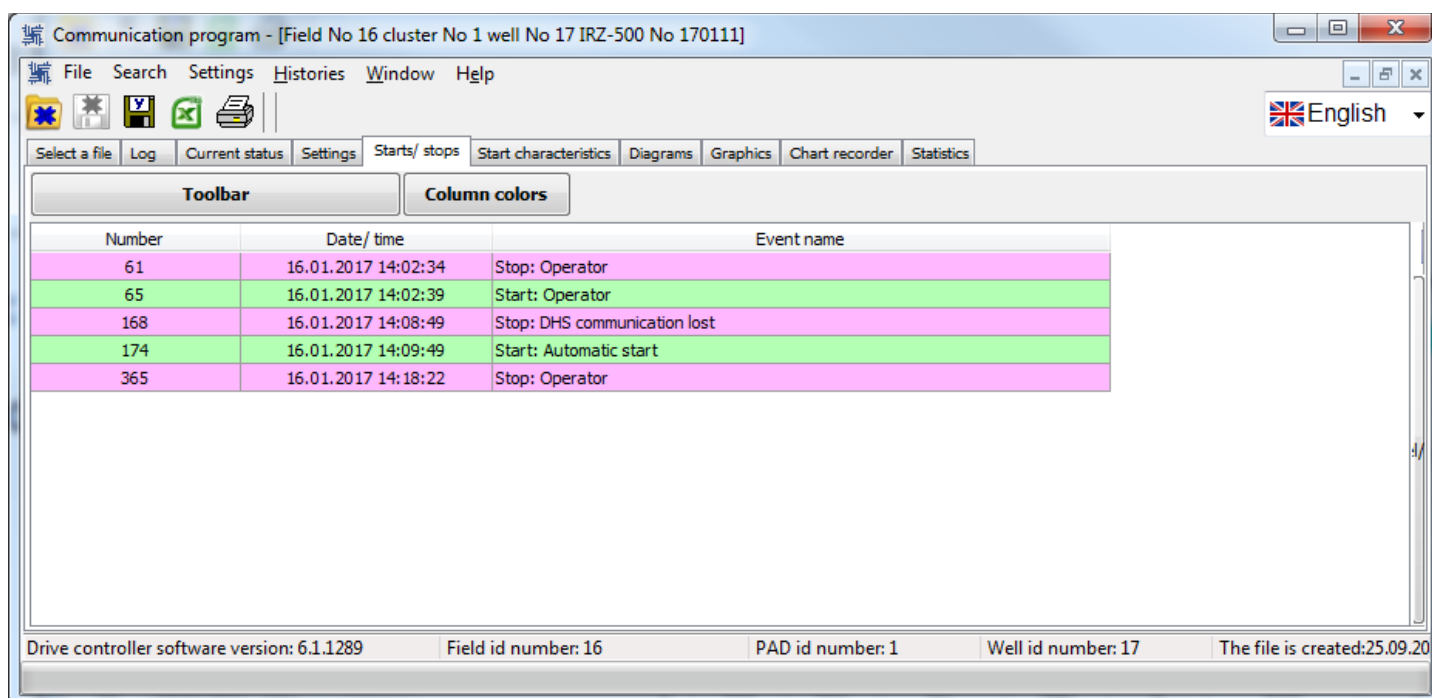


Fig. 24


All starts and stops are summarized in the table with the columns as follows:

- “Number.” The column contains numbers of **Log** tab lines with entries regarding the current start or stop,
- “Date/time.” The column contains date and time of the current start or stop, and
- “Event name.” The column contains name of the current event (start or stop), with cause and values of the parameters resulting in the event (for protection-related shutdowns).

#### 3.4.6.2 Add and Delete Displayed Columns

In **Starts / Stops** tab, you can set the number of the table columns to be displayed. The columns to be displayed are added or deleted according to item 3.4.3.2.

#### 3.4.6.3 Configuring Color of Start and Stop Events

Lines of “Starts / Stops” table can be highlighted with different colors for convenience. Default colors correspond to those specified for start and stop events in **Log** tab. To edit the colors used for start and stop events, press  (see Fig. 24) and configure the colors in the displayed lists.

#### 3.4.6.4 Sort Table Values

Sorting criteria for the table values are configured in **Starts / Stops** tab according to the same procedure used for **Log** tab (refer to item 3.4.3.4).

#### 3.4.6.5 Filter Table Values

You can create, configure, and use filters for the table values in **Starts / Stops** tab according to the same procedure as in **Log** tab (see item 3.4.3.5).

#### 3.4.6.6 Select Table Entry

Table entries are selected and copied in **Starts / Stops** tab according to the same procedure used for **Log** tab (see item 3.4.3.6).

### 3.4.7 Start characteristics Tab

#### 3.4.7.1 Overview

In **Start characteristics** tab, you can view graphs of main parameters of a drive at the time of start, for all starts registered in drive log archive.

Figure 25 demonstrates **Start characteristics** tab. The tab window can be conditionally divided into three areas, 1, 2, and 3 (see Fig. 27).

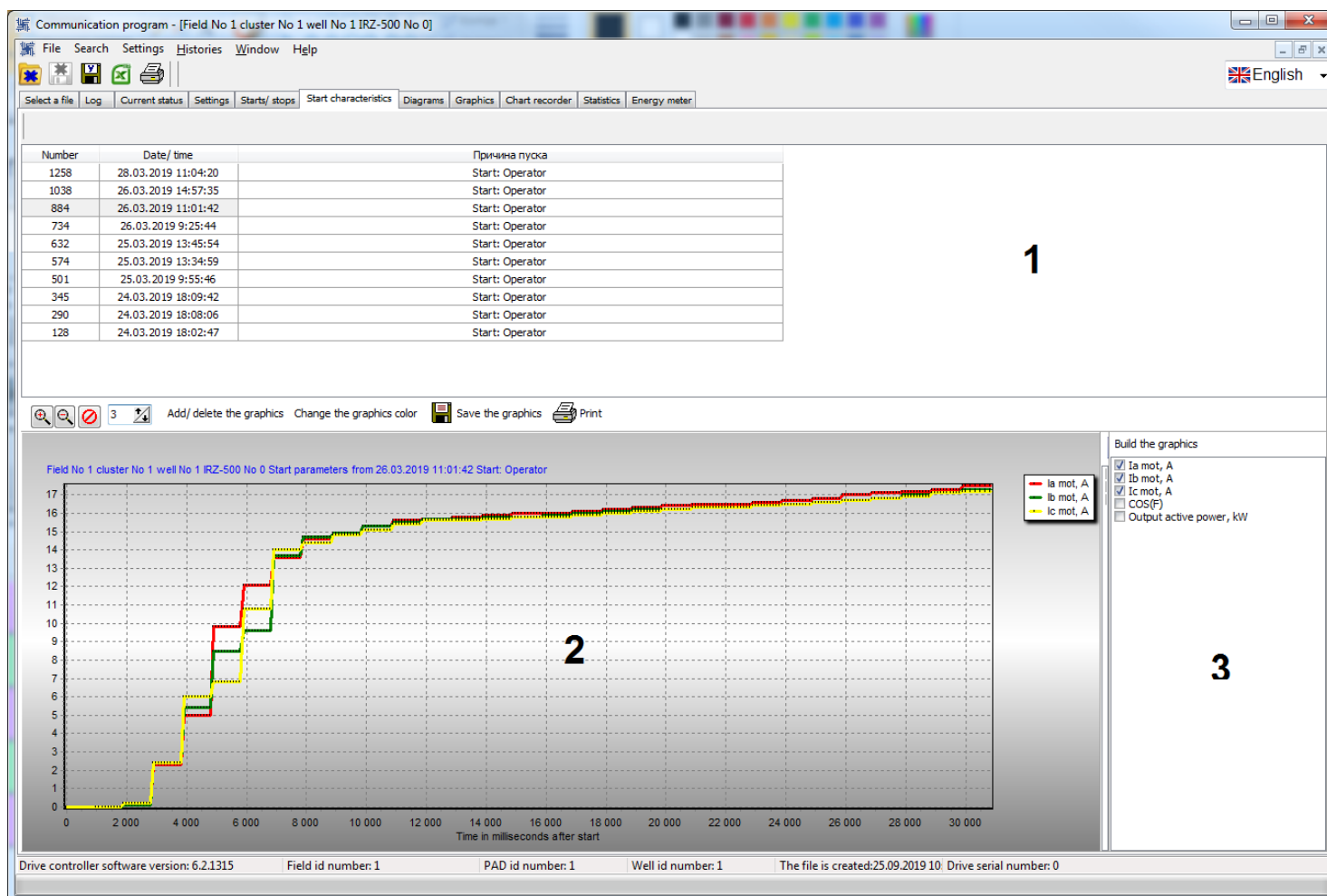


Fig. 25

Area 1 contains table of all registered motor starts, with indicated date/time of start and its reason. The table has the columns as follows:

- "Number." The column contains numbers of **Log** tab lines with entries regarding the current start,
- "Date/time." The column contains date and time of the current start, and









- "Start reason." The column contains the cause for the current start.

Area 2 contains graphs of main current parameters of the drive at the time of start. Time after drive start is plotted at the X axis in milliseconds, whereas current value of the drive parameters is plotted at the Y axis (see Fig. 25). The buttons used to configure the graph display settings are provided at the top of the Area 2 (see Fig. 25). The graph header is located directly above the display area (see Fig. 25). The header is generated based on the data as follows: field number, wellpad number, well number, name and serial number of the drive, graph name (**Start parameters**), as well as start date/time and the reason for start. Area 3 of **Start characteristics** tab contains the parameters to be plotted. Alternatively, the parameters to be plotted can be assigned by pressing *Add/delete the graphics* (at the top of the Area 2) and selecting the required parameter in the drop-down menu.

Area 3 contains the list of current parameters of a drive to be registered in the log archive in fast mode, at the time of motor start. To enable or disable parameter plotting, check  or uncheck  the relevant box in the Area 2 of **Start characteristics** tab.


### 3.4.7.2 Graph Management

#### 3.4.7.2.1 Graph Scaling

You can scale the graph using , , and  at the top of the Area 2 (graph area).  is used to scale the graph up, and  is used to scale the graph down, whereas  is used to return to default graph scale.

You can also scale up part of the graph only. To scale up a part of the graph, left-click and hold the required part to select, stretch the window as required (see Fig. 26).

#### 3.4.7.2.2 Configure Graph Lines Width

You can configure width of the graph lines. Moreover, you can configure width of the graph lines for all displayed graphs at once. To do so, use  (at the top of the Area 2). Up arrow to increase the value, and down arrow to decrease.

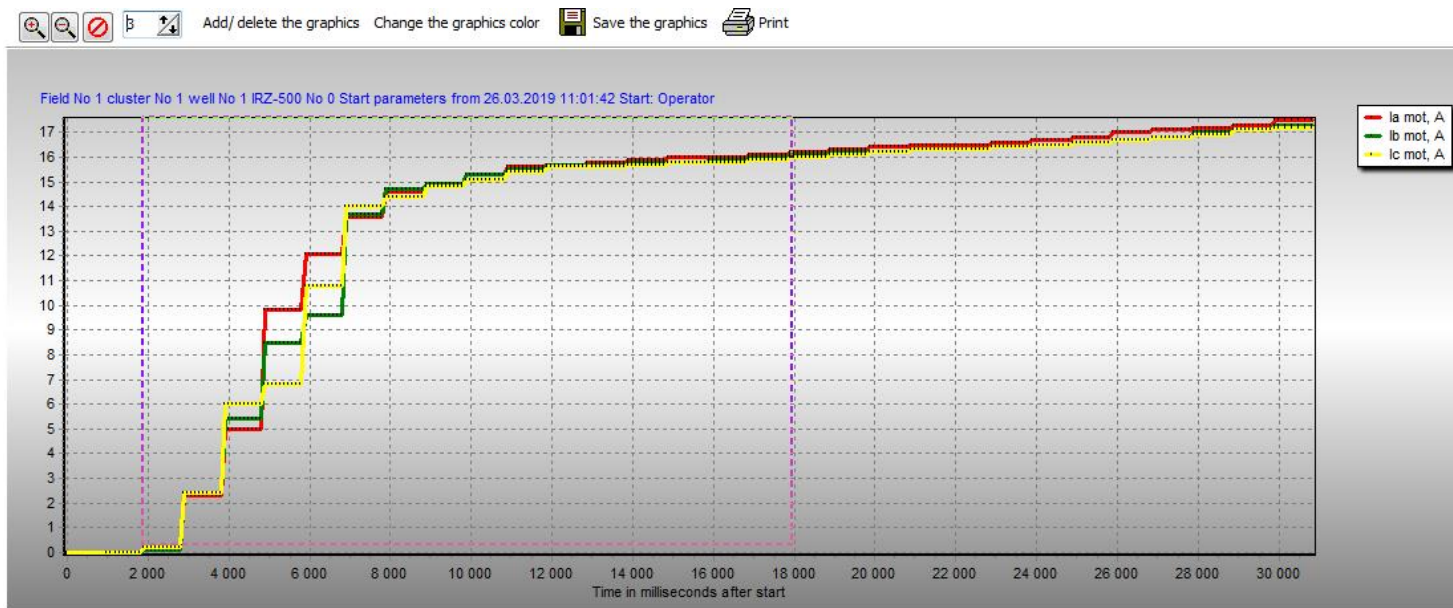


Fig. 26

### 3.4.7.2.3 Configure Graph Colors


You can configure colors of the graph lines displaying values of various parameters, for convenience. To configure color for a certain parameter, press **Change the graphics color** (at the top of the Area 2), select the parameter to get its graph color configured in the drop-down list, and select color in the window appeared.

