

**FISCAL PRINTER
FP-1000/700**

PROTOCOL DESCRIPTION

Version 1.00xx, where xx is the code of the country, where the device will operate:

EN - England

BG - Bulgaria

UA - Ukraine

LT - Lithuania

RO - Romania

RU – Russia

CG – Montenegro

INTRODUCTION

The fiscal device operates under the control of an application program, with which communicates via the RS232 serial connection. The device executes a previously set of wrapped commands, arranged according to the type of the operations which have to be executed. The application program does not have a direct access to the resources of the fiscal device although it can detect data connected with the status of the fiscal device and the fiscal memory.

The fiscal device performs the following types of operations:

- < Saves the serial number of the fiscal device and the number of the fiscal memory;
- < Saves fiscal parameters, like the ЕИК (EIK - Unified Identification Code), the date of entering into exploitation, etc.;
- < Saves information on the owner - name and address, etc.;
- < Saves the daily turnover in the fiscal memory and generates a daily report;
- < Saves the text from the fiscal receipts and daily reports in KLEN (electronic journal)
- < Generating reports on concluded sales and the content of the fiscal memory;
- < Dispatching data to the application program.
- Printing reports generated by the application.
- Remember the sales and generate customer receipt.

TAXATION CATEGORIES AND CALCULATION OF VAT (ДДС)

Each concluded sale can be related to a certain taxation category (VAT) defining a tax rate, applicable to the base price used for the formation of the sale price. The fiscal printer can operate with a maximum of 8 taxation categories, which are most often indicated with the first letters of the language of the country, where the fiscal printer is used-in the case of Bulgaria these letters are А, Б, В, Г, Д, Е, Ж, З. The Latin letters ('A', 'B', 'C', 'D', 'E', 'F', 'G' и 'H') are acceptable only as input parameters.

Each of the taxation groups has a set tax rate (in percent) which is expressed by a number not greater than 99.00 and by no more than two digits after the decimal point.

Part of the four standard categories may be forbidden by using Enabled_taxes in the 83(53H) command. The commands for registering sales read the said four letters as a parameter.

FUNCTION MODES OF THE FISCAL DEVICE

The fiscal device has two functional modes:

1. The tutorial mode. The device is not fiscalized and all data needed for its normal functioning are entered and saved in the fiscal memory with the exception of the tax registration number of the owner. Fiscal receipts can be opened and closed but they always bear the inscription that they are not fiscal. Daily financial reports with clearing can be generated but they are not saved in the fiscal memory.

2. Normal mode. The device has been fiscalized and the tax registration number of the owner is saved in the fiscal memory. All fiscal rules apply.

STATUS OF THE FISCAL DEVICE

The status of the fiscal device can differ. Shifting from one to another condition is not always possible. The control of the printer and the shifting between the different functions - when this is possible - is executed by the application program Host (PC), which must relate to the included protocol. If this protocol is not applied correctly the printer might enter into an undesirable status or to skip a given functional status, leading to an ERROR.

A) INITIAL STATUS

This is the functional status in which the date and the hour are set, the number of the fiscal memory is entered as well as the serial number and the code of the country where the device will be operated.

THE ABOVE-DESCRIBED OPERATIONS ARE PERFORMED PRIOR TO SELLING THE DEVICE TO THE CLIENT ONLY BY AN AUTHORISED SERVICE SPECIALIST!

The following commands must be performed in the order in which they are presented: **61 (3DH)** and **91 (5BH)**.

B) STATUS AFTER THE FORMATTING OF THE FISCAL MEMORY

This is the state in which the name of the currency is entered, the number of the digits after the decimal point and the tax rates. After performing these operations the fiscal printer is ready for delivery to the future operator (owner). This is also the status in which the device is kept in the warehouse of the manufacturer.

Command **83 (53H)** has to be performed.

C) STATUS WHEN PRESENTING THE DEVICE TO THE CLIENT

In this functional state the **header** and the **footer** are set - the beginning and the end of each receipt. The header contains information on the owner (name of the company, address etc.) while the footer is usually a short advertisement text.

The command **43 (2BH)** is performed as many times as is the number of printed lines.

D) TUTORIAL MODE

The fiscal printer is in this status prior to fiscalization. Receipts can be issued but it must be born in mind that they will bear the mark "non-fiscal". The generation of a daily turnover report with clear but it will not be saved into the fiscal memory. A tax registration number is also entered but not into the fiscal memory and is subject to change. The clearing of the memory does not cause an entry in the fiscal memory. The clock may be set arbitrarily.

In tutorial mode the fiscal printer can not be used in commercial places - its purpose is for training.

E) A FISCALIZED PRINTER

In this functional status fiscal receipts may be issued and they will be marked "fiscal". The daily report and clear(Z-отчет or Z-report) is registered in the fiscal memory and the setting of the date is possible only ahead in relation to the last entry in the fiscal memory. The tax registration number is registered in the FM and cannot be changed from this point on. It is IMPOSSIBLE for the printer to exit the fiscal mode without changing the fiscal memory.

The EIK (EIK - Unified Identification Code) number of the owner of the device must be known prior to fiscalization. Command **98 (62H)** after which the command **72 (48H)** must be executed.

F) IRRECOVERABLE ERROR IN THE FISCAL PRINTER

This is the status of the printer when a serious technical or logical mistake has occurred as well as in case of fiscal memory failure or „KJIEH”(KLEN). After switching ON the device in this mode a bold sign ““ΦΑΤΑΛΙΗ ΓΡΕΣΗΚΑ: 4” („FATAL ERROR: 4”) appears. The printer does not perform commands for opening fiscal receipts as well as documents, which save data entries into the fiscal memory. Only diagnostic commands and periodic reports can be executed. Clearing the RAM and placing a new fiscal memory module must be performed because the module used before the error is now switched to the READ ONLY mode. ALL THESE OPERATIONS MUST BE PERFORMED BY AN AUTHORIZED SERVICE SPECIALIST.

The events, which can bring the printer to this state, are:

- Impossibility to make a correct entry in the fiscal memory;
- Invalid control sum, EIK, serial number, reg. No. of the fiscal memory or some of the entries which contain the tax rates.
- Unidentified format of the fiscal memory module;
- If during the fiscal memory check up (immediately after switch ON) more than three invalid control sums from a daily report fiscal entry are found.
- No communication with KLEN or locked one
- Filled up KLEN. It is unlikely to come given its size.

CONTROL PANEL INDICATORS

“Power” indicator

- Be on continuously: *printer is ready*
- Blinks steady, 2 times in a second: *the printer is executing a long command. You have to wait.*

“Error” indicator

- No lighting: *device is in normal operating mode.*
- Activated continuously: *when there is no paper in the device.*
- Blinks steady, 2 times in a second: *overheating of the printer head. Goes out when the error is cleared.*
- Activated continuously with a short blink in approximately two seconds: *no communication with KLEN. The printer can be turned on and off for KLEN reset. If this action does not help, a service*

technician is needed.

- Activated continuously with two short blinks in approximately two seconds: *no communication with the fiscal memory, a service technician is needed.*

DIP SWITCHES

The change of the “switches” is can be done with command **41 (29H)**

Switch	Turned off	Turned on
1		Sets the speed of the serial port
2		Sets the speed of the serial port
3		Sets the speed of the serial port
4	Normal mode of the display	Mode “Transparent display”
5	Work with a standard display of Datecs	Work with display with code table 1251
6		Not used
7		Not used
8	No automatic cutting	Automatic cutting off after a receipt

Serial port communication speed

Switch 1	Switch 2	Switch 3	Speed (bps)
OFF	OFF	OFF	1200
ON	OFF	OFF	2400
OFF	ON	OFF	4800
ON	ON	OFF	9600
OFF	OFF	ON	19200
ON	OFF	ON	38400
OFF	ON	ON	57600
ON	ON	ON	115200

STATUS BITS OF THE FISCAL PRINTER

The current status of the device is coded in field 6 bytes long which is sent within each message of the fiscal printer. Description of each byte in this field:

Byte 0: General purpose

0.7 Reserved – is always 1

0.6 Not used

0.5 General error – “OR” of all errors marked with ‘#’

0.4 # Failure in printing mechanism

0.3 Not connected a customer display

0.2 The clock needs setting

0.1 # Code of incoming command is invalid

0.0 # Incoming data has syntax error

Byte 1: General purpose

1.7 Reserved – is always 1

1.6 Not used

1.5 Paper cover is open

1.4 # RAM failure after switch ON

1.3 # Low battery (the clock is in reset state)

1.2 # Operational memory was cleared

1.1 # If command cannot be performed in the current fiscal mode

1.0 # If during command some of the fields for the sums overflow. Status 1.1 will also be set and the command will not cause changes to the data in the printer.

Byte 2: General purpose

2.7 Reserved – is always 1

2.6 It is opened an non-fiscal receipt with 90 degree rotated text

2.5 A non-fiscal receipt is opened

2.4 Coming end of KLEN (10MB free)

2.3 A fiscal receipt is opened

2.2 End of KLEN(under 1MB free)

2.1 Not enough paper

2.0 # No paper - valid for both paper rolls. If the flag is raised during a print-related command it will be rejected and the status of the printer will remain unchanged.

Byte 3: The status of the configuration switches

- 3.7 Reserved – is always 1
- 3.6 SW7 state
- 3.5 SW6 state
- 3.4 SW5 state
- 3.3 SW4 state
- 3.2 SW3 state.
- 3.1 SW2 state
- 3.0 SW1 state

Byte 4: The fiscal memory

- 4.7 Reserved – is always 1
- 4.6 Given a serial number
- 4.5 OR of all mistakes marked by ‘*’ from bytes 4 and 5.
- 4.4 * Fiscal memory is fully engaged.
- 4.3 If there is space for not more than 50 entries in the FM.
- 4.2 Not found fiscal memory
- 4.1 * Error during reading from the fiscal memory
- 4.0 * Error during writing from the fiscal memory

Byte 5: The fiscal memory

- 5.7 Reserved – is always 1
- 5.6 Given a tax number.
- 5.5 Given the number of the fiscal memory.
- 5.4 Tax rates have been entered at least once
- 5.3 The printer is in a fiscal mode
- 5.2 * The last record in the fiscal memory is not successful
- 5.1 The fiscal memory is formatted
- 5.0 * The fiscal memory is in the “read-only” mode

POWER SUPPLY CUT-OFF

The status of the printer at each particular moment is reflected in the so-called “status bytes”. The application program must get information on the status of the printer when switched ON after a power cut-off. This is performed by the commands **76 (4AH)** and **103 (67H)**.

The application program must make a decision on the future behavior of the printer depending on its current status. It is guaranteed that the fiscal memory will not be affected by the power failure as well as that all accumulated sums in the operational memory of the device will be valid. If the power cut-off has occurred during a printing session, when switched ON, again the printer will print a line containing the text “* **POWER DROP** *” (“*СПАД НАПРЕЖЕНИЕ*”) in an expanded bold type and will then complete the print.

ISSUING FISCAL AND NON-FISCAL RECEIPTS**A) NON-FISCAL RECEIPTS**

The receipt is first opened, a text is then printed and the receipt is closed. The commands **38 (26H)** are used, an indefinite number of times the command **42 (2AH)** and **39 (27H)**.

B) FISCAL RECEIPTS

A fiscal receipt is first opened, the sales are registered, payment is performed and the receipt is finally closed. The following commands are used: **48 (30H)**, **49 (31H)**, **51 (33H)**, **52 (34H)**, **53 (35H)**, **54 (36H)**, **56 (38H)** and **58 (3AH)**. At the end of the day a daily financial report and clear are performed in order to enter and save the accumulated information in the fiscal memory. The function is started with the command **69 (45H)**.

К/ЛЕЖ/KLEN (KLEN – Electronic Journal)

This printer remember every line from the fiscal receipts, official receipts, documents with service information from the initialization, X and Z reports in the KLEN. KLEN is with capacity of maximum 2 GB and during normal operation must be able to store all data coming from printer’s work until the fiscal memory is filled up. In case of damage or filling up (really active work with the printer) KLEN can be replaced with an empty one and the old card to be stored for further reference.

