FISCAL PRINTER PROGRAMMING INTERFACE DESCRIPTION
DATECS FP-800 / FP-2000 / FP-650 / SK1-21F / SK1-31F/ FMP-10 / FP-700

Version 1.00BG

INTRODUCTION

The fiscal device is controlled by application software with which it communicates over an RS232 asynchronous serial or another interface. It is intended to execute a predefined set of commands in a logical order depending on the types of operations to be executed. The application software has no direct access to the resources of the fiscal device, but it can retrieve data on the status of the fiscal device and the fiscal memory.

The fiscal device executes the following types of operations:

- Store the Unique Fiscal Device ID and Fiscal Memory ID.
- Store the fiscal parameters, such as taxpayer's UIC, VAT number, date of placing into operation, etc.
- Store owner's information, such as address, name, etc.
- Store the sales values and generate a customer receipt.
- Store the daily sales in the fiscal memory and generate a daily financial report.
- Store the text of the fiscal receipts and the daily reports in the Electronic Journal (EJ) and generate EJ reports on demand.
- Generate sales and fiscal memory contents reports.
- Print reports generated by the application.
- Upload data to the application software.
- Send data to the National Revenue Agency over a GPRS modem.

TAX GROUPS AND VAT CALCULATION

Each sale is assigned to a specific tax (VAT) group specifying the tax rate applicable to the base price to form the sale price. The fiscal printer can operate with a maximum of 8 tax groups, usually coded with the first letters of the alphabet of the country for which the fiscal printer (FP) is set up, e.g., for Bulgaria, these are '**А**,' '**Б**,' '**В**,' '**Г**,' '**Д**,' '**Е**,' '**Ж**' and '**З**'.

Each tax group is assigned to a tax rate (percentage), which must be a number not higher than **99.00**, with no more than two decimal places. Some of the eight standard tax groups may be disabled by setting ***Enabled_taxes*** in command **83 (53H)**.

Sale commands accept as parameters the capital letters '**А**,' '**Б**,' '**В**,' '**Г**,' '**Д**,' '**Е**,' '**Ж**' and '**З**' (DOS or 1251 codepage) or, respectively, the first Latin alphabet letters '**A**,' '**B**,' '**C**,' '**D**,' '**E**,' '**F**,' '**G**' and '**H**'. The same applies to all commands expecting a tax group as an input parameter (for instance, PLU programming in command **107**). *LATIN CHARACTERS ARE ALLOWED ONLY AS AN INPUT PARAMETER! In every printout, the tax groups are in Cyrillic!*

The net sale value is calculated using the formula:
Net_Sum = ROUND(Sales/(1 + Rate))
The ***ROUND*** function performs standard rounding down to the smallest used currency unit (stotinki or leva where integers are used).

The value of the payable tax is calculated using the formula:
Tax = Sales – Net_Sum

OPERATION MODES OF THE FISCAL DEVICE

The fiscal device can operate in two modes.
- Training mode. The device is not fiscally registered. All data required for its normal operation are entered and stored in the fiscal memory except the owner's UIC and the tax rates. Customer receipts may be opened and issued, but the text 'non-fiscal receipt' is always printed on them. Daily financial reports with reset may be created, but they are not stored in the fiscal memory. Printed information is not stored in the EJ.
- Normal mode. The device is fiscally registered. The owner's UIC is entered and stored in the fiscal memory. All fiscal rules apply. The registration with the NRA is made over the modem and the respective IDs are received and stored.

STATUSES OF THE FISCAL DEVICE

The fiscal printer may have a number of statuses. Transition from one status to another is not always possible. Printer control and transitions between statuses, where possible, are carried out by the application software on the Host (PC), which must be strictly consistent with the used protocol. If the protocol is incorrectly applied, the printer may enter an undesired status or its transition through a certain status may be skipped, resulting in the printer entering the ***ERROR status.***

A) INITIAL STATUS

In this status, the date and time must be set, the Fiscal Memory ID, the Unique Device ID and the country code must be programmed. **THESE OPERATIONS ARE CARRIED OUT ONLY BY THE MANUFACTURER BEFORE THE HANDOVER TO THE CUSTOMER!**

The following commands must be carried out in the specified order: **61 (3DH)** and **91 (5BH)**.

B) STATUS AFTER THE SERIAL NUMBER AND FISCAL MEMORY ID ARE SET

In this status, the following operations must be performed:

- Format the EJ using command **134 (86H)**.

- Set the currency name, number of decimal places and number and values of the tax rates using command **83 (53H)**.

After these operations are performed, the fiscal printer is ready to be handed over to its customer/user, i.e., in this status, the devices are held at the manufacturer's warehouse.

C) STATUS AT THE TIME OF HANDOVER TO THE CUSTOMER

In this status, the **"header"** and **"footer"** must be set, i.e., the information printed at the top and the bottom of each receipt. The **"header"** usually contains information on the owner (company name, address, etc.), while the "**footer**" contains some advertisement. The command **43 (2BH)** needs to be performed for each line being set.

Additional settings, such as the programming of a logo graphic, print density, serial port settings, etc., can also be made here.

D) TRAINING MODE

The FP remains in this status until it is fiscally registered. Receipts can be issued, however, one must bear in mind that even the customer receipts in this mode are marked as non-fiscal. A daily financial report with reset (Z-report) can be created, but no record is made in the fiscal memory. An UIC is set, but it is not stored in the fiscal memory and can be edited. Fiscal memory reports are not run. Memory resets, if any, are not recorded in the fiscal memory. The clock can be set freely. ***In training mode, the fiscal printer CAN NOT BE USED at points of sale—it is intended to be used for training purposes only.***

E) FISCALLY REGISTERED FISCAL PRINTER

In this status, customer financial receipts marked as fiscal can be issued. When a daily financial report with reset (Z-report) is run, it is recorded in the fiscal memory. The date can only be set after the last fiscal memory record date. The UIC is stored in the FP and can no longer be edited. **IT IS NOT POSSIBLE** for the printer to exit the fiscal mode without replacing the fiscal memory.

Before the fiscal registration, the device owner's UIC must be set, if it was not set already (command **98 (62H)**), and then command **72 (48H)** must be executed. Then, the printer enters fiscal mode, but is not yet ready for operation and will reject an attempt to print fiscal receipts. For normal operation, the printer needs to be registered at the NRA using the software provided for this purpose.

F) IRRECOVERABLE ERROR IN THE FISCAL PRINTER

The fiscal printer enters this status when a serious hardware or logic error is detected during operation of the device or if there is a fault in the fiscal memory unit, EJ or tax terminal. In this mode, after the printer is powered on, it prints the "**FATAL ERROR: 4**" bold text for an error in the fiscal memory or a descriptive message for the problem with any of the other printer peripherals. The printer rejects any command to open fiscal receipts or make a record in the fiscal memory. Only diagnostic commands and regular reports can be run.

The RAM needs to be reset and a new fiscal memory unit, EJ or tax terminal needs to be installed, depending on the fault.

THESE OPERATIONS MUST BE CARRIED OUT BY A SERVICE CENTRE, AUTHORISED BY THE BULGARIAN INSTITUTE OF METROLOGY AND HOLDING A SERVICE CERTIFICATE FOR THE RESPECTIVE FISCAL DEVICE MODEL, WITH WHICH THE TAXPAYER HAS EXECUTED A SERVICE AGREEMENT.

Events leading to this status are:
- Inability to store a correct record in the fiscal memory.

- Invalid checksum of the UIC, Unique Fiscal Device ID, Fiscal Memory ID or any record containing tax rates.
- Unrecognised format of the fiscal memory unit.
- If the fiscal memory power-on check detects more than three invalid checksums of a fiscal record in a daily financial report. The fiscal records with invalid checksums are printed on power-on (unless the device is in the open receipt status) and also at the respective area of the fiscal memory reports.
- No communication with the tax terminal or an "unknown" tax terminal, i.e., with a serial number other than the one stored in the fiscal memory.
- No communication with the EJ or a read-only EJ from another printer.
- The EJ is full (highly unlikely, considering the size of the EJ).

PRINTER STATUS INDICATIONS ON THE FRONT PANEL

If the printer detects a fault during operation, it can disable some commands. The printer status is indicated by the LED on the front panel. The possible LED signals are described below:

Green light:
Continuous:
The printer is ready to execute commands.
Blinking, about 2 flashes per second:
The printer initializes and checks its performance or performs a continuous command. You have to wait.

Red light:
Off:
The peripherals are operating normally.
Continuous:
No paper or open cover. Find and clear the fault.
Blinking, about 2 flashes per second:
The printing head is overheated. Wait—printing will continue after it cools down.
Intermittent blinking: 2 flashes followed by a pause.
No communication with the EJ. Try to power the printer off and then on again to reset the EJ. If the problem persists, service intervention is required.

FISCAL PRINTER CONFIGURATION SWITCHES

The printer uses 16 bits from the flash memory as configuration switches setting the device mode. Their values can be changed using command **41 (29H)**, whereby the first 8 or all 16 bits must be set. Their functions are described in the following table:

Switch	Off	On
1	Normal display mode	"Transparent display" mode
2	Standard DATECS display operation	Codepage 1251 display operation
3*	3-inch paper tape printing	Narrow paper printing
4	No automatic cut	Automatic paper cut after the receipt
5	Codepage 1251 is used for Cyrillic	DOS codepage (856) is used for Cyrillic
6	Serial port baud rate setting	
7	Serial port baud rate setting	
8	Serial port baud rate setting	
9**	Not used	Half Cut
10***	Not used	Allows work with presenter
11	Not used	
12	115200 bps modem communication	230400 bps modem communication
13	Not used	
14	Not used	
15	Not used	
16	Not used	

Serial port baud rate selection

Switch 6	Switch 7	Switch 8	Baud rate (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

*By default, printers not supporting 3-inch paper operation, do not accept switch 3 as a valid setting. (switch 3 will remain off).

**Allows Half Cut and automatically stops work of the presenter even it is allowed.

***Allows work of presenter in printers SK1-21F and SK1-31F

FISCAL PRINTER STATUS BITS

The current device status is coded in a 6-byte field sent in the frame of each message from the fiscal printer. Each byte of this field is described below:

Byte 0:   **General purpose**
0.7   Reserved: always 1.
0.6   The printer cover is open.
0.5   General error: an OR of all errors marked with the '#' character.
0.4 #   Printing unit fault.
0.3   No customer display is connected.
0.2   The clock is not set.
0.1 #   Invalid command code received.
0.0 #   Syntax error in the received data.

Byte 1:   **General purpose**
1.7   Reserved: always 1.
1.6   The built-in tax terminal is not responding.
1.5   A service receipt with 90-degree rotated text printing is open.
1.4   A refund (storno) receipt is open.
1.3 #   Low battery (the real-time clock is in RESET status).
1.2 #   The RAM has been reset.
1.1 #   The command is not allowed in the current fiscal mode.
1.0   The command resulted in an overflow of some amount fields. Status 1.1 will also be set and the command will not change any data in the printer.

Byte 2:   **General purpose**
2.7   Reserved: always 1.
2.6   The end of the EJ is very near (only certain receipts are allowed).
2.5   A service receipt is open.
2.4   The end of the EJ is near (less than 10 MB free in the EJ).
2.3   A fiscal receipt is open.
2.2   End of the EJ (less than 1 MB free in the EJ).
2.1   Low paper.
2.0 #   No paper. If this flag is raised during a print command, the command is cancelled and does not change the printer status.

Byte 3:   **For the status of the configuration switches**
3.7   Reserved: always 1.
3.6   Sw7 status.
3.5   Sw6 status.
3.4   Sw5 status.
3.3   Sw4 status.
3.2   Sw3 status.
3.1   Sw2 status.
3.0   Sw1 status.

Byte 4:   **For the fiscal memory**

4.7	Reserved: always 1.
4.6	The printing head is overheated.
4.5	OR of all errors marked with the '*' character from bytes 4 and 5.
4.4 *	The fiscal memory is full.
4.3	There is space for less than 50 records remaining in the FP.
4.2	Unique Printer ID and Fiscal Memory ID are set.
4.1	BULSTAT UIC is set.
4.0 *	Fiscal memory store error.

Byte 5: **For the fiscal memory**

5.7	Reserved: always 1.
5.6	Not used.
5.5	Fiscal memory read error.
5.4	The tax rates are set at least once.
5.3	The printer is in fiscal mode.
5.2 *	The last fiscal memory store operation is not successful.
5.1	The fiscal memory is formatted.
5.0 *	The fiscal memory is set in READONLY mode (locked).

POWER OUTAGE

The printer status at all times is reflected in its status bytes. When the printer is powered on after a power outage, the application software, using commands **76 (4AH)** and **103 (67H)**, needs to query the printer status.

The application software needs to decide how to proceed depending on the printer status. It is guaranteed that the fiscal memory will not be damaged by a power outage and that the sums accumulated in the RAM will be valid. If there has been a power outage during printing, then, after the printer is powered on, it will print a line with the **"*VOLTAGE DROP*"** text in wide letters and will complete the printout.

FISCAL AND SERVICE RECEIPTS

A) SERVICE RECEIPTS.

First, the receipt is opened, then the text is printed and, finally, the receipt is closed.
The commands used are **38 (26H),** unlimited number of times **42 (2H)** and, finally, **39 (27H)**.
Barcode printing is also enabled, using command **84 (54H)**.

The printer also supports printing of service receipts with 90-degree rotated text and tables. The commands used are **122 (7AH)**, **123 (7BH)**, **124 (7CH)** and, optionally, **84 (54H)** for barcodes.

B) FISCAL RECEIPTS.

First, the fiscal receipt is opened, the sales are entered, the payment is made and, finally, the receipt is closed.
The commands used are **48 (30H), 49 (31H), 51 (33H), 52 (34H), 53 (35H), 54 (36H), 58 (3AH)** and **56 (38H)**.
Barcode printing is also enabled, using command **84 (54H)**.
At closing time, a daily financial report with reset (Z-report) is run to store the information in the fiscal memory. This is done using command **69 (45H)**.

EJ (ELECTRONIC JOURNAL)

The printer stores each line of the fiscal receipts, service receipts, service information documents during initialisation, X- and Z-reports in the Electronic Journal (EJ). The EJ has a minimum capacity of 2 GB and, in normal operation, should be able to store all data generated during the printer operation until the fiscal memory is full. If it becomes damaged or full (in heavy-duty operation), the EJ can be replaced with an empty one, whereby the old one must be stored under the terms and procedure defined in Ordinance N-18.

The following reports can be generated from the EJ:
- Print a copy of a document by number, date and time or sequential number of a Z-report.
- Download document(s) over the serial interface as text with layout as close as possible to the original paper layout. This also can be selected by number, date and time or sequential number in a Z-report.
- Information on the capacity of the EJ, used space in bytes, numbers of the first and last documents stored in it and the first and last Z-reports.
- SHA-1 checksum validity verifications for the documents from a complete Z-report, directly calculated by the printer.
- Verify the SHA-1 checksums for one or more Z-reports with the ones stored in the fiscal memory and print a report with the verification result.

Two flags in the status bytes warn of a near end (10 MB free) and end (1 MB free) of the EJ. If the "End of the EJ" flag is raised, the following commands are disabled: **38** (Open a service receipt), **42** (Free text in a service receipt), **48** (Open a fiscal receipt), **49** (Enter a sale), **52** (Enter and display), **54** (Print fiscal text), **58** (PLU sale) and **84** (Print a barcode).

REPORT GENERATION

The reports are generated entirely by the fiscal printer after it receives the respective command from the PC. For these reports, the application software can not make any changes to the report appearance, i.e., they look as they are pre-defined in the FP. They are invoked using commands:

50 (32H): tax rate and decimal place change report.
69 (45H): daily financial report with or without reset.
108 (6CH): daily financial report with or without reset, with printed totals by PLU.
117 (75H): daily financial report with or without reset, with printed totals by department.
118 (76H): daily financial report with or without reset, with printed PLUs and departments.
79 (4FH)/95 (5FH): summary fiscal memory report, from–to date/from–to fiscal block number.
73 (49H)/94 (5EH): full fiscal memory report, from–to date/from–to fiscal block number.
119 (77H): print documents from the EJ.

LOW-LEVEL PROTOCOL

A) PROTOCOL TYPE. - Master (Host) / Slave

The fiscal printer executes commands sent from the Host and returns a message depending on the result.

The fiscal printer can not initiate communication. Only messages resulting from the execution of received commands are sent to the Host.

The messages in the protocol are either packed messages or single bytes.

The fiscal printer supports communication over RS 232 at baud rates of **1200, 2400, 4800, 9600, 19200, 38400, 57600** and **115200 b/s, 8N1.** The baud rate is set by configuration bits 5, 6 and 7. LAN connection is also supported, whereby the parameters are set using command **36 (24H)**.

B) MESSAGE SEQUENCE

The Host sends a packed message, containing the command to the printer.

The FP executes the requested operation and responds with a packed response message.

The Host needs to wait for the response from the printer before sending another message.

The protocol uses non-packed codes with a length of one byte to process any required pauses and error statuses.

C) NON-PACKED MESSAGES, TIME-OUT

In normal operation, the Slave responds to all Host messages not later than 60 ms either with a packed message or a one-byte code. The Host needs a 500 ms time-out to receive a response from the Slave. If it does not receive any response within that time, it needs to resend the message with the same sequential number and the same command. After several unsuccessful attempts, the Host needs to indicate that there is no connection to the fiscal printer or there is a hardware error.

The non-packed messages consist of a single byte and are:

a) **NAK 15H**

This code is sent by the Slave, if it detects an error in the checksum or the format of the received message. When the Host receives a **NAK**, it needs to resend a message with the same sequential number

b) **SYN 16H**

This code is sent by the Slave, when it receives a command requiring longer execution time. **SYN** is sent every 60 ms, until the packed response message is ready

D) PACKED MESSAGES

a) Host to printer. (Send)
<01><LEN><SEQ><CMD><DATA><05><BCC><03>
b) Printer to Host. (Receive)
<01><LEN><SEQ><CMD><DATA><04><STATUS><05><BCC><03>

Where:

<01>   **Preamble**
length: 1 byte
value: 01H

<LEN>   Number of bytes from **<01>** (not included) to **<05>** (included) plus a fixed offset of **20H**
length: 1 byte
value: 20H - FFH

<SEQ>   **Sequential number of the frame**
length: 1 byte
value: 20H - 7FH
The fiscal printer enters the same **<SEQ>** in the response message. If the FP receives a message with the same **<SEQ>** as the last received message, then it takes no action, just repeats the last sent message.