The upper right corner of the graph (see Fig. 25) indicates current color designation of the parameter’s legend.

### 3.4.7.2.4 Save Graph

You can save the graph for start characteristics of any start in (\*.bmp) format. To save the currently displayed graph, press **Save the graphics** (at the top of the Area 2) and specify the path to save the graph file to. The file name is generated based on the data as follows: field number, wellpad number, well number, drive name and serial number, graph name (**Start parameters**), as well as start date/time and the reason.

### 3.4.7.2.5 Print Graph

You can print the graph for start characteristics of any start. To print the currently displayed graph, press  Print (at the top of the Area 2) and configure the print settings in the window appeared (see Fig. 27).

### 3.4.7.3 View Start Characteristics

To view the start characteristics for a certain start, select the relevant line in the table of the Area 1 (see Fig. 25). Herewith, graphs of start characteristics for the selected start will be displayed in the Area 2 (see Fig. 25).

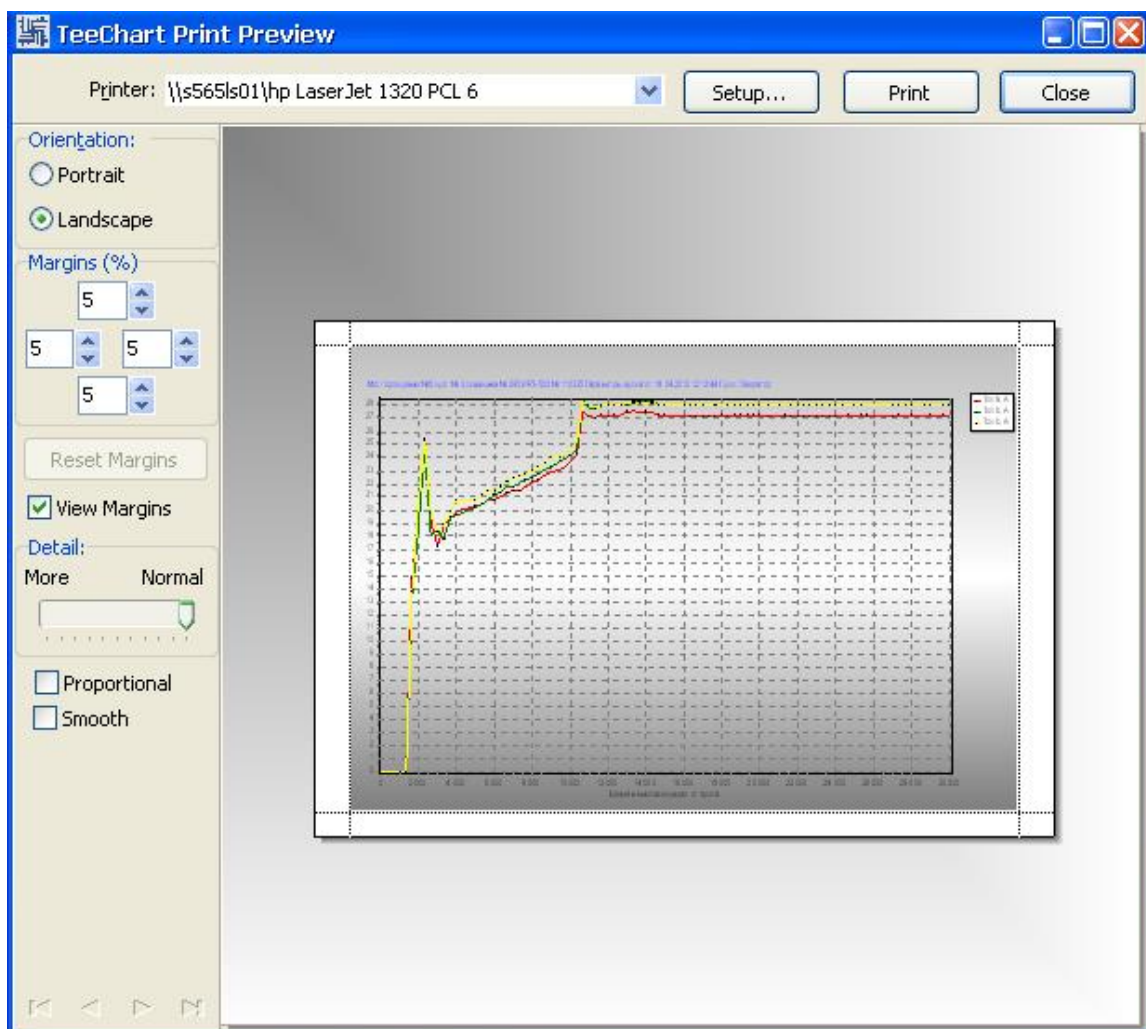


Fig. 27

## 3.4.8 Diagrams Tab

### 3.4.8.1 Overview

**Diagrams** tab contains statistical graphs with respect to drive operation. The information displayed is the data actual at the time of the log archive reading from the drive. The tab contains statistical information as follows:

- Drive work time, downtime, and their correlation,
- Number of stops of the drive for various reasons, and correlation.

Figure 28 indicates **Diagrams** tab.

The diagram header is displayed directly above the diagram. The header is generated based on the data as follows: field number, wellpad number, well number, drive name and serial number, as well as the name of the diagram view.

#### 3.4.8.2 View Diagrams

Diagrams have two view options:

- Drive work time/downtime,
- Reasons for drive stops.

To select the diagram view, check the relevant box at the top of **Diagrams** tab (see Fig. 28).

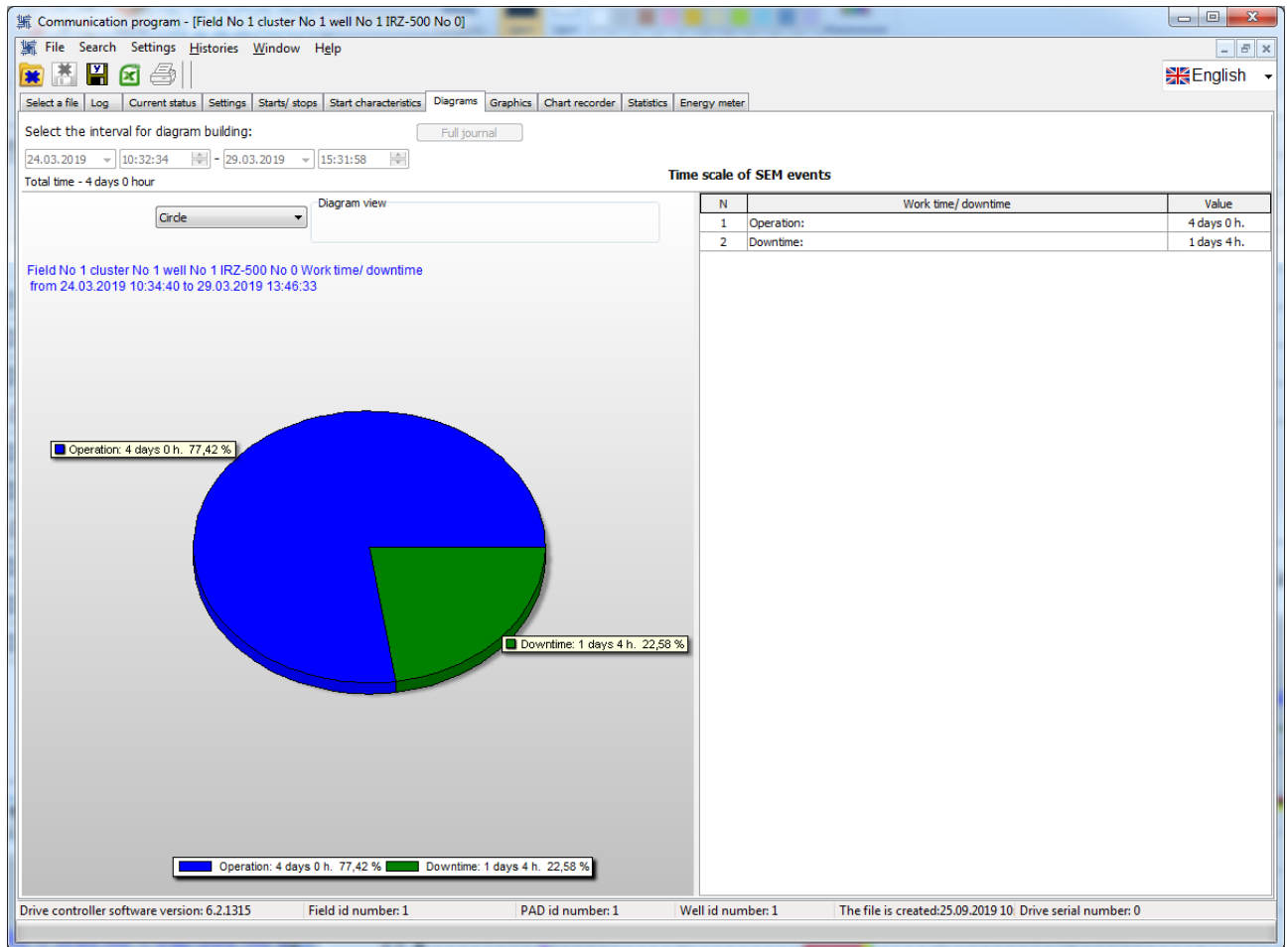


Fig. 28

### 3.4.8.2.1 Drive Work Time / Downtime Diagram

Figure 28 indicates drive work time/downtime diagram. The diagram shows a correlation graph related to drive work and down time. Work time is displayed in green, whereas down time is in blue. Every portion of the diagram has a legend with the type of the displayed event (e.g. "Operation"), duration of the event in days and hours, and percentage time of the event corresponding to total operation time of the drive (see Fig. 28). A legend is displayed at the bottom of the window. The legend contains relevant colors of the events shown in diagram, event name (operation or downtime), duration, and time in percent of each event corresponding to drive total operation time.

### 3.4.8.2.2 Drive Stop Reason Diagram

Figure 29 demonstrates drive stop reason diagram.