From KLEN can be made these enquires:

- Printing a copy of a document by a number, date, time or number of the Z-report.
- Downloading a document/documents through the serial port in text format and closure as it possible to the original view.
- Information for the full size of KLEN and for the used space in bytes, the numbers of the first and last

documents on it and the first and last Z-report.

-Verification of SHA-1 check sum for the documents from a whole Z-report.

-Comparing of the SHA-1 check sums for one or more Z-reports with those stored in the fiscal memory and printing a result.

Two flags from the status bytes warn for coming end of KLEN (only 10MB free) and end of KLEN (1MB free).

If the flag "End of KLEN" is set the next commands are prohibited: **38** (Opening a non-fiscal receipt), **42** (Printing non-fiscal free text), **48** (Open fiscal receipt (invoice)), **49** (Registration of sales), **52** (Registration and display), **54** (Print a free fiscal text), **58** (Registering the sale of an item) и **84** (Barcode printing), **122** (Open non-fiscal receipt with rotated text), **123** (Printing rotated text 90 degrees).

GENERATING REPORTS

Reports are generated singularly by the fiscal printer upon receiving the respective command from the PC. In these reports the user's program will not add any changes to the appearance and content of the reports, i.e., they appear exactly as they have been defined in the fiscal printer. The following commands are used for the generation of reports:

50 (32H) - Report on changes in tax rates and decimal points

69 (45H) - Daily financial report with or without clear

79 (4FH) / 95 (5FH) - Short financial report from date to date /from number to number of the respective fiscal entries

73 (49H) / 94 (5EH) - Detailed fiscal memory report by closure number / by date of entry.

81 (51H) - report of the fiscal memory by months

LOW LEVEL PROTOCOL

A) PROTOCOL TYPE - MASTER (HOST) / SLAVE

The fiscal printer performs the commands sent by the Host and returns messages, which depend on the result.

The fiscal printer cannot instigate asynchronous communications itself. Only responses to commands from the Host are sent to the Host. These messages are either wrapped or single byte control codes. The fiscal printer maintains the communication via the RS232 serial connection at baud rates of 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200 b/s, 8N1. The baud rate is set by adjusting the configuration bits 1,2 and 3. Supported is and a USB connection which is activated automatically after connecting the printer to the PC through USB cable.

B) SEQUENCE OF THE MESSAGES

Host sends a wrapped message, containing a command for the printer.

FP executes the requested operation and response with a wrapped message.

Host has to wait for a response from the printer before to send another message.

The protocol uses non-wrapped messages with a length one byte for processing of the necessary pauses and error conditions.

C) NON-WRAPPED MESSAGES - TIME-OUT

When the transmitting of messages from the Host is normal, Slave answers not later than 60 ms either with a wrapped message or with a 1 byte code. Host must have 500 ms of time-out for receiving a message from Slave. If there is no message during this period of time the Host will transmit the message again with the same sequence number and the same command. After several unsuccessful attempts Host must indicate that there is either no connection to the fiscal printer or there is a hardware fault.

Non-wrapped messages consist of one byte and they are:

A) NAK 15H

This code is sent by Slave when an error in the control sum or the form of the received message is found.

When Host receives a NAK it must again send a message with the same sequence number.

B) SYN 16H

This code is sent by Slave upon receiving a command which needs longer processing time. SYN is sent every 60 ms until the wrapped message is not ready for transmitting.

D) WRAPPED MESSAGES

a) Host to printer (Send)