<CMD>   **Command code**
length: 1 byte
value: 20H - FFH
The FP enters the same **<CMD>** in the response message. If the printer receives a non-existing code, it responds with a packed message with zero length of the data field and sets the respective status bit.

<DATA>   **Data**
length: 0–218 bytes for Host to Printer.
                0–213 bytes for Printer to Host.
value: 20H–FFH and, additionally, 09H and 0AH.
The data area format and length are command-dependent. If the command has no data, then the length of this field is zero. If there is a syntax error in the data, then the respective status bit is set and a packed message with zero length of the data field is returned.

<04>   **Separator (for Printer-to-Host messages only)**
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>   **Checksum (0000H-FFFFH)**
      length: 4 bytes
      value: 30H - 3FH
      The sum includes from **<01>** (not included) to **<05>** (included). Each digit in these two bytes is sent with an added 30H. For instance, the sum **1AE3H** is composed as **31H, 3AH, 3EH, 33H.**

<03>   **Terminator**
      length: 1 byte
      value: 03H

MESSAGE COMPOSITION, SYNTAX AND USED SYMBOLS

a) The data area is command-dependent.

b) Parameters sent to the printer may be either comma-delimited and/or have a fixed length.

c) If there is a comma between the parameters, it means that it is required.

d) The command syntax must be followed LITERALLY—even a space or tab added between or at the end of the data is considered an error!

When the individual parameters are enclosed in sharp brackets < >, it means that the parameters themselves are required, but the brackets are not included in the message.

When a parameter is enclosed in square brackets [ ] , it means that it is optional. The brackets themselves are not sent with the message.

The characters with ASCII codes below **32 (20H)** have special meanings and their use is clearly indicated in the description as needed. If, for some reason, such a character needs to be dent (for instance, in an ESCAPE command to the display), then it must be preceded by **16 (10H)** with an added offset of **40H**.

__For example:__ When we write for the data area **2500,100,Text**, then, in the data area, we have *2D 32 35 30 30 2C 31 30 30 2C 54 65 78 74,* where each hexadecimal number represents an ASCII value.

LIST OF COMMANDS WITH THEIR INTENDED USE

This section contains the list of the fiscal printer commands, divided into groups depending on their intended use:

INITIALISATION

29H	**(41)**	Store the settings, the logo graphic and the switches in the flash memory.
2BH	**(43)**	Set the HEADER, FOOTER and print options.
3DH	**(61)**	Set the date and time.
42H	**(66)**	Set the allowable invoice number range.
48H	**(72)**	Fiscal registration.
53H	**(83)**	Set the multiplier, decimal digits, currency name and tax rates.
55H	**(85)**	Program the additional payment types.
57H	**(87)**	Set a department name.
5BH	**(91)**	Program the Unique Printer ID, FP ID and country code.
62H	**(98)**	Set the UIC.
65H	**(101)**	Set an operator password.
66H	**(102)**	Set an operator name.
6BH	**(107)**	Specify and record PLUs.
73H	**(115)**	Upload a logo graphic.

SALES

2EH	**(46)**	Print a refund (storno) receipt.
30H	**(48)**	Open a fiscal receipt.
31H	**(49)**	Enter a sale.
33H	**(51)**	Subtotal.
34H	**(52)**	Enter and display a sale.
35H	**(53)**	Calculate a sum (Payment).
36H	**(54)**	Print free text in a fiscal receipt.
38H	**(56)**	Close a fiscal receipt.
39H	**(57)**	Print customer information.
3AH	**(58)**	Enter a sale of a programmed PLU.
3CH	**(60)**	Terminate (cancel) a fiscal receipt.
54H	**(84)**	Print a barcode.
6DH	**(109)**	Print a duplicate receipt.

CLOSING TIME

45H	**(69)**	Daily financial report (with or without reset).
6CH	**(108)**	Extended daily financial report (with PLU printout).
75H	**(117)**	Extended daily financial report (with department printout).
76H	**(118)**	Extended daily financial report (with department and PLU printout).

REPORTS

22H	**(34)**	Report of the registered service agreements.
32H	**(50)**	Report of the changes in the tax rates and decimal digits made during the respective period.
49H	**(73)**	Detailed fiscal memory report (from-to number).
4FH	**(79)**	Summary fiscal memory report (from-to date).
5EH	**(94)**	Detailed fiscal memory report (from-to date).
5FH	**(95)**	Summary fiscal memory report (from-to number).
69H	**(105)**	Operator report.
6FH	**(111)**	PLU report.

INFORMATION TO HOST

22H	**(34)**	Last service agreement information.
25H	**(37)**	Read the NRA data.
3EH	**(62)**	Read the date and time.
40H	**(64)**	Last fiscal record information.
41H	**(65)**	Information on the sums for the day.
44H	**(68)**	Number of free records in the fiscal memory.
4AH	**(74)**	Obtain the status bytes.
4CH	**(76)**	Fiscal transaction status.
56H	**(86)**	Last fiscal memory record date.
58H	**(88)**	Information on the accumulated sums in a department.
5AH	**(90)**	Obtain diagnostic information.
61H	**(97)**	Obtain the tax rates.

63H	**(99)**	Obtain the UIC.
67H	**(103)**	Current receipt information.
6EH	**(110)**	Obtain information on sums by payment types.
70H	**(112)**	Obtain operator information.
71H	**(113)**	Obtain the last printed document number.
72H	**(114)**	Obtain information on a fiscal record or set period.
74H	**(116)**	Read a fiscal memory block.

PRINTER COMMANDS

2CH	**(44)**	Paper feed.
2DH	**(45)**	Paper cut.

DISPLAY

21H	**(33)**	Clear the display.
23H	**(35)**	Show text (lower line).
2FH	**(47)**	Show text (upper line).
3FH	**(63)**	Show date and time.
64H	**(100)**	Display—full control.

OTHER

20H	**(32)**	Extended information on the last error.
26H	**(38)**	Open a service receipt.
27H	**(39)**	Close a service receipt.
2AH	**(42)**	Print free text in a service receipt.
46H	**(70)**	Service money deposit and withdrawal.
47H	**(71)**	Print diagnostic information.
50H	**(80)**	Beep.
59H	**(89)**	Program the production test area.
5AH	**(92)**	Print a divider line.
6AH	**(106)**	Open the drawer.
67H	**(119)**	EJ maintenance—read, print and information.
7AH	**(122)**	Open a rotated service receipt.
7BH	**(123)**	Print information on a rotated service receipt.
7CH	**(124)**	Close a rotated service receipt.

SERVICE COMMAND

79H	**(121)**	Read a firmware block.
80H	**(128)**	Service software RAM reset.
85H	**(133)**	Temporary disable printing for testing purposes.
86H	**(134)**	Service EJ maintenance.
87H	**(135)**	GPRS modem test.
90H	**(144)**	Initialise and read data from the tax terminal.

DETAILED COMMAND DESCRIPTIONS

__Note:__ All examples assume operation of a fiscal printer configured for Bulgaria. Country-specific clarifications are provided as appropriate.

20h (32)   EXTENDED INFORMATION ON THE LAST ERROR

Data area:	**[<Clear>]**
Response:	**<Command>,<ErrCode>,<DateTime>,<ErrText>**

The command allows to obtain information on the last command completed with an error. This information is saved for successfully completed commands and also after the printer is powered off. It is cleared only on RAM reset and on execution of the command with a "**CLEAR**" text input. An error code list is provided at the end of the documentation. The command returns a result for any input.

Clear	Fixed text contents: "**CLEAR**".
ErrCode	Number: error code.
DateTime	Error date and time in the **DD-MM-YY hh:mm:ss** format.
ErrText	Text description of the last error.

21h (33)   CLEAR THE DISPLAY

Data area:	No data
Response:	No data

A command to clear the display is sent. If there is an open fiscal receipt and **Sw4** is OFF, only the lower line is cleared.

22h (34)   SERVICE AGREEMENT INFORMATION AND REPORT

Data area:	*[<"P">]*
Response:	*<Left>,<RegDtTm>,<EIK>,<EndDate>*
	or
	"**F**"

Date	New service agreement expiration date in the **"DD-MM-YY"** format.
Left	Integer: number of remaining service agreement registration fields.
RegDtTm	Service agreement date and time: **"DD-MM-YYYY hh:mm:ss"**.
EndDate	Last service agreement expiration date in the **"DD-MM-YYYY"** format.
UIC	9 or 13 digits: service provider's UIC.

The command returns or prints information on the service agreements. The expiration date of the current service agreement is printed at the end of each daily report with reset. Returns data on the expiration date of the last registered agreement (or "**F**" if no agreement is registered). On input "**P**", a report of all registered agreements based on the data from the fiscal memory is printed.

23h (35)   SHOW TEXT ON THE LOWER LINE OF THE DISPLAY

Data area:	*<Text>*
Response:	No data
Text	Text, up to 20 characters, sent directly to the display. Before the text, a lower line positioning and clearing command is sent.

24H (36)   LAN SETTINGS

Data area:	*[<IPAddr>,<SubnetMask>,<TCPPort>,<Gateway>[,*<DHCP>][,<MACAddr>]]*
Response:	*[<IPAddr>,<SubnetMask>,<TCPPort>,<Gateway>,<DHCP>,<MACAddr>]*
IPAddr	4 numbers, between 0 and 255, separated by a dot, representing the IP address of the device.
SubnetMask	4 numbers, between 0 and 255, separated by a dot, representing the Subnet mask of the device.
TCPPort	Number, between 1 and 65535, representing the IP port of the device.
DefGateway	4 numbers, between 0 and 255, separated by a dot, representing the Default Gateway address of the device.

DHCP　　　　　One character: "0" or "1". Enables or disables DHCP (Receiving automatic LAN settings from the server).

MACAddr　　　Up to 12 hexadecimal characters representing the MAC address of the device. Works only if the service jumper is present!!!

If there is no data area, the command returns the current settings.

25h (37)　　READ NRA DATA

Data area:	**<Type>[,<Closure>]**
Response:	**P,<Data> or F**

Type　　　　Type of requested information:
- **'1'**　　**DT,Closure,FiscRec,LastFiscal,LastDoc,Journal**
- **'2'**　　**S1,S2,S3,S4,S5,S6,S7,S8,Total,GTotal**
- **'3'**　　**DiscountN,DiscountS,MarkUpN,MarkUpS,VoidN,VoidS,CancelN,CancelS**
- **'4'**　　**CashInN,CashInS,CashOutN,CashOutS,CashSum**
- **'5'**　　**CashPaid,CredPaid,CardPaid,CheckPaid,Payd1,Paid2,Paid3,Paid4**
- **'6'**　　**DT**
- **'7'**　　**DT**
- **'8'**　　**P<PLU>,<PluTotal>,<PluName>**

DT	String. Date and time in the "**DD-MM-YYYY hh:mm:ss**" format.
Closure	Integer. Next daily report number.
FiscRec	Integer. Number of fiscal receipts (customers) for the day.
LastFiscal	Integer. Global number of the last issued fiscal receipt.
LastDoc	Integer. Global number of the last issued document.
Journal	Integer. Current journal number.
Sx	Decimal number. Sales for a tax group, for the day.
Total	Decimal number. Total sales for the day.
GTotal	Decimal number. Total lifetime sales.
DiscountN	Integer. Number of discounts for the day.
DiscountS	Decimal number. Total amount of discounts for the day.
MarkUpN	Integer. Number of mark-ups for the day.
MarkUpS	Decimal number. Total amount of mark-ups for the day.
VoidN	Integer. Number of adjustments for the day.
VoidS	Decimal number. Total amount of adjustments for the day.
CancelN	Integer. Number of cancelled receipts for the day.
CancelS	Decimal number. Total amount of cancelled receipts for the day.
CashInN	Integer. Number of service deposit operations for the day.
CashInS	Decimal number. Total amount of service deposits for the day.
CashOutN	Integer. Number of service withdrawal operations for the day.
CashOutS	Decimal number. Total amount of service withdrawals for the day.
CashSum	Decimal number. Available cash.
CashPaid	Decimal number. Paid in cash.
CredPaid	Decimal number. Paid by credit card.
CardPaid	Decimal number. Paid by debit card.
CheckPaid	Decimal number. Paid by check.
Paid1	Decimal number. Paid by programmed payment type 1.
Paid2	Decimal number. Paid by programmed payment type 2.
Paid3	Decimal number. Paid by programmed payment type 3.
Paid4	Decimal number. Paid by programmed payment type 4.
PLU	PLU code. 9 digits.
PluTotal	Accumulated sales sum for the PLU. Decimal number.
PluName	PLU name. Up to 36 characters.

Subcommand '**6**' expects a daily report number and returns the daily report date and time. Returns '**F**', if the record has an invalid checksum. Returns '**E**', if no such record exists.

Subcommand '**7**' returns the date of fiscal registration or '**F**,' if the printer is not placed into operation.

Subcommand '**8**' returns PLU sales data by PLU codes in ascending order. The command is first sent once using command string "**8,F**" and then, the required number of times using command string "**8,N**" until the printer returns the '**F**' response (no data) or we have read the required number of PLUs. The PLU name is always returned encoded in codepage 1251.

This command is only used for compatibility with fiscal printers having an external terminal capable of reading these data. It is not really necessary, because the information can be obtained by other means as well. Data

identical to the ones received by this command are sent internally and automatically to the tax terminal to be transmitted to the NRA as needed.

26h (38)   OPEN A SERVICE RECEIPT

Data area:	No data
Response:	*Allreceipt*

Allreceipt   The number of all issued receipts (fiscal and service) since the last closing time until now (4 bytes).

The FP carries out the following actions:
- Prints a HEADER.
- Prints the seller's UIC.
- Returns a response containing *Allreceipt.*

The command can not be executed, if:
- The fiscal memory is not formatted.
- There is an open fiscal receipt.
- A service receipt has already been opened.
- The clock is not set.

27h (39)   CLOSE A SERVICE RECEIPT

Data area:	No data
Response:	*Allreceipt*

Allreceipt   The number of all issued receipts (fiscal and service) since the last closing time until now (4 bytes).

The FP carries out the following actions:
- Prints a FOOTER.
- Prints the document sequential number, date and time.
- Prints **"SERVICE RECEIPT"** in wide letters.
- Returns a response containing *Allreceipt*.

If S1.1 is raised, the command is not executed, because there is no open service receipt at this time.

29H (41)   STORE THE SETTINGS AND THE SWITCHES IN THE FLASH MEMORY

Data field:	*[<Switches>]*
Response:	*<ErrCode>*

Switches   8 or 16 bytes with values of '**0**' or '**1**': the configuration "switches."

ErrCode   "P" - successful recording; "F" - unsuccessful recording of the settings.

The printer has no hardware switches and uses an area in the flash memory for this purpose. They are set using this command. Additionally, the command stores the logo graphic, barcode length, print density and open-drawer pulse length in the flash memory. After a RAM reset, their values are restored for the flash memory. If only 8 bytes are submitted, the upper 8 remain unchanged.

If the command has no data, the old values of the "switches" are kept and the remaining data are stored.

The command stores the following data in the flash memory:
- Header and footer (from command **43**).
- The text of the additional payment types (from command **85**).
- The logo graphic (from command **115**).
- The print options (from command **43**).
- The configuration switches.

After a RAM reset, their values are restored for the flash memory.

2Ah (42)   PRINT FREE TEXT IN A SERVICE RECEIPT

Data area:	*[<Tab><Font>[<Flags>]]<Text>*
Response:	No data

Text   Free text to print. The '#' character is printed at the start and the end of the line. The text may be with any length, but only the characters fitting on the line are used (without raising a truncation error).

–

The command allows optional font and line print attributes to be set:

Font	Integer between 0 and 3:	
	0	32 dots (4 mm) height, higher letters
	1	32 dots (4 mm) height, normal letters
	2	24 dots (3 mm) height
	3	16 dots (2 mm) height
Flags	Between one and 3 letters: '**B**', '**H**' or '**I**'. Each may appear only once. Setting, respectively:	
	B	Bold (strong)
	H	High (double height)
	I	Italic (oblique)

2Bh (43)   SET THE HEADER, FOOTER AND PRINT OPTIONS

Data area:	*<Item><Text>*
Response:	Depends on the data area

The **HEADER** contains 6 lines of text printed at the top of each fiscal or service receipt. The normal operation of the printer requires at least 2 Header lines to be set. The UIC (set by command **98**) is always printed on the third line, therefore, the HEADER lines after line two are automatically moved down a line.

The **FOOTER** contains 2 lines of text printed at the bottom of each receipt.

The **HEADER** and **FOOTER** are centred automatically.

This command needs to be executed up to 8 times to set all **HEADER** and **FOOTER** lines.

Item   One character with the following meaning:

'**0**' to '**7**' is the number of the line being set. The **HEADER** lines have numbers between 0 and 5, the **FOOTER** lines—6 and 7.

'**A**'   Automatic invoice-like sales formatting (4 separate lines).

'**B**'   Sets the barcode height in pixels (0.125 mm). The possible values are between 24 (3 mm) and 240 (30 mm). The barcode is printed using command **84 (54H)**.

'**C**'   Enable/disable automatic paper cut after each document. After the printer is powered on, the printer behaviour is controlled by switch **Sw8**.

'**D**'   Sets the print density. Possible values:
   '**1**':   Very light
   '**2**':   Light
   '**3**':   Normal
   '**4**':   Dense
   '**5**':   Very dense

'**E**'   Enable/disable printing the total amount in **EUR** after the first payment command (**53**) in a fiscal receipt. Printing is disabled by default. Optionally, the command also sets the valid **EUR/BGN** exchange rate. Data syntax:
   <Enable>[,Rate]
   Enable   Print enable/disable flag. One byte: '**0**' or '**1**'.
   Rate   Exchange rate. Floating-point number with up to 8 significant and 5 decimal digits. If it is omitted, the old value is kept. If it is **0.00000**, no value in euros is printed, even if ***Enable*** is set.

'**F**'   Set the printer font. Possible values:
   0   32 dots (4 mm) height, higher letters
   1   32 dots (4 mm) height, normal letters
   2   24 dots (3 mm) height

'**L**'   Enable/disable printing the logo graphic right before the HEADER. The logo is set using command **115**. The ***Text*** data are in the *<Enable>,<H>* format. *H* is the logo height in pixels, ***Enable*** is one byte with a value of '**1**' (enabled) or '**0**' (disabled).

