

Commands protocol

Commercial universal fiscal printer

Version ~2.00

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1. Concepts and used terms

1.1. Interaction protocol

Find bellow list of concepts, commands and interfaces that are used to support proper interaction the fiscal printer and external program (device).

1.2. Work mode of fiscal registers

Control Mode	Stand-alone (by keyboard)	By PC
State of registers	Error mode	
	Service mode	
	Fiscal mode	

Control Mode: who set command for device (one of)

State of registers: current state of devise (in various combination)

Non fiscal mode

* number of Z report always 0

Stand-alone mode

To switch to the stand-alone mode it is necessary to press paper feed button of the receipt tape before turning on the fiscal printer, and do not release the button until the message «Start Up HM» appears.

The rules of Stand-alone mode:

- In failure mode all the modes that work with X,Z-reports and item reports are locked;
- In non-fiscal mode all periodical reports are locked.

This mode gives access to the following submodes

1) Reports (the modes require entering password):

- a) X;
- b) Z;
- c) periodical reports;
- d) sold items;
- e) fiscal printer status.

2) Tests:

- a) hardware tests;
- b) software versions;
- c) service maintenance;

3) Set-up communication speed by default.

Service operating mode

By setting switch of the fiscal block to the appropriate position the fiscal printer pass into the service mode and the monitor display show message «Service mode». This mode is used to execute operations that are not allowed in basic mode.

1.3. Type of receipt

There is next type of receipt

	Text receipt	For print any text information and addition report
	Sale receipt	Bill sum ≥ 0
	Refund receipt	Bill sum ≤ 0
	In/Out receipt	

1.4. Item attributes

Every item in the fiscal printer database contains special parameters that are named by attributes. Item attributes are the following: "item code", "item name", "tax group", "department number". It is not possible to change item attributes when the item was sold (or returned). It could be done only after executing Z-report.

Item code

This item attribute contains 14-digit code. As a rule this attribute corresponds to the corresponding attribute of the external program data base, that works with the fiscal printer. This attribute uniquely identify the item (it means that the fiscal printer database cannot contain two different items with the same item code).

Item index

It is the hidden item attribute that uniquely determine location an attribute in the fiscal printer item database. Fiscal printer assigns and stores value of the item index when programming item in the fiscal printer. By using item index it is possible to receive information about programmed item (command 26h). Index of specific programmed item may be determined with the help of command 25h.

Item name

This item attribute contains the item name. Maximum length of the attribute – 75 alphanumeric characters (semicolon character “;” cannot be used in item name). If the length of the item name does not exceed 25* characters, it will be printed in one line while item selling; it will be printed in 2 lines if item name does not exceed 50* characters; otherwise it will be printed in 3 lines

Notes:

- * -default value;
- after character LF (0Ah) the name outputs from a new line.

References:

- Command 27h: Programming of the fiscal printer parameters.

Price

This item attribute contains price of the item unit. It is set in the «Sale» command.

The value of price can be 0 but can't be <0.

Tax group

This item attribute contains tax group of the item value added tax (VAT). Attribute “tax group” may take the values from 0 to 4.

0 corresponds to the tax group A,

1 - to the tax group Б,

2 - to the tax group B,

3 - to the tax group Г,

4 - to the tax group Д.

References:

- Command 47h: Tax rates programming
- Command 48h: Tax rate reading

Department number

This attribute attaches an item to the store department number. It may take the values from 0 to 99.

Measurement unit

Text notation of the item measurement unit. It is printed in the receipt after quantity of the sold item.

1.5. User logotype

Fiscal printer gives possibility to print customer logotype in the header of the receipt.

To print logotype:

- load it into temporary buffer of the fiscal printer (command 29h);
- move it from temporary buffer to logotype buffer (command 31h);
- permit to print it in a receipt (command 27h).

Command 80h can be used to inquire available logotype size.

1.6. Print barcode

The fiscal printer also gives possibility to print barcode in fiscal receipt. Command 6Fh provides creation of the barcode. The command uses the following two parameters: mask of one horizontal line of the barcode pattern and the height of the printed pattern. Mask must be prepared in external program. Mask depends on the type of the printed barcode (EAN13, etc.).

1.7. Item programming

To execute an item sale (return) operations it is necessary to enter information about an item into the fiscal printer internal items database. The purpose of this operation is to program an item attributes into the fiscal printer by command 24h. While executing this command the fiscal printer put information about an item into internal database and assigns it value of the item index that uniquely identify physical location of an item in the database.

1.8. Item sale

Only previously programmed items can be sold in fiscal receipt (command 64h). The command uses item code (that is necessary to extract item description from the data base), price and quantity of the item.

1.9. Type of payment

Fiscal printer supports 10 types of payment. Besides of cash type of payment it can use other types of payment. The names and properties of such types should be programmed (see. command 2Dh).

1.10. Passwords of commands and functions

Name	Number of characters	Comments
PWD_NONE	6	The password field does not verified when the command executed
PWD_PROG	6	Programming mode
PWD_REPR	6	Reports mode (including Stand-alone mode***)
PWD_ADM	6	Administrator password allows to nullify all other passwords *
PWD_SERVICE	6	Password for service maintenance
PWD_FISCAL	6	Access to the changed parameters of the fiscal memory * Does not verified in non-fiscal mode Is defined/changed by the «fiscalization» command
PWD_OPR	6	Operator password **

Default value is “000000”

* In service mode does not verified

**The command parameters contain operator number

*** It is possible to enter only digit passwords in off-line mode

1.11. Kinds of taxes

It is allowed to simultaneously use in the receipt item/service prices with included tax and prices with excluded tax.

For use additional tax implemented term – secondary tax.

При задании налога указывается secondary tax (or «-1» when no link).

Taxes: main and secondary tax:

Type	Main tax	Secondary tax
0.	Disable	no link
1.	Include	- no link - Tax 2 Include (Type 4)
2.	Exclude	- no link - Tax 2 Exclude (Type 5)
3.	Tax free	- no link - Tax 2 Include (Type 4) - Tax 2 Exclude (Type 5)
4.	Tax 2 Include	- Include (Type 1) - Tax free (Type 3)
5.	Tax 2 Exclude	- Exclude (Type 2) - Tax free (Type 3)

The secondary tax always has link with tax group!!!!

1.12. Receipt copies

It is possible to print copy of the closed fiscal receipt*. Number of the copies is not restricted.

* Comments and barcode are not included into the receipt copy.

1.13. Print of the user information (comments)

The user can create own report by non-fiscal receipts. Such user's reports can include comments, periodic reports etc.

References:

- Command 60h: Opening non-fiscal receipt,
- Command 61h: Print text,
- Command 65h: Closing a receipt.

1.14. Receipt cancellation

Opened fiscal receipt can be cancelled at any moment from start to end. Use the command "Cancellation" (6Bh) with parameter "all receipts" to do it.