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<01><LEN><SEQ><CMD><DATA><05><BCC><03>
```

b) Printer to Host (Receive)

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<01><LEN><SEQ><CMD><DATA><04><STATUS><05><BCC><03>
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Where:

<01>	Preamble. 1 byte long. Value: 01H.
<LEN>	Number of bytes from <01> preamble (excluded) to <05> (included) plus the fixed offset of 20H. Length: 1 byte. Value: 20H - 7FH.
<SEQ>	Sequence number of the frame. Length : 1 byte. Value: 20H – FFH. The fiscal printer saves the same <SEQ> in the return message. If the FP gets a message with the same <SEQ> as the last message received it will not perform any operation, but will repeat the last sent message.
<CMD>	The code of the command. Length: 1 byte. Value: 20H - 7FH. The fiscal printer saves the same <CMD> in the return message. If the printer receives a nonexisting code it returns a wrapped message with zero length in the data field and sets the respective status bit.
<DATA>	Data. Length: 0-213bytes for Host to printer, 0-218 bytes for Printer to Host. Value: 20H – FFH ; . The format and length of the field for storing data depends on the command. If the command has no data the length of this field is zero. If there is a syntax error the respective status bit is established in the data and a wrapped message is returned with zero field length.
<04>	Separator (only for printer-to-Host messages) Length: 1 byte. Value: 04H.
<STATUS>	The field with the current status of the fiscal device. Length: 6 bytes. Value: 80H-FFH.
<05>	Postamble Length: 1 byte. Value:05H.
<BCC>	Control sum (0000H-FFFFH) Length: 4 bytes. Value of each byte: 30H-3FH. The sum includes between <01> preamble (excluded) to <05>. Each digit from the two bytes is sent after 30H is added to it. For example the sum 1AE3H is presented as 31H, 3AH, 3EH, 33H.
<03>	Terminator Length: 1 byte. Value: 03H.

MESSAGE COMPOSITION, SYNTAX, AND MEANINGS

- The data field depends on the command.
- The parameters sent to the printer may be separated with a comma and/or may have a fixed length.
- The comma between the parameters shows that it is mandatory.
- When the parameters are closed by <> they are mandatory although the brackets themselves are not present in the message. When a given parameter is closed in [] it is not mandatory - the bracket themselves are also not present in the message. When parameters are separated by ‘|’ symbol, only one of them may present in the input data.

The symbols with ASCII codes under 32 (20H) have special meanings and their use is explained whenever necessary. If such a symbol has to be sent for some reason (for example in an ESCAPE-command to the display) it must be preceded by 16 (10H) with an added offset 40H.

Example: when we write **2500, 100, Text** for the data field then in that field there will be **2D 32 35 30 2C 31 30 30 2C 54 65 78 74** where each hexadecimal digit is an ASCII value.

LIST OF FISCAL COMMANDS - FUNCTIONAL ARRANGEMENT

This section contains a list of the fiscal printer commands arranged in groups depending on their functions:

INITIALIZATION

- 29H (41) Saving the settings of the configuration switches and graphic logo in the flash memory
- 2BH (43) Setting the HEADER and the FOOTER and printing options
- 3DH (61) Date and hour
- 48H (72) Fiscalization
- 53H (83) Setting the multiplier, decimal points, name of currency and tax rates.
- 55H (85) Setting the additional methods of payment
- 5BH (91) Programming the manufacturer’s serial number, the number of the fiscal module and the number of the country
- 5CH (92) Programming the number of the fiscal memory
- 60H (96) Set tax rates.
- 62H (98) Setting of ЕИК (ЕИК - unified identification code)
- 65H (101) Entering the operator’s password

66H (102) Entering the name of the operator
68H (104) Reset data operator
6BH (107) Defining of and item's report
73H (115) Loading the graphic logo

SALES

30H (48) Opening a fiscal receipt
33H (51) Subtotal
34H (52) Registering a sale and showing it on the screen
35H (53) Sum calculation (tender).
36H (54) Printing a free fiscal text
38H (56) Closing a fiscal receipt
39H (57) Cancellation a fiscal receipt
3AH (58) Registering an item sale
54H (84) Barcode printing
6DH (109) Printing a duplicate receipt

DAILY CLOSURE

45H (69) Daily financial report

REPORTS

32H (50) Report on changed tax rates and decimal points through the period
49H (73) Detailed report of the fiscal memory (from number to number)
4FH (79) Short report of the fiscal memory (from date to date)
51H (81) Monthly Report for the entire period of operation
5EH (94) Detailed report of the fiscal memory (from date to date)
5FH (95) Short report of the fiscal memory (from number to number)
69H (105) Operator's report
6FH (111) Items report

INFORMATION TO HOST

3EH (62) Read date and the hour
40H (64) Information on the last fiscal entry
41H (65) Information for sums(for the day)
44H (68) Number of the free entries in the fiscal memory
4AH (74) Receiving the status bytes
4CH (76) Status of the fiscal transaction
56H (86) Reading the data of the last memory record
5AH (90) Return diagnostic information
61H (97) Receiving the tax rates
63H (99) Tax registration number
67H (103) Information on the current receipt
6EH (110) Receiving information on the sums arranged according to the type of payments
70H (112) Receiving information on the operator
71H (113) Receiving information on the last printed document
72H (114) Receiving information on a fiscal entry or selected period.
74H (116) Reading a fiscal memory block.

PRINTER CONTROL COMMANDS

2CH (44) Advance paper
2DH (45) Cut off.

DISPLAY

21H (33) Clearing the display.
23H (35) Showing a text (lower line)
28H (40) Showing a text (upper line).
2FH (47) Showing a text (upper line).
3FH (63) Showing the date and the hour.
4EH (78) Showing a text (lower line).
64H (100) Display - full control.

OTHERS

26H (38) Opening a non-fiscal receipt.
27H (39) Closing a non-fiscal receipt.
2AH (42) Printing text of a non-fiscal receipt.
46H (70) Office cash-in and cash-out.
47H (71) Print diagnostic information.

50H (80) Sound signal.
 59H (89) Programming the manufacturing test area.
 5AH (93) Print the dividing line.
 6AH (106) Drawer kick-out.
 67H (119) Maintenance of KLEN/KJIEH (KLEN – Electronic journal) – read, write and information.
 7AH (122) Opening an non-fiscal receipt for printing with 90 degree rotated text.
 7BH (123) Print 90 degree rotated text.
 7CH (124) Closing an non-fiscal receipt for printing with 90 degree rotated text.

SERVICE COMMANDS

80H (128) Service reset the RAM.
 85H (133) Disable printing.
 86H (134) Service maintenance of KLEN/KJIEH (KLEN – Electronic journal)

DETAILED DESCRIPTION OF THE COMMANDS

21H (33) CLEARING THE DISPLAY

Data field: No data

Response: None

A clear display command is sent. If a fiscal receipt is opened and SW4 is OFF only the lower line is cleared.

23H (35) TEXT ON THE LOWER LINE OF THE DISPLAY

Data field: <Text>

Response: None

Text A text of up to 20 symbols is sent directly to the display. Prior to this a command for positioning and clearing the lower line is sent.

26H (38) OPENING A NON-FISCAL RECEIPT.

Data field: None

Response: Allreceipt,ErrCode

Allreceipt The number of all issued receipts (fiscal and non-fiscal) from the last daily closure on (4 bytes).

ErrCode Error code when the command is unsuccessful /1 byte/.

The FP performs the following actions:

- Prints the header
- Print the tax registration number of the seller
- A response is received which contains **Allreceipt**

If the command cannot be executed:

- 1 The fiscal memory has not been formatted
- 2 There is an opened fiscal receipt
- 3 There is an opened non-fiscal receipt
- 4 The clock is not set

27H (39) CLOSING A NON-FISCAL RECEIPT.

Data field: None

Response: Allreceipt

Allreceipt The number of all issued receipts (fiscal and non-fiscal) from the last daily closure on (4 bytes).

The FP performs the following actions:

- Prints the footer
- The sequence number, date and hour of the document are printed
- **НЕФИСКАЛЕН БОМ** (“NON-FISCAL RECEIPT”) is printed in expanded style

If the S1.1 flag is raised the command is not executed because there is no opened non-fiscal receipt.

28H (40) Showing a text (upper line).

Data field: TEXT

Response: None

TEXT Text up to 20 characters, that is sent directly to the display. Before text sends a command to clear and positioning upper line. The command is rejected, if is open fiscal receipt and Sw4 is on position **OFF**.

29H (41) SAVING THE SETTINGS OF THE CONFIGURATION SWITCHES ON THE FLASH MEMORY**Data field:** [<Switches>]**Response:** None**Switches** 8 bytes with value '0' or '1' – configuration “switches”.

This printer does not have hardware switches and software ones are used. Besides this the command stores on the flash memory and the graphical logo, height of the barcode, printing density and duration of the pulse for drawer kick-out. In case of RAM reset the default values stored on the flash memory are restored.

If no data is send with this command, the previous values of the “switches” are not changed, but the other data is saved.

ATTENTION! Switches are counted from right to left!

This command stores the following data in the non-volatile flash memory:

- Header и footer (from command **43**).
- The text of the additional types of payment (from command **85**).
- The graphical logo (from command **115**).
- Printing options (from command **43**).
- Configuration switches.

In case of RAM reset the default values stored on the flash are restored.

2AH (42) PRINTING OF A FREE NON-FISCAL TEXT**Data field:** Text**Response:** None

Text A text up to 46 symbols. The symbols after 46th are cut off. In the beginning and end of the line is printed a symbol '#’.

If S1.1 is raised there is no non-fiscal receipt opened and the text is not printed.

2BH (43) SETTING HEADER, FOOTERS AND PRINTING OPTIONS**Data field:** <Item>,<Text>**Response:** Depends on field data

HEADER consists of 6 lines of text, which are printed at the beginning of each fiscal and non-fiscal receipt. The printer will function normally only when at least two “header” lines have been programmed for printing.

FOOTER consists of 2 lines of text printed at the end of each receipt.

HEADER and **FOOTER** are automatically center aligned.

This command must be fulfill to 8 times, to set all lines on **HEADER** and **FOOTER**.

Item One symbol having the following meaning:

“0” to “7” The sequence number of the set line the **header** lines being numbered from 0 to 5 and those of the **footer** - 6 and 7.

“B” Sets the height of the barcode in pixels (0,125mm). Acceptable values: form 24 (3mm) to 240 (30mm). Barcode is printed with command **84 (54H)**.

“C” Permission/rejection of the automatic cutting of the paper after each receipt. After power on the performance of the printer is defined in accordance with the setting of DIP switch **Sw8**.

“D” Sets printer intensity. Possible values:

‘1’: very pale

‘2’: pale

‘3’: normal

‘4’: dense

‘5’: very dense

“L” Permission/rejection of the printing of the graphic logo immediately before the header.

This logo is defined with the command **115 (73H)**. Data “Text” is in format <Enable>, <H>. **H** - logo height (in pixels), **Enable** - one byte with value “1”(enable) or “0”(disable).

“R” Add extra space between characters in mode “printing with 90 degree rotated text”. After the letter follow integer value from 0 to 4.

“T” Permission/rejection of the printing of the accumulated tax (ДДС) for the receipt in normal (not extended /invoice/) fiscal receipt.

“X” Permission/rejection of the automatically generated pulse for drawer kick-out after commands **53 (35H)** и **70 (46H)**.

“I” Gives us the option to read the values, set earlier with command 43. After the letter “I”

only one more symbol follows which coincides with some of the above.

Text A text string up to 36 symbols:

- If <Item> is a digit from “0” to “7” - the text of the respective line.
- If <Item> = 'B' - Barcode height (in pixels)
- If <Item> = 'C' - One symbol value '0' or '1', where “0” forbids and “1” permits automatic cutting of the receipt.
- If <Item> = 'D' - Printing density (1 to 5).
- If <Item> = 'L' - Return **Enable,H** (H - logo height in pixels, **Enable** – is flag enable/disable).
- If <Item> = 'R' - Integer - value '0' to '4' - additional space between characters in mode 90 degree rotated text.
- If <Item> = 'T' - One symbol value '0' or '1', where “0” forbids and “1” permits printing the printing of the accumulated tax (ДДС) for the receipt in normal (not extended /invoice/) fiscal receipt.
- If <Item> = 'X' - One symbol value '0' or '1', where “0” forbids and “1” permits the automatically opening of the drawer after commands **53 (35H)** и **70 (46H)**.

2CH (44) ADVANCING PAPER

Data field: Lines

Response: None

Lines Advancing paper measured in lines. The programmed line count cannot be greater than 99 (1 or 2 bytes). If the parameter is not there the default setting is 1 line.

2DH (45) CUTTING OFF PRINTED DOCUMENTS

Data field: None

Response: None

The command causes the cutting off of the printed, ready document. It must be considered that the program must advance the paper with at least two lines or the document will not be cut off correctly. If the printer is in the “automatic cut off” mode it positions the paper itself and the command becomes redundant.

When the printing mechanism blocks for some reason, the paper roll must be taken out of the cutter mechanism and the command must be executed again. This will position the blade in the extreme right-end of the mechanism.

2F(47) DISPLAYING A TEXT ON THE UPPER LINE OF THE DISPLAY

Data field: Text

Response: None

Text A text of 20 symbols which is sent directly to the display. Prior to this a command for the positioning and clearing of the upper line. If a fiscal receipt is opened and SW1 is OFF the command is rejected.

30H(48) OPENING A FISCAL CLIENT’S RECEIPT

Data field: <OpCode>,<OpPwd>,<TillNmb>

Response: Allreceipt,FiscReceipt

OpCode Operator’s number (1 to 16)

OpPwd Operator’s password (4 to 8 digits)

TillNmb Number of the point of sale (a whole number of maximum 99999)

Allreceipt The number of all issued receipts (fiscal or not) from the last daily closure up to the moment (4 bytes).