'**N**'   Enable/disable printing the department name at the top of each fiscal receipt.

'**Q**'   Enable/disable suppressed printing in a fiscal or service receipt. The data are in the *Q0* or *Q1,<Lines>,<Seconds>* format.
   Q0 disables accumulation of unprinted lines in the receipt.
   Q1 enables accumulation of unprinted lines in the receipt. Printing starts when any of the following conditions is true:
      - Accumulation of the number of unprinted lines set in ***Lines***. ***Lines*** can be between 4 and 1000 or 0. If the value is 0, printing starts when the print buffer is full.
      - The number of ***Seconds*** has passed without any new print line added. ***Seconds*** can be between 2 and 120 or 0. If the value is 0, there is no time limit.
      - The receipt is closed.
      - The printer is powered off and then back on.
      - Command 75 is executed.

'**R**'   Sets the additional letter spacing in pixels (0.125 mm) in a 90-degree rotated service receipt. The possible values are between 0 and 4.

'**SIM**'   Selects the SIM card to be used by the GPRS modem. The value can be either 0 or 1.

> **'T'**   Enable/disable printing accumulated VAT for the receipt in a normal (not extended) fiscal receipt.
>
> **'X'**   Enable/disable automatic generation of an open-drawer pulse for commands **53 (35H)** and **70 (46H)**.
>
> **'W'**   Sets the time to trigger the warning for unsent data on payment documents and not updated data on the level measuring system. Printed as a service receipt (immediately after closing a fiscal receipt), which is not stored in the electronic journal.
>
> **'c'**   Disable/enable the *FEED* button functionality (**'1'**: disabled, **'0'**: enabled). After the printer is powered on, the button functionality is always enabled.
>
> **'d'**   Disable/enable returning optional text in the command response when an error occurs (**'0'**: disabled, **'1'**: enabled).
>
> **'P'**   Enable / disable automatic roll-up of paper in a container after each document. After turning on the printer, the printer does not pick up the paper in a container. (**Printers SK1-21F and SK1-31F**)
>
> **'O'**   Set time to automatically retract paper in a container after each printed and waiting to takeout document. (**Printers SK1-21F and SK1-31F**)
>
> **'I'**   Allows reading the values previously set using command **43**. Following the letter **'I'**, there is exactly one other character matching one of the above.

Text   Text, up to **48** characters, where:

If *<Item>* is a digit between **'0'** and **'7'**: the text on the respective line.

If *<Item>* = **'A'**: a single **'0'** or **'1'** character, where **'0'** disables and **'1'** enables "invoice" type formatting. If enabled, 4 lines are printed for each sale: name, unit price, quantity and price with tax group.

If *<Item>* = **'B'**: a number setting the barcode height in pixels.

If *<Item>* = **'C'**: a single **'0'** or **'1'** character, where **'0'** disables and **'1'** enables automatic receipt cutting.

If **<Item>** = **'D'**: the print density (between 1 and 5).

If *<Item>* = **'E'**: returns *Enable,Rate*, where *Enable* is the disable/enable flag and *Rate* is the currently programmed exchange rate.

If *<Item>* = **'F'**: returns the current printer font.

If *<Item>* = **'L'**: returns *Enable,H*, where *H* is the height of the logo graphic and *Enable* is the disable/enable flag.

If *<Item>* = **'N'**: a single **'0'** or **'1'** character, where **'0'** disables and **'1'** enables printing the department name at the top of each fiscal receipt.

If *<Item>* = **'Q'**: returns *Enable,Lines,Seconds*, where *Enable* controls whether printing is suppressed and *Lines* and *Seconds* are the limit values to start printing, in number of lines and seconds.

If *<Item>* = **'R'**: returns the additional character spacing when printing a rotated service receipt, in pixels.

If *<Item>* = **'SIM'**: a single **'0'** or **'1'** character indicating the SIM holder to be used (**SIM0** or **SIM1**)—if **SIM1** is populated, obviously.

If *<Item>* = **'T'**: a single **'0'** or **'1'** character, where **'0'** disables and **'1'** enables printing the accumulated VAT on a normal (not extended) fiscal receipt.

If *<Item>* = **'X'**: a single **'0'** or **'1'** character, where **'1'** disables and **'0'** enables automatic drawer opening for commands **53 (35H)** and **70 (46H)**.

If *<Item>* = **'W'**: two parameters—*<WarnTimeRec>,<WarnTimeGInfo>*. Both times are in minutes, between **10** and **1440** or **0**. If it is zero, there is no warning.

If *<Item>* = **'c'**: a single **'0'** or **'1'** character, where **'1'** disables and **'0'** enables the *FEED* button functionality.

If *<Item>* = **'d'**: a single **'0'** or **'1'** character, where **'0'** disables and **'1'** enables returning optional text in the command response when an error occurs. For example: "command response@error cause".

If '*<Item>* =' **P** '- a '**0**' or '**1**' symbol with '**0**' prohibiting and '**1**' permitting automatic paper retention, one ',' and '0' or '1' to indicate whether there is paper in the presenter (' 1'- has paper). (Answer example: "0.1" - automatic paper picking disabled, and paper in the presenter.) (SK1-21F and SK1-31F printers)

If '*<Item>* =' **O** '- Timing threshold for triggering of automatic retrieval of printed and waiting to take document, possible values: 0 - automatic retraction disabled and 5 - 600 seconds waiting. (SK1-21F and SK1-31F printers)

2Ch (44)   PAPER FEED.

Data area: *Lines| <GetP>*
Response: No data

Lines   The number of lines to feed the paper. Must be a positive number, at least 99 (1 or 2 bytes). If the parameter is missing, the default 1 line is used.

GetP   One character with value "P". Retracts a printed and waiting dokument in the inner container (ONLY for models SK1-21F and SK1-31F). Possible answers "P" and "F".

2Dh (45)   PAPER CUT.

Data area:	No data
Response:	No data

Causes paper to be cut. Please, bear in mind that the program needs to ensure the paper is fed by at least two lines—otherwise, the bottom of the receipt may be cut. If the printer is in the "automatic cut" mode, it will position the paper correctly before the cut and the command is unnecessary.

If the cutting unit is blocked, the paper (if any) needs to be removed from the cutter and the printer needs to powered off and then back on—the cutter will return to its home position.

2E (46)   ISSUE A REFUND (STORNO) RECEIPT

Data area: *<OpNum>,<Password>,<TillNum>[,<Invoice><InvNum>][,<UNP>]*

,<StType><DocNo>[,<StUNP>,<StDT>,<StFMIN>][#<StornoReason>]

Response: ***Allreceipt, StornoReceipt***

OpCode	Operator ID (between 1 and 16)
OpPwd	Operator password (between 4 and 8 digits)
TillNmb	Cash register location number (integer between 1 and 99999)
UNP	Unique Sale ID (format: FD Serial Number-four digits or Latin letters-sequential number of the sale (seven digits with leading zeroes), for example: **DT000600-OP01-0001000**). When opening a sales receipt for the first time, the UNP (Unique Sale ID) must be set at least once, if the parameter is then omitted, the FU will increment the unit by the sale number automatically.
InvNum	Number of invoice being reversed.
Invoice	One **"I"** character. When present, an extended reversal customer receipt (credit note) will be printed. After the HEADER, the invoice number will be printed automatically and then, after the first payment command—a printout of the sums by tax group. After the payment, customer information must be printed using command **57 (39h)**.
StType	Reversal reason:

E: operator error

R: return/claim

T: tax base reduction

DocNo	(Global) number of the document being reversed.
StUNP	Unique Sale ID of the document being reversed. The whole Unique Sale ID must be set.
StDT	Date and time of the reversed document. Format "DDMMYYhhmmss".
StFMIN	Fiscal Memory ID of the FD which has issued the receipt being reversed.
StornoReason	Reversal reason (up to 30 characters).
Allreceipt	The number of all issued receipts (fiscal and service) since the last closing time until now. (4 bytes).
StornoReceipt	The number of all fiscal receipts since the last closing time until now. (4 bytes).

If the last argument is ***DocNo*** and there are no other arguments, the FD searches for the issued receipt in its journal. If it is not found, the command fails. If it is found, the data are filled in automatically and a reversal receipt is issued with all the data from the original fiscal receipt.

If ***StUNP, StDT, StFMIN*** are submitted, the command will be accepted only as an opening of a reversal receipt which needs to have sales and payments entered and then needs to be closed (similar to command 48).

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

Data area:	*Text*
Response:	No data

Text   Text, up to 20 characters, sent directly to the display. Before the text, an upper line positioning and clearing command is sent. The command is rejected, if a fiscal receipt is open and **Sw1** is **OFF**.

30h (48)   OPEN A FISCAL (CUSTOMER) RECEIPT

Data area:	*None or <OpNum>,<Password>,<TillNum>[,<Invoice>][,<UNP>] or [*]*
Response:	*UNPshort or Allreceipt, FiscReceipt or FdocGlob,UNPfull[,UNPfullST]*

OpCode	Operator ID (between 1 and 16)
OpPwd	Operator password (between 4 and 8 digits)
TillNmb	Cash register location number (integer between 1 and 99999)
UNP	Unique Sale ID (format: FD Serial Number-four digits or Latin letters-sequential number of the sale (seven digits with leading zeroes), for example: **DT000600-OP01-0001000**). When opening a sales receipt for the first time, the UNP (Unique Sale ID) must be set at least once, if the parameter is then omitted, the FU will increment the unit by the sale number automatically.
Invoice	One **"I"** character. When present, an extended customer receipt (invoice) will be printed. After the HEADER, the invoice number will be printed automatically and then, after the first payment command—a printout of the sums by tax group. After the payment, customer information must be printed using command **57 (39h)**.
Allreceipt	The number of all issued receipts (fiscal and service) since the last closing time until now. (4 bytes)
FiscReceipt	The number of all fiscal receipts since the last closing time until now. (4 bytes).
UNPshort	Unique Sale ID in short format of the last issued fiscal document.
FdocGlob	Global number of the last issued fiscal document.
UNPfull	Unique Sale ID in full format of the last issued fiscal document.
UNPfullST	Unique Sale ID in full format of the last issued Storno document, if last issued is fiscal document this field would be missing.

If the command is submitted without arguments, a sequential number of the sale from the Unique Sale ID of the last issued fiscal receipt is returned. (example: **0001000**).

If the command is submitted with the argument "*" returns the global number of the last issued fiscal document and the Unique Sale ID (in the full format, example: DT000600-OP01-0001000) of the last issued fiscal receipt. If the last issued document was a Storno document, there would be another field of the Unique Sale ID on the document that was refunded. (example: 398554, DT000601-0001-0398101, DT000601-0001-0203305)

The FP carries out the following actions:
- Prints a **HEADER**.
- Prints the **UIC**.
- Prints the operator ID and name, and cash register location number.
- Returns *AllReceipt* and *FiscReceipt*.

The command will not be executed successfully, if:
- There is an open fiscal or service receipt.
- The fiscal memory is full.
- The fiscal memory is damaged.
- Operator ID (code), password or cash register location number is missing.
- HEADER contains less than 2 lines.
- UIC is not set.
- The operator password is wrong.
- The clock is not set.
- The EJ is full or inoperable.
- The tax terminal is inoperable or the information in it does not match the information in the fiscal memory

After three wrong operator passwords are entered, the printer is locked and needs to be powered off and then back on to continue to operate.

31h (49)   ENTER A PRODUCT (SALE)

Data area:	*[<L1>][<Lf><L2>]<Tab><TaxCd><[Sign]Price>[*<Qwan>[#UN]][,Perc|;Abs]* or *[<L1>][<Lf><L2>]<Tab><Dept><Tab><[Sign]Price>[*<Qwan>[#UN]]* *[,Perc|;Abs]*

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Response:	No data

L1	Text, up to 42 bytes, containing a line describing the sale
Lf	One byte containing **0Ah**.
L2	Text, up to 42 bytes, containing a second line describing the sale
Tab	One byte containing **09h**.
TaxCd	One byte containing the letter indicating the tax type ('**A**', '**B**', '**C**', **...**). There is a restriction dependant on the **Enabled_Taxes** parameter which is set when the tax rates are set using command **83**.
Dept	Department number. Integer between 1 and 1200 inclusive. The sale is assigned to the tax group associated with the department when it is programmed.
Sign	One byte with a value of '-'.
Price	This is the unit price, with up to 8 significant digits.
Qwan	Optional parameter indicating the product quantity. By default, it is **1.000**. Length, up to 8 significant digits (no more than 3 after the decimal point). The result of the multiplication ***Price*Qwan*** is rounded by the printer to the number of decimal digits set and also must not exceed 8 significant digits.
UN	Name of the unit of measurement. Optional text for the unit of measurement for the quantity, up to 8 characters, for instance, "**kg**".
Perc	This is an optional parameter indicating the value of the mark-up or discount (depending on the sign), as a percentage of the current sale. The allowable values are between -99.00% and 99.00%. Up to 2 decimal digits are accepted.
Abs	This is an optional parameter indicating the value of the mark-up or discount (depending on the sign), as an amount. A discount amount exceeding the value of the sale is not allowed.

Only one of the ***Perc*** or ***Abs arguments is allowed.***

The FP carries out the following actions:
- If the sale is by department and it is enabled using command **43**, subcommand '**N**', the department name is printed.
- The text describing the sale is printed together with the price and tax group code. If a quantity is set, the information for the quantity is also printed.
- The product price is added to the accumulated sums in the RAM registers. In the event of an overflow, the respective bits of the status field are set.
- If there is a discount or mark-up, it is printed on a separate line and added to the printer registers provided for this purpose. The values for the whole day are printed on the daily financial report.
- If a department is indicated, the accumulated value is added to it. Mark-ups and discounts, if any, are reported.

The command will not be executed successfully, if:
- No fiscal receipt is open.
- The maximum allowed number of sales for a single receipt (512) has been reached.
- Command **(35h)** is executed successfully.
- The sum under any tax group becomes negative.
- The sum of any mark-ups or discounts within the receipt becomes negative.
- The EJ is full.
- The printer has detected a non-registered SIM card in the modem.

32h (50) TAX RATES SET DURING THE RESPECTIVE PERIOD

Data area:	*[<Start>,<End>]*

Response:	= **F**: if no tax rates for the period are found or there is an error.

> = **PAA,BB,CC,DD,EE,FF,GG,HH,DDMMYY:** if tax rates are found, where '**P**' means '**PASS**', followed by the last active rates for the specified period and their respective setting dates.

If there are any unused groups (disabled under ***Enabled_rates***), then '**DT**' (Disabled Tax) is returned for them instead of a percentage rate.

Start	Period start date: DDMMYY (6 bytes).
End	Period end date: DDMMYY (6 bytes).

The command prints a report of the changes to the decimal digits and tax rates for the specified period. If no start and end dates are specified, the period from the fiscal registration until now is used.

33h (51) SUBTOTAL

Data area:	*<Print><Display>[,Perc|;Abs]*
Response:	***SubTotal,TaxA,TaxB,TaxC,TaxD,TaxE,TaxF,TaxG,TaxH***

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Print	One byte: if it is '**1**', the subtotal will be printed.
Display	One byte: if it is '**1**', the subtotal will be displayed.
Perc	Optional parameter indicating the percentage value of the discount or mark-up on the sum accumulated until now.
Abs	This is an optional parameter indicating the value of the mark-up or discount (depending on the sign), as an amount (up to 8 significant digits). A discount amount exceeding the value of the sale is not allowed.

Only one of the ***Perc*** or ***Abs arguments is allowed.***

SubTotal	The sum until now for the current fiscal receipt (up to 10 bytes)
TaxA	The sum under tax group **A** (up to 10 bytes)
TaxB	The sum under tax group **B** (up to 10 bytes)
TaxC	The sum under tax group **C** (up to 10 bytes)
TaxD	The sum under tax group **D** (up to 10 bytes)
TaxE	The sum under tax group **E** (up to 10 bytes)
TaxF	The sum under tax group **F** (up to 10 bytes)
TaxG	The sum under tax group **G** (up to 10 bytes)
TaxH	The sum under tax group **H** (up to 10 bytes)

The sum of all sales entered in the fiscal receipt until now is calculated. Optionally, the sum may be printed and/or displayed. The calculated sum and the sums accumulated until now for each tax group are sent to the PC. If a mark-up or discount is specified, it is printed on a separate line and the accumulated sums under the tax groups are adjusted accordingly.

34h (52)   ENTER AND DISPLAY

Data area:	*[Line]]<Tab><TaxCd><[Sign]Price>[*Qwan[#UN]][,Perc|;Abs]*
	or
	[Line]]<Tab><Dept><Tab><[Sign]Price>[*Qwan[#UN]][,Perc\;Abs]
Response:	No data

Line	String, up to 20 bytes, containing a line of text describing the sale.
Tab	One byte containing **09h**
TaxCd	One byte containing the letter indicating the tax type ('**A**', '**B**', '**C**', **...**). There is a restriction dependant on the ***Enabled_taxes*** parameter which is set when the currency is set using command **83**.
Dept	Department number. Integer between 1 and 1200 inclusive. The sale is assigned to the tax group associated with the department when it is programmed.
Sign	One byte with a value of '-'.
Price	This is the price, with up to 8 significant digits.
Qwan	Optional parameter indicating the product quantity. By default, it is **1.000**. Length, up to 8 significant digits.
UN	Name of the unit of measurement. Optional text for the unit of measurement for the quantity, up to 8 characters, for instance, "**kg**".
Perc	This is an optional parameter indicating the value of the mark-up or discount (depending on the sign), as a percentage of the current sale. The allowable values are between -99.00% and 99.00%.
Abs	This is an optional parameter indicating the value of the mark-up or discount (depending on the sign), as an amount. A discount amount exceeding the value of the sale is not allowed.

Only one of the ***Perc*** or ***Abs arguments is allowed.***

The FP will carry out the following actions:
- If the sale is by department and it is enabled using command **43**, subcommand '**N**', the department name is printed.
- The text describing the sale is printed together with the price and tax group code.
- The product price is added to the accumulated sums in the RAM registers. In the event of an overflow, the respective bits of the status bytes are set.
- If there is a discount or mark-up, it is printed on a separate line and added to the printer registers provided for this purpose. The values for the whole day are printed on the daily financial report.
- The product price is displayed on the upper line and the product description is displayed on the lower line of the display.
- If a department is indicated, the accumulated value is added to it. Mark-ups and discounts, if any, are reported.