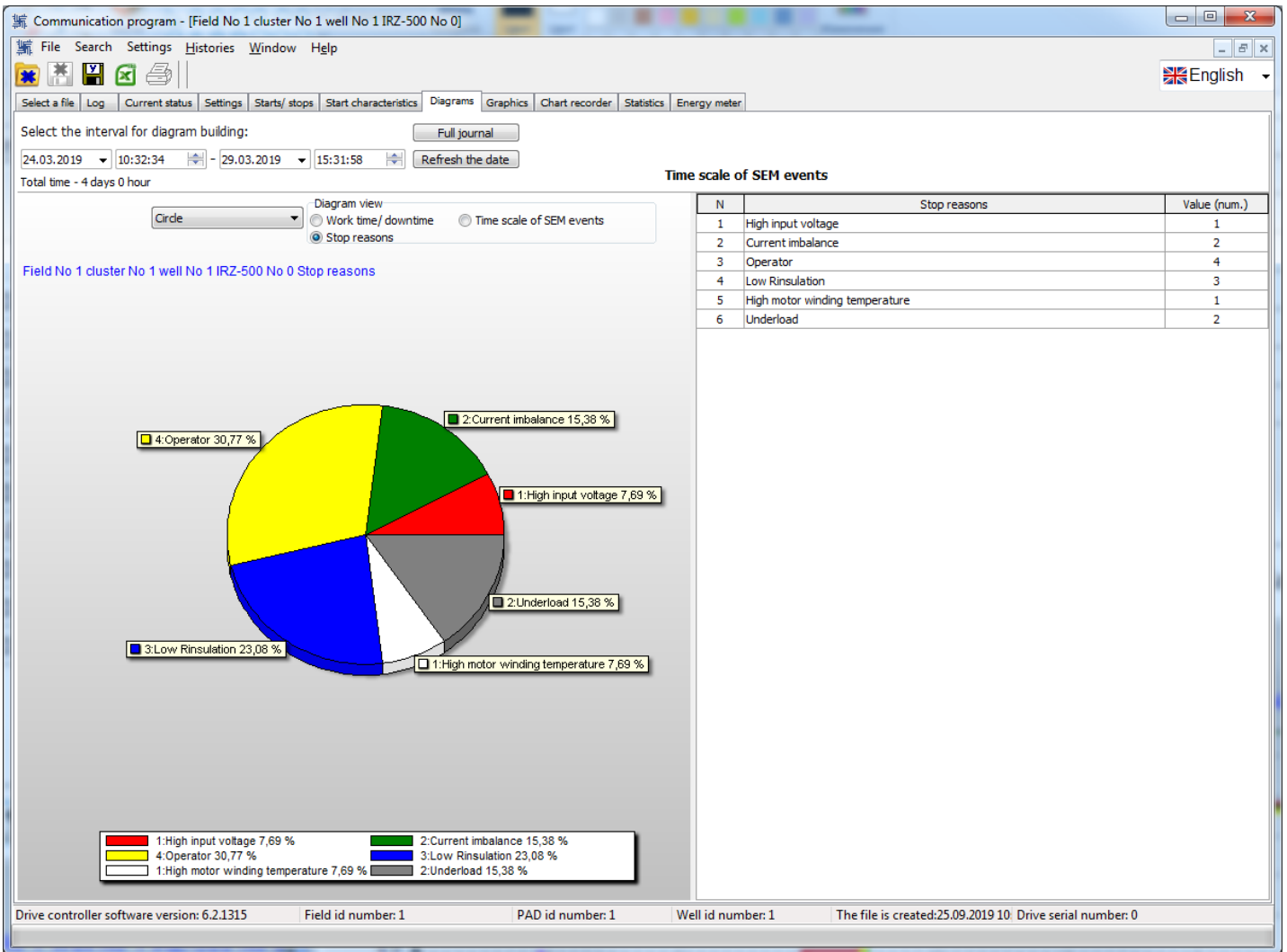


Fig. 29

The diagram shows correlation of numbers of drive stops for various reasons, shown on the diagram in different colors. Every portion of the diagram has a legend indicating reason for stop, number of stops by certain reason, and percentage number of stops for the reason corresponding to total number of drive stops (see Fig. 29). A legend is displayed at the bottom of the window. The legend contains relevant colors of the reasons for stop, reason for stop, number of stops by each reason, and percentage number of stops by each reason corresponding to total number of drive stops.

### 3.4.8.3 Diagram Type

Diagrams may be displayed in two forms:

- Pie Chart (or Circular, see Fig. 28, 29),

- Bar Diagram (see Fig. 30, 31). A bar-type drive work time/downtime diagram is shown in Fig. 30, whereas a bar-type drive stop reason diagram is shown in Fig. 31.

To select the diagram type to be displayed, use a drop-down list of diagram types

Circle at the upper left of **Diagrams** tab.

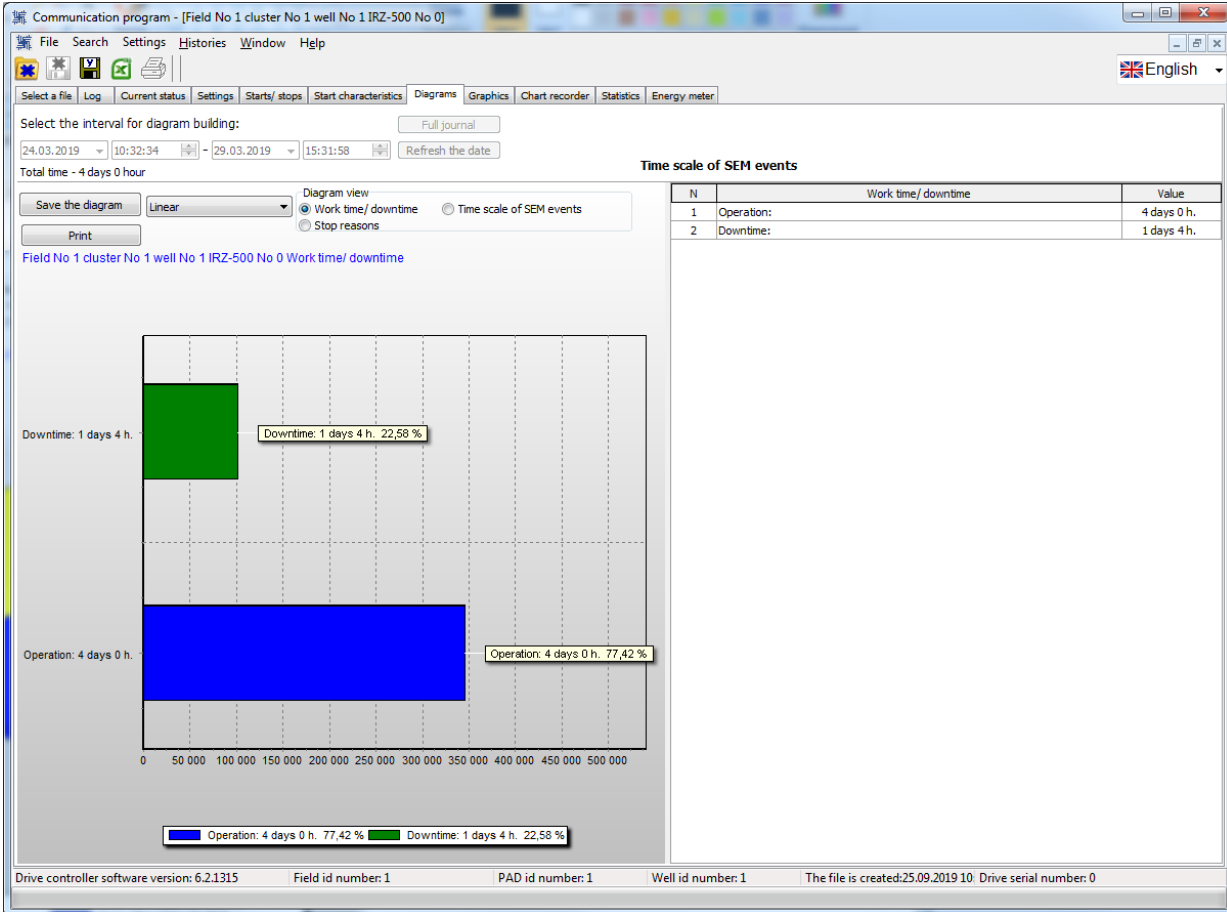


Fig. 30

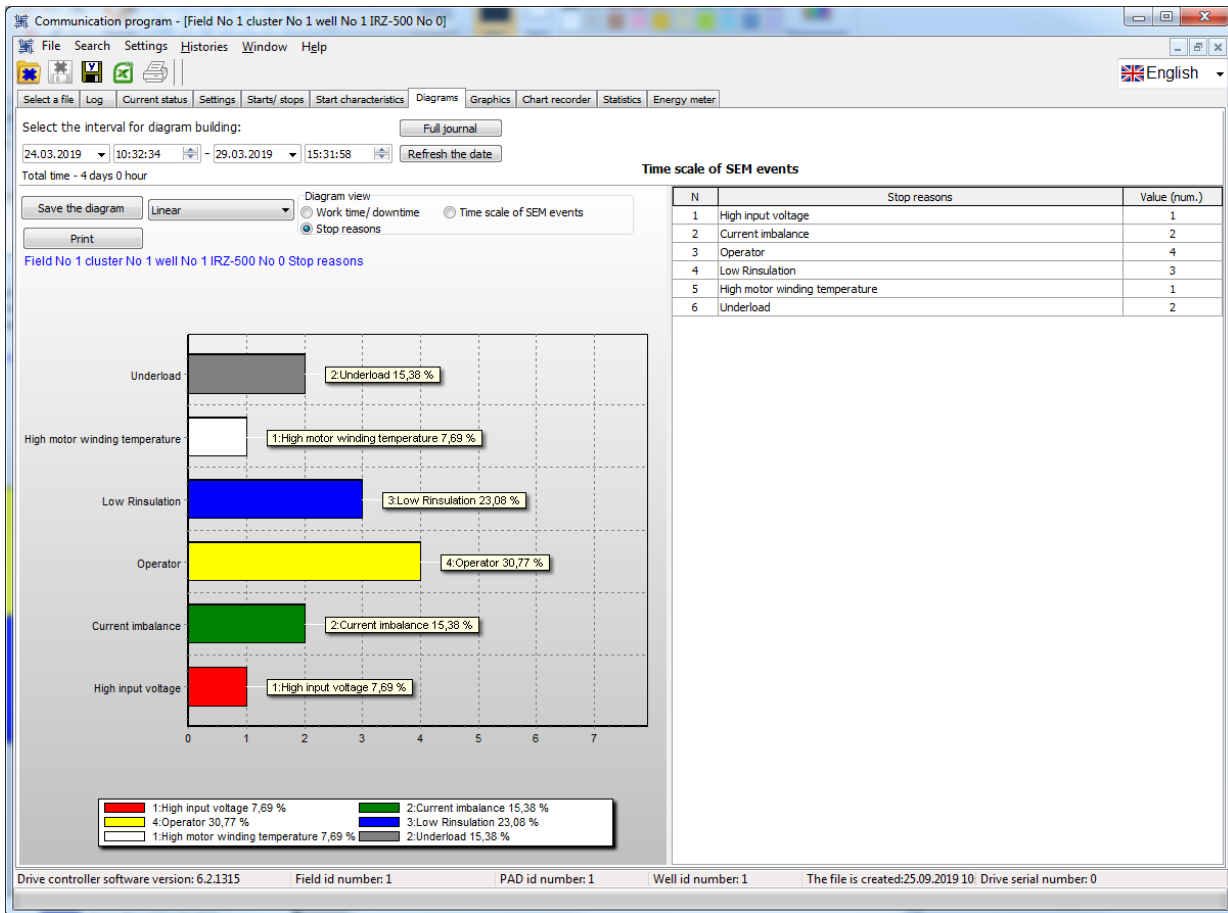

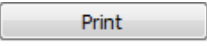


Fig. 31

### 3.4.8.3 Save Diagram

You can save the diagram of any type in a (\*.bmp) format. To save the currently displayed diagram, press  at the upper left corner of **Diagrams** tab and specify the path to save the diagram file to. The file name is generated based on the data as follows: field number, wellpad number, well number, drive name and serial number, as well as the diagram view.

### 3.4.8.4 Print Diagram

You can print the diagram of any type. To print the currently displayed diagram, press  (at the upper left corner of **Diagrams** tab) and configure the print settings in the window appeared (see Fig. 32).