FiscReceipt The number of all fiscal receipts from the last daily closure up to the moment (4 bytes).

The FP performs the following actions:

- Prints the HEADER
- Prints EИК (EIK - Unified Identification Code)
- Prints the number and name of the operator as well as the cashier desk number
- **Allreceipt** and **FiscReceipt** are returned

The command will not be successful if:

- There is an opened fiscal or non-fiscal receipt
- The fiscal memory is full

- The fiscal memory is damaged
- No code or operator password available or cashier desk number
- The HEADER contains less than 2 lines
- No ЕИК (EIK - Unified Identification Code) number available
- Wrong operator password
- The clock needs setting
- The electronic journal (KLEN) is full or not functioning.

After entering three wrong operator's passwords the printer blocks and must be switched off and ON again to restart operating.

32H (50) TAX RATES ENTERED DURING THE ACCOUNTED PERIOD

Data field: [<Start>,<End>]

Response: = F - if no tax rates for the period have been found or in case of error

= PAA, BB, CC, DD, DDMMYY if rates have been found, where 'P' means 'PASS' after which the active rates are listed out as well as the date of their entry.

If there are unused groups (closed with *Enabled_rates*) for them instead of a rate in percent a 'DT' is returned (Disabled tax).

Start The starting date for the period - DDMMYY/6 bytes/

End The end date for the period - DDMMYY /6 bytes/

The command prints a report on the changes made in the decimal points and tax rates during the selected period.

33H(51) SUBTOTAL

Data field: <Print><Display>[,Perc;Abs]

Response: SubTotal, TaxA, TaxB, TaxC, TaxD, TaxE, TaxF, TaxG, TaxH

Print One byte, which if '1' the sum of the subtotal will be printed out.

Display One byte which if '1' the sum of the subtotal will appear on the display.

Perc A non-mandatory parameter which shows the value of the discount or surcharge in percent over the sum accumulated so far.

Abs A non-mandatory parameter which shows the value of the discount or surcharge as an amount (up to 8 significant digits). It is not allowed a surcharge bigger than the sale.

Permitted only one of the arguments Perc or Abs.

SubTotal The sum accumulated for the current fiscal receipt (10 bytes).

TaxA The sum over tax group A/10 bytes/

TaxB The sum over tax group B/10 bytes/

TaxC The sum over tax group C/10 bytes/

TaxD The sum over tax group D/10 bytes/

TaxE The sum over tax group E/10 bytes/

TaxF The sum over tax group F/10 bytes/

TaxG The sum over tax group G/10 bytes/

TaxH The sum over tax group H/10 bytes/

The sum of all sales registered in the fiscal receipt is calculated. If necessary the sum may be printed out and/or brought out on the display. The calculated total sum and the accumulated separate sums for each tax group are returned to the PC. If a discount or surcharge is entered it is printed out on a separate line and the accumulated sums over the different tax groups are respectively corrected.

34H(52) REGISTRATION AND DISPLAY

Data field: <[Sign]PLU>[*<Qwan>][,Perc;Abs]

Response: None

Sign One byte with a possible value '-'.

PLU This is the number of items.

Qwan This is a non-mandatory parameter setting the quantity of the items sold. By default its value is 1.000 and its length is 8 valid digits. (Unit price)*Qwan rounded by the printer to the specified number of decimals and the same should not exceed 8 significant digits.

- Perc** This is a non-mandatory parameter showing the value of the surcharge and discount (depending on the sign) in percent over the current sale. Possible values are between -99.00% to 99.00%.
- Abs** This is a non-mandatory parameter showing the value of the surcharge and discount (depending on the sign) as an amount. It is not acceptable a discount with value higher than the value of the sale.

Permitted only one of the arguments Perc or Abs.

Fiscal Printer performs the following actions:

- Read the table of items with name and price of the commodity tax group.
 - Print the name of the item, the quantity and unit price. The second line prints the resulting value with the letter setting out the tax group. Registers are updated accumulated amounts and quantities of items.
 - The price of the item is added to the accumulated amount in the records in memory. In case of overflow is set corresponding bits of the status field.
 - If there is a discount or surcharge, it is printed on a separate line and add in the registers provided for this printer.
- Values for the day are printed in the daily financial report.

The command will not be executed successfully if:

- Non-programmable item with that number.
- Is not open fiscal receipt.
- Already reached the maximum number of sales for a single receipt(512)
- The Command(**35h**) has been successfully executed
- The sum under some of the tax groups has become negative
- The sum of the surcharge or discount within the receipt remains negative.
- The electronic journal (KLEN) is full.

35H(53) CALCULATION OF A TOTAL

Data field: [<Line1>][<Lf><Line2>]<Tab>[[<PaidMode>]<Sign>Amount]>

Response: <PaidCode><Amount>

- Line1** A text of 36 bytes containing the first line
- Lf** One byte containing 0Ah
- Line2** A text of 36 bytes containing the second line
- Tab** One byte containing 09h
- PaidMode** A non-mandatory code indicating the terms of payment. It may have the following values:
- 'P' - Payment in cash (default)
 - 'N' - Payment with a credit card
 - 'C' - Payment with a check
 - 'D' - Payment with a debit card
 - 'V' - Payment with a virman
 - '1' - Programmable type paying 1
 - '2' - Programmable type paying 2
 - '3' - Programmable type paying 3
 - '4' - Programmable type paying 4

Depending on the code the sums are accumulated in different registers and may be recovered in the daily report.

Sign One byte with a value '+' indicating the **Amount** (the sum which has to be tendered)

Amount The sum tendered (up to 8 meaningful symbols)

PaidCode One byte - resulting from the execution of the command

- 'F' Error
 - 'E' The calculated sub-total sum is negative. Payment is withheld and **Amount** will contain a negative sub-total.
 - 'D' If the paid sum is less than the sum of the receipt. The residual sum due for payment is returned to **Amount**
 - 'R' When the paid sum is greater than the sum of the receipt. A message "PECTO" ("CHANGE") will be printed out and the change will be returned to **Amount**.
 - 'I' An error has occurred because the sum under one of the tax groups is negative.
- The current subtotal is returned to **Amount**.

Amount Up to 9 digits with a sign. Depends on **PaidCode**.

This command starts the calculation of the sums from the fiscal receipt, the printing of the sum with a special font and showing the result on the display. An additional text may also be printed. When the command has been successfully executed a further command for opening a cash drawer is activated, if that is permit with sub command 'X' on command **43**. If there is no more data after the symbol <Tab> the printer will automatically pay out the whole available sum in cash.

The command will not be successful if:

- No fiscal receipt has been opened,
- The accumulated sum is negative,
- If some of the accumulated sums under taxation (tax group) is negative.

After the successful completion of the command the fiscal printer will not perform the commands 49 and 51 within the opened receipt although it can still perform command 53.

36H(54) PRINTING A FREE FISCAL TEXT

Data field: Text
Response: None
Text Up to 46 bytes

The text is surrounded by two '#' symbols.

A fiscal receipt must be opened because in the opposite case the text will not be printed and the S1.1. flag is raised. If the text is longer than 46 symbols the redundant letters are cut off.

38H(56) CLOSING A FISCAL RECEIPT

Data field: No data
Response: Allreceipt,FiscReceipt
Allreceipt All issued receipts from the last daily closure up to the moment
FiscReceipt All issued fiscal receipts from the last daily closure up to the moment
 The accumulated sums from the fiscal receipt are added to the daily sums in the registries of the operational memory.

The command will not be successful if:

- No fiscal receipt has been opened,
- Command **53 (35h)** has failed,
- The sum paid under command **53** is less than the total sum of the fiscal receipt.

39h (57) CANCELING OF A FISCAL RECEIPT

Data field: None
Response: None

This command is accessible only over opened fiscal receipt and only before the execution of **53 (Total)**. Causes canceling of all accumulated sums in the receipt. With a double width is printed a message “=АНУЛІРАНО=” (“=ANNULATED=”) and the receipt ends with a message “ФІСКАЛІЕН БОН” (“FISCAL RECEIPT”).

3AH (58) REGISTERING THE SALE OF AN ITEM

Data field: <[Sign]PLU>[*<Qwan>][,Perc;Abs]
Response: None

Sign - One byte with a value '-'

PLU - The individual number of the item - a whole number between 1 and 999999999 (not more than 9 digits).

Qwan - A non-mandatory parameter setting the quantity of the items for sale with a default value of 1.000. Length cannot be longer than 8 meaningful digits (not more than 3 after the decimal point). The resulting (singular price)*(**Qwan**) is rounded up to the set number of digits after the decimal point and also cannot be greater than 8 meaningful digits.

Perc - This is a non-mandatory parameter showing the value of the surcharge and discount (depending on the sign) in percent over the current sale. Possible values are between -99.00% to 99.00%.

Abs - This is a non-mandatory parameter showing the value of the surcharge and discount (depending on the sign) as an amount. It is not acceptable a discount with value higher than the value of the sale.

It is possible only one of the arguments Perc or Abs.

The fiscal printer performs the following operations:

- The name, price and the tax group of the item is read from the items list, programmed in the printer.
- Prints out the name of the item, the selected quantity and the singular price. The second printed line

contains the final price together with the letter, designating the tax group from which the sale will be performed. The registries for accumulated sums and item quantities are updated.

- The price of the item is added to the accumulated sums in the registries of the operational memory.

In case of overflows the respective bytes from the status field will be set.

- If there is a discount or surcharge it is printed out on a separate line and is added in specially selected registries in the printer. The values from the whole day will be printed together with the daily financial report.

The command will not be successful if:

- No item has been programmed under the given number,
- No fiscal receipt has been opened,
- The maximum number of sales for one receipt (512) has already been registered.
- The command (**35h**) has been successfully executed,
- The sum under one or more of the tax groups has turned out negative,
- The sum of the surcharges and discounts within the receipt has remained negative.
- The electronic journal (KLEN) is full.

3DH(61) SETTING THE CLOCK - DATE AND HOUR

Data field: <DD-MM-YY><space>HH:MM[:SS]>
Response: None

You cannot set a date which is earlier than the date of the last entry into the fiscal memory or KLEN of the device. The last acceptable year is 2099. After RESET of the memory this command must be executed - otherwise the normal functioning, after that is executed RESET and write on fiscal memory. The printer's real-time clock must always be set correctly.

It not possible to set the date and time earlier than the last printed document, written in KLEN(electronic journal).

3EH (62) READING CURRENT DATE AND HOUR

Data field: None
Response: <DD-MM-YY><Space><HH:MM:SS>

3FH (63) DISPLAYING THE DATE AND HOUR

Data field: None
Response: None

Current date and time are displayed on lower line using the format: **DD-MM-YY HH:MM:SS**.

40H (64) INFORMATION ON THE LAST FISCAL ENTRY

Data field: None
Response: ErrCode[,N,TaxA,TaxB,TaxC,TaxD,TaxE,TaxF,TaxG,TaxH,Date]

ErrCode:

- 'P' - The command is succesfull
- 'F' - The last record cannot be read

N - The number of the last fiscal records - 4 bytes.

TaxX - The amounts of each VAT group 'A', 'B', 'B', ... (A,B,C...)- 12 signed bytes.

Date - Date of the fiscal records - 6 bytes /DDMMYY/.

The command requires the printer to be fiscalised.

41H (65) INFORMATION ON DAILY TAXATION

Data field: [Option]
Response: TaxA,TaxB,TaxC,TaxD,TaxE,TaxF,TaxG,TaxH
Option: Determines what information to be returned:
 '0' - total turnover (default)
 '1' - accumulated VAT (ДДС)
TaxX The amounts of each VAT group 'A', 'B', 'B', ... (A,B,C...)- 12 signed bytes.

44H (68) NUMBER OF THE FREE FIELDS IN THE FISCAL MEMORY

Data field: None

Response: Logical,Physical

Logical The number of logical locations for fiscal entries (4 bytes)

Physical Not used. Repeats the previous entry.

The number of free fields in the fiscal memory, reserved for saving information from the daily report with clear(Z-report).

45H (69) DAILY FINANCIAL REPORT

Data field: [<Option>[N][a]]

Response: Closure,FM_Total,TotA,TotB,TotC,TotD,TotE,TotF,TotG,TotH

Option A non-mandatory parameter controlling the type of generated report.

'0' - The printout ends with the inscriptions "FISCAL RECEIPT" or "NON-FISCAL RECEIPT" depending on the status of the printer (fiscalized or non-fiscalized).

'2' - A daily report without closure is generated i.e., no entry into the fiscal memory is made and no closures are performed. The printout ends with the inscription "OFFICIAL RECEIPT". The same actions may be generated directly from the printer if during power on the left button is pressed down.

N - The presence of this symbol at the end of the data cancels the option to clear the data accumulated on the operators during a report with clear.

a - The presence of this symbol at the end of the data prohibits clearing of accumulated data items in a report with clear.

Closure - Fiscal closure (Daily report) number – 4 bytes.

FM_Total - The sum of all sales for the day - 12 bytes with a sign.

TotX - The nett sums (Total –VAT) under all tax categories - A, B, C, D, E, F, G, and H - 12 bytes with a sign.