The command will not be executed successfully, if:
- No fiscal receipt is open.
- The maximum allowed number of sales for a single receipt has been reached.

- Command **"Total"** is executed successfully.
- The sum under any tax group becomes negative.
- The sum of any mark-ups or discounts within the receipt becomes negative.
- The EJ is full.

35h (53)   TOTAL CALCULATION

Data area:	*[<Line1>][<Lf><Line2>]<Tab>[[<PaidMode>]<[Sign]Amount>]*
Response:	*<PaidCode><Amount>*

Line1	Text, up to 36 bytes, containing the first line
Lf	One byte containing **0Ah**
Line2	Text, up to 36 bytes, containing the second line
Tab	One byte containing **09h**
PaidMode	Optional code indicating the payment method. It can have the following values:

- **'P'** - Cash payment (default);
- **'N'** - Credit payment;
- **'C'** - Check payment;
- **'D'** - Debit card payment
- **'I'** - Programmable payment type 1
- **'J'** - Programmable payment type 2
- **'K'** - Programmable payment type 3
- **'L'** - Programmable payment type 4
- **'i'** - Programmable payment type 1
- **'j'** - Programmable payment type 2
- **'k'** - Programmable payment type 3
- **'l'** - Programmable payment type 4
- **'m'** - Coupons
- **'n'** - External coupons
- **'o'** - Packing
- **'p'** - Internal service
- **'q'** - Damages
- **'r'** - Bank transfers
- **'s'** - Check

Depending on the code, the sums are accumulated in various registers and can be obtained in the daily report.

Sign	One byte with a value of '+' indicating the sign of the ***Amount*** (payable).
Amount	The amount payable (up to 10 significant digits).
PaidCode	One byte: command result.

- **'F'**   Error.
- **'E'**   The calculated subtotal is negative. No payment is made and ***Amount*** will contain the negative subtotal.
- **'D'**   If the amount paid is less than the amount on the receipt. The remaining amount to be paid is returned to Amount.
- **'R'**   If the amount paid is more than the sum on the receipt. A **"CHANGE"** message will be printed and the change is returned to ***Amount***.
- **'I'**   The sum under any tax group is negative, causing an error. The current subtotal is returned to ***Amount***.

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

This command will calculate the sums on the fiscal receipt, print the sum with a special font and display it. Additional text can be printed. If the command is successful, an open-drawer pulse is sent, if enabled using subcommand 'X' of command **43**. If there are no more data after the ***<Tab>*** character, the printer automatically pays the entire available cash.
The command will not be executed successfully, if:

- No fiscal receipt is open.
- The accumulated sum is negative.
- The accumulated sum under any tax group is negative.

After the command is successfully executed, the fiscal printer will not execute commands **49** and **51** within the open receipt, however, it still can execute command **53**.
<u>*Note:*</u> Error codes **'E'** and **'I'** will never appear in the Bulgarian version of the printer, because commands **49** and **52** (Enter a sale) will not allow negative sums.

36h (54)   PRINT FREE FISCAL TEXT

Data area:	<Tab><Font>[<Flags>]]<*Text*>
Response:	No data

Text   Free text to print. The '#' character is printed at the start and the end of the line. The text may be with any length, but only the characters fitting on the line are used (without raising a truncation error).

The command allows optional font and line print attributes to be set:

Font   Integer between 0 and 3:
- **0**   32 dots (4 mm) height, higher letters
- **1**   32 dots (4 mm) height, normal letters
- **2**   24 dots (3 mm) height
- **3**   16 dots (2 mm) height

Flags   Between one and 3 letters: '**B**', '**H**' or '**I**'. Each may appear only once. Setting, respectively:
- **B**   Bold (strong)
- **H**   High (double height)
- **I**   Italic (oblique)

A fiscal receipt needs to be open. Otherwise, the text is not printed and S1.1 is raised.

38h (56)   CLOSING A FISCAL RECEIPT

Data area:	No data
Response:	***Allreceipt, FiscReceipt***

Allreceipt	All receipts issued since the last closing time until now.
FiscReceipt	All fiscal receipts issued since the last closing time until now.

The accumulated sums from the fiscal receipt are added to the daily sums in the RAM registers.

The command will not be executed successfully, if:
- No fiscal receipt is open.
- Command **53(35h)** is not executed successfully.
- The amount paid using command **53** is less than the total on the fiscal receipt.

39h (57)   PRINT CUSTOMER INFORMATION

Data area:	*[#	*	^]<Bulstat>[<Tab><Seller>[<Tab><Receiver>[<Tab><Client>*
	[<Tab><TaxNo>[<Tab><Address>[<Tab><AccPer>]]]]]]
Response:	No data

Bulstat	Customer's UIC. Between 9 and 14 characters. If preceded by the '#' character, the data are treated as a PIN, if '*' - personal number, if '^' - work number.
Tab	Tabulator *(09H)*. Separator between the parameters.
Seller	Seller's name. Up to 26 characters.
Receiver	Recipient's name. Up to 26 characters.
Client	Customer's name. Up to 26 characters.
TaxNo	Customer's VAT number. Between 10 and 14 characters.
Address	Customer's address. Up to two lines of text, separated by *LF (0AH)*, the first line has a maximum length of 28 characters, the second line has a maximum length of 34 characters.
AccPer	*A*ccountable Person

All parameters except the first one are optional. If any parameter needs to be set, all parameters preceding it need to be set as well. If any parameter is empty or not set, a blank space is left for manual entry.
    The command is allowed only in an extended fiscal receipt (invoice) to ensure a uniform receipt layout. It needs to be executed immediately after a full payment of the sum accumulated on the receipt. After that, the receipt is allowed to be closed.

3Ah (58)   ENTER (SALE OF) AN PLU OR FUEL

Data area:	*[D]<[Sign]PLU>[<Tab><Dept><Tab>][*<Qwan>[#UN]][,Perc|;Abs]*
	[D]@<FTT>[<Quantity>][,|;<Discount_MarkUp>]*
Response:	No data

D	One byte with a value of '**D**'. If present, the sale is shown on the customer display. If the length of the PLU name is more than 20, the characters after 20 are truncated.
Sign	One byte with a value of '-'.
PLU	This is the PLU code. Integer between 1 and 999999999 (up to 9 digits).
FTT	***FTT number.***
Tab	One byte: tabulator (ASCII code 9).
Dept	Department number. Integer between 1 and 1200 inclusive. If this parameter is present, then the tab separators need to be there as well.

Qwan	Optional parameter indicating the product quantity. By default, it is **1.000**. Length, up to 8 significant digits (no more than 3 after the decimal point). The result of the multiplication (***Unit price)*Qwan*** is rounded by the printer to the number of decimal digits set and also must not exceed 8 significant digits.
UN	Name of the unit of measurement. Optional text for the unit of measurement for the quantity, up to 8 characters, for instance, "**kg**".
Perc	This is an optional parameter indicating the value of the mark-up or discount (depending on the sign), as a percentage of the current sale. The allowable values are between -99.00% and 99.00%. Up to 2 decimal digits are accepted.
Abs	This is an optional parameter indicating the value of the mark-up or discount (depending on the sign), as an amount. A discount amount exceeding the value of the sale is not allowed.

Only one of the ***Perc*** or ***Abs arguments is allowed.***

The FP carries out the following actions:
- The product name, price and tax group are read from the PLU table.
- If the sale is by department and it is enabled using command **43**, subcommand '**N**', the department name is printed.
- The PLU name, quantity and unit price are printed. The calculated price with the letter indicating the tax group is printed on the second line. The registers for the accumulated sums and PLU quantities are updated. If command **43h** was used to set an invoice-type text formatting, then the product name, unit price, quantity and price are printed on separate lines.
- The product price is added to the accumulated sums in the RAM registers. In the event of an overflow, the respective bits of the status field are set.
- If there is a discount or mark-up, it is printed on a separate line and added to the printer registers provided for this purpose. The values for the whole day are printed on the daily financial report.
- If a department is indicated, the accumulated value is added to it. Mark-ups and discounts, if any, are reported.

The command will not be executed successfully, if:
- No PLU with the specified code is programmed.
- For a printer registered for operation at a gas station and 'C'-VAT group PLU, there is no fuel with this name in any tank.
- No fiscal receipt is open.
- The maximum allowed number of sales for a single receipt (512) has been reached.
- Command **(35h)** is executed successfully.
- The sum under any tax group becomes negative.
- The sum of any mark-ups or discounts within the receipt becomes negative.
- The EJ is full.

3Ch (60)   CANCEL (TERMINATE) A FISCAL RECEIPT

Data area:	No data
Response:	No data

The command is allowed only in an open fiscal receipt and only before running command **53** (Total). Cancels all sums accumulated in the receipt. Prints double-width "=**CANCELLED=**" and the receipt ends with the "**FISCAL RECEIPT**" text.

3Dh (61)   SET THE DATE AND TIME

Data area:	***<DD-MM-YY><space><HH:MM[:SS]>***
Response:	No data

A date before the last fiscal memory record date cannot be set. The device is intended to operate until the year 2099 inclusive. After a memory RESET, the command must be executed to continue normal operation, whereby a RESET record is made in the fiscal memory.
It is not possible to set the date and time before those of the last printed document stored in the EJ. This is to ensure correct searching for documents in the EJ by date and time for printing or downloading over the serial interface as text.

3Eh (62)   READ THE DATE AND TIME

Data area:	No data.
Response:	***<DD-MM-YY><Space><HH:MM:SS>***

3Fh (63)   DISPLAY THE DATE AND TIME

Data area:	No data	
Response:	No data	

The current printer date and time are displayed on the lower line of the display in the following format:

DD-MM-YY HH:MM:SS.

40h (64)   LAST FISCAL RECORD INFORMATION

Data area:	*[[<LongDT>]<Option>]*
Response:	*ErrCode[,N,TaxA,TaxB,TaxC,TaxD,TaxE,TaxF,TaxG,TaxH,Date]*

LongDT	One optional byte with a value of '*'. If present, the time of the daily report is returned as well.
Option	One optional byte with a value of '**0**' or '**1**'. If it is omitted, it is assumed to be '**0**'. '**0**' returns the sales by tax group, '**1**' returns the accumulated taxes.
ErrCode	Error code:
	'P' The command is successful. Data follow.
	'F' The command is unsuccessful.
N	This is the last fiscal record number: 4 bytes.
TaxX	The sums under each tax group '**A**', '**B**', '**C**', **…**: 12 bytes with a sign.
Date	The fiscal record date: 6 bytes (DDMMYY).

The command sends the information from the last record in the fiscal memory to the PC.

41h (65)   INFORMATION ON THE SUMS UNDER TAX GROUPS FOR THE DAY

Data area:	*[Option]*
Response:	*TaxA,TaxB,TaxC,TaxD,TaxE,TaxF,TaxG,TaxH*

Option	Specifies the information to return:
	'0': Total sales.
	'1': Accumulated VAT.
	If the parameter is omitted, it is assumed to be '**0**'.
TaxX	The sums under each tax group '**A**', '**B**', '**C**', **...** : 12 bytes with a sign.

Returns the sums under tax groups since the last closing time until the time the command is received.

42h (66)   SET ALLOWABLE INVOICE NUMBER RANGE

Data area:	*[Start,End]*
Response:	*[Start,End,Current]*

Start	Sets the range start value. Integer up to 10 digits.
End	Sets the range end value. Integer up to 10 digits.
Current	The current invoice counter value. 10-digit integer.

Start must be less or equal to *End*. If the command is successful, the current invoice number becomes *Start*.

If the data area is empty, the printer returns the current range and counter.

The command is allowed, if:
- It has never been executed after the printer was placed into operation.
- The RAM was reset, therefore, the current counter and allowed range information was lost.
- The incremental invoice counter reached a number outside the allowed range. A new range must be set.

44h (68)   NUMBER OF AVAILABLE FIELDS IN THE FISCAL MEMORY

Data area:	No data
Response:	*Free,Total*

Free	The number of available locations for fiscal records. (4 bytes).
Total	The total number of fiscal records in the printer. (4 bytes).

Returns the number of available fields in the fiscal memory provided to store information when a daily financial report with reset (Z-report) is run.

45h (69)   DAILY FINANCIAL REPORT

Data area:	*[<Option>[N]*
Response:	*Closure,FM_Total,TotA,TotB,TotC,TotD,TotE,TotF,TotG,TotH*

Option	Optional parameter controlling the report type being generated:
	'0' Prints a Z-report. The printout ends with the **"FISCAL RECEIPT"** text.

–

'2'	A daily financial report without reset is run (i.e., no information is recorded in the fiscal memory and the registers are not reset). The printout ends with the "**SERVICE RECEIPT**" logo.
N	This character at the end of data disables the clearing of accumulated data by operator when a report with reset is run.
Closure	The fiscal record number: 4 bytes.
FM_Total	The sum of all non-VAT sales: 12 bytes with a sign
TotX	The sums under each tax group 'A', 'B', 'C', … : 12 bytes with a sign.

A daily report without reset can be run also by pressing and holding the **<FEED>** button when the printer is powered on until the second beep.

46h (70)   SERVICE MONEY DEPOSIT AND WITHDRAWAL

Data area:	*[<Amount>]*
Response:	*ExitCode,CashSum,ServIn,ServOut*

Amount	The amount to be registered (up to 10 significant digits). Depending on the sign of the number, it is interpreted as a deposit or withdrawal.

ExitCode	'**P**' The request is executed. If the requested amount is not zero, the printer prints a service receipt to register the transaction.
	'**F**' The request is denied. This happens, if:
	    • The available cash is less than the requested service withdrawal.
	    • There is an open fiscal or service receipt.

CashSum	Available cash. The amount is increased both with this command and with each cash payment.
ServIn	The sum of all "Service Deposit" commands.
ServOut	The sum of all "Service Withdrawal" commands.

Changes the contents of the available cash register. Depending on the sign of the specified amount, it is accumulated in the service deposit or withdrawal register. The information is not stored in the fiscal memory and remains available until closing time. It is printed using command **69 (45h)** and when a daily financial report without reset is run on the printer. If the command is successful, an open-drawer pulse is sent by a parameter, if enabled using subcommand '**X**' of command **43**.

47h (71)   PRINT DIAGNOSTIC INFORMATION

Data area:	No data
Response:	No data

This command prints a service receipt with diagnostic information.

The receipt contains the following:
- The software date and version.
- The firmware checksum.
- The serial port baud rate.
- The positions of the configuration switches and the country name.
- The emergency time in the event of a power failure.
- The number, date and time of the last RAM reset (if any).
- The current printing head temperature.
- The total number and the number of available fields in the fiscal memory.
- The current date and time.

The command will not be executed, if there is an open receipt or no paper. It can be run also by pressing and holding the **<FEED>** button when the printer is powered on until the first beep.

48h (72)   FISCALIZATION

Data area:	*<Serial>*
Response:	*ErrCode*

Serial	The unique device ID. Should be as set by command **91** (**5Bh**).
ErrCode	Error code or **'P'** for successful execution.

Status **5.3** is used to verify if the command was successfully executed. The command is not executed, if:
- The Unique ID is not valid.
- The fiscal printer is already fiscally registered.
- No Unique Device ID is programmed.
- The Unique ID does not match the one specified.
- There is an open receipt.
- There are customer fiscal receipts issued after the last daily financial report with reset.

- The tax rates are not set.
- The UIC contains only zeroes.
- The clock is not set.
- The EJ is not formatted.

The fiscal registration of the device is carried out. After the command is successfully executed, the device can no longer be returned in the fiscally non-registered status.

The UIC is stored in the fiscal memory together with the current date and time. All registers are reset. The printer opens the first fiscal receipt, records the time of fiscal registration on it and closes the receipt. The documents begin to be stored in the EJ.

49h (73)   FULL FISCAL MEMORY REPORT BY BLOCK NUMBER

Data area: *[[<SHA1>][<SkipZ>]<Start>,<End>]*
Response: No data

SHA1 Optional argument: one byte with a value of '#'. If present, for each Z-report, prints also the checksum using the SHA-1 algorithm.
SkipZ Optional argument: one byte with a value of '*'. If present, for each Z-report, prints only the tax rates with non-zero accumulated sums for the day. ***Such report is non-standard and can be used only as an internal reference at the location!***
Start Start fiscal block number. 4 bytes.
End End fiscal block number. 4 bytes.

This command prints a full fiscal memory report from one number to another. Without data input, the entire period of operation is assumed.

Without start and end number, a report for the entire period of operation is printed.

4Ah (74)   OBTAIN THE PRINTER STATUS

Data area: *[Option]*
Response: *<S0><S1><S2><S3><S4><S5>|<NLines>|HdwInfo|InfoReciepts*

Option One byte with the following meanings:
  W   First, waits for the printer to finish printing everything in the print buffer.
  X   Does not wait for the printer, but responds immediately.
  L   Returns the number of lines remaining to be printed.
  P   Returns printer hardware information.
  R   Returns data on the customer documents sent to the NRA server.

Sn Status byte **N**.
Nlines Number of pending lines in the print buffer. A value of **0** means that there are no pending print data.
HdwInfo Returns printer operation statistics since the manufacture date until now. The data are in the following format:
    P<Len>,<Docs>,<Cuts>,<PwOns>,<MdRst>
Len Length of the printed paper in millimetres.
Docs Number of printed documents.
Cuts Number of paper cuts.
PwOns Number of times the printer was powered-on.
MdRst Number of modem restarts. Not currently supported.

InfoReciepts   Returns data on the sent and unsent customer receipts
    <Lastprintdoc>,(Nlastsentdoc, Dtlastsentdoc, Minfromlastsuccesssent),(Nfirstnotsentdoc, Dtfirstnotsentdoc, Minfromfirstnotsuccesssent)
Lastprintdoc   Number of the last printed document.
Nlastsentdoc   Number of the last successfully sent document.
Dtlastsentdoc   Date and time of the last successfully sent document.
Minfromlastsuccesssent   Minutes since the last successfully sent document.
Nfirstnotsentdoc   Number of the first unsent document.
Dtfirstnotsentdoc   Date and time of the first unsent document.
Minfromfirstnotsuccesssent Minutes since the first unsent document.