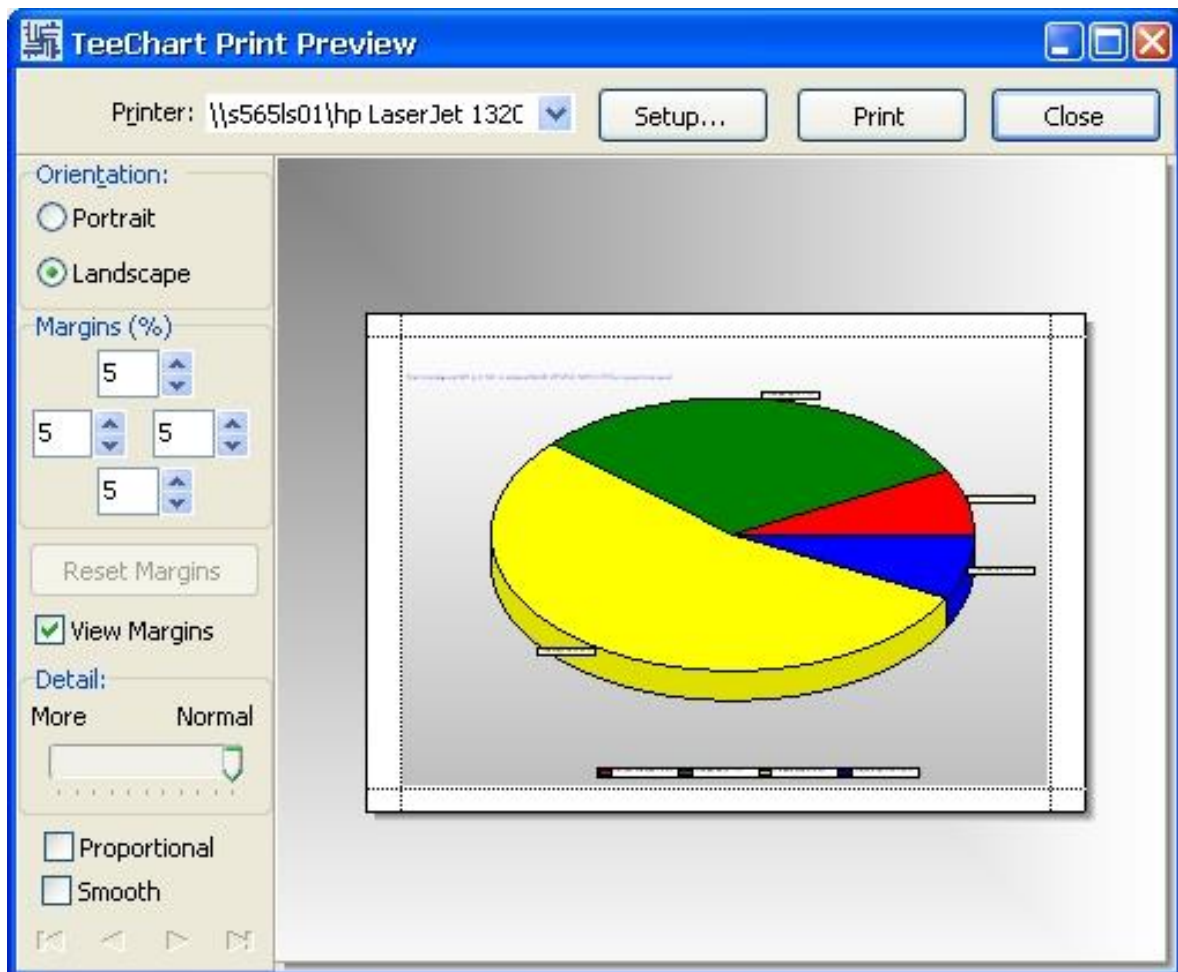


Fig. 32

### 3.4.9 Graphics Tab

#### 3.4.9.1 Overview

**Graphics** tab contains graphs of current parameters of the drive versus time.

Figure 33 displays **Graphics** tab.

A graph header is displayed directly above the graph. The header is generated based on the data as follows: field number, wellpad number, well number, drive name and serial number.

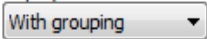
#### 3.4.9.2 Graph Display Modes

Graphs may be displayed in three modes:

- "With grouping,"
- "Separately," and

- "One graphics."

To select display mode, find the relevant item in drop-down list of "Display mode"



at the upper right corner of **Graphics** tab (see Fig. 33).

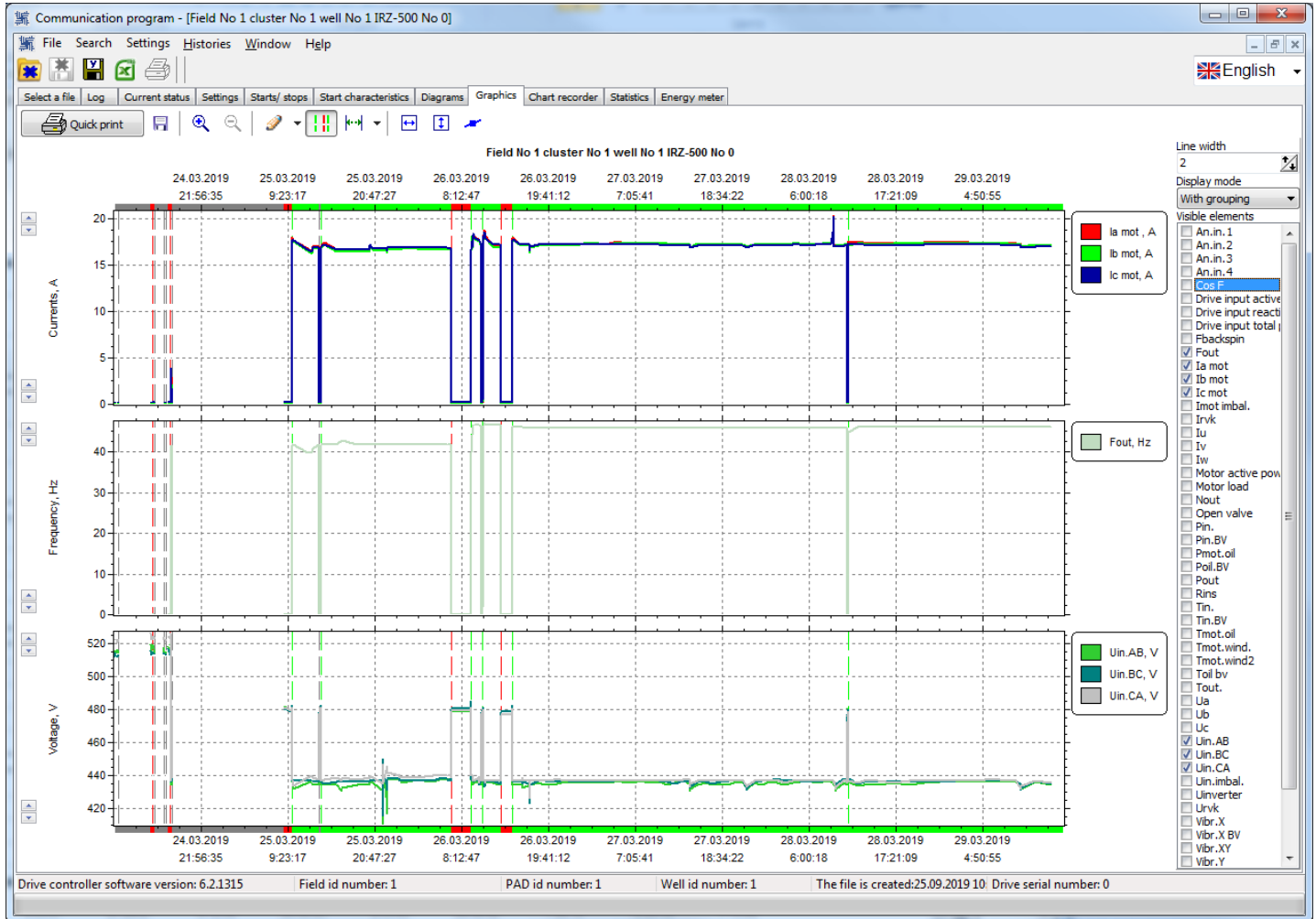


Fig. 33

When in "With grouping" mode, graphs are grouped by types of parameters, i.e. graphs of several same-type parameters are displayed on the same axis. For example, three main voltage graphs (Uab, Ubc, Uac) or three motor current consumption graphs (Ia, Ib, Ic) may be displayed on the same axis (see Fig. 33).

When in "Separately" mode, graphs of each parameter are displayed on individual axis (see Fig. 34).

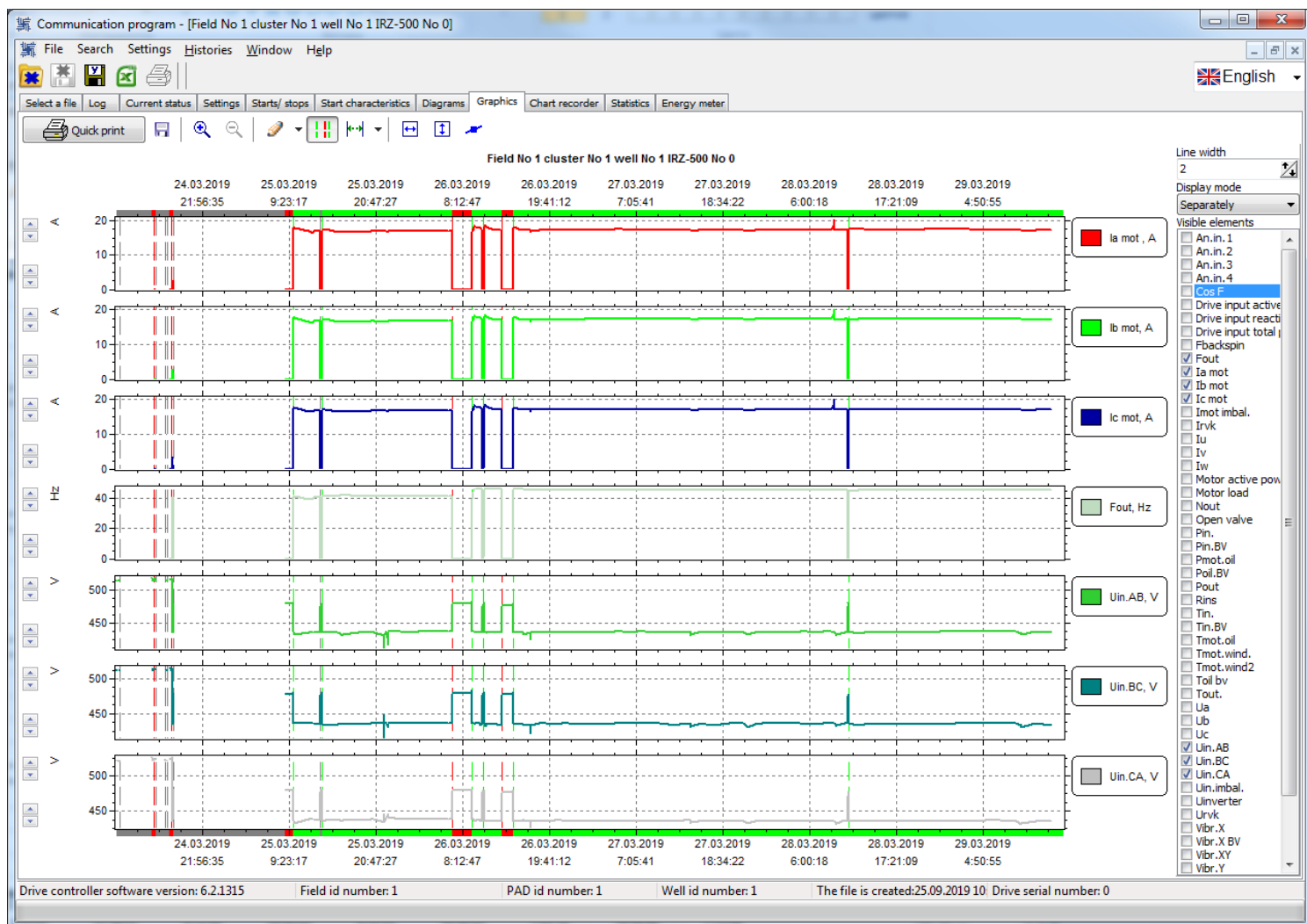


Fig. 34

When in "One graphics" mode, graphs of all parameters are displayed on the same axis (see Fig. 35).

In every display mode, a legend is displayed at the right side of the graph. The legend contains brief description of the plotted parameter, unit of measure and color.