1.15. Sales cancellation

If it is necessary to cancel any selling operation within a receipt, use the cancellation transaction. Start it to do with the command Cancellation (6Bh) (use parameter “Start cancellation mode”). After that you should execute those commands that you want cancel inside receipt. And then you should execute the command Cancellation (6Bh) with the parameter “Execute cancellation” (or with the parameter “Reject cancellation” if it was make a decision to refuse sales cancellation mode).

* Switching off the power will return to the previous state.

1.16. Self-testing

When switching on

When printer turns on it begins self-testing. At that moment the phrase “Start Up” is displayed on the screen. And at the bottom you may see «[current test]/[total number of tests] [% of current test]».

Result of the testing may be one of the following:

- **Normal termination**
- **Logical error** – executing of the basic functions is locked
- **Data validity error** –nullification failure procedure is executed
- **Hardware error** – fiscal printer is locked

List of tests by order

No	Test name	Response of the fiscal printer in the case of error
1	Checksum of the program memory	Locking
2	Chip of the flash-memory	Locking
3	Launching of the print device	Locking
4	Is reinitialization necessary	Abnormal nullification
5	Validity of data in RAM	Abnormal nullification
6	Genuinity of the fiscal memory	Abnormal nullification
7	Data memory	Abnormal nullification
8	Items database	Abnormal nullification
9	Sales database	Abnormal nullification
10	Start of the last receipt	Abnormal nullification
11	Start electronic journal	Abnormal nullification
12	Print buffer	Abnormal nullification
13	Start the text messages	Abnormal nullification

In case of locking:

- executing of the tests terminates,
- error message outputs to the indicator,
- repeated beeps are heard. Number of beeps corresponds to the failed test number.

During a work

- Clock
- Data checksums

Before execution of current command fiscal printer does some verification. This verification tests if clock works properly. During this test the clock value is compared with date-time of the last receipt (Z-report). If the current clock value is less – the previous values are reset automatically and the corresponding bit in the status is activated. Changing of the clock value should be done after Z-report.

Note: If the clock value will not be adjusted, opening of the session/fiscal receipt is blocked

References:

- Command 20h: Date and time setting.

1.17. Memory allocation of articles and control tape

Memory blocks, allocated for control journal tape and articles, are assigned dynamically.

Free/maximum amount of memory were calculated by following restrictions:

- article records (article name contains 75 characters *);
- receipts (receipt contains information about 16 sales and additionally about one type of payment **).

* Actually it is possible to program more items if item name is less than 75 characters (this dependency is proportional).

** Increasing number of receipt operations leads to increasing memory consumption.

1.18. Fiscal Area

Size of fiscal area calculate on next default parameters:

	Name	count
1.	serial number	1
2.	Turn to fiscal mode	1
3.	VAT Table	10
4.	fiscal number	10
5.	tax/identification number	10
6.	Reports	2000*

* all tax is exclude

Limitation only by free space.

1.19. User information

Permanent memory area contains 100 bytes.

It is intended for arbitrary usage.

It is not initialized.

100,000 Program/Erase Cycles Per Page Minimum

1.20. Service journal

Array of strings with dates of these strings creation. It is used to trace the fiscal printer operational capabilities

It is not initialized.

1.21. Electronic journal

It is used to determine a defect causes. It is a list of last executed commands/events. Contains the following information:

- command/event code;
- the fiscal printer status before the command execution;
- result of the command execution.

It is not initialized.

1.22. Temporally buffer

The data value for executing same command overflow receiver/transmitter buffer (example “Set Tax”, “Set User Logo”). The data will sent partition. When you write at zero position will init buffer by this operation. During execute next operation write, device check buffer is init for this operation. If do not will generate error message.

1.23. Data time

Data-time setting limitation:

1. Must not set data previous data of last fiscal record (Z report, error report...)
2. When shift is opened you have not set date-time previous then current (set in register)
3. In fiscal mode you have not change data
 - Exception
 - i. Service mode
 - ii. Аварийный режим

References

- Service operating mode
- Command 20h: Set data and timeCommand 21h: Get Date and time
- Appendix A. List of commands their passwords and allowed states

1.24. The rules of sum rounding

In according of «Protocol decision of Government commissions by issue adoption electronics systems and means of control and administration goods and money turnover from [15.06.99](#) г. N 8» -

«

2.4. In rounding tax sym on value-added tax must use rules rounding value with accuracy 1 kopeck (for example , value below 0,499 kopeck is rounded to 0 kopeck, sum from 0,500 to 0,999 kopeck is rounded to 1 kopeck).

»

Comment: Rounding of negative value makes in following method:

1. take absolute value of value
2. Do rounding (of positive value)
3. Result is multiplied by “-1”

2. Description of the interaction protocol

2.1. Common concepts

Fiscal printer communicates with control device (PC) via RS 232 interface, 8 bits, without parity check, one stop-bit.

Speed by default - 9600 bauds.

Protocol type – Master (PC) / Slave (fiscal printer).

Fiscal printer never initiates connections with PC.

Fiscal printer executes commands transmitted as messages (from PC).

Messages have sequential number in order to distinguish them from each other.

Fiscal printer accepts messages from the PC and send back response messages that have sequential number of the initial messages..

PC waits for response message in order to send the next message.

If the fiscal printer receives message with the sequential number that is equal to the number of the previous message, it ignore this message and repeats transmission the last sent response message.

2.2. Timeout

In a normal operation with PC the fiscal printer responds after 60ms. PC waits for 500 ms the fiscal printer response and when the time expires it initiates timeout status. After that PC can repeat the message with the current sequential number.

In depend of command executing state, will be:

1. prevision command is received and executed, PC has missed answer, then device will resend answer on prevision command
2. prevision command is not received – device will execute command and send answer

If timeout arises next time PC recognize this event as a fatal error status.

2.3. Single bytes

The protocol uses single bytes to process pauses and errors.

NAK (value 15h)

It is sent by the fiscal printer if checksum of the received message is not correct. After receiving NAK it is necessary to repeat the message with the next sequential number.

SYN (value 16h)

Sometimes a command processing may take significant amount of time. In such cases the fiscal printer sends the message SYN every 60ms until the response message will be ready.

2.4. Messages

Message format:

a) from PC to the fiscal printer

< SOH ><len><seq><cmd><pwd><data><ENQ><bcc><ETX>

б) from the fiscal printer to PC (response message).