A daily report with no clearing can be executed and by holding the <FEED> button, at turning on, until the second sound signal.

46H (70) INTERNAL DEBITING AND CREDITING (SERVE IN AND OUT)

Data field: [<Amount>]

Response: ExitCode,CashSum,ServIn,ServOut

Amount The sum which will be registered (up to 9 bytes). Depending on the sign of the digit this sum is interpreted either as credit or debit (serveIn or serveOut).

ExitCode One byte:

'P' The order has been completed. If the ordered sum is not 0 the printer will print an interior receipt for registering the operation.

'F' The order has been canceled. This happens if:

- The cash sum available is less than the ordered interior credit (serveIn),
- There is an opened fiscal and non-fiscal receipt.

CashSum Available cash. Apart from this command the sum grows after each payment in cash.

ServIn The sum from all commands "Interior credit"

ServOut The sum from all commands "Interior debit"

Changes the content of the cash availability register. Depending on the sign of the sum in question it is accumulated in the register for interior debit-credit. The information is not saved in the fiscal memory of the device and is accessible until the performance of the daily closure. It is printed out at the command **69 (45h)** and at the generation of the daily report without closure from the printer itself. At the successful completion of this command the drawer "kick-out" function is activated (if it is permitted wit subcommand 'X' of command **43**).

47H (71) PRINTING DIAGNOSTIC INFORMATION

Data field: No data

Response: None

The command initiates the generation of an interior receipt containing diagnostic information as follows:

- Prints the date and the version of the employed software,
- Prints the control sum of the employed firmware,
- Prints the serial port's baud rate,
- Prints out the status of the configuration keys and the number of the country
- Prints emergency time after power supply cut-off,

- Prints the number, date and hour of the last reset of the RAM (if there is such),
- Prints the current temperature of the two printer heads,
- Prints the overall number of fields in the fiscal memory and the number of the free fields,
- Prints the current date and hour.

The command will not be executed when there is an open receipt in progress or when the paper roll has finished. It may also be activated by pressing the <FEED> button while power on.

48H (72) FISCALIZATION

Data field: <Serial>

Response: ErrCode

Serial The serial number of the device - it must be the number entered with command 91 (**5Bh**).

Status 5.3 is used to verify whether the command has been successfully executed.

ErrCode Error or 'P' code when the action has been successful.

The command will not be executed (and an error code will be set) if:

- The serial number is invalid,
- The printer has been fiscalized,
- No serial number has been programmed,
- The serial number is different from the one programmed,
- There is an opened receipt in progress,
- There are some already issued fiscal receipts after the last daily report with closure,
- No tax rates have been entered into the memory of the device,
- The clock needs setting.

Fiscalization of the device must be performed and after the successful execution of the command the returning of the printer to a "non-fiscalized" mode becomes impossible.

The tax number is entered in the fiscal memory together with the current date and hour. All registries are cleared (to zero) after which the printer opens the first fiscal receipt, marks the moment of fiscalization on this receipt and closes it.

49H (73) DETAILED FISCAL MEMORY REPORT BY CLOSURE NUMBER

Data field: [[<SHA1>][<SkipZ>]<Start>,<End>]

Response: None

SHA1 - Optional argument - a byte with value '#'. If exists, for each Z-report and a check sum is printed (SHA-1 algorithm)

SkipZ - Optional argument - a byte with value '*'. If exists, for each Z-report are printed only the VAT groups with no zero amount.

A such report is not standard and its use is not encouraged.

Start The number of the starting fiscal entry - 4 bytes

End The number of the ending fiscal entry - 4 bytes

The command leads to the printing of a detailed report of the fiscal memory from one selected number to another. If no parameters are entered the command will be executed for the whole period of exploitation.

4AH (74) READING THE STATUS OPTIONS

Data field: [Option]

Response: <S0><S1><S2><S3><S4><S5>

Option One byte with the following meanings:

'W' All printer buffers must be printed out first.

'X' The status is returned immediately (default).

Sn Status byte n.

4CH (76) STATUS OF THE FISCAL TRANSACTION

Data field: [Option]

Response: Open,Items,Amount[,Tender]

Option = 'T' If the parameter has been selected the command will return the information on the current state of the sum due for payment by the client.

Open	One byte which is '1' if a fiscal or a non-fiscal receipt has been opened (which it is can be understood from the status bytes) and '0' if there is no opened receipt.
Items	The number of sales registered on the on the current or last fiscal receipt - 4 bytes.
Amount	The sum from the last fiscal receipt - 9 bytes with a sign.
Tender	The sum tendered for the current or the last receipt - 9 bytes with a sign (Only if Option is present).

The command supports the PC application's ability to monitor the status and if needed to restore and complete an already started fiscal operation which has been interrupted on emergency or out of time - for example as a result of a power failure.

4Eh (78) Showing a text (lower line).

Data field: <Text>
Response: None

Text Text up to 20 characters that is sent directly to the display. Before it sends a command is clear and the positioning lower line.

4FH (79) SUMS ACCUMULATED IN THE FISCAL MEMORY FOR A SELECTED PERIOD

Data field: <Start>[,<End>]
Response: None

Start Starting date - 6 bytes (DDMMYY)

End End date - 6 bytes (DDMMYY)

The command generates the printing out of a short periodic financial report.
 If the second parameter is missing, the command will generate monthly or annual. The syntax in this case is:

Start Month - 4 bytes (MMYY) for monthly report.

Start Year - 2 bytes (YY) for annual report.

50H (80) SOUND SIGNAL

Data field: [<SoundData>]
Response: None

This command creates a sequence of sound tones with a set frequency and continuity.
 If there is no input data, a sound signal with frequency 2 kHz and continuity 300 ms is played. If the input data is with format: <Hz>,<mSec>
 where **Hz** and **mSec** are integers, than a sound signal is created with a frequency between 100Hz and 5000 kHz and continuity between 50ms and 2000ms.
 In the rest cases the data is in format similar to writing of music notes and the length can be various (the restriction is defined by the protocol – 218bytes). The first invalid symbol will terminate the command. The acceptable subcommands are:

- Note: A Latin capital letter with range: 'A' - 'G'.
 - 'C' do
 - 'D' re
 - 'E' mi
 - 'F' fa
 - 'G' sol
 - 'A' la
 - 'B' si

If right after the note there is a symbol '#', the note will be raised with a halfnote. The symbol '&' is for altered chord, decreases the note with a semitone.

- Pause: Symbol interval (ASCII 20h).

After a note or pause there can be one or several bytes indicative of continuity. Valid symbols are in the range "0"- "5":

- '0' Base continuity
- '1' Base continuity * 2
- '2' Base continuity * 4
- '3' Base continuity * 8
- '4' Base continuity * 16
- '5' Base continuity * 32

If there a full continuities they will be summed.

- Switching to higher scale: symbol '+'.
- Switching to lower scale: symbol '-'.
- Switching to higher tempo: Symbol '^', followed by a digit. The digit defines the percentage continuity of the notes compared with the base. Acceptable values:
 - '1' 200 %
 - '2' 175 %
 - '3' 140 %
 - '4' 120 %
 - '5' 100 %
 - '6' 80 %
 - '7' 60 %
 - '8' 50 %
 - '9' 40 %
- Turning back to scale 1 (the default one): symbol '@'. The tone A (1a) for it is 440 Hz.

The playing of the sent sequence is proceeded in the background, so other commands can be executed during the sound signal.

51H (81) Monthly Report for the entire period of operation

Data field: None

Response: None

The command is printing monthly data for the entire period of use of fiscal printer.

53H (83) SETTING THE MULTIPLIER, DECIMALS, CURRENCY NAME AND TAXES

Data fields: [#][Decimals,Currency,EnabledT,TaxA,...]

Response: Decimals,Currency_name,EnabledT[,TaxA,TaxB,TaxC,TaxD,...]

- optional parameter, symbol '#'. Command sets the values of tax rates and returns their current values.

Decimals - One byte with a value between 0 and 2 and shows the exact place of the decimal point.

Currency - The name of the currency used for the payments - not more than 5 bytes.

EnabledT - 8 bytes with value '0' or '1', determines whether the relevant VAT group is forbidden '0' or not '1'

TaxX - The value of each tax rate.

If no parameters are entered, FP will return the existing values.

If one of the parameters has to be set and the others must too.

Setting of new tax rates is permitted only before printing of the first fiscal receipt for the day.

Before fiscalization the data will be stored only in the RAM memory, so in this case the command can be executed unlimited times.

54H (84) BARCODE PRINTING

Data field: <Type>,<Data>

or

<Type>;<Data>

Response: None

Type Barcode type. A byte with possible values:

'1' EAN8. Data bytes are 7 and contain only digits. The check sum is calculated by the printer.

'2' EAN13. Data bytes are 12 and contain only digits. The check sum is calculated by the printer.

'3' Code 128. Data bytes present ASCII codes between 32 and 127. Their length is between 22 and 42 symbols (depends on the content – maximal length can be achieved if all symbols are digits. The check sum is calculated by the printer.

'4' ITF (Interleaved 2 of 5). Data contains only digits.

'5' ITF (Interleaved 2 of 5). Data contains only digits. The printer automatically generates and prints a checksum.

This command prints a barcode. It is accessible only if a receipt is opened. The barcode is printed centered. If the data separator is a comma, under the barcode is printed the information in text format too. If data length or/and its content are invalid, the status bit "syntax error" is set and a barcode is not printed.

Barcode height is set with command 43.

55H (85) SETTING THE ADDITIONAL METHODS OF PAYMENT

Data fields: <Option>[,<Name>]

Response: Result|Name

Option Method of payment:

'P', - additional payment 1
 'J', - additional payment 2
 'K', - additional payment 3
 'L', - additional payment 4

Name The name of the method for additional paying printed on the receipt – free text up to 24 characters. If it is not set, the current value will be returned.

Result Error code(one byte)

'P' pass
 'F' false – The name is longer than 24 bytes.

The command sets the comment text that is printed before the data types of the additional payments (command 53). The definition of the methods have to be completed before the first fiscal receipt for the day to be printed.

56H (86) READING THE DATE OF THE LAST FISCAL MEMORY RECORD

Data field: [<WithTime>]

Response: DT

WithTime Optional parameter - symbol 'T'. If it presents, is returned the date and time of the last fiscal memory record.

DT Date (or date and time) of the last fiscal memory record:

DD-MM-YYYY
 or
 DD-MM-YYYY hh:mm:ss

59H (89) PROGRAMMING THE PRODUCTION TEST AREA

Data field: <Test>

Response: Result,Free

Test One byte. If 'T' an entry into the fiscal memory is done - otherwise there will be no 'save' performed and only the parameters will be returned.

Result One byte:

= P (50h) No error
 =F (46h) Error

Free The number of the free blocks left for saving such entries - 4 bytes.

The command is executed for testing the fiscal memory.

Test block for entries into the fiscal memory: 55h,AAh,33h,CCh,5Ah,A5h,3Ch,C3h

If- and when- the S1.1 flag has been raised the fiscal memory has not been formatted or is in the READONLY mode.

5AH (90) RETURN DIAGONSTIC INFORMATION

Data field: <Calc>

Response: <Name>,<FwRev><Country><Sp><FwDate><Sp><FwTime>,<Chk>,<Sw>,<Ser>,<FM>

Calc - If '1' the control sum of the fiscal memory is calculated - 1 byte.

Name - Name of the fiscal device (in this case "FP2000KL")

FwRev - The version of the software program - 4 bytes.

Country - Country code - pair of letters (2 bytes; in this case "BG").

Sp Space - 1 byte.

FwDate - The date of the software program DDMmmYY - 7 bytes.

Sp Space - 1 byte.

FwTime - Hour of the software program HHMM - 4 bytes.

Chk - The EPROM control sum - a 4 bytes string in the hexadecimal code. For example if the control sum is 214Ah it will be presented as 32h, 31h, 34h, 42h

Sw - The configuration switches from Sw1 to Sw4 - a 4 bytes string with '0' or '1'.

Ser - The serial number - 8 bytes.

FM - Number of the fiscal module - 8 bytes.

5BH (91) PROGRAMMING THE SERIAL NUMBER, THE NUMBER OF THE COUNTRY AND THE FISCAL MODULE NUMBER

Data field: <Serial>,<FMnumber>

Response: Result,CountryStr

Serial - The serial number. 8 symbols – 2 letters and 6 digits.

FMnumber - The fiscal module number. 8 digits.

Result - One byte. 'P' - OK; 'F' - errors.

CountryStr - The name of the country. For example: "CRNA GORA"

The command IS NOT INCLUDED in the software program package and can be performed only by the manufacturer of the printer. The printer is handed over to the owner with the name of the country, serial number and fiscal memory number.

If **Result** = 'F' and the S1.1 flag is raised the command has not been successful because either the fiscal memory has not been formatted or the serial number has already been entered.

5Ch (92) Programming the number of the fiscal memory

Data field: FMnumber

Response: Result

FMNumber – 11 bytes – serial number of the printer, which must contain two letters and digits.

Result - One byte containing the letter: 'P' – no errors, 'F' – errors.

Command can be executed only in the service mode in a manufacturing company. The printer provides the customer with pre-recorded serial number of the printer.

If result = 'F' and the S1.1 is raised the command has not been successful because not set serial number or already is set serial number of fiscal memory.