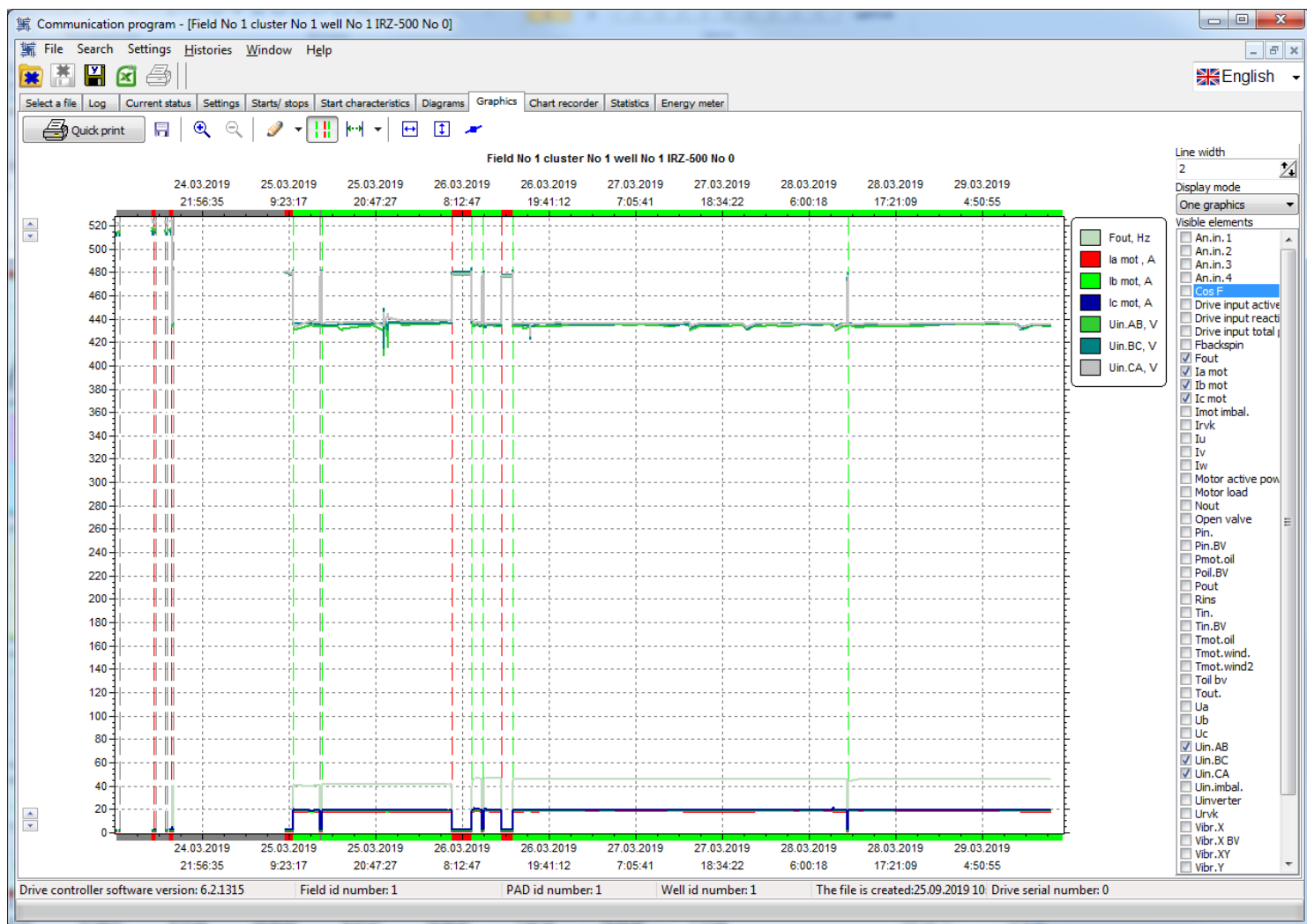


Fig. 35

### 3.4.9.3 Select Plotted Parameters

You can select the current parameters to be plotted. To add or delete parameter to be plotted, check  (add) or uncheck  (delete) the relevant box in the list of the displayed elements to the right side of **Graphics** tab.




### 3.4.9.4 Graph Configuring

#### 3.4.9.4.1 Configure Graph Line Width

To configure width of the graph lines, set a numerical value in the "Line width" field  at the upper right corner of **Graphics** tab (see Fig. 34). Increase the value to increase the line width or decrease the value to decrease width of the graph lines. The acceptable range is 1 to 20. New value of the line width is applied to all graphs displayed in **Graphics** tab. The line width is changed directly after the value is configured in **Line width** field.

### 3.4.9.4.2 Graph Scaling

Graphs can be scaled along the horizontal (time) axis as follows:

- using  (scale up) and  (scale down) on **Graphics** toolbar at the upper left of **Graphics** tab,
- using  (configure scale). When the button is pressed, a drop-down list appears. Select the required value of time scale in the list (see Fig. 36),

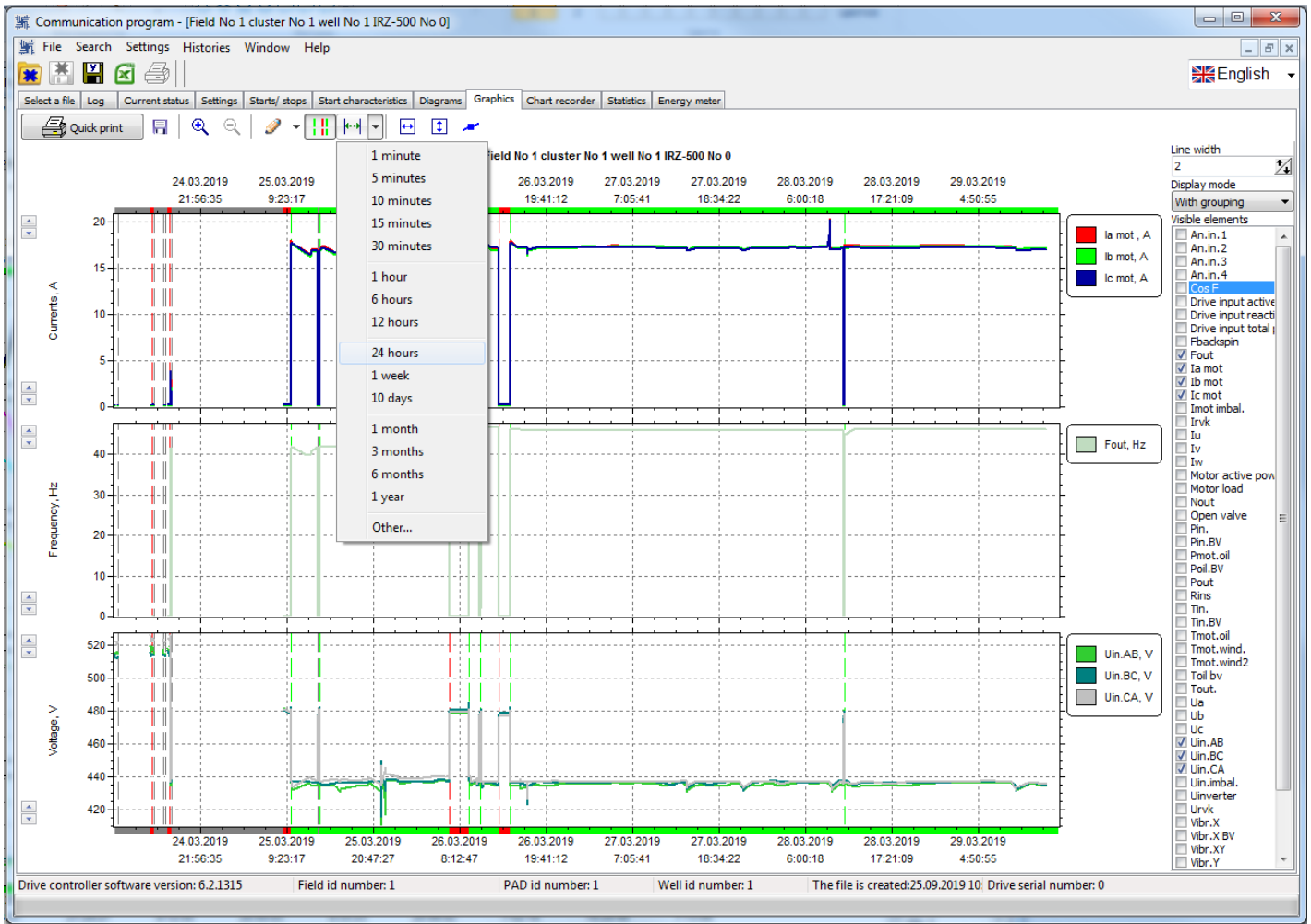


Fig. 36

- selecting the graph area to be scaled up or down. The area is selected from left to right. To select the graph area, set the pointer to the start point, left-click, and move the pointer to the right until the required end point is reached, holding the left mouse button; then release the button (see Fig. 37). The selected graph area scaled as required will be displayed in the window (see Fig. 37).

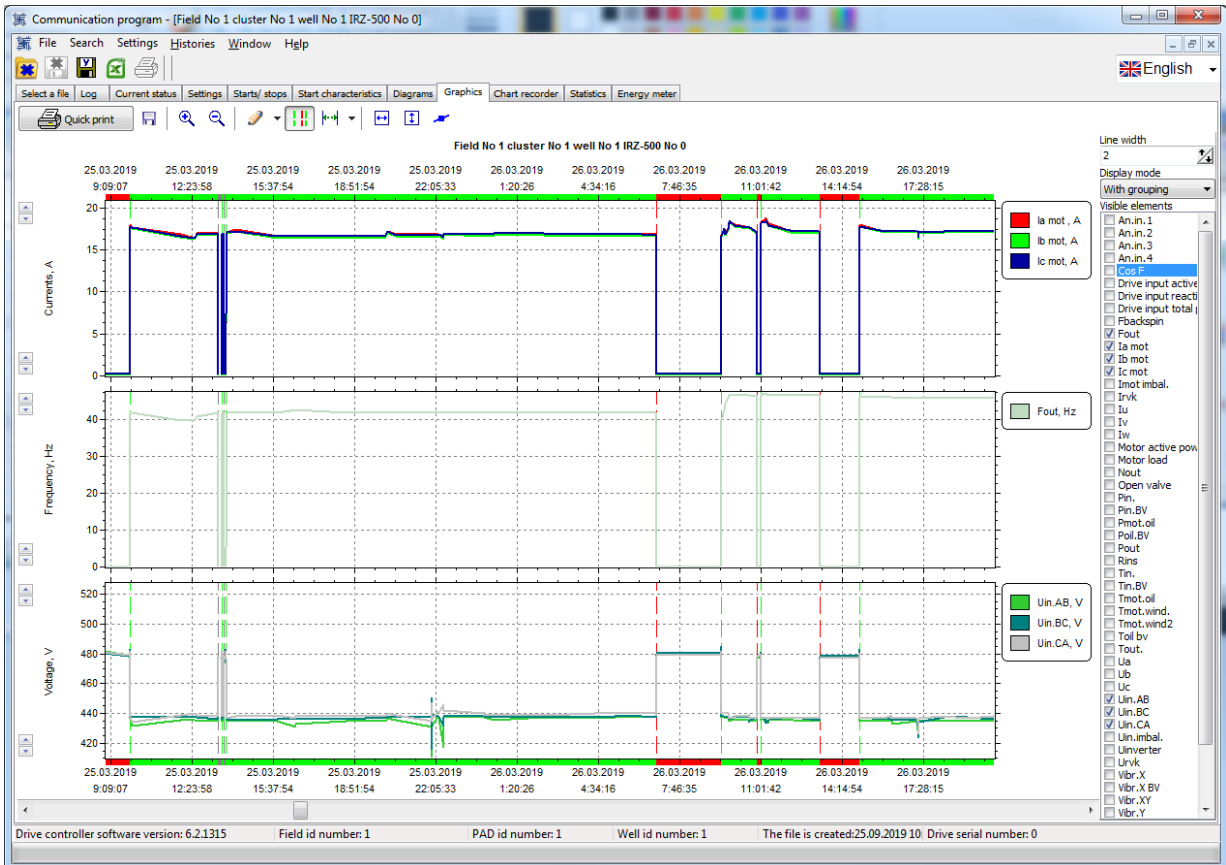
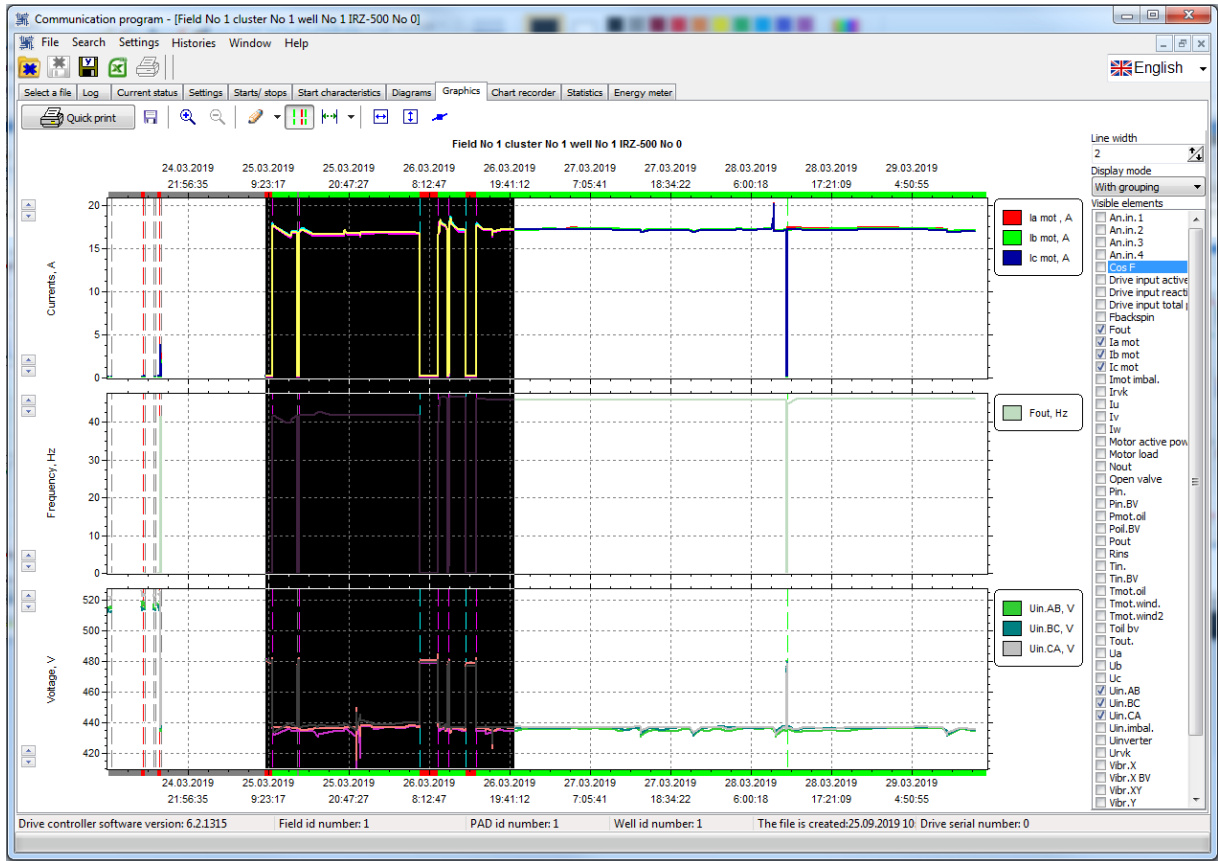