If there are no data, the dates are 01-01-2000 00:00:00 and the minutes are 0.
If the minutes of ***Minfromfirstnotsuccesssent*** are more than **1440**, the printer is blocked.

4Bh (75)   FORCE SUPPRESSED PRINTING

Data area: *[<Restore>]*

        Response: No data

Resumes receipt printing suppressed as a result of command **43**, subcommand '**Q**'.

     Restore   One byte with the following possible values:
        0   After the end of printing, printing is reenabled—next data will be printed immediately.
        1   After the print buffer is cleared, printing remains suppressed until the end of the receipt.

4Ch (76)   FISCAL TRANSACTION STATUS

        Data area: *[Option]*
        Response: *Open,Items,Amount[,Tender]*

        Option   = '**T**'.   If this parameter is set, the command will return the information on the current status of the bill payable by the customer until now.
        Open   One byte which is '1', if a fiscal or service receipt is open (the exact type is indicated by the status bits), and '0', if no receipt is open.
        Items   The number of sales entered on the current or last fiscal receipt. 4 bytes.
        Amount   The amount on the last fiscal receipt: 9 bytes with a sign.
        Tender   The amount paid on the current or last receipt. 9 bytes with a sign.

    This command allows the PC application to set the status and, if needed, also resume and complete a fiscal transaction, interrupted prematurely in an emergency, such as a power failure.

4Fh (79)   SUMMARY TAX MEMORY REPORT FROM-TO DATE

        Data area: *<Start>[,<End>]*
        Response: No data

        Start   Start date: 6 bytes (DDMMYY)
        End   End date: 6 bytes (DDMMYY)

    The command calculates and prints a summary fiscal memory report.
    If the second parameter is omitted, the command generates a monthly or annual report. The syntax in this case is:
        Start   Month: 4 bytes (MMYY) for a monthly report.
        Start   Year: 2 bytes (YY) for an annual report.

50H (80)   BEEP (TONE)

        Data area: *[<SoundData>]*
        Response: No data

    The command is used to emit a sequence of tones with set frequencies and durations.
    Without data input, a beep with a frequency of 2 kHz and a duration of 300 ms is emitted.
    If the data input is of the following type: *<Hz>,<mSec>*
where *Hz* and *mSec* are integers, then a tone with a frequency of *Hz* Hertz (between 100 and 5000) and a duration of *mSec* milliseconds (between 50 and 2000) is emitted.

    In the other cases, the data are similar to a musical notation and can have any length (not exceeding the protocol limit of 218 bytes). The first invalid character interrupts the command. The allowed subcommands in the data are:
- Note: One Latin capital letter with a value between '**A**' and '**G**'.
  - '**C**'   Do
  - '**D**'   Re
  - '**E**'   Mi
  - '**F**'   Fa
  - '**G**'   Sol
  - '**A**'   La
  - '**B**'   Ti

    If the note is immediately followed by the '#' character, then it is raised by one semitone (*sharp*). If the note is immediately followed by the '**&**' character, then it is lowered by one semitone (*flat*).
- Rest: The space character (ASCII 20h).

    After a note or a rest, there can be one or more bytes specifying the duration. The valid characters are between '0' and '5', having the following meanings:
- '**0**'   Base duration
- '**1**'   Base duration * 2
- '**2**'   Base duration * 4
- '**3**'   Base duration * 8
- '**4**'   Base duration * 16
- '**5**'   Base duration * 32

    If there are multiple sequential durations, they are added together.

- Play on a higher scale: the '+' character.
- Play on a lower scale: the '-' character.
- Set the tempo: The '^' character followed by a single digit. The digit sets the note and rest durations as a percentage of the base duration. Allowed value:

'**1**'	200%
'**2**'	175%
'**3**'	140%
'**4**'	120%
'**5**'	100%
'**6**'	80%
'**7**'	60%
'**8**'	50%
'**9**'	40%

- Return to scale 1 (default). The '@' character. The 'La' tone in this scale is 440 Hz.

The sent sequence is played on the background and the printer can continue executing commands during playback.

51H (81)   OBTAIN THE SUPPLY VOLTAGE AND TEMPERATURE

Data area:	No data
Response:	*<Vh>,<Temp>*

Vh	The supply voltage in volts.
Temp	The printing head temperature in degrees.

53h (83)   SET THE DECIMAL DIGITS, CURRENCY AND TAX RATES

Data area:	*[Multiplier,Decimals,Currency,EnabledT,TaxA,...]*
Response:	*Multiplier,Decimals,Currency_name,EnabledT,TaxA,TaxB,TaxC,TaxD,…*

Multiplier	Multiplier: between 0 and 3, specifying the power of 10 before being multiplied by the input or output number. Currently deactivated and not used.
Decimals	This is one byte with a value between 0 and 2 specifying the decimal point position.
Currency	The currency name. Up to 6 bytes.
EnabledT	8 bytes with possible values of '**0**' or '**1**' specifying whether the respective tax group is disabled ('**0**') or enabled ('**1**').
TaxX	The values of the tax rates.

If nothing is set in the data area, the FP returns the currently valid values.
If any parameter must be set, then the remaining parameters must also be set.
Setting new tax rates is only allowed before the first customer fiscal receipt for the day is issued.
Before fiscal registration, the command data are stored in the RAM only and can be changed any number of times.

54H (84)   PRINT A BARCODE

Data area:	*<Type>[<Align>][<AllowN>],<Data>*
	or
	<Type>[<Align>];<Data>
Response:	No data

Type	Barcode type. One byte with the following allowed values:

'**1**'	**EAN8**. The data contain only digits and are 7 bytes long. The checksum is calculated by the printer.
'**2**'	**EAN13**. The data contain only digits and are 12 bytes long. The checksum is calculated by the printer.
'**3**'	**Code 128**. The data are characters with ASCII codes between 32 and 127. Their length is between 22 and 42 characters (depends on the contents—the maximum length is achieved when all characters are digits). The checksum is calculated by the printer. When printing on narrow paper, the data length is obviously smaller.
'**4**'	**ITF (Interleaved 2 of 5)**. The data contain only digits.
'**5**'	**ITF (Interleaved 2 of 5)**. The data contain only digits. The printer automatically generates and prints a checksum.
'**D**'	Two-dimensional barcode **Data Matrix**. The data are any printable characters (with length up to 140).
'**Q**'	Two-dimensional barcode **QR Code**. The data are any printable characters (with length up to 140).
'**P**'	Two-dimensional barcode **PDF417**. The data are any printable characters (with length up to 140).

Align   One byte: **'L'**, **'R'** or **'C'**: left-, right-aligned or centred, respectively. It is allowed only in the two-dimensional barcodes. If the data are separated by ',', then they are printed as text as well.

AllowN   Optional parameter: one character with a value of **'*'**. If present, barcodes **Code 128** and **ITF** will be printed, if needed (longer data input), with a thin-line size of a single dot. Please, bear in mind that this barcode printing is not standard-compliant, but most readers can still read it. This way, the maximum length of the data input is doubled. The parameter has no effect on the other barcodes.

The command prints a barcode. It is allowed only on an open fiscal or service receipt. The two-dimensional barcodes can be printed left-, right-aligned or centred, while the one-dimensional barcodes can be printed only centred. If the data are comma-separated, the information is additionally printed as text under the barcode. If the data length or contents are invalid, the "Syntax Error" status bit is raised and the barcode is not printed.

The height of the one-dimensional barcodes is set by command 43.

55H (85)   SET THE ADDITIONAL PAYMENT NAMES

Data area: *Option[,Name]*
Response: *Result|Name*

Option:
    'I'   Additional payment 1**.**
    'J'   Additional payment 2**.**
    'K'   Additional payment 3**.**
    'L'   Additional payment 4.
    'i'   Additional payment 1. Identical to **'I'**.
    'j'   Additional payment 2. Identical to **'J'**.
    'k'   Additional payment 3. Identical to **'K'**.
    'l'   Additional payment 4. Identical to **'L'**.
    'm'   Additional payment 5.
    'n'   Additional payment 6.
    'o'   Additional payment 7.
    'p'   Additional payment 8.
    'q'   Additional payment 9.
    'r'   Additional payment 10.
    's'   Additional payment 11.

Name   Name of the respective payment type (up to 24 characters). If not set, returns the current name.

Result   One byte:
    'P'   No error.
    'F'   The name is longer than 24 bytes.

The command sets a comment text to be printed before the data from the additional payment types (command **53**). It is allowed only before the first customer fiscal receipt for the day is issued.

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

Data area: *[<WithTime>]*
Response: *DT*

WithTime   Optional parameter: the **'T'** character. If present, also returns the time of the last record.
DT   The date (or date and time) of the last (latest) record in the fiscal memory, in the following format:

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

57H (87)   PROGRAM A DEPARTMENT NAME

Data area: *<Dept>,<TaxGr>,<Line1>[<LF><Line2>]*
Response: No data

Dept   Department number. Integer between 1 and 1200.
TaxGr   Tax group associated with the department.
Line1   Department name or descriptive text. Up to 28 characters.
LF   Separator. One character: ASCII code 10.
Line2   Department name or descriptive text—second line. Optional parameter: up to 34 characters.

The command can be executed only if no fiscal receipts for the department have been issued after the last Z-report. With a new printer or after a RAM reset, the department names are empty. The programmed

name is printed on the extended daily financial report with department printout (command **117**) and, optionally, at the top of each fiscal receipt.

58H (88)   OBTAIN DATA ON THE ACCUMULATED SUMS FOR A DEPARTMENT

Data area:	*<Dept>*
Response:	*ExitCode[TaxGr,RecSales,RecSum,TotSales,TotSum,Line1<LF>Line2]*

Dept   Department number. Integer between 1 and 1200. Value 0 returns data on the sales made without department specified. In this case, the tax group is missing.

ExitCode One byte with the following possible values:
  '**P**'   The department is programmed. Followed by the department data listed below.
  '**F**'   The department is not programmed. No data on it exist.

TaxGr   The tax group of the department.

RecSales Number of sales for the department in the receipt.

RecSum   Accumulated sum for the current or last fiscal receipt for the respective department. Floating-point number with two decimal digits.

TotSales Number of sales for the department, for the day.

TotSum   Accumulated sum for the day, for the respective department. Floating-point number with two decimal digits.

Line1   Department name or descriptive text.

Line2   Department name or descriptive text—second line.

59h (89)   PROGRAM THE PRODUCTION TEST AREA

Data area:	*<Test>*
Response:	*Result,Free*

Test   One byte. If it is '**T**', then makes a record in the fiscal memory. Otherwise, makes no record, just returns the parameters.

Result   One byte:
  = **P** (50h)   No error.
  = **F** (46h)   Has an error.

Free   The number of remaining blocks available to record such blocks. 4 bytes.

This command is executed to test the fiscal memory.

Test block to record in the fiscal memory: *55h,AAh,33h,CCh,5Ah,A5h,3Ch,C3h*.
If S1.1 is raised, the fiscal memory is not formatted or is in **READONLY** mode.

5Ah (90)   READ DIAGNOSTIC INFORMATION

Data area:	[*]*<Calc>*
Response:	
	<Name>,<FwRev><Country><Sp><FwDate><Sp><FwTime>,<Chk>,<Sw>,<Ser>,<FM>

*   Optional parameter allowing to read all 16 configuration switches.

Calc   If it is '**1**', calculates a firmware checksum. Otherwise, returns 'FFFF'. 1 byte.

Name   Name of the fiscal device (in this case, **"FP-800 FP-800 / FP-2000 / FP-650 / SK1-21F / SK1-31F/ FMP-10 / FP-700"**).

FwRev   The software version. 4 bytes.

Country   Two-letter country code (in this case, **"BG"**).

Sp   Space. 1 byte.

FwDate   The software date: DDMmmYY. 7 bytes.

Sp   Space. 1 byte.

FwTime   The software time: HHMM. 4 bytes.

Chk   EPROM checksum. A 4-byte hexadecimal string. For instance, if the checksum is **214Ah**, it will be sent as *32h,31h,34h,41h*.

Sw   The switches between Sw1 and Sw8. A 8-byte string containing '0' or '1'

Ser   Unique Device ID: 8 bytes.

FM   Fiscal Memory ID: 8 bytes.

5Bh (91)   PROGRAM THE UNIQUE DEVICE ID AND FISCAL MEMORY ID

Data area:	*Serial,FMnumber*
Response:	*Result,CountryStr*

Serial   These are 8 bytes: Unique Printer ID containing 2 Latin letters and at least 6 digits.

FMnumber   These are 8 bytes: the Fiscal Memory Unit ID. Contains only digits.

Result   One byte containing a letter: '**P**': no errors, '**F**': has errors.

         CountryStr   String containing the name of the country. For instance, **"BULGARIA"**

The command can only be executed in service mode at the manufacturer's facilities. The printer is delivered to the customer with pre-set Unique Printer ID and Fiscal Memory ID.

If ***Result*** = 'F' and S1.1 is raised, the command is not executed, because the fiscal memory is not formatted or the Unique ID is already set.

5Ch (92)   PRINT A DIVIDER LINE

         Data area: ***Type***
         Response: No data

     Type   One byte with the following allowed values:

         '1'   Fill with the '-' character.
         '2'   Fill with alternating '-' and ' ' characters.
         '3'   Fill with the '=' character.
         '4'   Fill with the double-width '*' character.
         'W<bm>' where **bm** is a number between 0 and 3 (bit mask).
                The text "**not payable!**" with a triple height is added unconditionally.
                1: adds the text "**under this receipt**".
                2: adds a frame of double-width '*' characters above and below.
         'W<bm>' is supported only on service receipts.

The printer prints a divider line of the specified type along the entire paper width.
A fiscal or service receipt must be open.

5Dh (93)   OBTAIN INFORMATION ON THE DISCOUNTS AND MARK-UPS FOR THE DAY

         Data area: No data
         Response: **<CntD>,<SumD>,<CntM>,<SumM>**

     CntD   Number of discounts after the last Z-report.
     SumD   Sum of discounts after the last Z-report.
     CntM   Number of mark-ups after the last Z-report.
     SumM   Sum of mark-ups after the last Z-report.

5Eh (94)   FULL FISCAL MEMORY REPORT BY FISCAL RECORD DATE

         Data area: ***[<SHA1>][<SkipZ>]<Start>[,<End>]***
         Response: No data

     SHA1   Optional argument: one byte with a value of '#'. If present, for each Z-report, prints also the checksum using the SHA-1 algorithm.
     SkipZ   Optional argument: one byte with a value of '*'. If present, for each Z-report, prints only the tax rates with non-zero accumulated sums for the day. ***Such report is non-standard and can be used only as an internal reference at the location!***
     Start   The start fiscal record date. 6 bytes (DDMMYY).
     End   The end fiscal record date. 6 bytes (DDMMYY).

This command prints a full fiscal memory report for the period between the two dates.
If the second parameter is omitted, the command generates a monthly or annual report. The syntax in this case is:

     Start   Month: 4 bytes (MMYY) for a monthly report.
     Start   Year: 2 bytes (YY) for an annual report.

5Fh (95)   SUMMARY FISCAL MEMORY REPORT FOR A PERIOD

         Data area: ***[<Start>,<End>]***
         Response: No data

     Start   Start fiscal record number.
     End   End fiscal record number.

The command calculates and prints a summary fiscal memory report. This report for the entire period of operation of the fiscal printer can also be run by pressing and holding the **<FEED>** button when the printer is powered on until the fourth beep.
With no data input, a report for the entire period of operation is printed.

61h (97)   READ THE SET TAX RATES

Data area:	No data	
Response:	*TaxA,TaxB,TaxC,TaxD,TaxE,TaxF,TaxG,TaxH*	

TaxA   Tax rate **A**
TaxB   Tax rate **B**
TaxC   Tax rate **C**
TaxD   Tax rate **D**
TaxE   Tax rate **E**
TaxF   Tax rate **F**
TaxG   Tax rate **G**
TaxH   Tax rate **H**

62h (98)   SET THE UIC

Data area:	*<Text>[,<Name>]*
Response:	*Result*

Text   These are up to 14 bytes containing the UIC as text.
Name   This is the comment text before the UIC. By default, it is "**UIC**".

Result   '**P**' No error.
            '**F**' Error.

63h (99)   READ THE UIC

Data area:	No data
Response:	*<Text>,<Name>*

Text   The UIC as text.
Name   The comment text before the UIC.

64h (100)   SHOW TEXT ON THE DISPLAY

Data area:	*Text*
Response:	No data

Text   Text, up to 40 characters, sent to the display. If ASCII characters below 20h (control sequences) need to be sent, they are increased by 40h and are preceded by 10h (DLE).

For example: to send 1Bh,4Bh,00h, it must be entered as 10h,5Bh,4Bh,10h,40h in the data field.

65h (101)   SET AN OPERATOR PASSWORD

Data area:	*<OpCode>,<OldPwd>,<NewPwd>*
Response:	No data

OpCode   Operator code. Between 1 and 16.
OldPwd   Old password (between 4 and 8 digits).
NewPwd   New password (between 4 and 8 digits).

Sets one of the sixteen operator passwords. The password will be requested when opening a fiscal receipt. After three unsuccessful attempts to set a password, the printer is locked and needs to be powered off and then back on to continue to operate.

After initialisation or RAM reset, all passwords are **"0000".**

66h (102)   SET AN OPERATOR NAME

Data area:	*<OpCode>,<Pwd>,<OpName>*
Response:	No data

OpCode   Operator code. Between 1 and 16.
Pwd   Password (between 4 and 8 digits).
OpName   Operator name (up to 24 characters).

Sets one of the sixteen operator names. The operator ID and name is printed at the top of each fiscal (customer) receipt. After three wrong passwords are entered, the printer is locked and needs to be powered off and then back on to continue to operate.

After initialisation or RAM reset, all sixteen operator names are empty**.**

67h (103)   CURRENT RECEIPT INFORMATION

Data area:	No data

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

CanVd:	Is a return possible (sale with a negative sign) [0/1]
TaxA:	Accumulated sum under tax group **A**
TaxB:	Accumulated sum under tax group **B**
TaxC:	Accumulated sum under tax group **C**
TaxD:	Accumulated sum under tax group **D**
TaxE:	Accumulated sum under tax group **E**
TaxF:	Accumulated sum under tax group **F**
TaxG:	Accumulated sum under tax group **G**
TaxH:	Accumulated sum under tax group **H**
Inv:	Is an extended customer receipt open.
InvNmb:	Number of the next invoice (10 digits).