< SOH ><len><seq><cmd><error code><data><EOT><status><ENQ><bcc><ETX>;

where:

Field	Description
< SOH >	Preamble (message opening bracket) length: 1 byte value: 01h
<len>	Message length. Is equal to the number of bytes between <01> and <bcc> plus 20h. length: 1 byte value: 20h – 7Fh
<seq>	Message sequential number. length: 1 byte value: 20h - 7Fh The fiscal printer writes received <seq> into the response message.
<pwd>	Password. length: 6 bytes value: 20h – FFh The fiscal printer checks password depends on a command code that is passed in the message. There are the following password types: • report password; • programming password; • operator password (sale password); • administrator password. Some commands do not require password. That is why if such commands was transmitted in a message with passwords, they will not be verified. In service mode the fiscal printer does not verify administrator password. List of passwords may be found in Appendix A
<cmd>	Command code. length: 1 byte value: 20h - FFh The fiscal printer writes received <cmd> into the response message.
<error code>	Error code length – 4 байта value – (see. Appendix B)

Field	Description
<data>	Data. length: 0 – 120 value: 20h – FFh, 0Ah Format and length of the <data> field depends on a command. Field <data> may be null (that is does not contain any byte) or may contain one or mode arguments. Every argument ends with character ';' (3Bh). Argument types are listed in the Table 2. When error occurred a batch message is returned with zero length of the field data and with corresponding error code..
<EOT>	Separator. length: 1 byte value: 04h
<status>	Field with current status of the fiscal printer. length: 6 bytes value: 80h – FFh (see Table 1)
<ENQ>	Postamble (message close bracket) length: 1 byte value: 05h
<bcc>	Checksum – it is two lower bytes of the sum of the message bytes (only part of the message beginning with the first byte after preamble (SOH) and ending with postamble (ENQ), is summarized). range of values: 0000h-FFFFh. length: 4 bytes Every digit of the checksum is transmitted as a symbol that is equal value of the digit plus 30h. For example, value 1AE3h is transmitted as a sequence of characters with codes 31h, 3Ah, 3Eh, 33h.
<ETX>	Terminator (terminal byte) length: 1 byte value: 03h

An example of a command:

01 37 38 20 30 30 30 30 30 30 3B 32 38 30 34 30 37 3B 31 31 34 31 3B 05 30 34 36 31 03

Table 1. Description of the <status> field bytes

Bit No	Description
Byte S0 – general status	
7	Always 1
6	Not defined
5	If set – it is necessary to reload fiscal printer in order to coming into effect all done settings
4	If set – print device is in fault state
3	If set – display is not connected
2	If set – date and time was not set since the last abnormal nullification of the RAM
1	If set – document buffer is near to end (90% completion)
0	If set – the fiscal printer is in service mode
Byte S1 – printer status	

Bit No	Description
7	Always 1
6	If set – print buffer is do not free (Has non printed data)
5	If set – manual paper feed
4	If set – printer cover is opened
3	If set – control journal tape is over
2	If set – receipt tape is over
1	If set – control journal tape is near to end (for Datecs FP-T260)
0	If set – receipt tape is near to end (for Datecs FP-T260)
Byte S2 – receipt status	
7	Always 1
6	Not defined
5	Not defined
4	If set – refund receipt is open – if bill close, previous bill was refund bill
3	Current state of the receipt (see section «Receipt statuses»)
2	
1	
0	
Byte S3 – switches status	
7	Always 1
6	Not defined
5	Not defined
4	Not defined
3	Not defined
2	Not defined
1	MCardError
0	SIMError
Byte S4 – fiscal memory	
7	Always 1
6	If set – fiscal memory has corrupted
5	Not defined
4	Not defined
3	If set – the fiscal memory overflows
2	If set – the fiscal memory has space for less than 30 reports
1	If set – the fiscal printer has fiscalized
0	If set – factory number has already programmed
Byte S5 – fiscal memory	
7	Always 1
6	If set – It is less than 60 minutes to the end of shift (24 hours)
5	If set – It is necessary to correct a clock
4	If set – shift has opened

Bit No	Description
3	If set – alarm
2	If set – low battery
1	Not defined
0	Not defined

2.5. Check message

The checking makes in following:

1. Directly, during receive, making check of format message
2. After it received whole message – check CRC of message.
3. Compare number of message (if it is different will update internal counter)
4. Look for code of message in code list
5. Check data field for format

Error handle:

The registers acknowledge for error only on point 2-5, in other hand:

1. When error found in format message, receiver will set at state “Wait for SOH”
2. When it received SOH, in body of message, the receiver will start receive new message. Previous message is ignored.

2.6. Fiscal printer states

By executing commands the fiscal printer passes from one status into another providing user program information about functions it executed, executes now and may execute after accepting a new command. This information may be received by external program from the <status> field (see Table 1).

List of statuses is present in Appendix A.

2.7. Receipt statuses

Bit field				Value	Status
S2.3	S2.2	S2.1	S2.0		
0	0	0	0	0	Document is closed
0	0	0	1	1	Receipt header is printed
0	0	1	0	2	Sale operation has performed
0	0	1	1	3	Payment status
0	1	0	0	4	Closing
0	1	0	1	5	Free text document is opened
0	1	1	0	6	Discount/extra charge was done
0	1	1	1	7	Open in/out receipt
1	0	0	0	8	
1	0	0	1	9	CANCELLATION mode

2.8. Initial state

In this state: date and time are set, fiscal memory number is programmed, identification number is set. These commands are executed in the fiscal printer manufacturer. From this state the fiscal printer passes to the fiscal memory formatting state.

2.9. Non-fiscal (training) mode

The fiscal printer is in this state up to its fiscalization. All receipts printed in this mode will be marked as non-fiscal. Transition from this mode to the fiscal state mode is done with the help of fiscalization commands.

2.10. Fiscal mode

It is possible to do sales and print fiscal receipts in this mode. Before fiscalization registration number is set and the command of the fiscal printer fiscalization is executed. It is not possible to exit from the fiscal mode.

2.11. Device fiscalization

In order to setup the device into fiscal mode it is necessary to meet the following conditions:

- shift is close;
- factory number has programmed;
- !!!the following values established in next sequence:
 - tax rate;
 - fiscal number;
 - identification/tax number.

During the device re-registration “Password to change fiscal memory parameters” is used. See Appendix A.

* In non-fiscal and service modes password is not verified.

2.12. Shift

Shift is a period of the fiscal printer functioning starting from registration of the first settlement operation after executing Z-report and ending with the next Z-report;

The first clearing transaction is fiscal receipt opening operation.

In fiscal mode duration of the shift cannot exceeds 24 hours. Before 1 hour of the shift termination the corresponding flag is set in the status; and after expiration 24 hours the fiscal receipt opening operation is locked (all other commands functioning without any restrictions).

2.13. Fatal error of the fiscal printer

The fiscal printer passes into this state in the case of serious technical failure or data corruption in the fiscal memory. Please, repair the fiscal printer in order overcome this problem.