Fig. 37

To undo the scaling and display the graph in full, press **Overview**  on the toolbar at the upper right side of the **Graphics** tab.

All scaling operations above are applied to all graphs displayed in the **Graphics** tab, at once. No individual graph scaling in terms of time is provided.


Graphs can be scaled along the vertical axis as follows:

- using **Adjust graphics by height**  to configure the graph scale so that all parameter values (from maximum to minimum) registered in the archive of current parameters are plotted. When the button is pressed, vertical scale is configured for all graphs displayed in the **Graphics** tab,

- using **On/Off Markers**  to enable or disable selection of the graph points corresponding to actual data of the archive entries,

- using  to the left of each graph to configure individual vertical scale of the graph.

#### 3.4.9.4.3 Start/Stop Lines

You can plot start and stop of the drive, with vertical dash lines highlighted in different colors. Green lines correspond to drive start, whereas red lines correspond to drive stop (see Fig. 35). To enable or disable displaying start/stop lines, press **Show starts/stops**  on the toolbar at the upper left side of the **Graphics** tab.

#### 3.4.9.4.4 Configure Graph Line Colors



You can configure line color for each graph displayed. To do so, press  on the toolbar of the **Graphics** tab and select the parameter to get the color configured in the drop-down list (see Fig. 38), then select the required line color in the appeared dialog.






Fig. 38

### 3.4.9.5 Save Graph

You can save the graphs displayed in the **Graphics** tab in a (\*.bmp) format. To save currently displayed graphs, press **Save the picture**  on the toolbar at the upper left side of the **Graphics** tab and specify the path to save the graph file to. The file name is generated based on the data as follows: field number, wellpad number, well number, drive name and serial number, as well as the date and time range for the data to be plotted.

### 3.4.9.5 Print Graph

You can print the graphs displayed in the **Graphics** tab. To print currently displayed graphs, press  **Quick print** on the toolbar at the upper left side of the **Graphics** tab. The currently displayed graphs will be printed with default print settings.



### 3.4.10 Chart recorder Tab

#### 3.4.10.1 Overview

**Chart recorder** tab contains circular diagram with current drive versus time parameters in polar coordinates.

Figure 39 displays **Chart recorder** tab.

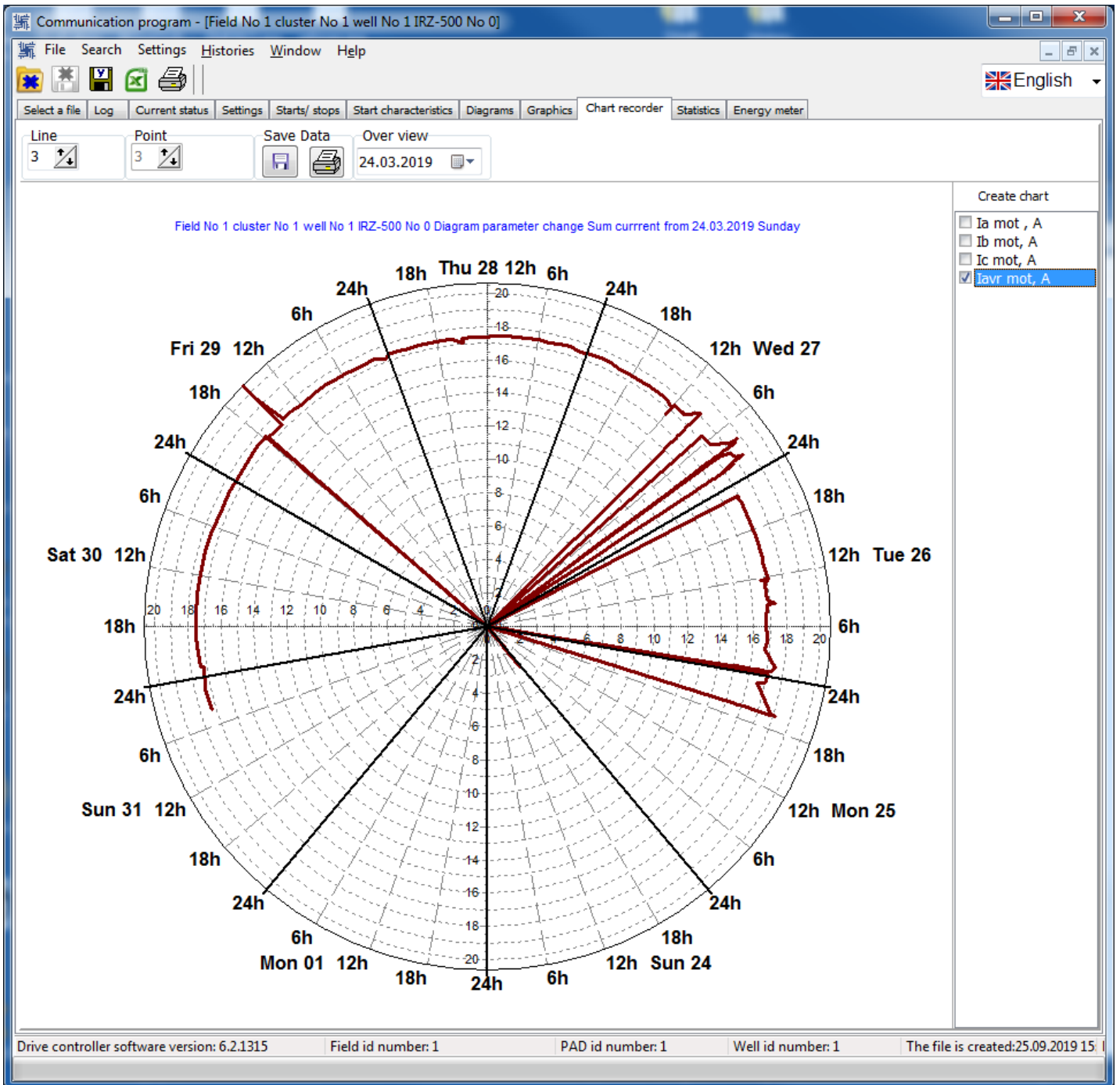


Fig. 39

The graph header is displayed directly above the graph. The header is generated based on the data as follows: field number, wellpad number, well number, drive name and serial number.

#### 3.4.10.2 Select Plotted Parameters

You can plot one of the following parameters at a time:

- "Ia mot." Phase A motor current,
- "Ib mot." Phase B motor current,
- "Ic mot." Phase C motor current, or
- "Iavr mot." Average motor current per three phases.

To select the parameter to be plotted, check  (show) or uncheck  (do not show) the relevant box at the upper right side of the **Chart recorder** tab (see Fig. 39).


#### 3.4.10.3 Configure Graph

##### 3.4.10.3.1 Display Range


Data are plotted in the form of a circular graph for a fixed period equal to 8 days. Hence, circular area of the graph is divided into eight sectors corresponding to number of days. Each day sector is in its turn divided in four more sectors corresponding to six hours each.

To configure the graph default, select the relevant date in "Over view" field at the top of the **Chart recorder** tab (see Fig. 40).

##### 3.4.10.3.2 Configure Graph Line Width

To configure width of the graph lines, set numerical value in **Line** field   at the upper left corner of the **Chart recorder** tab (see Fig. 39). Increase the value to increase the line width or decrease the value to decrease width of the graph lines. The acceptable range is 1 to 20. The line width is changed directly after the value is configured in the **Line** field.

##### 3.4.10.3.3 Configure Graph Line Colors

You can configure line color for the currently displayed graph. To do so, press  in the **Line** field at the upper left side of the **Chart recorder** tab and select the required line color.