5Ch (93) SEPARATOR LINE PRINTING

Data field: Type

Response: None

Type A byte with possible values:

'1' Filling with sequence of symbols '!'.
'2' Filling with sequence of symbols '! ' and ' '.

'3' Filling with sequence of symbols '= '.

The printer prints separator line through the whole width of the paper.

A receipt must be opened.

5Eh (94) DETAILED FISCAL MEMORY REPORT BY CLOSURE DATE

Data field: [<SHA1>][<SkipZ>]<Start>[,<End>]

Response: None

SHA1 - Optional argument - a byte with value '#'. If exists, for each Z-report and a check sum is printed (SHA-1 algorithm)

SkipZ - Optional argument - a byte with value '*'. If exists, for each Z-report are printed only the VAT groups with no zero amount.

A such report is not standard and its use is not encouraged.

Start - The number of the starting fiscal entry - 6 bytes (DDMMYY)

End - The number of the ending fiscal entry - 6 bytes (DDMMYY)

This command prints out a detailed financial report on the period between two selected dates.

If the second parameter is missing, this command generates monthly or annual report. The syntax in this case is:

Start Month – 4 bytes (MMYY) for monthly report.

Start Year – 2 bytes (YY) for annual report.

5FH (95) SUMS ACCUMULATED IN THE FISCAL MEMORY FOR A GIVEN PERIOD OF TIME

Data field: <Start>,<End>

Response: None

Start Starting number of the fiscal entry

End End number of fiscal entry

The command starts the calculation and the printing of a short periodic financial report. This report can be made by holding <FEED> when the printer to the fourth signal.

60h (96) Set tax rates.

Data field: TaxA, TaxB,...

Response: ErrCode

TaxX – value of tax rates

If one of the parameters must be specified, then the other must be set.

Establishment of new rates only allowed prior to the issuance of the first client cash receipt for the day.

Before fiscalization command data are stored only in memory and can be changed several times.

Tax rates can be set with command **83**(command **96** is reserved for compatibility).

61H (97) READING THE SET TAX RATES

Data field: None

Response: TaxA, TaxB, TaxC, TaxD, TaxE, TaxF, TaxG, TaxH

TaxA Данъчна ставка **A**

TaxB Данъчна ставка **B**

TaxC Данъчна ставка **C**

TaxD Данъчна ставка **D**

TaxE Данъчна ставка **E**

TaxF Данъчна ставка **F**

TaxG Данъчна ставка **G**

TaxH Данъчна ставка **H**

62H (98) SETTING OF EIK/EIK (EIK - Unified Identification Code)

Data field: <Text>[,<Name>]

Response: Result

Text 14 bytes which contain EIK as a text.

Name This is the comment in front of EIK. By default is "EIK".

Result 'P' No errors.

'F' Error

63H (99) READING THE TAX REGISTRATION NUMBER

Data field: None

Response: <Text>[,<Name>]

Text The tax registration number as a text.

Name This is the comment in front of EIK.

64H (100) SHOWING TEXT ON DISPLAY

Data field: Text

Response: None

Text A text of no more than 40 symbols sent for displaying. If symbols with ASCII codes smaller than 20h (control symbols) they are increased with 40h and are preceded by 10h.

Example: To send 1Bh, 4Bh, 00h the data field will have to contain 10h, 5Bh, 10h, 40h.

65H (101) SETTING THE OPERATOR'S PASSWORD

Data field: <OpCode>,<OldPwd>,<NewPwd>

Response: None

OpCode Operator's code (1 to 16)

OldPwd Old password (4 to 8 digits)

NewPwd New password (4 to 8 digits)

Sets one of the 16 operator's passwords, which will be demanded upon opening a fiscal receipt. After three erroneous password entries the printer will block, it must then be switched OFF and ON again to continue operating.

After initialization or reset of the operational memory all 16 passwords are "0000".

66H (102) ENTERING OPERATOR'S NAME

Data field: <OpCode>,<Pwd>,<OpName>

Response: None

OpCode Operator's code (1 to 16)

Pwd Password (4 to 8 digits)

OpName Name of the operator (up to 24 symbols)

Enters one of the 16 operator names. The number and the name of the operator are printed at the beginning of each fiscal (clients) receipt. After three erroneous password entries the printer will block, it must then be switched OFF and ON again to continue operating. After initialization or reset of the operational memory all eight passwords locations are empty.

67H (103) INFORMATION ON THE CURRENT RECEIPT

Data field: None

Response: CanVd,TaxA,TaxB,TaxC,TaxD,TaxE,TaxF,TaxG,TaxH

CanVd Possible/impossible return (sale registration with a negative sign) ['0' / '1']

TaxA The sum accumulated under tax A

TaxB The sum accumulated under tax B

TaxC The sum accumulated under tax C

TaxD The sum accumulated under tax D

TaxE The sum accumulated under tax E

TaxF The sum accumulated under tax F

TaxG The sum accumulated under tax G

TaxH The sum accumulated under tax H

The command offers information on sums accumulated so far under the different tax groups and whether it is possible to return the registered items sold.

68H (104) Reset data operator

Data field: <OpCode>,<Pwd>

Response: None

OpCode Code operator. From 1 to 16.

Pwd Password(4 to 8 digits)

68H (105) OPERATOR'S REPORT

Data field: None

Response: None

Information on the sales, performed by the operators, is printed out where for each separate operator the following data is printed out: name, individual number, number of fiscal receipts, discharges made,surcharge, sum adjustments and accumulated total sums.

6AH (106) DRAWER KICK OUT

Data field: [<mSec>]

Response: None

mSec - The length of the impulse in milliseconds (5-100)

Sends an impulse for opening the cash drawer. This parameter sets a new value for the length of the impulse, which is stored in the memory of the printer. If this parameter is skipped, the last entered value remains valid. After memory RESET a value of 15 ms is set.

6BH (107) DEFINING AND READING ITEMS

Data field: [#]<Option>[Parameters]

Response: ErrorCode[,Data]

Optional byte with the value '#'. If you have it, the commands for reading the articles returned extended information. Stand in front of the commands 'R', 'F', 'L', 'N', 'f', 'l', 'n'.

Option One byte, defining the type of the selected operation. Depending on this the command might - or might not - demand the entering of additional parameters. The possible values are: 'P', 'D', 'A', 'C', 'R', 'F', 'L', 'N', 'X', 'f', 'l', 'n', 'x'

ErrorCode One byte, showing the result from the operation and having the following meaning:
- 'P' A successful command
- 'F' Unsuccessful command

Parameters Data on the command - described in detail further on <Option>.

- 'P' Article information

Syntax: <I>

Response: **Total,Prog,Len**

Total Total count of the programmable articles (3000 for this printer).

Prog Total count of the programmed articles.

Len Maximum length name of article.

- 'P' Article programming.

Syntax: <P><TaxGr><PLU>,<SPrice>,<Replace>,<Quantity>,<Name>

TaxGr VAT group ('A','B','C','D',...)

PLU Article's number (1 to 999999999)

Group Stock group (1to 99)

SPrice Single price. Up to 8 significant digits.

Replace - Optional parameter – a byte with value 'A'. Changes the meaning of the next parameter (**Quantity**).

Quantity - A number with up to 3 decimal symbols – the available quantity of the item.

If the parameter **replace** exists, then the available quantity is replaced with **Quantity**.

Otherwise it is added to the old value (of course only if the item

is programmed already. Each command for selling of the article will reduce its quantity.

Name - Article's name. Up to 36 bytes.

Up to 11350 articles can be programmed. The command will be rejected if there is already a such article and there are sells of it.

- 'A' Change of the available quantity for article.

Syntax: <A><PLU>,<Quantity>

PLU Article's number (1 to 999999999).

Quantity Quantity correction – floating point number with up to 3 decimal numbers.

Positive numbers increase the quantity and the negative decrease it.

Command is rejected if the article is not programmed.

- 'D' Item deleting

Syntax: <D><A | PLU | PLU1,PLU2>

A - Delete all item with non-zero accumulated sums.

PLU - Deletes article with selected number if there are no accumulated sums.

PLU1,PLU2 - Deletes the articles within a set interval which do not have accumulated sums.

- 'R' Reading item data.

Syntax: <R><PLU>

Response: <'P'><PLU>,<TaxGr>,<Grp>,<SPrice>,<Total>,<Sold>,<Avail>,<Name>

<PLU> - Article's number. Between 1 and 999999999.

<TaxGr> - VAT group. 1byte

<**SPrice**> - Single price. Floating point number with decimal symbols current for the printer.

<**Avail**> - Current quantity. Floating point digit with 3 decimal symbols.

<**Sold**> - Sold out quantity. Floating point number with 3 decimal symbols.

<**Total**> - Accumulated amount of the article.

<**Name**> - Item's name (Up to 36 bytes).

If item is not found returns a byte 'F'.

- **'F'** Returns data about the first found programmed item.
Syntax: <**F**>[<**PLU**>]
Returned data is the same as in subcommand **'R'**. If a parameter **PLU** is set, searching starts from 1.
- **'L'** Returns data about the last found programmed item.
Syntax: <**L**>[<**PLU**>]
The returned data is the same as in subcommand **'R'**. If a parameter **PLU** is set, searching starts from **999999999**.
- **'N'** Returns data for the next found programmed item
Syntax: <**N**>
Response is the same as for subcommand **'R'**.

The last three subcommands are for extracting of all programmed items. A subcommand **'F'** or **'L'** is being sent and after that subcommand **'N'** until an answer **'F'** is received (the last article is read). The articles are returned sorted by **PLU** number ascending or descending depending of the first sent command.

- **'f'** Returns data about the first found item with sales on it.
Syntax: <**f**>[<**PLU**>]
Returned data is the same as in subcommand **'R'**. If a parameter **PLU** is set, searching starts from 1.
- **'l'** Returns data about the last found item with sales on it.
Syntax: <**l**>[<**PLU**>]
The returned data is the same as in subcommand **'R'**. If a parameter **PLU** is set, searching starts from **999999999**.
- **'n'** Returns data for the next found item with sales on it.
Syntax: <**n**>
Response is the same as for subcommand **'R'**.

The last three are subcommand to retrieve data from your PC for all items, with sales for the day. Submitted subcommand **'f'** or **'l'** after that **'n'**, until receive **'F'**, which means that the last item read. Returned items is sorted by number increasing or decreasing direction depending on the first submitted command.

- **'X'** Find the first not programmed article
Syntax: <**X**>[<**PLU**>]
Response: **PLU**
If the parameter **PLU** is set, the first not programmed article with a number higher or equal to it is returned. If missing **PLU=1** by default.
- **'x'** Find the last not programmed article
Syntax: <**x**>[<**PLU**>]
Response: **PLU**
If the parameter **PLU** is set, the first not programmed article with a number lower or equal to it is returned. If missing **PLU=999999999** by default.

6DH (109) PRINTING A DUPLICATE RECEIPT

Data field: <Count>

Response: None

Count - Number of duplicate receipts (only a value of 1 is accepted).

The command initiates the printing of a copy of the last closed receipt containing registered sales. The copy is marked as an „**НЕОФІЦІАЛЬНИЙ БОН**” („**NON-OFFICIAL RECEIPT**”), immediately after **HEADERA** is printing with bold „**ДУБЛІКАТ**” (“**DUPLICATE**”). When retry the command will refuse to print. Printing duplicate receipt is impossible if the number of rows in the receipt is greater than 810.

6EH (110) ADDITIONAL DAILY INFORMATION**Data field:** None**Response:** Cash,Credit,Debit,Cheque,Pay1,Pay2,Pay3,Pay4,Closure,Receipt**Cash** - Paid in cash**Credit** - Payment credited**Debit** - Paid with a debit card**Cheque** - Paid with a cheque**Virman** - Paid with a virman**PayX** - Paid by one of the additional payment types.**Closure** - Current (last) fiscal entry**Receipt** - Number of the next fiscal receipt

Returns information on the distribution of the daily sum according to the terms of payment used.

6FH (111) ITEMS REPORT**Data field:** <Option>>[<Start>,<End>]**Response:** ErrorCode

Option Defines the type of the information under print. Possible values:

- '0' - Prints all items programmed number, tax group, the name and quantity available.
- '1' - Prints all programmed items number, tax group, name and unit price.
- '2' - Prints only items, with sales for the day. For each item number is printed, the tax group, the name and quantity sold.
- '3' - Prints all items programmed number, tax group, name, unit price, quantity sold and quantity available.
- '4' - Prints only items, with sales for the day number, tax group, name, unit price, quantity sold and turnover items.

Start Number of the first article which to be included in the report. Default: 1.**End** Last number of article which to be included in the report. Default: 999999999.

Items are arranged according to their individual numbers. In a daily report with a closure the accumulated sums are cleared.

70H (112) READING INFORMATION ON THE OPERATOR**Data field:** Operator**Response:** Receipts,Total,Discount,Surcharge,Void,Name,[,Password]**Operator** Number of the operator (1 to 16)**Receipts** Number of fiscal receipts, issued by the operator**Total** Number of registered sales and total accumulated sum, divided by a ','**Discount** Number of discounts and total number of discounts**Surcharge** Number of surcharges and total number of surcharges made**Void** Number of voids (and corrections of sums) and their total sum**Name** Name of the operator**Password** Operator's password. Can be read only if there is a service jumper put.

The command leads to the reading of the available information, which will be printed out in the operator's report. The sums are returned as floating-point numbers incorporating the currently set number of decimal places.

71H (113) READING THE NUMBER OF THE LAST PRINTED DOCUMENT**Data field:** None**Response:** DocNum**DocNum** The number of the last issued document (7 digits)**72H (114) INFORMATION ON A FISCAL ENTRY OR A FISCAL PERIOD****Data field:** <Closure1>[,<Type>[,<Closure2>]]**Response:** Depends of the value of 'Type'

Closure1 Number of a report in the fiscal memory.

Type The type of the information demanded.