3. Commands description

3.1. Data types (arguments)

Table 2. Description of argument types

Symbol	Name	Length*	Description
S	String	Length <= Size (less or equal)	codes 0x20-0xff (excluding ';') Arbitrary text string
F	String fixed	Length == Size	The same as «S»
X	Extended String	Length <= Size	The same as «S» '\n'-carry line
N	Numeric	Length <= Size	'0'-'9', '-' Integer Example: 123->"123"
M	Money	Length <= Size	'0'-'9', '.', '-' 2 digits after decimal point Example: 123.45->"123.45"
Q	Quantity	Length <= Size	'0'-'9', '.' 3 digits after decimal point Example: 123.456->"123.456"
H	Hexadecimal	Length == Size	'0'-'9' 'A'-'F' Every data byte is coded by 2 symbols Example: array {0x01,0x12,0x3F} -> "01123F"
P	Percent	Length <= Size	'0'-'9', '.', '-' 2 digits after decimal point Example: 12.34%->"12.34"
D	Date	6 chars	DDMMYY
T	Time	4 chars	HHMM

- Argument length relatively to the size indicated in command description.

3.2. Initialization commands

Command 20h: Set data and time

Message arguments:

N	Description	Type	Size (bytes)	Notes
1.	New date	D		Format: DDMMYY
2.	New time	T		Format: HHMM

Example: 30 may 2006y 14:30 transmitted as "300506;1430;"

Restriction – It is impossible to set new date in the fiscal mode.

Response message arguments: No.

Command 21h: Get Date and time

Message arguments: No.

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Current date	D	6	Format: DDMMYY
2.	Current time	T	4	Format: HHMM

Command 22h: Programming document header and footer

Message arguments:

N	Description	Type	Size (bytes)	Notes
1.	String number	N	2	0-9-header 10-13-footer
2.	Text*	S	38/40	Depends on printer type
3.	Double width	N	1	

Response message arguments: No.

-
- * Zero length string does not print and the next strings do not print too.

References:

- Command 80h: Software version.

Command 23h: Reading document header and footer

Message arguments:

N	Description	Type	Size (bytes)	Notes
1.	String number	N	2	0-9-header 10-13-footer

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Text	S	38/40	
2.	Double width	N	1	

Command 24h: Item programming

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Item code	N	14*	
2	Item name**	X	75	
3	Tax group	N	1	
4	Department number	N	2	
5	Modifier	H	2	Table 3
6	Measurement unit	F	5	Dimension designation

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Item index	H	6	

*depends of firmware

**Number of printed characters in one line is specified in the command «Programming of the fiscal printer parameters». It is within 25-34 characters.

References:

- Command 27h: Programming of the fiscal printer parameters
- Command 47h: Tax rates programming

Table 3

Bit	Value
0	1: sold by weight item (0 is always printed in the quantity)
1	Reserved
2	Reserved
3	Reserved
4	Reserved
5	Reserved
6	Reserved
7	Reserved

Example:

value “01” – quantity “2.000” will print as “2.000”

value “00” – quantity “2.000” will print as “2”

when quantity is fractional then always print fractional part

quantity “2.001” will print as “2.001” independent of state bit 0 (sold by weight item)

Command 25h: Searching item index by code

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Item code	N	14*	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Item index	H	6	

If returned value is 0xffff item code is not found

*in depend of firmware

Command 26h: Reading item parameters by index

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Item index	H	6	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Item code	N	9 (14*)	
2	Item name	S	37	
3	Tax group	N	1	
4	Department number	N	2	
5	Modifier	H	2	Table 3
6	Measurement unit	S	5	Dimension designation

References:

- Command 24h: Item adding
- Command 25h: Searching item index by code

Command 37h: Reading item parameters by code

Message:

N	Description	Type	Size (bytes)	Notes
1	Item code	N	14**	

Response:

N	Description	Type	Size (bytes)	Notes
1.	Item name	X	75	
2.	Tax group	N	1	
3.	Department number	N	2	
4.	Modifier	H	2	Таблица 3
5.	Measurement unit	S	5	Обозначение размерности

** in depend of firmware

Command 27h: Programming of the fiscal printer parameters

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Communication speed	N	9	4800-115200** 0- without change
2	Print contrast*	N	1	0 by default (2) 1-Light 2-Normal 3-Dark 4-Extra Dark
3	Document parameters	H	4	See table 4
4	Document extended parameters	H	2	See table 5
5	Cash drawer opening pulse***	H	2	
6	Cash drawer closing pulse***	H	2	
7	Number of symbols in one line of a item name	N	2	25-34 (25 by default)

Response message arguments: No..

* Print contrast takes into effect only after restarting the fiscal printer.

** There is no clearly defined gradation. If after setting parameters the fiscal printer does not respond, communication speed may be set to 9600 in stand-alone mode.

*** Actual pulse length calculated according to the formula $T = \text{field value} * 2\text{ms}$

Closing pulse must be longer than opening pulse.

Table 4.Document parameters

Bit	Value
0	Does not print advertisement at the end of the receipt
1	Switch off cutter
2	Print user logotype *
3	Execute paper feed with empty lines right up to the cutting position
4	Do not execute paper feed right up to the cutting position **
5	Always print quantity of item
6	Print number of places in a receipt
7	Print article code
8	Print quantity and price together
9	Does not nullify sale/item database
10	Not defined
11	Not defined
12	Not defined
13	Not defined
14	Not defined
15	Not defined

* If logotype does not set, flag automatically set to 0.

** Only when cutter switched on.

Table 5.Document extended parameters (only DATECS FP-T260)

Bit	Value
0	Does not print control journal tape *
1	Print reduced control journal tape
2	Use postponed print of a fiscal receipt
3	Continue print after printer recovery **
4	Does not print canceled items in delayed print
5	Not defined
6	Not defined
7	Not defined

* In fiscal mode control journal tape does not contain only reports.

** If there occurred the printer reloading, the receipt printing repeats once more.

Command 28h: Receiving the fiscal printer parameters

Message arguments: No

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Communication speed	N	9	
2	Print contrast	N	1	
3	Document parameters	H	4	
4	Document extended parameters	H	2	
5	Cash drawer opening pulse	H	2	
6	Cash drawer closing pulse	H	2	
7	Number of symbols in one line of a item name	N	2	25-34

Command 29h: Prepare for user logotype

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Line number	N	3	It is considered as an address in the image buffer. Begins from 0
2	Line content	H	48	

Response message arguments: No.

Notes: data put into temporary buffer.

References:

- Command 31h: Programming logotype

Command 31h: Programming logotype

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Size by X	N	3	
2	Size byY	N	3	

Response message arguments: No.

References:

- Command 29h: Prepare for user logotype
- Command 80h: Software version

Command 2Bh: Setup mode passwords

Message:

N	Description	Type	Size (bytes)	Notes
1.	Номер пароля	N	1	1. PROG 2. REPR 3. ADM
2.	Новое значение	F	6	

Response : no

Command 2Ch: Delete operator

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operator Number	N	4	

Response message arguments: No

Notes: when « Operator Number » is «-1» delete all operators

Command 2Dh: Setup payment parameters

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Payment number	N	2	0-9
2	Permission mask	H	2	See table 6
3	Name	S	20	

Response message arguments: No.