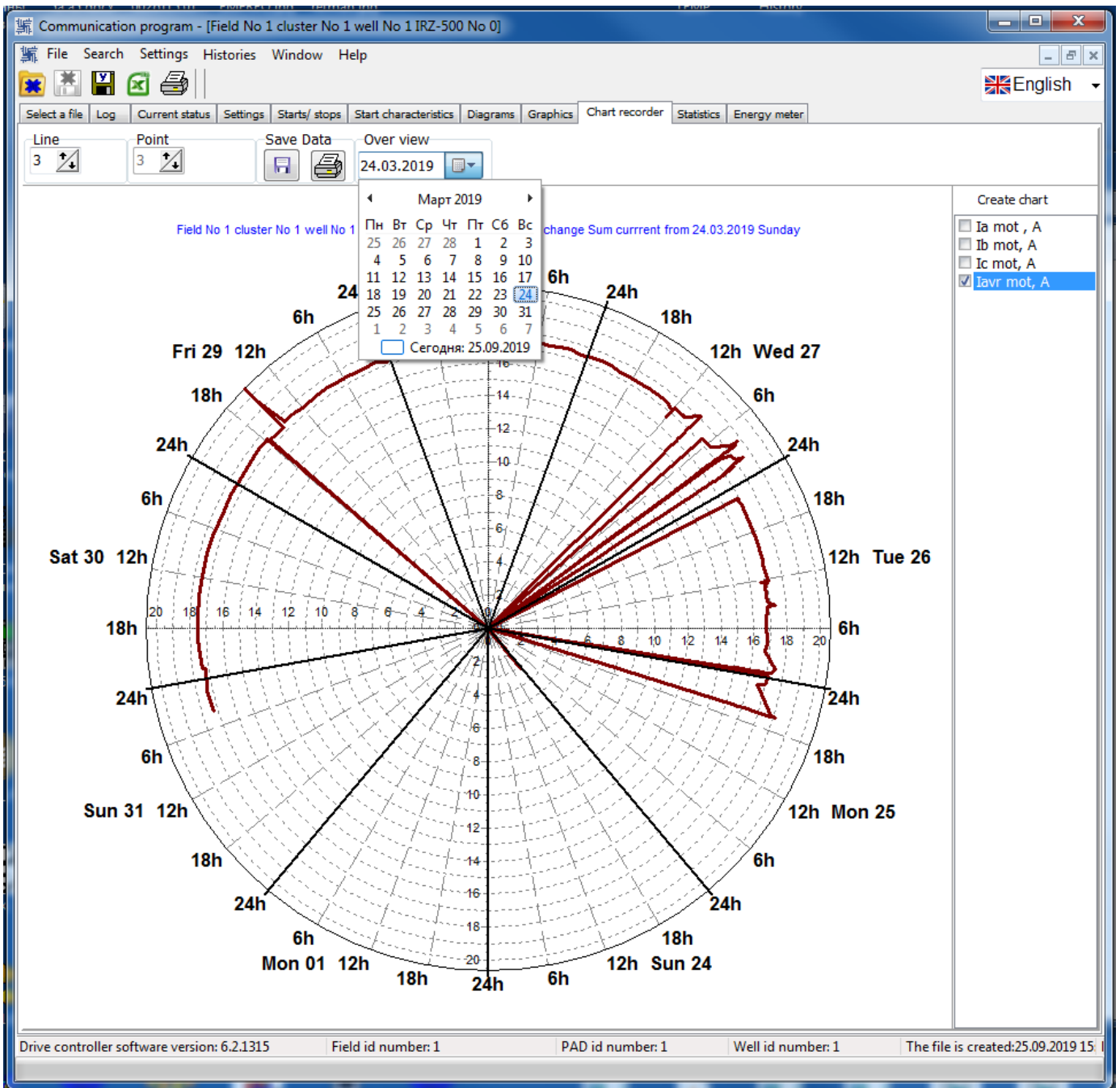




Fig. 40

### 3.4.10.3.4 Configure Graph Points

You can configure size and color of the individual points corresponding to actual registered values in the circular graph. To enable showing individual points, check  **Point** box at the upper left side of the **Chart recorder** tab (see Fig. 39). To configure color of the graph points, press  in **Point** field at the upper left side of the **Chart recorder** tab (see Fig. 39) and select the required point color

in the appeared dialog. The point size is configured by setting numerical value in the **Point** field  (see Fig. 39). Increase the value to increase the point width or decrease the value to decrease width of the points. The point width is changed directly after the value is configured in the **Point** field. Figure 41 gives example of the graph with enabled selection of individual points.

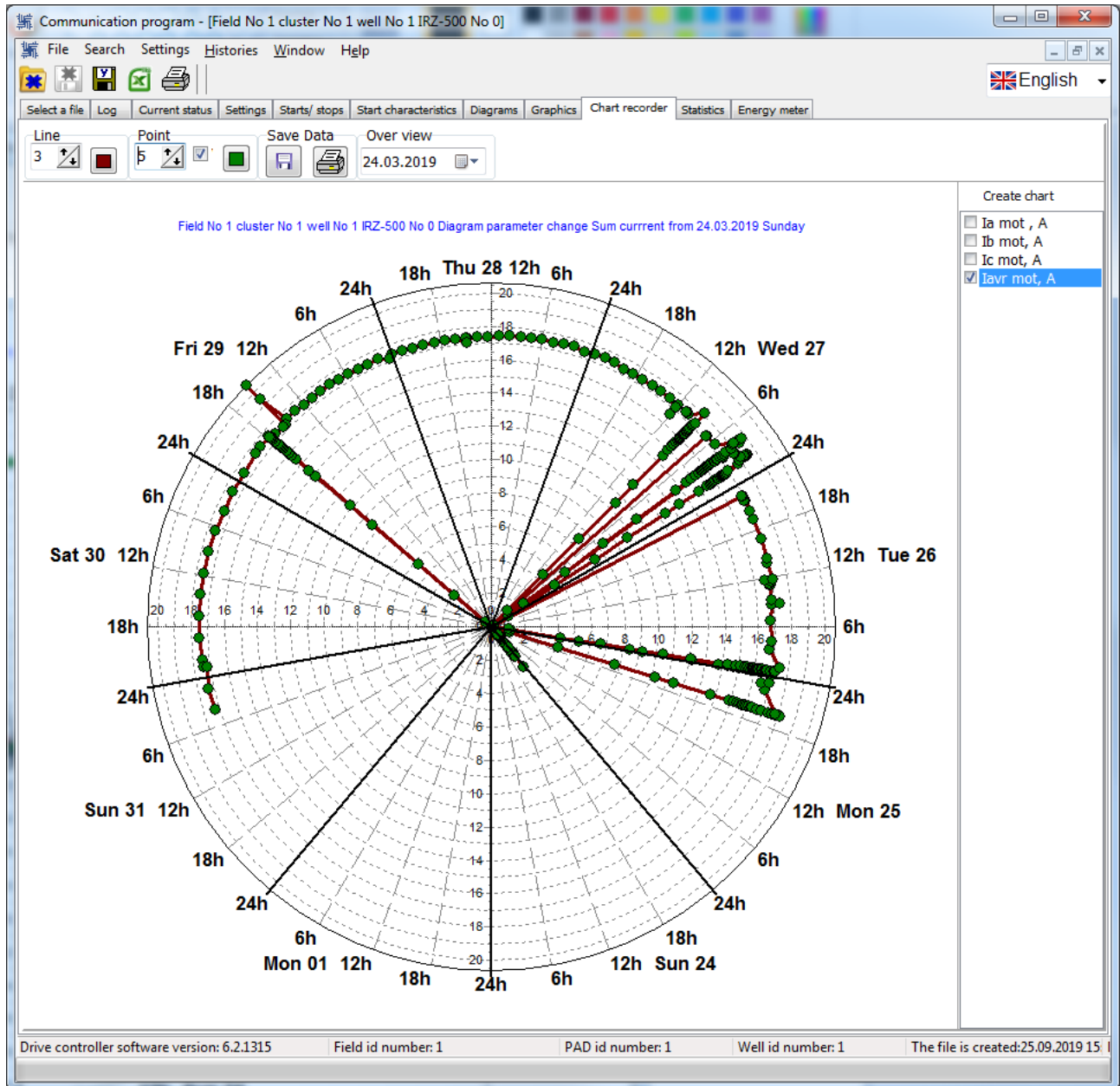




Fig. 41

### 3.4.10.4 Save Circular Graph

You can save the graph displayed in the **Chart recorder** tab in (\*.bmp) format. To save the currently displayed graphs, press **Save data**  on the toolbar at the upper left side of the **Chart recorder** tab and specify the path to save the graph file to. The file name is generated based on the

data as follows: field number, wellpad number, well number, drive name and serial number, as well as the date and time range for the data to be plotted.

#### 3.4.10.5 Print Graph

You can print the graph displayed in the **Chart recorder** tab. To print currently displayed graph, press  at the upper left side of the **Chart recorder** tab and configure print settings.

### 3.4.11 Statistics Tab

#### 3.4.11.1 Overview

**Statistics** tab contains drive statistics parameters and operation hours. Parameters displayed are the values actual at the time of the log archive reading from the drive. Figure 42 indicates **Statistics** tab.

The parameters are displayed in the form of a table with the columns as follows:

- "Parameter." The column contains name of drive parameters,
- "Parameter value." The column contains values of the drive parameters actual at the time of the log archive reading, and
- "Parameter measurement unit." The column contains units of measure for the parameters specified in "Parameter value" column.

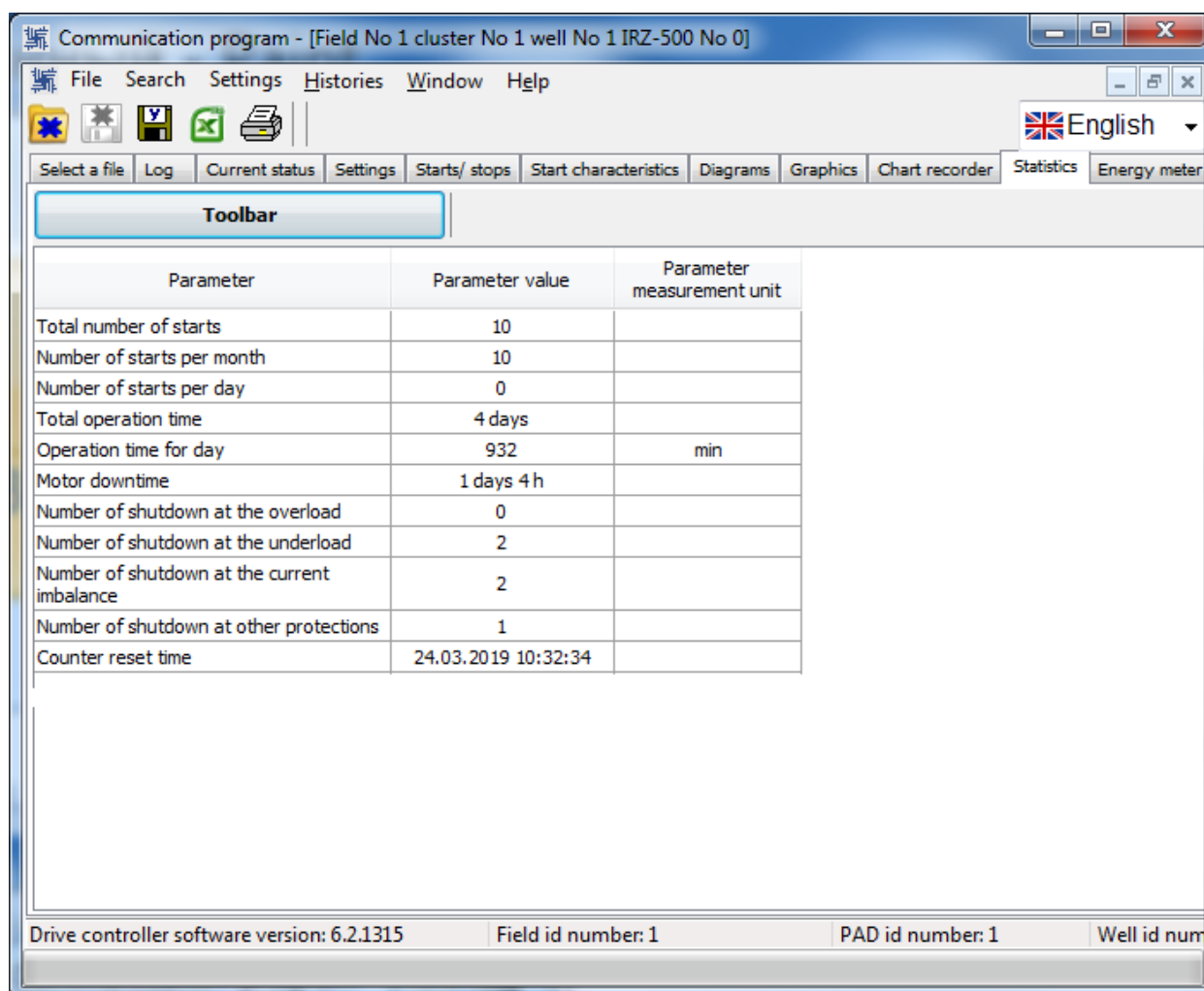


Fig. 42

### 3.4.11.2 Add and Delete Displayed Columns

In **Statistics** tab, you can set the number of the table columns to be displayed. The columns to be displayed are added or deleted as described in the item 3.4.3.2.

### 3.4.11.3 Sort Table Values

Sorting criteria for the table values are configured in the **Statistics** tab according to the same procedure used for the **Log** tab (see item 3.4.3.4).

### 3.4.11.4 Filter Table Values

User can create, configure and apply filters for the table values in the **Statistics** tab according to the same procedure used for the **Log** tab (see item 3.4.3.5).

#### 3.4.11.5 Select Table Entry

Table entries are selected and copied in the **Statistics** tab according to the same procedure used for the **Log** tab (see item 3.4.3.6).

### 3.5. Convert Drive Log Archive into Microsoft Excel Format

#### 3.5.1 General

Conversion function is meant to convert drive log archive in (\*.xlsx) format that can be viewed and processed with Microsoft Excel from the Microsoft Office package.

**ATTENTION!!! Proper operation of the conversion function requires Microsoft Excel to be installed on PC, from the software package as follows: Microsoft Office 2007 or later.**

#### 3.5.2 Conversion

To start conversion, press  on the toolbar or hot keys CTRL+E on the keyboard.