Provides information on the accumulated sums under tax groups and whether already sold products can be returned.

68h (105)   OPERATOR REPORT

Data area: No data
Response: No data

Prints information on the sales by operator. For each operator, prints the name, ID, number of fiscal receipts, discounts, mark-ups, adjustments and the accumulated sums.

6Ah (106)   OPEN THE DRAWER

Data area: *[<mSec>]*
Response*:*   No data
mSec   Pulse length in milliseconds (5-100)

Sends a pulse to open the drawer. The parameter sets a new pulse length value, which is saved by the printer. If the parameter is omitted, the last set value is used. After a memory RESET, the value is set to 15 ms.

6Bh (107)   DEFINE AND READ PLUs OR FUEL

Data area: *<Option>[Parameters]*
Response*:*   *ErrorCode[Data]*

Option	One byte defining the type of requested operation. Depending on it, the command may or may not require additional parameters. Possible values: '**I**', '**P**', '**D**', '**A**', '**C**', '**R**', '**F**', '**L**', '**N**', '**X**', '**f**', '**l**', '**n**', '**x**'.
ErrorCode	One byte indicating the result of the operation, with the following meanings:
	• '**P** The command is successful.
	• '**F**' The command is unsuccessful.
Parameters	Command data. Detailed below by ***<Option>.***

• '**I**' Article information
      Syntax: *<I>[@]*
      Response: *Total,Prog,Len | <9>,<ProgrFTT>,<NameMaxLength>*
      @ Optional parameter to read the number of programmed fuel FTT codes and the maximum number of characters for their names.
               *Only for type 3 and 31 printers.

Total	Total number of programmable PLUs (3000 for this printer).
Progr	Number of programmed PLUs.
Len	Maximum PLU name length.
ProgrFTT	Number of programmed fuel FTT.
NameMaxLength	The maximum number of characters for the FTT name.

• '**P**' Program a PLU.
      Syntax: *<P><TaxGr><PLU>,<Group>,<SPrice>,[<Replace>]<Quantity>,<Name>*

TaxGr	Tax group ('**A**','**B**','**C**','**D**','**E**','**F**','**G**','**H**')
PLU	PLU code (between 1 and 999999999)
Group	Product group (between 1 and 99)
SPrice	Unit price. Up to 8 significant digits.
Replace	Optional parameter: one byte with a value of '**A**'. Changes the meaning of the next parameter (***Quantity***).
Quantity	Number with up to 3 decimal digits: the available quantity for this PLU. If the parameter ***Replace*** is present, then the available quantity is replaced by ***Quantity***. Otherwise, it is added to the existing quantity (if the PLU is

already programmed, obviously). Each PLU sale command will decrease this quantity.

    Name   PLU name. Up to 36 bytes.

Up to 3000 PLUs can be programmed. The command will be rejected, if such PLU already exists and has sales. A PLU with zero accumulated sums can be edited. If the printer is registered for operation at a gas station and the PLU group is '**C**', the duplicate name check is also carried out.

- **'A'**   Edit the available PLU quantity.
  - Syntax: ***<A><PLU>,<Quantity>***
  - *PLU*   PLU code (between 1 and 999999999).
  - *Quantity*   Quantity adjustment: a floating-point number with up to 3 decimal digits. Positive numbers increase and negative numbers decrease the quantity.
  - The command is rejected if the PLU is not programmed.

- **'C'**   Set the PLU or fuel price.
  - Syntax: ***C<PLU>,<Price>***
  - *PLU* PLU code.
  - *Price* PLU unit price.
  - Syntax 1:***C@<FTT>,<Price>***
  - *FTT* Fuel FTT code.
  - *Price* Fuel unit price.

- **'D'**   Delete the PLU.
  - Syntax: ***<D><A | PLU | PLU1,PLU2>***
  - *'A'*   Deletes all PLUs with zero accumulated sums.
  - *PLU*   Deletes the specified PLU code, if it has no accumulated sums.
  - *PLU1,PLU2* Deletes the PLUs within the set range without accumulated sums.

- **'R'**   Read the PLU data.
  - Syntax: ***<R><PLU> | R@<FTT>***
  - Response: ***<'P'><PLU>,<TaxGr>,<Grp>,<SPrice>,<Total>,<Sold>,<Avail>,<Name>***
  - ***<PLU>***   PLU code. Between 1 and 999999999.
  - ***<TaxGr>***   Tax group. One byte.
  - ***<Grp>***   Product group. Between 1 and 99.
  - ***<SPrice>***   Unit price. Floating-point number with the current decimal digits for the printer.
  - ***<Total>***   Accumulated sum for this PLU.
  - ***<Sold>***   Sold quantity. Floating-point number with 3 decimal digits.
  - ***<Avail>***   Available quantity. Floating-point number with 3 decimal digits.
  - ***<Name>***   PLU name. Up to 36 bytes.

  - Response1:**<P><FTT>,<TaxGr>,<Grp>,<SPrice>,<Total>,<Sold>,<Avail>,<FTTName>**
  - **<FTT>**   FTT number.
  - **<Grp>**   It will always be 0.
  - **<SPrice>**   Unit price. Floating-point number with the current decimal digits for the printer.
  - **<Total>**   Accumulated sum for the FTT.
  - **<Sold>**   Sold quantity. Floating-point number with 3 decimal digits.
  - **<Avail>**   It will always be 0.
  - **<FTTName>**   FTT name. Up to 16 bytes.

  If the PLU or FTT is not found, returns one byte: **'F'**.

- **'F'**   Return the data on the first programmed PLU or FTT found.
  - Syntax: ***<F>[<PLU>] | <F@>***
  - The data returned are like those for subcommand **'R' | 'R'@**. If the *PLU* parameter is set, the search starts from it, in ascending order. Otherwise, it starts from **1**.
  - With the F@ input, will return the first found FTT.

- **'L'**   Return the data on the last found programmed PLU.
  - Syntax: ***<L>[<PLU>]***
  - The data returned are like those for subcommand **'R'**. If the *PLU* parameter is set, the search starts from it, in descending order. Otherwise, it starts from **999999999**.

- **'N'**   Return the data on the next found programmed PLU or FTT.
  - Syntax: ***<N> | <N@>***
  - The data returned are like those for subcommand **'R'**.

The last three subcommands are used to download the data on all programmed PLUs from the PC. Subcommand **'F'** or **'L'** is sent followed by subcommand **'N'** until the **'F'** response is received meaning that the

last PLU was read. The PLUs are returned sorted as numbers in ascending or descending order, depending on the first sent command.

- **'f'**   Return the data on the first found PLU or FTT having sales.
  Syntax: *<f>[<PLU>] | <f@>*
  The data returned are like those for subcommand **'R'**. If the *PLU* parameter is set, the search starts from it, in ascending order. Otherwise, it starts from **1**.

- **'l'**   Return the data on the last found PLU having sales.
  Syntax: *<l[<PLU>]*
  The data returned are like those for subcommand **'R'**. If the *PLU* parameter is set, the search starts from it, in descending order. Otherwise, it starts from **999999999**.

- **'n'**   Return the data on the next found PLU or FTT having sales.
  Syntax: *<n> | <n@>*
  The data returned are like those for subcommand **'R'**.

The last three subcommands are used to download the data on all PLUs having sales for the day from the PC. Subcommand **'f'** or **'l'** is sent followed by subcommand **'n'** until the **'F'** response is received meaning that the last PLU was read. The PLUs are returned sorted as numbers in ascending or descending order, depending on the first sent command.

- **'X'**   Find the first available (not programmed) PLU.
  Syntax: *<X>[<PLU>]*
  Response: *PLU*

If the *PLU* parameter is set, returns the first available (not programmed) PLU with a number higher than or equal to it. If it is omitted, *PLU=1* is assumed.

- **'x'**   Find the last available (not programmed) PLU.
  Syntax: *<X>[<PLU>]*
  Response: *PLU*

If the *PLU* parameter is set, returns the first available (not programmed) PLU with a number lower than or equal to it. If it is omitted, *PLU=999999999* is assumed.

6Ch (108)   EXTENDED DAILY FINANCIAL REPORT

Data area: *[<Option>[N]*
Response: *Closure,FM_Total,TotA,TotB,TotC,TotD,TotE,TotF,TotG,TotH*

The command has the same syntax as command **69 (45H)**, however, at the top of the daily report, it additionally prints the list of PLUs with **PLU** lower than or equal to 10 having sales for the day (fuels).

6Dh (109)   PRINT A DUPLICATE RECEIPT

Data area: *<Count>*
Response*:*   No data

Count   Number of duplicate receipts (accepts only 1 as a value!).

Prints a copy of the last fiscal receipt with sales. The copy is marked as a **SERVICE RECEIPT** and, immediately after the HEADER, a line with the bold **"DUPLICATE"** text is printed. For any repeated attempt, the command will refuse to print. Duplicate receipt printing is also not possible, if the number of lines on the receipt is more than 1000.

6Eh (110)   PAYMENT INFORMATION BY TYPE FOR THE DAY

Data area: *[<Extended>]*
Response*:*   *Cash,Credit,Debit,Cheque,Pay1,Pay2,Pay3,Pay4,Closure,Receipt[,Pay5,...]*

Extended   Optional parameter: one byte with a value of '*'. If present, returns all 11 additional payment types.

Cash   Paid in cash
Credit   Credit
Debit   Debit card
Cheque   Paid by check
PayX   Paid by one of the additional payment types
Closure   Current (last) fiscal record
Receipt Next fiscal receipt number

Returns information on the sum breakdown for the day by payment method.

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6Fh (111)   REPORT BY PLU OR FUEL

Data area:	*<Option>[<Start>,<End>[,<Group>]]*
Response:	*ErrorCode*

Option   Specifies the type of information to be printed. Possible values:
- **'S'**   Prints only the PLUs having sales for the day. For each PLU, prints the code, tax group, product group, name, unit price, sold quantity and sales.
- **'P'**   All PLUs with their codes, tax groups, product groups, names, sold quantities, available quantities and unit prices are printed.
- **'@S'** Only the FTT codes having sales for the day are printed. For each FTT, prints the code, tax group, name, unit price, sold quantity and sales.
- **'@P'** All programmed FTT codes, tax groups, names and unit prices are printed.

Start   First PLU code to be included in the report. By default, it is 1.
End   Last PLU code to be included in the report. By default, it is 999999999.
Group   Number between 1 and 99. If this parameter is set, only the PLUs of this group are included in the report. Otherwise, all groups are printed.

The PLUs are sorted as numbers. When a daily financial report with reset is run, the accumulated sums for the PLUs are reset, unless an explicit instruction to keep them is sent.

70h (112)   OBTAIN OPERATOR INFORMATION

Data area:	*Operator*
Response:	*Receipts,Total,Discount,Surcharge,Void,Name[,Password]*

Operator   Operator ID (between 1 and 16).
Receipts   Number of fiscal receipts issued by the operator.
Total   Number of sales and accumulated total, separated by ';'.
Discount   Number of discounts and discount total.
Surcharge   Number of mark-ups and mark-up total.
Void   Number of adjustments and adjustment total.
Name   Operator name.
Password   Operator password. Returned only if the printer has the service jumper installed.

The command allows to obtain the information printed on an operator report. The amounts are returned as floating-point numbers with the current number of decimal digits.

71h (113)   OBTAIN THE LAST PRINTED DOCUMENT NUMBER

Data area:	No data
Response:	*DocNum*

DocNum   Last issued document number (7 digits).

72h (114)   INFORMATION ON A FISCAL RECORD OR FISCAL PERIOD

Data area:	*<Rec1>,<Type[Storno]>[,Rec2]*
Response:	Depends on the value of **Type**

Rec1   Fiscal memory record number.
Type   Type of requested information. Integer with a value of:
- **0**   *ErrorCode[,DecRec,Dec,Enabled,PerA,PerB,PerC,PerD,PerE,PerF,PerG,PerH,DT]*
  Information on the active tax rates for the Z-report record in question.
- **1**   *ErrorCode[,Closure,Receipts,TotA,TotB,TotC,TotD,TotE,TotF,TotG,TotH]* or
  ErrorCode[,ClCnt,VR,VE,VT,SR,SE,ST,TotA,TotB,TotC,TotD,TotE,TotF,TotG,TotH]
  Information on the sales for the specified record or period.
- **2**   *ErrorCode[,Closure,Receipts,NetA,NetB,NetC,NetD,NetE,NetG,NetG,NetH]* or
  ErrorCode[,ClCnt,VR,VE,VT,SR,SE,ST,NetA,NetB,NetC,NetD,NetE,NetG,NetG,NetH]
  Information on the net amounts for the specified record or period.
- **3**   *ErrorCode[,Closure,Receipts,TaxA,TaxB,TaxC,TaxD,TaxE,TaxF,TaxG,TaxH]* or
  ErrorCode[,ClCnt,VR,VE,VT,SR,SE,ST,TaxA,TaxB,TaxC,TaxD,TaxE,TaxF,TaxG,TaxH]
  Information on the VAT assessed for the specified record or period.
- **4**   *ErrorCode[,Closure,DecRec,ResetRec,KLEN,DT]*
  Additional information on the specified record.
- **5**   *ErrorCode[,Dec,Enabled,PerA,PerB,PerC,PerD,PerE,PerF,PerG,PerH,DT]*
  Information on the specified fiscal memory record used to set tax rates.
- **6**   *ErrorCode[,DT]*
  Information on the specified FM record with RAM reset.

- **7**   **$ErrorCode[,CashP,CardP,CredP,CheqP,APayd_1,...,APayd_{11}]$**
  Information on the amounts by payment type for the specified record or period.
- **8**   **$ErrorCode[,DiscC,DiscS,MkUpC,MkUpS,VoidC,VoidS,CanC,CanS]$**
  Information on the amounts by payment type for the specified record or period.
- **9**   **$ErrorCode[,InC,InS,OutC,OutS]$**
  Information on the amounts by payment type for the specified record or period.
- **10**   **$ErrorCode[,GTotal,GVAT]$**
  Information on the total sales and VAT before the specified Z-report.
- **11**   **$ErrorCode[,FTT_1,Name_1,...,FTT_n,Name_n]$**
  Information on the programmed fuel **FTT** and names for this Z-report. Only for type 3 and 31 printers.
- **12**   **$ErrorCode[,FTT_1,Vol_1,S_1,...,FTT_n,Vol_n,S_n]$**
  Information on the sold quantities and accumulated sales for the programmed fuels for this Z-report. Only for type 3 and 31 printers.
- **13**   **$ErrorCode[,Disp_1,...,Disp_n]$**
  Information on the programmed pumps for this Z-report. Only for type 31 printers.
- **14**   **$ErrorCode[,Term_1,VolAct_1,Vol15C_1,FL_1,Tmpr_1,...]$**
  Information on the programmed pumps for this Z-report. Only for type 31 printers.
- **15**   **$ErrorCode[,Nozzle_1,Term_1,CVal_1,...]$**
  Information on a programmed pump for this Z-report. Only for type 31 printers.

Rec2	Fiscal record number for type **1**, **2** and **3** reports. For type **0**, **4**, **5**, **6**, **10**, **11**, **12**, **13** and **14** reports, this field is empty. If the parameter is present, returns the data on the period set by ***Rec1*** and ***Rec2*** for type **1**, **2**, **3**, **7**, **8** and **9** reports. For a type **15** report, the field contains a pump number and not an end record.
ErrorCode	One byte with a value of:

- **'P'**   The data are valid.
- **'F'**   Invalid record checksum. No data.
- **'E'**   No such record exists. No data.

Closure	Fiscal record number.
ClCnt	Count of fiscal records.
VR	Number of return bills from type „Return".
VE	Number of return bills from type „Operator error".
VT	Number of return bills from type „Tax base reduction".
SR	Number of sales in bills from type „Return".
SE	Number of sales in bills from type „Operator error".
ST	Number of sales in bills from type „Tax base reduction".
DecRec	Last (active) record with tax rates.
Dec	Number of decimal digits for the specified Z-report record.
Enabled	Enabled tax rates: 8 bytes with a value of '**0**' or '**1**' where '**1**' means "enabled".
Receipts	Number of fiscal receipts.
PerX	Tax rate for the respective tax group, as a percentage.
TotX	Sales for the respective tax group.
NetX	Net amount for the respective tax group.
TaxX	VAT assessed for the respective tax group.
ResetRec	Last RAM reset before this fiscal block.
KLEN	EJ number for this fiscal block.
DT	Date and time of the data in the following format: **DD-MM-YY hh:mm:ss**.
CashP	Paid in cash.
CardP	Paid by debit card.
CredP	Paid by credit card.
CheqP	Paid by check.
$APayd_x$	Additional payment types.
DiscC,DiscS	Number of discounts and accumulated discount sum.
MkUpC,MkUpS	Number of mark-ups and accumulated mark-up sum.
VoidC,VoidS	Number of adjustments and adjustment total.
CanC,CanS	Number of cancelled receipts and cancelled receipt total.
InC,InS	Number of service deposits and total.
Out,OutS	Number of service withdrawals and total.
GTotal	Accumulated sales up to and including the specified daily report.
GVAT	Accumulated VAT up to and including the specified daily report.
FTT_i	Programmed fuel **FTT**.
$Name_i$	Programmed fuel name.
Vol_i	Accumulated programmed fuel sales volume.
S_i	Accumulated programmed fuel sales amount.
$Disp_i$	Programmed pump number.
$Term_i$	Programmed tank number.
$VolAct_i$	Tank volume at current temperature.

Vol15C$_i$	Tank volume at 15 degrees.
FL$_i$	Tank fuel level.
Tmpr$_i$	Tank fuel temperature.
Nozzle$_i$	Nozzle number.
CVal$_i$	Nozzle counter value.

The command returns information by tax groups or another criterion for a single record or for a specified period. For a longer period, the report may take a few seconds to complete.

73h (115)   PROGRAM A LOGO GRAPHIC

Data area:	***<RowNum>,<Data>***
or	***R<RowNum>***
Response*:*	No data
or	***Data***

R	If the character '**R**' exists at the start of the data, the command returns the contents of the respective graphic line in hexadecimal form.
RowNum	The line being programmed. Number between 0 and 95.
Data	Graphic data. Set as hexadecimals, two characters for each byte of information. The data length is up to 72 bytes. If it is less than that, the data are automatically padded with 00.