Table 6. Permission mask

Bit	Permission
0	Permission to use during sale
1	Permission to use during return
2	Not defined
3	Not defined
4	Not defined
5	Not defined
6	Not defined
7	Permission to change charge in cash

Table 7. Types of payment programmed in the factory

№	Name	Permission mask
0	Cash (Готівка)	Sale + return + change
1-9		Not allowed

Command 2Eh: Reading payment parameters

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Payment number	N	2	0-9

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Permission mask	H	2	See table 6
2	Name	S	20	

Command 2Fh: Setup operator parameters

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operator number	N	4*	
2	New password	F	6	
3	Name	S	20	

Response message arguments: No

*if version of firmware 2.01 Operator number will be 0-19

Command 30h: Reading operator parameters

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operator number	N	4*	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Performed sales	N	1	1- Performed sales
2	Name	S	20	

Command 2Ch: Erase operator*

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operator number	N	4	When =="-1"erase all

Response message arguments: none

*firmware 2.02 or higher

Command 32h: Programming department

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Department number	N	2	
2	Name	S	34	

Response message arguments: No

Command 33h: Reading department parameters

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Department number	N	2	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Name	S	34	

Command 34h: Add text string to temporally buffer

Message:

N	Description	Type	Size (bytes)	Notes
1.	Function	N	1	0- First string 1- Next
2.	Text	X	75	

Response: no

Command 35h: Set Reminder

Message:

N	Description	Type	Size (bytes)	Notes
1.	New password	F	6	
2.	Date of event	D		
3.	Remind before... days	N	1	
4.	Mask of event	H	1	table 7

Response: no

table 7. Mask of event

bit	Permission
0.	Remind once after power up
1.	Output message to display
2.	Output message to printer
3.	Wait key press
4.	Sound signal
5.	Reserved
6.	Reserved
7.	Reserved

Comment

- Text message will get from temporally buffer (If it not set the message if not changed)
- When output to display, first 40 chars (but no more then 2x line) output to display, other to printer
- When “Wait key press” is activated – at low line of display output «Нажмите клавишу» (“Press Key”)

Reference

Command 36h: Read Reminder

Message: no

Response:

N	Description	Type	Size (bytes)	Notes
1.	Date of event	D		
2.	Remind before... days	N	1	
3.	Mask of event	H	1	Таблица 7

3.3. Fiscal parameters setup commands

Command 40h: Fiscalization

Message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Serial number	S	11	The fiscal printer number
2.	New password	F	6	For changes of fiscal parameters

Response message arguments: No.

Notes: Serial number sent by this command must coincide with actual fiscal printer serial number recorded previously by the command 41h.

References:

- Fiscalization of the device;
- Command 41h: Programming serial number.

Command 41h: Programming serial number

Message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Serial number	S	11	

Response message arguments: No.

Command 42h: Reading serial number

Message arguments: No

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Serial number	S	11	

Command 43h: Programming fiscal number

Message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Fiscal number	S	10	

Response message arguments: No

Command 44h: Reading fiscal number

Message arguments: No

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Fiscal number	S	10	

Command 45h: Programming tax/identification number

Message arguments:

N	Description	Type	Size (bytes)	Notes
1.	ИД (Identification code of the printer)	S	12	Size 0 or 12
2.	ПН (Tax number)	S	13	Size 0 or 13

Response message arguments: No.

Command 46h: Reading tax/identification number

Message arguments: No

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Identification number	S	12	
2	ПН	S	13	

Command 47h: Tax rates programming

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Tax rate number	N	1	0-4: tax rate number
2	Tax rate type	N	2	See table 8
3	Tax value	P	5	0.00-99.99
4	Name	S	19	
5	Linked tax group*	N	2	=-1 if link is absent

Table 8 Tax rate type

value	Comments
0.	Tax prohibited
1.	Included
2.	Excluded
3.	Group that is not imposed by tax
4.	Second tax included
5.	Second tax excluded

Notes. Tax rates are programmed as packages. It is necessary to program consecutively all rates from 0 to Last. After programming last rate the whole rate package is stored into memory.

Response message arguments: No.

The count of Tax you can get from command 0x80.

Command 48h: Reading tax rates

Message arguments: No

N	Description	Type	Size (bytes)	Notes
1	Tax number	N	1	0-4

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Tax rate setup mask	H	2	See table 8
2	Tax value	P	5	0.00-99.99
3	Name	S	19	
5	Linked tax group*	N	2	

Command 49h: Set decimal point position of money

Message:

N	Description	Type	Size (bytes)	Notes
1	Quantity of decimal char	N	1	0-3

Response: no

Default value 2

Command 4Ah: *Get decimal point position of money*

Message: no

Response:

N	Description	Type	Size (bytes)	Notes
1	Quantity of decimal char	N	1	0-3

3.4. Sale commands

Command 60h: Opening free text receipt

Message arguments: No

Response message arguments: No

Command 61h: Print text

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Text	X/S*	75	

*In depend of receipt type:

- Fiscal (S)
 - Automatic carry when string exceed 34** chars
- free text receipt (X)
 - Print on all printer width*

* width depends of device model.

References:

- Command 80h: Software version.

Response message arguments: No.

Command 62h: Select paper for print **

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Paper	N	1	1. Journal 2. Customer 3. Both

*firmware 2.02 or higher

**Free text RECEIPT

Command 63h: Opening fiscal receipt

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operator number	N	3	
2	Cash desk number	N	2	
3	Receipt type	N	1	0. Sell goods 1. Refund goods 2. In-Out cash

Response message arguments: No.

Notes: Before executing the command the fiscal printer check that duration of the current shift does not exceed 24 hour. On the clock failure the shift opening is locked.

Command 64h: Selling of the programmed item

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Item code	N	14*	
2	Quantity	Q	11	Not equal 0
3	Price	M	10	May be equal 0

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operation result	M	11	

*firmware 2.02 or higher

Command 65h: Closing a receipt

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Output to a user display	N	1	When !=0 ОТРИМАНО X.XX” (RECEIVED X.XX) „РЕШТА X.XX” (REMAINS X.XX)

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Document global number	N	9	

*closing document of any type

Command 67h: Payment

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Payment type	N	1	0-9
2	Payment amount	M	11	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Amount to be paid	M	11	

Notes: State of the receipt will be changed when payment amount exceeds Total amount by receipt.

References:

- Command 2Dh: Setup payment parameters.

Command 68h: Item discount/extra charge in percents

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Discount value	P	5	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operation result	M	11	

Command 69h: Item absolute discount/extra charge

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Discount value	M	11	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operation result	M	11	

Command 6Bh: Cancellation

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operation	N	1	0. All receipt 1. Start cancellation mode 2. Execute cancellation 3. Reject cancellation 4. Execute cancellation w/o check integrity

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operation result	M	11	For „Execute cancellation” only

Description: Function 0 executed when fiscal receipt is opened.