- '0' Information about the active tax rates for the Z-report

ErrorCode[,DecRec,Dec,Enabled,PercA,PercB,PercC,PercD,DT]

- '1' Information about the turnover for the selected record or period.

ErrorCode[,Closure,Receipts,TotA,TotB,TotC,TotD,TotE,TotF,TotG,TotH]

- '2' Information about net amounts for the selected record or period.

ErrorCode[,Closure,Receipts,NetA,NetB,NetC,NetD,NetE,NetG,NetH]

- '3' Information about the total VAT (ДДС) for the selected record or period.

ErrorCode[,Closure,Receipts,TaxA,TaxB,TaxC,TaxD,TaxE,TaxF,TaxG,TaxH]

- '4' Additional information about the selected record.

ErrorCode[,Closure,DecRec,ResetRec,KLEN,DT]

- '5' Information from the selected record from the fiscal memory with tax rate setting.

ErrorCode[,Dec,Enabled,PercA,PercB,PercC,PercD,DT]

- '6' Information from the selected record from the FM with RAM reset.

ErrorCode[,DT]

Closure2 Number of the fiscal entry for references '1' '2' and '3'. For references '0', '4' '5' and '6' this field is empty. If the parameter exist is returned data for the period set by **Closure1** and **Closure2** for references '1', '2' и '3'.

ErrorCode One byte with value
 'P' - The data are valid.
 'F' - Invalid checksum of the record. Not available.
 'E' - No such record. Not available.

Closure - Number of fiscal record.

DecRec - Last (active) record with tax rates.

Dec - Number of decimal symbols for the selected Z-report record.

Enabled - Permitted tax rates – 4bytes with value '0' or '1', where '1' means "permitted".

Receipts - Total count of fiscal receipts.

PercX - Tax rate for the relevant tax group in percentage.

TotX - Turnover for the relevant tax group.

NetX - Net total for the relevant tax group.

TaxX - Total amount of ДДС (VAT) for the relevant tax group.

ResetRec - Last RAM reset before this fiscal block.

KLEN - Number of KJIEH (KLEN – electronic journal) for this fiscal receipt.

DT - Date and time of the data with format: **DD-MM-YY hh:mm:ss**.

The command returns information on the different tax groups for each separate entry and or a selected period of time. Periodic references for longer time periods may take a few seconds to process.

73H (115) PROGRAMMING A GRAPHIC LOGO

Data field: <RowNum>,<Data>
 or R<RowNum>,<Data>
Response: None
 or Data

R - If symbol 'R' presents in the beginning of the data, the command returns the contents of the relevant graphic line in hex format.

RowNum - Shows the line which is being programmed - a number between 0 and 95

Data - Graphic data. Two symbols for each byte of information are entered in the hexadecimal code (Two symbols for every byte). The length of the data is up to 54 bytes and if they are less an automatic addition of "00" follows.

This command offers the option to define a graphic logo with dimensions 54 x 12 mm (432 x 96 dots) designed by the user himself. The printing of this logo is activated with command 43. It is printed out immediately before the HEADER -

at the beginning of each fiscal or non-fiscal receipt. In order to define the whole logo, the command must be executed 96 times - once for each line. After RESET of the memory, the logo is loaded from the flash memory. The logo can be stored in the flash memory by virtue of command 41.

74H (116) READING A FISCAL MEMORY BLOCK

Data field: <Address>,<Bytes>

Response: Data

Address - Start address (from the beginning of the fiscal memory) – a hexadecimal number from 00000h to 1FFFFh (for 1 Mbit fiscal memory).

Bytes - Number of bytes to be returned (a decimal integer from 1 to 64).

Data - The contents of the requested fiscal memory block in a hexadecimal view (2 symbols for each byte).

This command returns the contents of a part from the fiscal memory. For reading of the whole memory the command has to be executed several times with a different start address.

77h (119) WORKING WITH KJEH/KLEN (KLEN – ELECTRONIC JOURNAL)

Data field: <Type>[,<InpData>]

Response: Depends on input data

Type Command class. A byte with value:

'C' Verification of KLEN or a part of it.

'T' Information about KLEN.

'N' Reading of a next text line from KLEN.

'R' Data reading from KLEN.

'P' Data printing from KLEN.

Commands class 'C': Verification of KLEN or a part of it.

P[#] - Prints report about the validity of all SHA-1 check sums for Z-reports, found in KLEN.

The check sums are compared with those from the fiscal memory. If a difference is found, a line with the number of the Z-report, date and time is printed. If the optional symbol '#' presents, information for all SHA-1 is printed regardless if they are valid or not.

R[<Num>] - Returns information from KLEN for Z-report with number **Num**. The data is read as a document. Response format:

P,FDocs,DT,SK - Information about the found Z-report.

FDocs - Document number of the Z-report.

DT - Date and time of the Z-report in format „DD-MM-YYYY hh:mm:ss”.

SK - 40 symbols – SHA-1 of the Z-report in a hex format.

F - No data is found in KLEN for this Z-report.

Z[<Num>] - Returns information from KLEN for a Z-report with number **Num**. It is read the real text of the document records in KLEN, SHA-1 is calculated and compared with SHA-1 of the Z-report. It is possible a long time to be necessary for the command to be finished in case of too many documents.

Response:

P,Docs,Bytes,SK - The check sum is valid. The documents (**Docs**) and data bytes (**Bytes**) are read. **SK** is 40 symbols – the check sum in a hexadecimal.

F,Docs,Bytes,SK,SZ - The check sum is invalid. **Docs** and **Bytes** are read. **SK** and **SZ** are 40 Symbols each – the respectively stored value in KLEN and the calculated one.

F - No data is found in KLEN for this Z-report.

[X] *Commands class 'T': Information about KLEN.* The 'X' symbol can be omitted. Response:

P,Tot,Used,C1,C2,D1,D2

Tot - Total capacity of the electronic journal in bytes.

Used - Used space of the electronic journal.

C1 - First number of a Z-report in the electronic journal.

C2 - Last number of a Z-report in the electronic journal.

D1 - First number of document Z-report in the electronic journal.

D2 - Last number of a document Z-report in the electronic journal.

Commands class 'R': Data reading from KLEN.

<D1>[,<D2>] - Returns the first line from document **D1** and sets the end of searching at document **D2** (including). Next lines are got with command class 'N'. If the second argument is missed, only one document is set - **D1**.

***<CI>[<D1>[,<D2>]] -** Returns the first line from document number **D1**, for Z-report **CI** and sets the end of searching at document **D2** (including) for the same Z-report. Next lines are got with command class 'N'. Document counter is for the

Zreport.

Example: command „*5,1,3“ will select the first tree documents from Z-report number 5. If **D2** is missed, only one document is selected – **D1**. If **D1** and **D2** are missed, all documents are selected for the Z-report.

<Flg><DT1>,<DT2> - Returns the first line from a document with date and time **DT1** and sets the searching end at document with date and time **DT2** (including). There is a filtration of the selected documents depending on the argument **Flg**. Next lines are got with command class 'N'. Input arguments format:

Flg - A symbol which sets the type of document for reading:

'A' - All types of documents.

'F' - Fiscal receipts.

'N' - Official receipts.

'R' - Official receipts with 90 degree rotated text.

'S' - Receipts form service manipulations.

'X' - X-reports.

'Z' - Z-reports.

DT1 - Beginning and end date of the check up in format **DDMMYY[hmmss]**. If time is missed a default value is used „000000“ (00:00:00).

DT2 - End date and time of the check up in format **DDMMYY[hmmss]**. If the time is missed a default value is used „235959“ (23:59:59).

The tree previous subcommands (by document, Z-report and data) return one of the next responses:

- **P,Text** There is a destroyed text line in KLEN (KJIEH). Its content is in **Text**. The read text is always coded with table 1251, regardless if it is chosen a DOS table by the switches.

The code table is important for the right calculation of the SHA-1 check sum.

- *****, There is a destroyed text line in KLEN and it is an empty line - document separator.

Can be used for counting of the found documents or for stopping of the reading exactly at the end of the document.

- **F** No more data in KLEN.

Example:

One of the previous commands is sent. If the response is 'F', there is not such data in KLEN.

Otherwise a command class 'N' is being sent until a response 'F' (no more data) is received. By this way all desired lines from KLEN can be got one by one as a text.

Q<Addr>,<Bytes> Direct reading of data from KLEN in a raw format. This command returns **2*Bytes** symbols starting from address **Addr**. **Addr** is set hexadecimal and **Bytes** – decimal. Data is returned in hexadecimal format.

q<Addr>,<Bytes> Direct reading of data from KLEN in a raw format. The difference in comparison with the previous command: the symbols are returned as a normal text if they are printable (above 1Fh) or in format „<XX>“ (hexadecimal), if they are check numbers (under 20h).

Commands class 'N':

There is no additional data after this symbols. It is used in combination with some of the commands class 'R'. Reads the next line in KLEN. The responses are the same as the initial command class 'R' and described above.

ATTENTION! The sending of this command without previous one from class 'R' setting a range of the inquire can cause reading of illegal information!

Commands class 'P': Data printing from KLEN.

[<Fnt><D1>[,<D2>]	Documents from number D1 to D2 including are printed. If the second argument is missed, only one document is selected - D1 .
[<Fnt>]*<Cl>[<D1>[,<D2>]]	Documents from number D1 for Z-report Cl to number D2 including for the same Z-report are printed. The document counter is for the Z-report. Example: command „*5,1,3“ will print the first 3 documents from Z-report number 5. If D2 is missed, only one document is selected – D1 . If D1 and D2 are missed, all documents for the Z-report are selected.
[<Fnt><Flg><DT1>,<DT2>	Documents with date and time from DT1 to DT2 including are printed. There is a filtration of the documents selected depending on the argument Flg . Input arguments format:
Fnt	Optional parameter. By virtue of it a document from KLEN can be printed with a font with a set height (if the printer can accept it). One byte with a possible value: '>' Printing with a normal font. '<' Printing with . font height.
Flg	A symbol which sets the type of document for reading: 'A' All types of documents. 'F' Fiscal receipts. 'N' Official receipts. 'R' Official receipts with 90 degree rotated text. 'S' Receipts form service manipulations. 'X' X-reports. 'Z' Z-reports.
DT1	Beginning and end date of the check up in format DDMMYY[hmmss] . If time is missed a default value is used „000000“ (00:00:00).
DT2	End date and time of the check up in format DDMMYY[hmmss] . If the time is missed a default value is used „235959“ (23:59:59).

The 3 previous subcommands (by document, Z-report and data) return in a result the count of printed documents as an integer.

The copies of the documents from KLEN are almost identical with the original documents. The differences are:

- The copies never have a graphical logo before the header.
- In the copies there is no graphical fiscal logo.
- The notice „ФИСКАЛЕН БОИ“ (“FISCAL RECEIPT”) with fiscal logo is substituted with notice „ФИСКАЛЕН БОИ – КОПИЕ“ (“FISCAL RECEIPT - COPY”) with double wight.

INFORMATION FOR THE VIEW OF THE RETURNED TEXT AT KLEN READING

- The read documents do not have a graphical logo.
- The centering is imitated with adding of interval at the beginning of the line.
- Printing with double width is imitated with adding of interval before each letter.
- If in the fiscal or officail receipts there is a barcode, it will be substituted with a notice „БАРКОД [XXXX]” („BARCODE [XXXX]”), where **XXXX** is the text string from the barcode.
- The read line include only text without the symbols **<CR>** and **<LF>** at the end of the line. At getting a text information from KLEN these symbols must be added at the end of each line. If this is done, an external program will be able to calculate the SHA-1 check sum and to collate it with the one recorded in KLEN - they should be the same.
 - A returned line with a prefix '*' (end of document) must be added in the file too (as an empty line – only the symbols **<CR>** and **<LF>**), because takes a part in SHA-1 for the Z-report.

77h (119) JOURNAL SUPPORT

Input data:	<Type>[,<InpData>]
Response:	Depends on input data
Type	Journal command type. One byte with possible value:
'C'	Check journal data validity.
'I'	Journal information.
'N'	Read next journal line. (Command type 'R' must be sent before it).
'R'	Start reading journal data. (Command type 'N' follows).
'P'	Print journal data.

Command type 'C': Check journal data.

P[#][Z1,Z2] Print validity report for all SHA-1 sums of Z-reports, found in journal. The printer compares SHA-1 from journal and from fiscal memory. If different, one line is printed, containing Z-report number, date and time. If optional symbol '#' is present, then is printed information about all SHA-1 sums, independent of that are they correct or not. Z1 and Z2 are start and end Z-report for checking. If Z2 is omitted, then only one report is checked. If both omitted, all Z-reports are checked.

R<Num> Returns information about Z-report *Num*. Some data about this Z-report are read from journal. Response format:

P,FDocs,DT,SK Information about this Z-report:
FDocs Global document number of the Z-report.
DT Date and time in format „DD-MM-YYYY hh:mm:ss”.
SK 40 symbols – SHA-1 of the Z-report in hexadecimal mode.
F No data found in journal about this Z-report.

Z<Num> Returns information from journal for a Z-report with number *Num*. It is read the real text of the document records in journal, SHA-1 is calculated and compared with SHA-1 of the Z-report. It is possible a long time to be necessary for the command to be finished in case of too many documents.

Response:

P,Docs,Bytes,SK The check sum is valid. The documents (*Docs*) and data bytes (*Bytes*) are read. *SK* is 40 symbols – the check sum in a hexadecimal.