The command allows the user to enter an optional logo graphic with a size of up to 72x12mm (576x96 dots) or 54x12 mm (384x96 dots) depending on the used thermal paper width. It is printed using command **43**. The same command is used to set its vertical size. To enter the entire logo, the command needs to be executed up to 96 times, once for each line. After a RAM reset, the logo is loaded from the flash memory. The logo programmed using command **115** can be stored in the flash memory using command **41**.

74h (116)   READ A FISCAL MEMORY BLOCK

Data area:	***<Address>,<Bytes>***
Response*:*	***Data***

Address	Start address (relative to the start of the fiscal memory): hexadecimal number between 000000h and 1FFFFFh (for a 16-Mbit fiscal memory).
Bytes	Number of bytes to return, decimal (between 1 and 64).
Data	The hexadecimal contents of the requested fiscal memory block (2 characters for each data byte).

The command returns the contents of a part of the fiscal memory. To read the entire fiscal memory, it needs to be executed repeatedly with a different start address.

75h (117)   DAILY FINANCIAL REPORT WITH DATA PRINTED BY DEPARTMENT

Data area:	***[<Option>[N]]***
Response:	***Closure,FM_Total,TotA,TotB,TotC,TotD,TotE,TotF,TotG,TotH***

The command is identical to **69 (45h)** from the previous version, the only difference being that, at the top of the daily report, it additionally prints the departments having sales for the day. Command **69** is left unchanged. Commands **69**, **108**, **117** and **118** with option '**0**' (daily financial report with reset) reset the accumulated department data as well.

76h (118)   DAILY FINANCIAL REPORT WITH DEPARTMENT AND PLU PRINTING

Data area:	***[<Option>[N]]***
Response:	***Closure,FM_Total,TotA,TotB,TotC,TotD,TotE,TotF,TotG,TotH***

The command is identical to **69 (45h)** from the previous version, the only difference being that, at the top of the daily report, it additionally prints the departments having sales for the day and the PLUs with codes between 1 and 40, if they have sales. Command **69** is left unchanged. Commands **69**, **108**, **117** and **118** with option '**0**' (daily financial report with reset) reset the accumulated department data as well.

77h (119)   EJ OPERATIONS

Data area:	***<Type>[,<InpData>]***
Response:	Depends on the data input

Type	EJ operation command class. One byte with the following allowed values:

	'C'	Check the validity of the EJ or a part of it.
	'I'	EJ information.
	'N'	Read the next text line from the EJ.
	'R'	Read EJ data.
	'P'	Print EJ data.

Class **'C'** commands: Verify EJ data.

P[#]	Prints report on the validity of all SHA-1 checksums for the Z-reports found in the EJ. It compares the EJ and fiscal memory SHA-1 checksums. For each mismatch, prints one line with the Z-report number, date and time. If the optional character **'#'** is present, prints information on each found SHA-1, valid or not.

R[<Num>]	Returns EJ information for the Z-report number ***Num***. The data from the specified Z-report are read as a document. Response format:
P,FDocs,DT,SK	Information on the found Z-report:
FDocs	Document number of the Z-report.
DT	Date and time of the report in the "**DD-MM-YYYY hh:mm:ss**" format.
SK	40 characters: hexadecimal SHA-1 of the Z-report.
F	No EJ data are found for this Z-report.

Z[<Num>]	Returns EJ information for the Z-report number ***Num***. Reads the actual text of the documents stored in the EJ, calculates the SHA-1 and compares it to the SHA-1 from the Z-report. The command can take a long time to complete, if there are many documents in the daily report. Possible responses:
P,Docs,Bytes,SK	The checksum is valid. ***Docs*** documents and ***Bytes*** data bytes are read. ***SK*** is 40 characters: the hexadecimal checksum.
F,Docs,Bytes,SK,SZ	The checksum is invalid. ***Docs*** documents and ***Bytes*** data bytes are read. ***SK*** and ***SZ*** are 40 characters each: the EJ checksum and the calculated checksum, respectively.
F	No EJ data are found for this Z-report.

Class **'I'** commands: EJ information.

[X]	The **'I'** character may be followed by nothing or the letter **'X'**. Returns the following information:

P,Tot,Used,C1,C2,D1,D2	
Tot	Total journal size in bytes.
Used	Used journal size in bytes.
C1	First Z-report number in the EJ.
C2	Last Z-report number in the EJ.
D1	First document number in the EJ.
D2	Last document number in the EJ.

Class **'R'** commands: Read EJ data.

[#<Flg>,]<D1>[,<D2>]	Returns the first line of document number ***D1*** and sets the end of search on document ***D2*** (inclusive). The next lines are retrieved by sending command class **'N'**. If the second argument is omitted, only one document is selected: ***D1***.

[#<Flg>,]*<C1>[,<D1>[,<D2>]]	Returns the first line of document number ***D1*** for a Z-report ***C1*** and sets the end of search on document ***D2*** (inclusive) for the same Z-report. The next lines are retrieved by sending command class **'N'**. The document counter is for the Z-report, i.e., command "***5,1,3**" will select only the first three documents of Z-report number 5. If ***D2*** is omitted, only one document is selected: ***D1***. If both ***D1*** and ***D2*** are omitted, all documents for the Z-report are selected.

<Flg>,<DT1>,<DT2>	Returns the first line of the document with date and time ***DT1*** and sets the end of search on document with date and time ***DT2*** (inclusive). A filter is applied to the selected documents, depending on the ***Flg*** argument. The next lines are retrieved by sending command class **'N'**. Input argument format:

Flg		Character specifying the document type to be selected for reading:
	'A'	All document types.
	'F'	Fiscal (customer) receipts.
	'V'	Refund (storno) receipts.
	'C'	Cancelled (customer) receipts.
	'N'	Service receipts.
	'I'	Service deposit receipts.
	'O'	Service withdrawal receipts.

	'R'	Service receipts with 90-degree rotated printing.
	'S'	Service operation receipts.
	'P'	Reports (only date/time and receipt number information)
	'X'	X-reports.
	'Z'	Z-reports.
DT1		Report start date and time in the **DDMMYY[hhmmss]** format. If the time is omitted, "**000000**" is assumed, i.e., 00:00:00.
DT2		Report end date and time in the **DDMMYY[hhmmss]** format. If the time is omitted, "**235959**" is assumed, i.e., 23:59:59.

The three previous subcommands (by document, Z-report and date) return one of the responses listed below:

P,Text		There is a next text line in the EJ, its contents are in **Text**. The text read is always in the 1251 codepage, even if DOS codepage was selected with the switches. The codepage is important for the correct calculation of the SHA-1 checksum.
*,		There is a next text line in the EJ and it is an empty line—document separator. It can be used to count the found documents or stop reading exactly at the end of a document.
F		There are no more data in the EJ.

The workflow is as follows:

One of the above commands is sent. If the response is **'F'**, no such data exist in the EJ. Otherwise, command class **'N'** is sent repeatedly until the **'F'** response is received (no more data). This way, the required part of the EJ can be retrieved line by line as text.

Q<Addr>,<Bytes>	Direct reading of "raw" EJ data. The command returns **2*Bytes** characters, representing **Bytes** bytes from the EJ, starting from address **Addr**. **Addr** is hexadecimal and **Bytes** is decimal. The data are returned as hexadecimals.
q<Addr>,<Bytes>	Direct reading of "raw" EJ data. The difference with the previous command is that the characters are returned as text, if they are printable (above 1Fh), or as "**<XX>**" (hexadecimal), if they are control characters (below 20h).

Class **'N'** commands:

There are no additional data after this character. It is used in combination with some of the class **'R'** commands. It is used to read the next text line from the EJ. The possible responses are the same as those for the start class **'R'** command and are described above.

CAUTION! Sending this command without preceding it by class 'R' to set the report range may result in reading meaningless data!

Class **'P'** commands: Print EJ data.

[<Fnt>][#<Flg>,]<D1>[,<D2>]	Prints the documents between number **D1** and number **D2** inclusive. If the second argument is omitted, only one document is selected: **D1**.
[<Fnt>][#<Flg>,]*<Cl>[,<D1>[,<D2>]]	Prints the documents between number **D1** for a Z-report **Cl** to number **D2** inclusive for the same Z-report. The document counter is for the Z-report, i.e., command "***5,1,3**" will print the first three documents from Z-report number 5. If **D2** is omitted, only one document is selected: **D1**. If both **D1** and **D2** are omitted, all documents for the Z-report are selected.
[<Fnt>]<Flg>,<DT1>,<DT2>	Prints the documents with dates and times between **DT1** and **DT2** inclusive. A filter is applied to the selected documents, depending on the **Flg** argument. Input argument format:

Fnt		Optional parameter to request printing the EJ documents with a different font size, if the printer allows. One byte with the following allowed values:
	'>'	Print with a normal font size.
	'<'	Print with a S font size.
Flg		Character specifying the document type to be selected for reading:
	'A'	All document types.
	'F'	Fiscal (customer) receipts.
	'V'	Reversal (customer) receipts.
	'C'	Cancelled (customer) receipts.
	'N'	Service receipts.
	'I'	Service deposit receipts.
	'O'	Service withdrawal receipts.
	'R'	Service receipts with 90-degree rotated printing.
	'S'	Service operation receipts.
	'P'	Reports (only date/time and receipt number information)
	'X'	X-reports.

'Z'		Z-reports.
DT1		Report start date and time in the **DDMMYY[hhmmss]** format. If the time is omitted, "**000000**" is assumed, i.e., 00:00:00.
DT2		Report end date and time in the **DDMMYY[hhmmss]** format. If the time is omitted, "**235959**" is assumed, i.e., 23:59:59.

The previous three subcommands (by document, Z-report and date) return, as a result, the number of printed documents as an integer.

The copy of the document from the EJ is almost identical to the original document. The differences are:

The copies never have a logo graphic before the header.

The fiscal logo graphic is not printed anywhere on the copies.

The "**FISCAL RECEIPT**" text with the fiscal logo is replaced by the double-width "**FISCAL RECEIPT—COPY**" text.

INFORMATION ON THE APPEARANCE OF THE TEXT RETURNED WHEN READ FROM THE EJ

The read documents have no logo graphic.

Centre aligned text is rendered by adding spaces to the left of the line.

Double-width printing is rendered by adding a space before each letter.

If a barcode is present anywhere in the fiscal or service receipts, it is replaced by the "**БК [XXXX]**" text, where **XXXX** is the text information from the barcode.

The read line contains only text, without the <**CR**> and <**LF**> characters at the end of the line. When text information is retrieved from the EJ, these characters need to be added at the end of each line in the same sequence. If this is done, an external program can calculate the SHA-1 checksum and compare it to the one stored in the EJ—they should match.

The line returned with the '*' prefix (end of document) also needs to be added to the file (as an empty line containing only the <**CR**> and <**LF**> characters), because it is included in the SHA-1 for the Z-report.

Class '**W**' commands: return structured information

W,<FirstDoc>[,<LastDoc>]   Find document <**FirstDoc**> and return the first text line of structured information.

w   Return the next line of structured information

FirstDoc   Number of the first document for the report.
EndDoc   Number of the last document for the report. If it is omitted, it is the same as the first.

The returned structured information can have the following format:

U,<UNP>,<OperNum>,<TillNum>,<RecType>,<DocNum>
V,<DecRec>,<Decimals>,<TaxRate1>, ... ,<TaxRate8>
R,<TaxGrPos>,<TaxRate>,<SinglePrice>,<Quantity>,<Discount_MarkUp>,<Price>,<ArticleName>
M,<Discount_MarkUp>,[<Percent>],<Subtotal>
T,<DiscCnt>,<DiscSum>,<MarkUpCnt>,<MarkUpSum>,<VoidCnt>,<VoidSum>,<SalesCnt>,<Total>,<TotGr1>, ... ,<TotGr8>
P,<CashPayd>,<CheqPayd>,<CardPayd>,<CredPayd>,<MorePayd1>, ... ,<MorePayd11>
S,<StornoType>,<StornedDocNo>,<StornedDT>,<StornedFMIN>,<StornedUNP>,<StrornedInvoice>
I,<Invoice>,<PIN>,<PINtype>
D,<StartDT>,<EndDT>
Z,<ZNo>,<DocNum>,<FiscNum>,<DateTime>,<Total>,<StornoSum>,<CashSum>
Q,<DocNum>,<StartDT>,<ServeINOUT>,<CashSum>
*,
F

where:

"**U**" report: Structured information on the receipt. Once on the receipt.
UNP   Unique Sale ID. 21 characters with the XXXXXXXX-YYYY-NNNNNNN format.
OperNum   Operator ID. Between 1 and 16.
TillNum   Cash register location number. Up to 5 digits.
RecType   Receipt type: 0: fiscal; 1: invoice; 2: reversal; 3: credit note; 4: cancelled.
DocNum   Global document number.

"**V**" report: Structured decimal digit and tax rate information. Once on the receipt.
DecRec Tax rate record number in the FP. Counted starting from 1.
Decimals   Decimal digits. 0 or 2.
TaxRateX   Decimal rate X as a percentage.

"**R**" report: Structured sale or adjustment information. Can appear multiple times on the receipt.
TaxGrPos   Tax group (between 1 and 8).
TaxRate   Tax rate as a percentage.
SinglePrice   Unit price. Negative for adjustments.

Quantity   Quantity. Negative for adjustments.
Discount_MarkUp   Discount/mark-up (depending on the sign). The sign is reversed for adjustments.
Price   Price.
ArticleName   Sold product name. If it contains two lines, the separator is <TAB>.

   "M" report: Structured group discount/mark-up information. Can appear multiple times on the receipt.
Discount_MarkUp   Discount/mark-up (depending on the sign).
PercentDiscount/mark-up percentage. The field can be empty, if it is included in a total.
Subtotal   Subtotal after the operation.

   "T" report: Structured information on the accumulated sums on the receipt. Once on the receipt.
DiscCnt   Number of discounts.
DiscSum   Discount total.
MarkUpCnt   Number of mark-ups.
MarkUpSum   Mark-up total.
VoidCnt   Number of adjustments.
VoidSum   Adjustment total.
SalesCnt   Number of mark-ups.
Total   Receipt total.
TotGrX   Tax group total.

   "P" report: Structured paid amount information. Once on the receipt.
CashPayd   Paid in cash.
CheqPayd   Paid by check.
CardPayd   Paid by card.
CredPayd   Paid by credit card.
MorePaydX   Additional payment (as defined by the printer).

   "S" report: Structured reversal receipt information. Not present in the fiscal receipts. Once on the receipt.
StornoType   Reversal type: 0: operator error; 1: return/claim; 2: tax base reduction
StornedDocNo Reversed document number.
StornedDT   Reversed document date and time in the DD-MM-YYYY hh:mm:ss format.
StornedFMIN Fiscal memory ID of the reversed document.
StornedUNP   Unique Sale ID of the reversed document.
StrornedInvoice Invoice number. If not a credit note, contains 0.

   "I" report: Structured invoice information. Once in invoice-type receipts.
Invoice Invoice number.
PIN   ID.
PINtype   ID type: 0: BULSTAT; 1: PIN; 2: Personal Number; 3: Company Number.

   Type "D" report: Receipt start and end date and time.
StartDT Start date and time in the DD-MM-YYYY hh:mm:ss format.
The date printed on the document.
EndDT End date and time in the DD-MM-YYYY hh:mm:ss format.

   "Z" report: Daily report with clearing.
ZNo   Z-report number.
DocNum   Document number.
FiscNum   Last fiscal document number. It may be 0 if it is not issued.
DateTime   Date and time in format DD-MM-YYYY hh:mm:ss.
Total   Total amount of sales per day.
StornoSum   Total amount of refunds per day.
CashSum   Cash availability.

   "Q" report: Serve In / Out sums.
ServeINOUT   Serve In / Out sum.

   "*" mark: End of receipt.
   "F" mark: No more data.

   Class 'Y' commands: return structured information
   Y,<FirstDoc>[,<LastDoc>]
 Find document <**FirstDoc**> and return the first text line of structured information.

   y   Return the next line of structured information

The returned structured information can have the following format:
u,<SerialNum>,<RecType>,<DocNum>,<UNP>
r,<TaxGrPos>,<TaxRate>,<SinglePrice>,<Quantity>,<Discount_MarkUp>,<Price>,<ArticleName>
t,<Total>,<TotGr1>, ... ,<TotGr8>
s,<StornoType>,<StornedDT>,<StornedFMIN>,<StornedUNP>,<StrornedInvoice>
i,<Invoice>,<PIN>,<PINtype>
*,
F

where:
    "**u**" report: Structured information on the receipt. Once on the receipt.
SerialNum   Printer serial number.
RecType   Receipt type: 0: fiscal; 1: invoice; 2: reversal; 3: credit note; 4: cancelled.
DocNum   Global document number.
UNP   Unique Sale ID. 21 characters with the XXXXXXXX-YYYY-NNNNNNN format.

    "**r**" report: Structured sale or adjustment information. Can appear multiple times on the receipt.
The information returned is the same as in "**R**" above.

    "**t**" report: Structured information on the accumulated sums on the receipt. Once on the receipt.
Total   Receipt total.
TotGrX   Tax group total.

    "**s**" report: Structured reversal receipt information. Not present in the fiscal receipts. Once on the receipt.
The information returned is the same as in "**S**" above.

    "**i**" report: Structured invoice information. Once in invoice-type receipts.
The information returned is the same as in "**I**" above.

    "*****" mark: End of receipt.
    "**F**" mark: No more data.

    Class '**V**' - commands: return structured information
    V[+],<FirstDoc>[,<LastDoc>]   Find document <FirstDoc> and return the first text line of structured information.
    or
    V[+],D<StartDateTime>,<EndDateTime> Find the first document between **StartDateTime** and **EndDateTime** and return the first text line of structured information. The date and time are in **DDMMYY [hhmmss]** format. If you skip the hour, the start time is 00:00:00 and the end time is 23:59:59.

    v   Return the next line of structured information

    +   Optional symbol "+". When it is available, the date and time of the document are added in the format: "DD-MM-YYYY HH: MM: SS + pasted tab symbol".

    FirstDoc   Number of the first document for the report.
    EndDoc   Number of the last document for the report. If it is omitted, it is the same as the first.