The registered data from the tabs are converted to the Microsoft Excel format as follows:

- "Log",
- "Current status",
- "Settings",
- "Starts / stops", and
- "Statistics".

The resulting (\*.xlsx) file is saved to the default directory specified for the Microsoft Excel files (see item 3.3.2). The file name is generated based on the data as follows: field number, wellpad number, well number, drive name and serial number.


Upon conversion, the resulting file will be automatically opened in the Microsoft Excel format.

### 3.6. Print Drive Log Archive

You can print information from any tab.

Procedure for printing the information from the **Start characteristics**, **Diagrams**, and **Graphics** tabs is described above.

To print information from the **Log**, **Settings**, **Starts / stops**, **Statistics**, and **Current status** tabs:

- Go to the relevant tab,
- Press  on the toolbar or hot keys CTRL+P on the keyboard. The relevant dialog will appear (see Fig. 40).

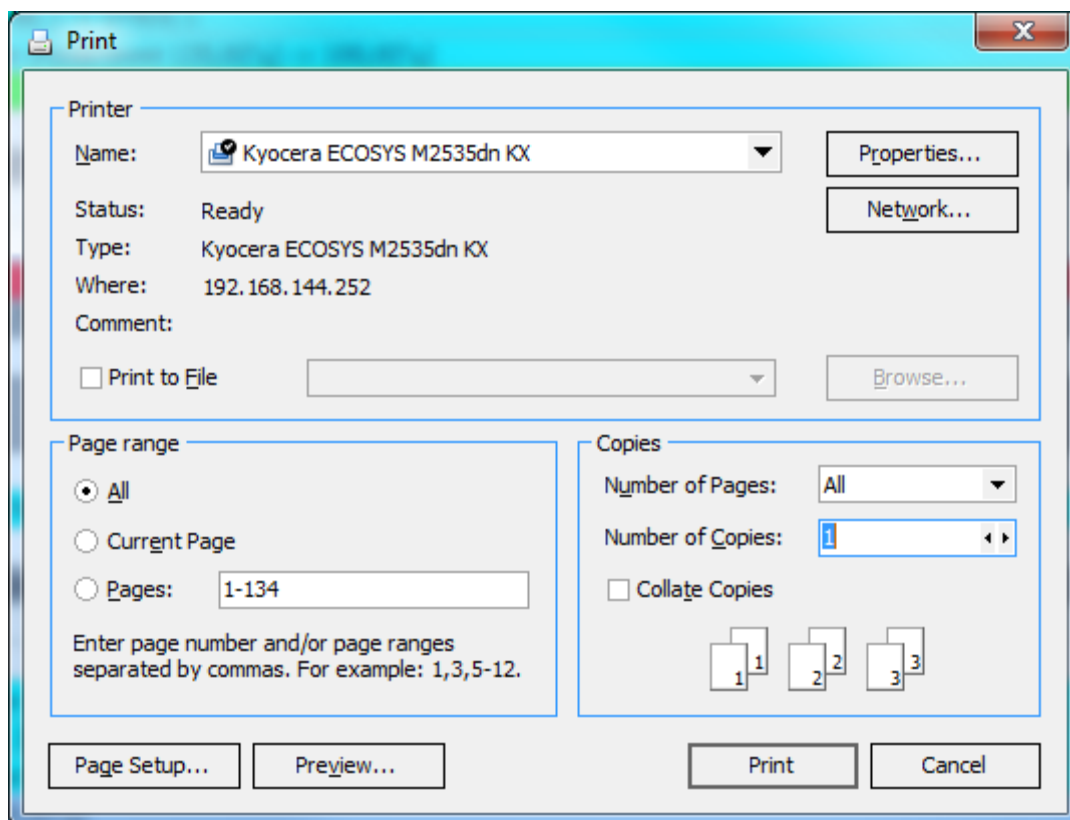


Fig. 40

Configure the standard print settings (printer, paper orientation and size, etc.). You can also switch to preview information to be printed (see Fig. 41). When printing, each page is automatically marked with a header as follows: tab name, field number, wellpad number, drive type and serial number, as well as total pages and current page number.



Print Preview

File View Format Go

Margins Left: 12,7 mm Top: 12,7 mm Right: 12,7 mm Bottom: 12,7 mm Header: 6,4 mm Footer: 6,4 mm

Журнал.Месторождение № 1 куст № 101 скважина № 1595 ИРЗ-700 № 190200259

№	Дата	Время	Событие	Заг.ПВД. %	Из ПВД. А	Из ПВД. А	Из ПВД. А	Цек.АВ. В	Цек.ВС. В	Цек.СА. В	Квад	Тех.ин. С	Тпаз. С	Дис.бл.и. %	Дис.б1 ПВД. %	Реклин. Ат	Сос Ф	Риз. юм	Выбо.ХУ. о	Выбо.З. о	Frюб	Сост.ТМС
1	11.04.2019	14:16:48	Отключен																			
2	24.06.2019	8:56:47	Электронит																			
3	24.06.2019	8:56:47	Параметры	0,0	0,0	0,0	0,0	0	0	0	0	0,00	0,00	0,0	0,0	43795,13	0,000	10000	0,00	0,00	0,0	0000000000
4	24.06.2019	8:56:47	Запись кон																			
5	24.06.2019	8:56:47	Параметры	0,0	0,0	0,0	0,0	360	361	361	0	0,00	0,00	0,2	0,0	43795,13	0,000	10000	0,00	0,00	0,0	0000000000
6	24.06.2019	8:56:49	Параметры	0,0	0,0	0,0	0,0	359	361	361	0	0,00	0,00	0,2	0,0	43795,13	0,000	10000	0,00	0,00	0,0	0000000000
7	24.06.2019	8:56:56	Параметры	0,0	0,0	0,0	0,0	359	361	361	0	0,00	0,00	0,2	0,0	43795,13	0,000	9999	0,00	0,00	0,0	0000000000
8	24.06.2019	8:57:07	Параметры	0,0	0,0	0,0	0,0	312	313	311	0	0,00	0,00	0,3	0,0	43795,13	0,000	74	0,00	0,00	0,0	0000000000
9	24.06.2019	8:57:54	Параметры	0,0	0,0	0,0	0,0	281	281	281	0	0,00	0,00	0,0	0,0	43795,13	0,000	74	0,00	0,00	0,0	0000000000
10	24.06.2019	8:58:28	Параметры	0,0	0,0	0,0	0,0	282	282	282	0	0,00	0,00	0,0	0,0	43795,13	0,000	74	0,00	0,00	0,0	0000000000
11	24.06.2019	8:58:32	Параметры	0,0	0,0	0,0	0,0	282	282	282	0	0,00	0,00	0,0	0,0	43795,13	0,000	9999	0,00	0,00	0,0	0000000000
12	24.06.2019	8:59:31	Параметры	0,0	0,0	0,0	0,0	282	282	282	0	0,00	0,00	0,0	0,0	43795,13	0,000	114	0,00	0,00	0,0	0000000000
13	24.06.2019	8:59:33	Параметры	0,0	0,0	0,0	0,0	282	282	282	0	0,00	0,00	0,0	0,0	43795,13	0,000	74	0,00	0,00	0,0	0000000000
14	24.06.2019	8:59:37	Параметры	0,0	0,0	0,0	0,0	283	283	282	0	0,00	0,00	0,3	0,0	43795,13	0,000	84	0,00	0,00	0,0	0000000000
15	24.06.2019	8:59:40	Параметры	0,0	0,0	0,0	0,0	247	247	247	0	0,00	0,00	0,0	0,0	43795,13	0,000	4231	0,00	0,00	0,0	0000000000
16	24.06.2019	8:59:44	Параметры	0,0	0,0	0,0	0,0	239	239	238	0	0,00	0,00	0,4	0,0	43795,13	0,000	4231	0,00	0,00	0,0	0000000000
17	24.06.2019	8:59:46	Параметры	0,0	0,0	0,0	0,0	240	240	240	0	0,00	0,00	0,0	0,0	43795,13	0,000	9999	0,00	0,00	0,0	0000000000
18	24.06.2019	8:59:48	Параметры	0,0	0,0	0,0	0,0	240	240	240	0	0,00	0,00	0,0	0,0	43795,13	0,000	794	0,00	0,00	0,0	0000000000
19	24.06.2019	8:59:51	Параметры	0,0	0,0	0,0	0,0	248	247	248	0	0,00	0,00	0,4	0,0	43795,13	0,000	9999	0,00	0,00	0,0	0000000000
20	24.06.2019	8:59:51	Параметры	0,0	0,0	0,0	0,0	272	272	271	0	0,00	0,00	0,3	0,0	43795,13	0,000	571	0,00	0,00	0,0	0000000000
21	24.06.2019	8:59:53	Параметры	0,0	0,0	0,0	0,0	288	288	288	0	0,00	0,00	0,0	0,0	43795,13	0,000	571	0,00	0,00	0,0	0000000000
22	24.06.2019	8:59:54	Параметры	0,0	0,0	0,0	0,0	317	318	317	0	0,00	0,00	0,3	0,0	43795,13	0,000	73	0,00	0,00	0,0	0000000000
23	24.06.2019	8:59:55	Параметры	0,0	0,0	0,0	0,0	321	322	321	0	0,00	0,00	0,3	0,0	43795,13	0,000	73	0,00	0,00	0,0	0000000000
24	24.06.2019	9:00:01	Параметры	0,0	0,0	0,0	0,0	345	347	346	0	0,00	0,00	0,2	0,0	43795,13	0,000	85	0,00	0,00	0,0	0000000000
25	24.06.2019	9:00:06	Параметры	0,0	0,0	0,0	0,0	347	347	347	0	0,00	0,00	0,0	0,0	43795,13	0,000	18	0,00	0,00	0,0	0000000000
26	24.06.2019	9:00:08	Параметры	0,0	0,0	0,0	0,0	354	354	353	0	0,00	0,00	0,2	0,0	43795,13	0,000	1	0,00	0,00	0,0	0000000000
27	24.06.2019	9:00:20	Отключен																			
28	24.06.2019	9:01:16	Электронит																			
29	24.06.2019	9:01:16	Параметры	0,0	0,0	0,0	0,0	0	0	0	0	0,00	0,00	0,0	0,0	43795,13	0,000	10000	0,00	0,00	0,0	0000000000
30	24.06.2019	9:01:16	Запись кон																			
31	24.06.2019	9:01:16	Параметры	0,0	0,0	0,0	0,0	361	361	361	0	0,00	0,00	0,0	0,0	43795,13	0,000	10000	0,00	0,00	0,0	0000000000
32	24.06.2019	9:01:17	Параметры	0,0	0,0	0,0	0,0	361	361	361	0	0,00	0,00	0,0	0,0	43795,13	0,000	10000	0,00	0,00	0,0	0000000000
33	24.06.2019	9:01:19	Параметры	0,0	0,0	0,0	0,0	361	361	361	0	0,00	0,00	0,0	0,0	43795,13	0,000	95	0,00	0,00	0,0	0000000000
34	24.06.2019	9:01:20	Параметры	0,0	0,0	0,0	0,0	361	361	361	0	0,00	0,00	0,0	0,0	43795,13	0,000	73	0,00	0,00	0,0	0000000000
35	24.06.2019	9:01:25	Параметры	0,0	0,0	0,0	0,0	361	361	361	0	0,00	0,00	0,0	0,0	43795,13	0,000	84	0,00	0,00	0,0	0000000000
36	24.06.2019	9:01:29	Параметры	0,0	0,0	0,0	0,0	361	361	361	0	0,00	0,00	0,0	0,0	43795,13	0,000	42	0,00	0,00	0,0	0000000000
37	24.06.2019	9:01:45	Пуск. Опер																			
38	24.06.2019	9:01:45	Параметры	45,0	14,5	13,9	13,1	357	358	358	0	0,00	0,00	0,2	5,0	43795,13	0,693	1	0,00	0,00	0,0	0000000000
39	24.06.2019	9:01:45	Параметры	20,2	8,1	8,1	7,9	359	360	360	0	0,00	0,00	0,2	1,2	43795,13	0,537	1	0,00	0,00	0,0	0000000000
40	24.06.2019	9:01:46	Параметры	18,9	7,9	7,9	7,7	359	360	360	0	0,00	0,00	0,2	1,2	43795,13	0,516	1	0,00	0,00	0,0	0000000000

Page: 1 of 5 Pages Paper Size: 210 mm x 297 mm Status: Ready

Fig. 41