In order to execute inter-receipt cancellation it is necessary

- 1) start cancellation mode,
- 2) execute sequentially all commands that you need to cancel,
- 3) execute operation Execute cancellation / Reject cancellation

Notes: Cancellation operation begins only after the following commands:

- Item sale;
- Discount/extra charge to the amount.

Searching of operations in a receipt starts with the end of the receipt.

If after operation that it is necessary to delete follows operation "Discount/extra charge to the amount", first of all it is necessary to delete discount/extra charge operation and only after that delete required operation.

Command 6Dh: Print Total

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Output to a user display	N	1	When !=0 „CYMA X.XX” (SUM X.XX)

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Amount to be paid	M	11	

Command 6Eh: Pay in/out

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operator number	N	3	
2	Amount	M	11	> 0 pay in <0 pay out =0 operation is not executed

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Money in cash drawer	M	16	

Command 6Fh: Print barcode(bitmap)

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Code height	N	3	1-255
2	Line to print	H	96	

Response message arguments: No.

Command 71h: Print barcode

Message:

N	Description	Type	Size (bytes)	Notes
1	Code height	N	3	1-127
2	Code width	N	1	2-4
3	Type of code	N	1	0-Bit line 1-EAN13 2-CODE128C
4	Human Rediable Information	N	1	0-off 1-on
5	Line to print	S	32	

Response: no

Comment for barcode EAN13: if quantity of char below 13, missing char add as zero and CRC is generated automatically.

Command 70h: Department selection

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Department number	N	2	0-99

Response message arguments: No.

Notes. All items sold after this command will be assigned to the selected department in the report by departments.

Command 73h: Subtotal discount/extra charge in percents

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Discount value	P	5	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operation result	M	11	

Command 74h: Subtotal absolute discount/extra charge

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Discount value	M	11	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operation result	M	11	

Command 75h: Discount from tax group in percents

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Discount value	P	5	
2	Tax group number	N	1	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operation result	M	11	

References:

- Command 47h: Tax rates programming.

Command 76h: Absolute discount from tax group

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Discount value	M	11	
2	Tax group number	N	1	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Operation result	M	11	

References:

- Command 47h: Tax rates programming.

Command 77h: Pay in/out

Message:

N	Description	Type	Size (bytes)	Notes
1.	Code	N	3	«0» - Local currency
2.	Quantity	N	9	>0 in <0 out

Response:

N	Description	Type	Size (bytes)	Notes
1	Money in cash drawer	N	16	

3.5. Other commands

Command 80h: Software version

Message arguments: No.

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Model	S	16	
2	Version	S	7	
3	Country	S	16	
4	date of version creation	S	20	“mmm dd yyyy”
5	Number of items	N	9	On the basis that article name contains 75 characters
6	Number of receipts	N	5	It is calculated on the bases that receipt has 16 sales
7	memory available for logotype	N	5	In bytes
8	Maximum logotype size by X	N	4	In pixels
9	Tape width	N	2	In characters
10	Tax count	N	2	
11	Pay type count	N	2	

* Maximum available number of records.

Command 81h: Output information to display

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Function	N	1	0 — cleaning 1-2 — output to the line 3 — output current date and time *
2	Position in line	N	2	
3	Text	S	20	

* At the bottom line of the display current date and time is displayed in the format:

“dd-mm-20yy hh:mm”.

It is displayed up to the next command.

The text will be displayed in the first line.

Response message arguments: No.

Command 82h: Sound

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Melody number	N	1	0 — Switch off 1 — Key press 2 — Confirmation 3 — Warning 4 — Error

Response message arguments: No.

Command 83h: Opening cash drawer

Message arguments: No.

Response message arguments: No.

References:

- Command 27h: Programming of the fiscal printer parameters

Command 84h: Print service reports

Message arguments

N	Description	Type	Size (bytes)	Notes
1	Report type	N	1	0. Technical information 1. Fiscal block status 2. Full test * 3. Reminder

Response message arguments: No.

* When error occurs the message outputs – equipment failure.

Command 85h: Skip lines

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Number of lines	N	2	

Response message arguments: No.

Command 86h: Cut receipt

Message arguments: No.

Response message arguments: No.

Command 87h: Pulse at additional exit

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Opening pulse	H	2	
2	Closing pulse	H	2	

Response message arguments: No.

Notes: Command operates only for FP-T260.

Command 88h: Set service counter

message:

N	Description	Type	Size (bytes)	Notes
1.	Parameter	N	1	
2.	Value	N	4	

Response: no

Meaning of Parameter

0.	R	Accumulator voltage						
1.	RW	Select interface mode 0. Auto 1. UART 2. USB 3. Bluetooth						
2.	RW	Idle timeout for “sleep” device <table><tr><td>0</td><td>Off device</td></tr><tr><td>-1</td><td>No automatic power off</td></tr><tr><td>>=60000</td><td>Time to power off (in ms)</td></tr></table>	0	Off device	-1	No automatic power off	>=60000	Time to power off (in ms)
0	Off device							
-1	No automatic power off							
>=60000	Time to power off (in ms)							
3.	W	Mode USB storage						
4.	W	Journal cover sensor mode (1- active)						

comment:

R- Read (command 88h)

W-Write (command 89h)
RW- Read and Write

Command 88h: Get service counter

Message:

N	Description	Type	Size (bytes)	Notes
1	Parameter	N	2	

Response:

N	Description	Type	Size (bytes)	Notes
1	Value	N	4	

3.6. Report commands

Command A0h: Information about available resources and statuses

Message arguments: No.

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	fiscalisation is allowed	N	1	
2	It is possible write serial number	N	1	
3	- of the fiscal number	N	1	*
4	- of the tax number	N	1	*
5	- tax rate package	N	1	*
6	- access to the fiscal memory password	N	1	*
7	Number of abnormal nullifications	N	3	*
8	available fiscal reports	N	4	*
9	Shift opening date	H	6	
10	Shift opening time	H	4	
11	available records in the item database	N	9	On the basis that article name contains 75 characters
12	Free receipts	N	5	It is calculated on the bases that receipt has 16 sales

* Physical recording fields into fiscal memory take place only after fiscalization.

Command A1h: Print daily reports

Message arguments

N	Description	Type	Size (bytes)	Notes
1	Report type	N	1	0. Z-report 1. X-report

Response message arguments: No.

Command A2h: Print periodical reports by date

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Date of the initial report	H	6	
2	Date of the final report	H	6	
3	Type	N	1	0 - reduced 1 – full

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Total amount by sales	M	20	*
2.	Number of sale receipts	H	6	*
3.	Total amount by returns	M	20	*
4.	Number of return receipts	H	6	*

* Information over a period of time.