The returned structured information have the following format:

    *ErrorCode***[,Data]**

    ErrorCode   One byte showing the result of the operation
        •   **'P'**   The command is successful.
        •   **'F'**   The command is unsuccessful or no data.
    Data   The data returned in the order described below is separated by a tab symbol enclosed in quotation marks.
- fiscal device ID;
- kind of receipt - *ФБ (fiscal receipt), РФБ (Invoice), СФБ (Refund receipt) or РФБ (Credit notification)*;
- global number of receipt;
- Unique Sale ID;
- commodity/service - name;
- commodity/service – single price;
- commodity/service - quantity;
- commodity/service - price;
- total price for the receipt;

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- *Invoice number/Credit notification - if the entry is for Invoice or Credit notification;*
- *UIC of recipient – if the entry is for Invoice or Credit notification;*
- *global number of the refund receipt – if the entry is for Invoice or Credit notification;*
- *number of the refunded invoice номер на сторнирана фактура – if the entry is for Invoice or Credit notification;*
- *reason for issue – in case if entry is for refund receipt or Credit notification.*

79H (121)   READ A FIRMWARE BLOCK

Data area:	***<Address>,<Bytes>***
Response*:*	***Data***
Address	Start address (relative to the firmware start): hexadecimal number between 00000h and 6FFFFh.
Bytes	Number of bytes to return, decimal (between 1 and 64).
Data	The hexadecimal contents of the requested fiscal memory block (2 characters for each data byte).

The command returns the contents of a part of the firmware. To read the entire firmware, it needs to be executed repeatedly. The command is available in service mode only!

7AH (122)   OPEN A SERVICE RECEIPT FOR 90-DEGREE ROTATED TEXT

Data area:	No data
Response:	***RotRec***

RotRec   The sequential number of the open 90-degree rotated receipt for the day. 4 bytes without a sign.

The command opens a service receipt where 90-degree rotated text can be printed.
The command will not be executed, if:
- There is an open receipt (service or fiscal).
- The printer is out of paper.
- The clock is not set.

7BH (123)   PRINT 90-DEGREE ROTATED TEXT

Data area:	***<Text>***
Response:	No data

Text   The contents of the next line of text we would like to print. Its length is up to 100 characters. Parts of the text can be printed with bold (Bold) and underlined (Underline) attributes. They are enabled and disabled as follows:
- **<Tab>B**   Starts bold printing.
- **<Tab>b**   Stops bold printing.
- **<Tab>U**   Starts underlined printing. Can be used as a horizontal divider line in a table.
- **<Tab>u**   Stops underlined printing.
- **<Tab>O**   Starts overlined printing. Can be used as a top horizontal divider line in a table.
- **<Tab>o**   Stops overlined printing.
- **<Tab>A**   Inserts a start vertical line for tables.
- **<Tab>Z**   Inserts an end vertical line for tables.
- **<Tab>T**   Adds a zero (non-printable) line. Used to print a horizontal line at the start of the table (before the first rotated line). The following characters are not printed, however, if the "underline" attribute is enabled, a line with a thickness of 2 dots is printed.

The command is used to print 90-degree rotated text. Up to 18 lines of text can fit on the paper tape (12 on a narrow paper tape). The lines of text sent are accumulated in the printer memory in the order sent. If the command is executed more than thirteen times after the receipt is opened, the accumulated information is printed and the printer waits for new lines of text or command **124** (close the receipt). When the information is printed, the printer detects the longest sent line and adjusts the remaining lines to the same length.
If more than 18 (12) lines are sent, more than one column of text is printed. There is no gap between the columns, which makes possible to print lines of unlimited length with properly formatted data.

The command will not be executed, if rotated service text print receipt is not open.

7EH (124)   CLOSE A SERVICE RECEIPT FOR 90-DEGREE ROTATED TEXT

Data area:	No data
Response:	***<RotRec>***

RotRec   The sequential number of the closed 90-degree rotated receipt for the day. 4 bytes without a sign.

The command closes the receipt. If there are any pending lines, they are printed automatically before the receipt is closed.

The command will not be executed, if rotated service text print receipt is not open.

80H (128)   SERVICE RAM RESET

Data area:	No data
Response:	No data

The command resets the printer RAM and then automatically restarts the printer. After it is executed, the clock needs to be set using command **61**, which makes a RAM reset record in the fiscal memory with the set date and time.
The command is allowed only with a service jumper installed.
The fiscal memory has space for 100 RAM reset records.

85H (133)   SERVICE-DISABLED PRINTING

Data area:	*<Disable>*
Response:	No data

Disable One byte with the following allowed values:
  '0'   Printing is enabled.
  '1'   Printing is disabled.

The command is allowed only with a service jumper installed. When printing is disabled, the printer executes all actions, including EJ store operations, but does not print anything on paper. All sent data are correctly accumulated in the printer registers, records are made in the fiscal memory and data are sent to the NRA, as appropriate.
The idea is to disable printing and send commands at high speed to test the printer and EJ which would be slowed down tens of times by printing.
When the printer is powered on, printing is always enabled.

86H (134)   SERVICE EJ MAINTENANCE

Data area:	*<Format>*
Response:	*<Result>*

Format One byte with a value of 'F'.
Result One byte with a value of '**P**' (success) or '**F**' (error).

The command is allowed only with a service jumper installed. Used for initial EJ formatting. Allowed only for a non-fiscally registered printer or an unformatted EJ. The command will not be executed, if the EJ has already been formatted, even in service mode (since it would destroy any data accumulated in it). If a new empty EJ is installed, it will be assigned a sequential number and enabled for operation, however, after that, the old EJ will be write-protected and can be used only to print and read reports.

87H (135)   GPRS MODEM TEST

Data area:	*<Cmd[,<PIN]>]*
Response:	*<Result>,<Data>*

Cmd   One byte with a value of '**M**'.
PIN   If the mobile carrier card requires a PIN, it is set here.

Result One byte with a value of '**P**' (success) or '**F**' (error).
Data   If it is successful, returns data on the modem, card and connection established. If it fails, returns an error code and a short description.

If the modem is busy (sending data) when the command is sent, it may take longer than usual to complete—it will wait for the modem to complete its task.

90H (144)   SERVICE INITIALISATION OF THE TAX TERMINAL

Data area:	*<Text>*
Response:	*<Resp>*

The data in this command are used for the tax terminal—to set it up and read data from it. The command is used to load all data required for the operation of the built-in terminal. The printer carries out additional actions only in the following cases:

- Successful printer registration and deregistration with the NRA.
- Successful change of the NRA data.
- Successful service agreement registration.

The command is disabled before the fiscal registration of the printer.

The printer verifies the status of the tax terminal and does not allow fiscal receipts to be issued, if the printer is fiscally set up but not registered.

FISCAL PRINTER CHARACTER SET

	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
0_				0	@	P	`	p	А	Р	а	р	А	Р	а	р
1_			!	1	A	Q	a	q	Б	С	б	с	Б	С	б	с
2_			"	2	B	R	b	r	В	Т	в	т	В	Т	в	т
3_			#	3	C	S	c	s	Г	У	г	у	Г	У	г	у
4_			$	4	D	T	d	t	Д	Ф	д	ф	Д	Ф	д	ф
5_			%	5	E	U	e	u	Е	Х	е	х	Е	Х	е	х
6_			&	6	F	V	f	v	Ж	Ц	ж	ц	Ж	Ц	ж	ц
7_			'	7	G	W	g	w	З	Ч	з	ч	З	Ч	з	ч
8_			(	8	H	X	h	x	И	Ш	и	ш	И	Ш	и	ш
9_			)	9	I	Y	i	y	Й	Щ	й	щ	Й	Щ	й	щ
A_			*	:	J	Z	j	z	К	Ъ	к	ъ	К	Ъ	к	ъ
B_			+	;	K	[	k	{	Л	Ы	л	ы	Л	Ы	л	ы
C_			,	<	L	\	l	|	М	Ь	м	ь	М	Ь	м	ь
D_			-	=	M	]	m	}	Н	Э	н	э	Н	Э	н	э
E_			.	>	N	^	n	~	О	Ю	о	ю	О	Ю	о	ю
F_			/	?	O	_	o		П	Я	п	я	П	Я	п	я

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APPENDIX 2

FISCAL COMMAND LIST BY CODE IN ASCENDING ORDER

HEX	DEC	FUNCTION
20h	**(32)**	Extended information on the last error
21h	**(33)**	Clear the display
22h	**(34)**	Return or print service agreement information
23h	**(35)**	Show text on the lower line of the display
24h	**(36)**	LAN setting
25h	**(37)**	Read NRA data
26h	**(38)**	Open a service receipt
27h	**(39)**	Close a service receipt
29h	**(41)**	Store the settings and switches in the flash memory
2Ah	**(42)**	Print free text in a service receipt
2Bh	**(43)**	Set the HEADER, FOOTER and print options
2Ch	**(44)**	Paper feed
2Dh	**(45)**	Paper cut
2Eh	**(46)**	Print a refund (storno) receipt.
2Fh	**(47)**	Show text on the lower line of the display
30h	**(48)**	Open a fiscal (customer) receipt
31h	**(49)**	Enter a sale
32h	**(50)**	Tax rates set during the respective period
33h	**(51)**	Subtotal
34h	**(52)**	Enter and display a sale
35h	**(53)**	Calculate a sum (Total)
36h	**(54)**	Print free text in a fiscal receipt
38h	**(56)**	Close a fiscal receipt
39h	**(57)**	Customer information on an extended receipt (invoice)
3Ah	**(58)**	Sale of a programmed PLU
3Ch	**(60)**	Terminate (cancel) a fiscal receipt
3Dh	**(61)**	Set the date and time
3Eh	**(62)**	Read the date and time
3Fh	**(63)**	Show the date and time on the display
40h	**(64)**	Last fiscal record information
41h	**(65)**	Information on the sums for the day
42h	**(66)**	Set the allowable invoice number range
44h	**(68)**	Number of available fields in the fiscal memory
45h	**(69)**	Daily financial report with or without reset
46h	**(70)**	Service deposit or withdrawal
47h	**(71)**	Print diagnostic information
48h	**(72)**	Fiscal registration
49h	**(73)**	Detailed fiscal memory report by record number
4Ah	**(74)**	Obtain the printer status
4Bh	**(75)**	Force suppressed receipt printing
4Ch	**(76)**	Fiscal transaction status
4Fh	**(79)**	Summary fiscal memory report by record date
50h	**(80)**	Beep
51h	**(81)**	Obtain the voltage and printing head temperature
53h	**(83)**	Set the decimal digits, currency and enabled tax rates
54h	**(84)**	Print a barcode
55h	**(85)**	Set the additional payment type names
56h	**(86)**	Read the last fiscal record date

57h	(87)	Program a department name
58h	(88)	Obtain the accumulated sums for a department
59h	(89)	Program the production test area
5Ah	(90)	Read diagnostic information
5Bh	(91)	Program the Unique Printer ID and FP ID
5Ch	(92)	Print a divider line
5Dh	(93)	Obtain data on the discounts and mark-ups for the day
5Eh	(94)	Detailed fiscal memory report by record date
5Fh	(95)	Summary fiscal memory report by record number
61h	(97)	Read the tax rates
62h	(98)	Set the UIC
63h	(99)	Read the set UIC
64h	(100)	Show free text on the display
65h	(101)	Set an operator password
66h	(102)	Set an operator name
67h	(103)	Current receipt information
69h	(105)	Operator report
6Ah	(106)	Open the drawer
6Bh	(107)	PLU definition and report
6Ch	(108)	Extended daily financial report (with PLU printout)
6Dh	(109)	Print a duplicate receipt
6Eh	(110)	Additional information on the day
6Fh	(111)	PLU report
70h	(112)	Obtain operator information
71h	(113)	Obtain the last printed document number
72h	(114)	Obtain information on a fiscal record or period
73h	(115)	Program a logo graphic
74h	(116)	Read a fiscal memory block
75h	(117)	Extended daily financial report with department printout
76h	(118)	Extended daily financial report with department and PLU printout
77h	(119)	EJ maintenance—read, print and information
79h	(121)	Read a firmware block
7Ah	(122)	Open a service receipt with 90-degree rotated text
7Bh	(123)	Print 90-degree rotated text
7Ch	(124)	Close a service receipt with 90-degree rotated text
80h	(128)	Service RAM reset
85h	(133)	Temporary service-disabled printing
86h	(134)	Service EJ maintenance
87h	(135)	GPRS modem test
90h	(144)	Initialise and read data from the tax terminal

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APPENDIX 3

MAP OF PAYMENT TYPES

Payment types map Fiscal Printers type 2

NAME / FW default	Programmable	Subcommand	NRA register
1. Cash payment (default)	fixed	"P"	"Cash"
2. Credit payment	fixed	"N"	"Credit/debit cards"
3. Check payment	fixed	"C"	"Check"
4. Debit card payment	fixed	"D"	"Credit/debit cards"
5. Programmable payment type 1	programmable	"I"/"i"	"Reserve 1" / NHIF*
6. Programmable payment type 2	programmable	"J"/"j"	"Reserve 1" / NHIF*
7. Programmable payment type 3	programmable	"K"/"k"	"Reserve 1" / NHIF*
8. Programmable payment type 4	programmable	"L"/"l"	"Reserve 1" / NHIF*
9. Coupons	programmable	"m"	"Coupons"
10. External coupons	programmable	"n"	"External coupons "
11. Packing	programmable	"o"	"Packing"
12. Internal service	programmable	"p"	"Internal service"
13. Damages	programmable	"q"	"Damages"
14. Bank transfers	programmable	"r"	"Bank transfers"
15. Check	programmable	"s"	"Check"

* NHIF – National Health Insurance Fund

Payment types map Fiscal Printers type 3 and 31 (Fuel Stations)

NAME / FW default	Programmable	Subcommand	NRA register
1. Cash payment (default)	fixed	"P"	"Cash"
2. Credit payment	fixed	"N"	"Credit/debit cards"
3. Check payment	fixed	"C"	"Check"
4. Debit card payment	fixed	"D"	"Credit/debit cards"
5. Programmable payment type 1	programmable	"I"/"i"	"Reserve 1" / Delayed payment
6. Programmable payment type 2	programmable	"J"/"j"	"Reserve 1" / Delayed payment
7. Programmable payment type 3	programmable	"K"/"k"	"Reserve 1" / Delayed payment
8. Programmable payment type 4	programmable	"L"/"l"	"Reserve 2" / Internal consumption
9. Coupons	programmable	"m"	"Coupons"
10. External coupons	programmable	"n"	"External coupons "
11. Packing	programmable	"o"	"Packing"
12. Internal service	programmable	"p"	"Internal service"
13. Damages	programmable	"q"	"Damages"
14. Bank transfers	programmable	"r"	"Bank transfers"
15. Check	programmable	"s"	"Check"

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APPENDIX 4

LIST OF EXTENDED INFORMATION ON THE LAST ERROR MESSAGES

Value	Description
-150001	Syntax error
-150002	Invalid command
-150003	Not permited
-150010	Printer is blocked
-150100	Clock not set
-150101	Out of paper
-150102	Journal error
-150103	Arithmetic overflow
-150104	Invalid password
-150105	Less than 2 lines in header
-150106	Invalid serial number
-150107	Invalid bar code data
-150108	Invalid request
-150109	Cutter error
-150110	Presenter error
-150111	Data contain 'FISCAL'
-150112	Wrong invoice number
-150113	UNP missing
-150114	UNP counter overflow
-150115	UNP must increase
-150116	Not logged in
-150117	Currency not defined
-150200	Receipt is open
-150201	No receipt is open
-150202	Receipts after Z-report
-150203	No receipts after Z-report
-150204	More than 24 hours without Z-report
-150205	Date and time before last FM record
-150206	Date and time before last JNL record
-150207	Probably wrong date and time
-150209	Cannot read from el. journal
-150210	Cannot write to el. journal
-150211	Cannot format el. journal
-150212	Cannot open el. journal document

-150213	No access to external display
-150214	Journal near end
-150215	Cannot format valid el. journal
-150216	El. journal number too big
-150217	No data for document found
-150218	Journal paper width different
-150231	Journal buffer full
-150232	Journal buffer write failed
-150300	Fiscal memory not formatted
-150301	Serial number not set
-150302	VAT number not set
-150303	VAT rates not set
-150304	All VAT rates disabled
-150305	Printer is not fiscalized
-150306	Printer is fiscalized
-150307	No records in fiscal memory
-150308	Fiscal memory not responding
-150309	Too many records in fiscal memory
-150310	Serial number already set
-150311	Fiscal memory is read only
-150312	Fiscal memory not found
-150313	Fiscal memory read error
-150314	VAT rates or decimals changed
-150400	PLU does not exist
-150401	Department does not exist
-150402	Invalid VAT group
-150403	VAT group is disabled
-150404	Too many sales in receipt
-150405	Payment or discount/mark up done
-150406	Negative sum or quantity
-150407	Discount larger than price
-150408	Void of non-existing sale
-150409	Payment is started
-150410	Payment type not programmed
-150411	Total is already paid
-150412	Total is not entirely paid
-150413	Not enough cash available
-150414	Cash payment only
-150415	Change not allowed

-150416	Non-zero sum for this operator
-150417	Non-zero sum for this PLU
-150418	Non-zero sum for this department
-150419	No free PLUs for programming
-150420	Too many lines in receipt
-150421	No receipt copy data
-150422	Non-zero sum for this payment type
-150423	PLU is sold in this receipt
-150424	Invalid fuel PLU
-150425	Fuels may be sold using PLU only
-150426	Not gas station
-150427	More than 200 departments with sales
-150428	No data for receipt copy
-150429	Fuel storno not allowed
-150430	Invalid storno date and time
-150431	Zero price
-150432	Too many fuel sales in receipt
-150433	Already paid non-cash
-150434	Payment transaction denied
-150435	Non-zero sums
-150436	No tip allowed
-150800	Printer is not registered
-150801	No invoice number
-150802	Invoice number outside interval
-150803	No invoice numbers interval programmed
-150804	No customer data entered
-150805	Customer data already entered
-150806	Not an invoice
-150807	Tax terminal error
-150808	GPRS-modem not responding
-150809	GPRS-modem busy
-150810	No SIM-card in modem
-150811	SIM-card different from registered one
-150812	Outdated petrol station info
-150813	No starting data command
-150819	This is an invoice