F,Docs,Bytes,SK,SZ The check sum is invalid. *Docs* and *Bytes* are read. *SK* and *SZ* are 40 symbols each – the respectively stored value in journal and the calculated one.

F No data is found in journal for this Z-report.

Commands class 'T': Information about journal.

[X] The 'X' symbol can be omitted. Response:

P,Tot,Used,C1,C2,D1,D2
Tot Total capacity of the electronic journal in bytes.
Used Used space of the electronic journal.
C1 First number of a Z-report in the electronic journal.
C2 Last number of a Z-report in the electronic journal.
D1 First number of document Z-report in the electronic journal.
D2 Last number of a document Z-report in the electronic journal.
 If 'X' symbol present, then *Tot* and *Used* sizes are returned hexadecimal.

Commands class 'R': Data reading from journal.

<D1>[,<D2>] Returns the first line from document *D1* and sets the end of searching are document *D2* (including). Next lines are got with command class 'N'. If the second argument is missed, only one document is set - *D1*.

***<Cl>[<D1>[,<D2>]]** Returns the first line from document number *D1*, for Z-report *Cl* and sets the end of searching at document *D2* (including) for the same Z-report. Next lines are got with command class 'N'. Document counter is for the Z-report. Example: command „*5,1,3“ will select the first three documents from Z-report number 5. If *D2* is missed, only one document is selected – *D1*. If *D1* and *D2* are missed, all documents are selected for the Z-report.

<Flg><DT1>,<DT2> Returns the first line from a document with date and time *DT1* and sets the searching end at document with date and time *DT2* (including). There is a filtration of the selected documents depending on the argument *Flg*. Next lines are got with command class 'N'. Input arguments format:

Flg A symbol which sets the type of document for reading:
'A' All types of documents.
'F' Fiscal receipts.
'N' Official receipts.
'R' Official receipts with 90 degree rotated text.
'S' Receipts form service manipulations.
'X' X-reports.
'Z' Z-reports.

DT1 Beginning and end date of the check up in format **DDMMYY[hmmss]**. If time is missed a default value is used „000000“ (00:00:00).

DT2 End date and time of the check up in format **DDMMYY[hhmmss]**. If the time is missed a default value is used „**235959**“ (23:59:59).

The three previous subcommands (by document, Z-report and data) return one of the next responses:

P,Text There is a destroyed text line in journal. Its content is in **Text**.
*****, There is a destroyed text line in journal and it is an empty line - document separator. Can be used for counting of the found documents or for stopping of the reading exactly at the end of the document.
F No more data in journal.

Example:

One of the previous commands is sent. If the response is 'F', there is not such data in journal. Otherwise a command class 'N' is being sent until a response 'F' (no more data) is received. By this way all desired lines from journal can be got one by one as a text.

Q<Addr>,<Bytes> Direct reading of data from journal in a raw format. This command returns **2*Bytes** symbols starting from address **Addr**. **Addr** is set hexadecimal and **Bytes** – decimal. Data is returned in hexadecimal format.

q<Addr>,<Bytes> Direct reading of data from journal in a raw format. The difference in comparison with the previous command: the symbols are returned as a normal text if they are printable (above 1Fh) or in format „<XX>“ (hexadecimal), if they are check numbers (under 20h).

Commands class 'N':

There is no additional data after this symbols. It is used in combination with some of the commands class 'R'. Reads the next line in journal. The responses are the same as the initial command class 'R' and described above.

ATTENTION! The sending of this command without previous one from class 'R' setting a range of the inquire can cause reading of illegal information!

Commands class 'P': Data printing from journal.

[<Fnt>]<D1>,<D2>] Documents from number **D1** to **D2** including are printed. If the second argument is missed, only one document is selected - **D1**.

[<Fnt>]*<Cl>,<D1>,<D2>] Documents from number **D1** for Z-report **Cl** to number **D2** including for the same Z-report are printed. The document counter is for the Z-report. Example: command „*5,1,3“ will print the first 3 documents from Z-report number 5. If **D2** is missed, only one document is selected – **D1**. If **D1** and **D2** are missed, all documents for the Z-report are selected.

[<Fnt>]<Flg><DT1>,<DT2> Documents with date and time from **DT1** to **DT2** including are printed. There is a filtration of the documents selected depending on the argument **Flg**. Input arguments format:

Fnt Optional parameter. By virtue of it a document from journal can be printed with a font with a set height (if the printer can accept it). One byte with a possible value:
 >' Printing with a normal font.
 <' Printing with ½ font height.

Flg A symbol which sets the type of document for reading:

'A' All types of documents.
 'F' Fiscal receipts.
 'N' Official receipts.
 'R' Official receipts with 90 degree rotated text.
 'S' Receipts form service manipulations.
 'X' X-reports.
 'Z' Z-reports.

DT1 Beginning and end date of the check up in format **DDMMYY[hhmmss]**. If time is missed a default value is used „**000000**“ (00:00:00).

DT2 End date and time of the check up in format **DDMMYY[hhmmss]**. If the time is missed a default value is used „**235959**“ (23:59:59).

The 3 previous subcommands (by document, Z-report and data) return in a result the count of printed documents as an integer.

The copies of the documents from journal are almost identical with the original documents. The differences are:

The copies never have a graphical logo before the header.

In the copies there is no graphical fiscal logo.

The notice “**FISCAL RECEIPT**” is substituted with notice “**FISCAL RECEIPT – COPY**” with double width.

INFORMATION ABOUT THE VIEW OF THE RETURNED TEXT AT JOURNAL READING

The read documents do not have a graphical logo.

The centering is imitated with adding of interval at the beginning of the line.

Printing with double width is imitated with adding of interval before each letter.

If in the fiscal or non-fiscal receipts there is a barcode, it will be substituted with a notice „**BARCODE [XXXX]**”, where **XXXX** is the text string from the barcode.

The read line include only text without the symbols <CR> and <LF> at the end of the line. At getting a text information from journal these symbols must be added at the end of each line. If this is done, an external program will be able to calculate the SHA-1 check sum and to collate it with the one recorded in journal - they should be the same.

A returned line with a prefix '*' (end of document) must be added in the file too (as an empty line – only the symbols <CR> and <LF>), because takes a part in SHA-1 for the Z-report.

79h (121) Read code from MEMORY BLOCK (FIRMWARE)

Input data:	<Address>,<Bytes>
Response:	Data
Address	Start address (start of the code memory) - hexadecimal number from 00000h to 2FFFFh.
Bytes	Number of bytes to be returned in decimal form (1 to 64).
Data	The contents of the fiscal memory block requests in hexadecimal (2 characters for each byte of data).

The command returns the contents of part of the code memory (firmware). To read the entire code memory to be performed repeatedly. The command is only available in service mode!

7AH (122) OPENING A NON FISCAL RECEIPT FOR 90 DEGREE ROTATED TEXT

Data field: No data

Response: RotRec

RotRec Serial number of the opened non fiscal receipt for 90 degree text for the day. 4bytes with no sign.

The command will not be executed if:

- There is opened another kind of receipt.
- There is no paper.
- The clock is not set.

7BH (123) PRINTING OF 90 DEGREE ROTATED TEXT

Data field: Text

Response: No data

Text The content of the text line for printing. The length is up to 100 symbols. The text can be printed with attributes: bold and underline. They can be turned on and of by the following way:

- <Tab>**B** Starts bold printing.
- <Tab>**b** Stops bold printing.
- <Tab>**U** Starts underline printing. Can be used for a separator line of a table,
- <Tab>**u** Stops underline printing.
- <Tab>**A** Inserts a start vertical line for tables.
- <Tab>**Z** Inserts an end vertical line for tables.
- <Tab>**O** Starts the printing line in the top two positions of the characters. It can be used as a dividing line horizontalna table.
- <Tab>**o** Terminate mode started with <Tab>**O**

This command is used for printing of a 90 degree rotated text, up to 18 lines. The sent text lines are accumulated in the memory by sequence of their sending. If the command is executed more than 18 times after the receipt opening, the accumulated information will be printed and printer will wait for new lines or command 124. The printer determines the longest line and fills the others to the same length.

If more than 18 lines are sent, more than one column will be printed. There is no space between two columns, therefore with appropriate picked out data can be printed lines with unlimited length.

The command will be not executed if there is not an opened receipt for 90 degree rotated text.

7CH (124) CLOSING OF A NON FISCAL RECEIPT FOR 90 DEGREE ROTATED TEXT**Data field:** No data**Response:** RotRec**RotRec** Serial number of the opened non fiscal receipt for 90 degree text for the day. 4bytes with no sign.

This command closes the receipt. If there are any not printed yet lines, they will be printed automatically before its closing.

The command will not be executed if there is not opened a receipt for 90 degree printing.

80H (128) Service reset the RAM.**Data field:** No data**Response:** No data

Command resets the printer memory. After implementation and need to update the clock command 61, which is done in RAM reset entry into the fiscal memory with date and time specified.

Command is enabled only when placed service jumper.

Have place for 100 RAM reset records.

85H (133) Disable printing.**Data field:** No data**Response:** No data**Disable** One byte with value:

'0'	Disable printing
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'1'	Enable printing
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Command is enabled only when placed service jumper. When printing is disabled printer performs all actions, including entry in KLEN, but does not print on paper. The records of the printer accumulate data correctly according to the data are sent when necessary, shall be entry in the fiscal memory.

When printing is disabled, it sends commands with high speed for testing printer and KLEN.

86H (134) Service maintenance of KLEN/KJIEH (KLEN – Electronic journal)**Data field:** No data**Response:** No data**Format** one byte with value 'F'**Result** one byte with value 'P'(successful) or 'F'(error)

Command is enabled only when placed service jumper. Used for initial formatting of KLEN. For initial formatting of KLEN. Permit only on non-FISCALIZED device or not formatting KLEN. The command will not run in already formatted KLEN, even in service mode.

LIST OF FISCAL COMMANDS - IN ASCENDING ORDER

HEX	DEC	FUNCTION
21h	(33)	Clear the display
23h	(35)	Text on lower line of display
26h	(38)	Opening a non-fiscal receipt
27h	(39)	Closing a non-fiscal receipt
28h	(40)	Displaying a text on the upper line of the display
29h	(41)	Saving the settings of the configuration switches on the flash memory
2Ah	(42)	Printing non-fiscal free text
2Bh	(43)	Setting HEADER and FOOTER and printing options
2Ch	(44)	Advancing paper
2Dh	(45)	Cutting off printed documents
2Fh	(47)	Displaying a text on the upper line of the display
30h	(48)	Open fiscal receipt (invoice)
32h	(50)	Tax rates set during the accounted period
33h	(51)	Subtotal
34h	(52)	Registration and display
35h	(53)	Calculation of a TOTAL
36h	(54)	Print a free fiscal text
38h	(56)	Closing a fiscal receipt
39h	(57)	Cancellation a fiscal receipt
3Dh	(61)	Setting the clock – date and hour
3Eh	(62)	Reading current date and hour
3Fh	(63)	Show date and hour on display
40h	(64)	Information on the last fiscal entry
41h	(65)	Information on daily taxation
44h	(68)	Number of the free fields in fiscal memory
45h	(69)	Daily financial report with/without closure
46h	(70)	INTERNAL DEBITING AND CREDITING (SERVE IN AND OUT)
47h	(71)	Print diagnostic information
48h	(72)	Fiscalization
49h	(73)	Detailed fiscal memory report by closure number
4Ah	(74)	Reading the status options
4Ch	(76)	Status of the fiscal transaction
4Eh	(78)	Showing a text (lower line)
4Fh	(79)	Short financial report from date to date
50h	(80)	Sound signal
51h	(81)	report of the fiscal memory by months
53h	(83)	Setting the Multiplier, Decimals, Currency Name and Taxes
54h	(84)	Barcode printing

55h	(85)	Setting the additional methods of payment
56h	(86)	Reading the data of the last fiscal memory record
59h	(89)	Program the production test area
5Ah	(90)	Return diagnostic information
5Bh	(91)	Program the serial number, country number and the fiscal memory number
5Ch	(92)	Programming the number of the fiscal memory
5Dh	(93)	Separator line printing
5Eh	(94)	Detailed of fiscal memory (selected by date of entry)
5Fh	(95)	Short financial report from date to date
60h	(96)	Set tax rates
61h	(97)	Reading the set tax rates
62h	(98)	Setting of EIK (EIK – Unified Identification Code)
63h	(99)	Reading the tax registration number
64h	(100)	Showing text on display
65h	(101)	Setting the operator's password
66h	(102)	Entering operator's name
67h	(103)	Information on the current receipt
68h	(104)	Reset data operator
69h	(105)	Operator's report
6Ah	(106)	Drawer kick-out
6Bh	(107)	Define and reading items
6Dh	(109)	Printing a duplicate receipt
6Eh	(110)	Additional daily information
6Fh	(111)	Items report
70h	(112)	Reading information on operator
71h	(113)	Read the number of the last printed document
72h	(114)	Information on a fiscal entry or a fiscal period
73h	(115)	Programming a graphic logo
74h	(116)	Reading a fiscal memory block
77h	(119)	Working with KJIEH/KLEN (KLEN – Electronic journal)
79h	(121)	Read code from MEMORY BLOCK (FIRMWARE)
7Ah	(122)	Opening an non-fiscal receipt for printing with 90 degree rotated text
7Bh	(123)	Print 90 degree rotated text
7Ch	(124)	Closing an non-fiscal receipt for printing with 90 degree rotated text