References:

- Command A1h: Print daily reports

Command A3h: Print periodical reports by number

Message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Initial report number	N	4	
2.	Final report number	N	4	
3.	Type	N	1	0 - reduced 1 - full

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Total amount by sales *	M	20	
2.	Number of sale receipts *	H	6	
3.	Total amount by returns *	M	20	
4.	Number of return receipts *	H	6	

* Information over a period of time.

References:

- Command A1h: Print daily reports.

Command A4h: Sold items report

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Minimal code	N	9(14*)	
2	Maximal code	N	9(14*)	

Response message arguments: No.

*firmware 2.02 or higher

Notes: When «Minimal code»=0 and «Maximal code»=99999999999999 additional report by discount/extra charge is printed.

Command A5h: Copy of fiscal receipts by through numbers

Allows to receive copy of fiscal receipts that was output starting from the last nullification of the control tape.

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Initial number	N	9	
2	Final number	N	9	

Response message arguments: No.

Reference:

- Command 65h: Closing a receipt.
- command E2h

Command A6h: Print addition day report

message:

N	Description	Type	Size (bytes)	Notes
1.	Report type	N	2	
2.	Reserve			
3.	Reserve			

Report type	
0.	By department
1.	By cashier
2.	Print journal

Response:

N	Description	Type	Size (bytes)	Notes
1.	Reserve			
2.	Reserve			

3.7. Information commands

Command E0h: Daily totals

Message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Data source	N	1	
2.	Data index	N	2	
3.	Cashier number	N	4	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Result 1	M	16	
2	Result 2	M	16	

Result in relation of argument

Data source	Data index	Operator index	Result 1	Result 2
0	VAT number (0-4)	0	Sale turnover	Refund turnover
1	VAT number (0-4)	0	Sate VAT	Sate VAT
2	Payment number*	0	By sale	By refund
3	0	0	Cash in register	
3	1	0	Service pay in	Service pay out
4	Payment number *	Operator	By sale	By refund
5	0	Operator	Service pay in	Service pay out

* When number == count of pay, returning rest turnover.

Notes: The command may be executed if at the moment of its execution the receipt is closed.

Command E1h: Receive information by receipt

Message arguments:

N	Description	Type	Size (bytes)	Notes
1.	Data source	N	1	
2.	Data index	N	2	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Result	M	9	

Notes: When receipt is closed the command returns state of the previous receipt.

Data source	Data index	Result
0	VAT number (0-4)	Turnover
1	VAT number (0-4)	VAT
2	Payment number*	turnover by payment type
3	0	Bill total without VAT
3	1	Bill total
3	2	Total pay

*When value equals quantity of payment type, returns rest from cashless payments.

Command E2h: Daily counter

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Data index	N	1	0-9

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Result	N	9	

Notes: When receipt is closed the command returns state of the previous receipt.

Data index	Result
------------	--------

0.	Number of Z- report
1.	Count of sale bill
2.	Count of ret bill
3.	Direct bill number
4.	First free items code
5.	Number of last document for print copy (sale, refund, pay in/out) . “-1”-no available document for copy * when bill is open return they number
6.	Have data for print journal? (1-have)

Command E6h: Nullification of sale bases

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Nullification mask	H	2	Table 10.

Response message arguments: No.

Notes: By default they are nullified after Z report.

Reference:

- Command 27h: Programming of the fiscal printer parameters

Table 10. Nullification of sale base

Bit	Value
1	Nullify sale history
2	Nullify item database *
3	Nullify history by operators
4	Not defined
5	Not defined
6	Not defined
7	Not defined
8	Not defined

* When nullifying «item database» sale history is nullified too automatically.

Command E7h: Temp buffer: set data source

Аргументы сообщения:

N	Описание	Тип	Размер (байт)	Примечание
1.	Тип	N	2	

2.	Параметр1	S	75	
3.	Параметр2	N	4	

Аргументы ответного сообщения: нет

Тип	Параметр1	Параметр2	Примечание
1			Вычитывание электронной контрольной ленты
		-1	Продолжить чтение
		смещение	Начать чтение со смещения

Command E8h: Temp buffer: write

Аргументы сообщения: нет

N	Описание	Тип	Размер (байт)	Примечание
1.	Размер	N	2	Если <50 – дошли до края памяти
2.	Данные	H	100	

Аргументы ответного сообщения: нет

Command E9h: Temp buffer: read

Аргументы сообщения:

N	Описание	Тип	Размер (байт)	Примечание
1	Размер	N	2	Если <50 – производится запись
2	Данные	H	100	

Аргументы ответного сообщения: нет

3.8. Service commands

Command F3h: Device restart

Message arguments: No.

Response message arguments: No.

Command F5h: Read user information

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Initial address	N	9	

Response message arguments:

N	Description	Type	Size (bytes)	Notes
1	Size	N	2	If <50 — memory end was reached
2	Data	H	100	

Command F6h: Write user information

Message arguments:

N	Description	Type	Size (bytes)	Notes
1	Initial address	N	9	
2	Size	N	2	
3	Data	H	100	

Response message arguments: No.

Appendix A. List of commands their passwords and allowed states

Command	Password	Allowed state
0x60:Opening text receipt		---345-----
0x61:Print coment: text		---345----A
0x63:Opening fiscal receipt		--2-----
0x64:Selling of the programmed item		--2-----A
0x65:Closing a receipt		---345----A
0x67:Payment		--2-----A
0x68:Item discount/extra charge in percents		--2-----A
0x69:Item absolute discount/extra charge		--2-----A
0x6B:Cancellation		--2-----A
0x6D:Print Total		--2-----A
0x6E:Pay in/out		--2-----A
0x6F:Print coment: barcode (bitmap)		-----A
0x71:Print coment: barcode		-----A
0x70:Department selection		--2-----A
0x73:Subtotal discount/extra charge in percents		--2-----A
0x74:Subtotal absolute discount/extra charge		--2-----A
0x75:Discount from tax group in percents		--2-----A
0x76:Absolute discount from tax group		--2-----A
0x77:In/out cash		--2-----A
0x20:Set data and time	PROG	-----5-----
0x21:Get data and time		-----
0x22:Set document header and footer	PROG	-1-----
0x23:Get document header and footer		-----
0x24:Add Item		-----
0x25:Searching item index by code		-----
0x26:Reading item parameters by index		-----
0x27:Programming of the fiscal printer parameters	PROG	-1-345-----
0x28:Receiving the fiscal printer parameters		-----
0x2B:Setup mode passwords		-1-----
0x2D:Setup payment parameters	PROG	-----7---
0x2E:Reading payment parameters		-----
0x2F:Setup operator parameters	PROG	-1-----
0x30:Reading operator parameters		-----
0x2C:Erase operator	PROG	-1-----
0x29:Prepare for user logotype	PROG	-----7---
0x31:Programming user logotype	PROG	-----7---
0x32:Programming department	PROG	-----
0x33:Reading department parameters		-----
0x34:TMPBuff:Add String		-----
0x35:Set Alarm	SERV	-----
0x36:Get Alarm		-----
0x37:Reading item parameters by code		-----
0x40:Fiscalization	FISC	-----7---
0x41:Programming serial number	PROG	-----7---
0x42:Reading serial number		-----
0x43:Programming fiscal number	FISC	-----7---

Command	Password	Allowed state
0x44:Reading fiscal number		-----
0x45:Programming tax/identification number	FISC	-----7---
0x46:Reading tax/identification number		-----
0x47:Tax rates programming	FISC	-----7---
0x48:Reading tax rates		-----
0x49:Set Money Point Pos	FISC	-1-----7---
0x4A:Get Money Point Pos		----4-----
0x4D:CreateSimPublicKey	FISC	-1-----7---
0x4E:GetSimPublicKey		-----
0x80:Software version		---345-----
0x81:Output information to display		--2345-----
0x82:Sound		---345-----
0x83:Opening cash drawer		---345-----
0x84:Print service reports		----45---9-
0x85:Skip Lines		-1-345-----
0x86:Cut receipt		-1-345-----
0x88:SetServiceCounter	PROG	---345-----
0x89:GetServiceCounter	PROG	---345-----
0xA0:Information about available resources and statuses		----45-----
0xA1:Print daily reports	REPR	-1-----
0xA2:Print periodical reports by date	FISC	----456--9-
0xA3:Print periodical reports by number	FISC	----456--9-
0xA4:Sold items report	REPR	----4---9-
0xA5:Copy of fiscal receipts by through numbers	REPR	----4---9-
0xA6:Print addition daily reports	REPR	----4---9-
0xE0:Daily totals		-----
0xE1:Bill totals		-----
0xE2:Daily counter		-----
0xF0:Flash_Erase		---345--8--
0xF1:Flash_Read	ADM	---345-----
0xF2:Flash_Write		---345--8--
0xF3:SystemReboot		---345-----
0xF4:Debug function		---345-----
0xF7:File Function		---345-----
0xF8:Set public key for check sign		---345-----
0xF5:Read user information	ADM	---345-----
0xF6:Write user information	ADM	---345-----

Appendix C. Transitions between receipt states

Function	Allowed bill state	New state	cancellation *
Open fiscal receipt: sale	0-----	1	----
Open fiscal receipt: return	0-----	1	----
Open service receipt: in out	0-----	7	----
Open service receipt: text document	0-----	5	----
Close fiscal receipt	----4----	0	----
Close service receipt: in out	-----7--	0	----
Close service receipt: text document	----5----	0	----
Total	-12---6--9	3	--2-
Pay	---3-----		----
Pay: closing	---3-----	4	----
Item sale	-12---6--9	2	0---
Item: discount	--2-----9		-1--
Item: discount absolute	--2-----9		-1--
Subtotal: discount percent	--2---6--9	6	0-2-
Subtotal: discount absolute	--2---6--9	6	0-2-
Tax: discount percent	--2---6--9	6	0-2-
Tax: discount absolute	--2---6--9	6	0-2-
Print comment: text	-1234567-9		----
Print comment: barcode	-1234567-9		----
Cancel bill	-1234-67-9	0	---3
in-out money	-----7--		----
Cancellation: execute point	-----9	#	---3
Cancellation: begin	--2---6---	9	----

* Cancellation

Type	Action
-	Do not cancel
0	First element of cancellation (cancellation sequence must begin from this element)
1	Must be cancel (when cancel «Type 0» all elements of Type1 have be canceled, in other case sequence not full and cancel do not make)
2	Disable cancel of previous element (if after elements, then we wish cancel, present elements of type 2, cancel do not make. In begin we must cancel all elements what blocking canceling sequence)

3	Execute always
---	----------------

** New value is set only in case of successful executing.

*** Receipt state that was before execution of the command «Start inter-receipt cancellation».

The state, which would have been in receipt without canceling of operation, will be set

Appendix D. Set user logotype

For example if image is 192 x 3 you can represent image as

Line	Number	bit in image
1	0	0.. 191
2	1	0.. 191
3	2	0.. 191

For example if image is 240 x 3 you can represent image as

Line	Number	bit in image	Number	bit in image
1	0	0.. 191	1	(192..239 (240..384 pad))<<192
2	2	0.. 191	3	(192..239 (240..384 pad))<<192
3	4	0.. 191	5	(192..239 (240..384 pad))<<192

List of changes

Appendix B. Result of executing

Code	Interpretation
0x0000	No error
0x0001	HW Error did not locate
0x0101	Printer error
0x0201	RAM error
0x0301	Error of program memory checksum
0x0401	Error of flash memory
0x0501	Display error
0x0601	Clock error / it is necessary to adjust time
0x0701	Power failure error
0x0801	SIM: Device failure
0x0901	MMC: Device failure
0x0002	Invalid instruction code
0x0102	This function do not support
0x0202	No data in message
0x0302	Transmitter/Receiver overflow
0x0003	Incorrect field format 0xNN03, where NN -sequential order of the incorrect field
0x0004	Field value 0xNN04 is out of valid range, where NN - sequential order of the incorrect field
0x0005	There is no free space to write
0x0105	Write to the fiscal memory error
0x0205	Serial number is not set
0x0305	Date of the last fiscal record is later than we try to set
0x0405	Try to change data time over than 24 hours
0x0505	Data failure in the fiscal memory
0x0605	Fiscal memory exhausted (writing prohibited)
0x0705	This command is executed only in fiscal mode
0x0805	Date and time was not set since the last abnormal nullification of RAM
0x0905	More than 24 hours passed since the begin of the shift
0x0A05	Have to adjust the Date Time
0x0B05	Fiscal table format error
0x0C05	Data format error
0x0D05	Time format
0x0E05	Try to set time lower then current
0x0006	Incorrect password
0x0007	Command cannot be executed in this mode of the fiscal printer (jumper)
0x0107	Incorrect state of the shift
0x0207	Have to upload journal (paper/signed)
0x0307	Device is in manual mode

Code	Interpretation
0x0008	Arithmetic overflow
0x0009	Does not nullified
0x0109	Read/write by not init pointer
0x0209	Address/Parameter is outrange
0x0309	Allocate low buffer
0x0409	Data Error
0x000A	There is no available space to execute a command
0x010A	Record length exceeds maximum
0x020A	Article with given code is not found
0x030A	Index is in out of base
0x040A	Article/department with given code exists and is different
0x050A	Tax group is not allowed
0x000B	Incorrect document state
0x010B	Insufficient available space to run a command
0x020B	Unknown type of record
0x030B	Cancellation: cannot begins with this operation
0x040B	Cancellation: this operation is not found in the receipt
0x050B	Cancellation: sequence is not complete (after the last operation follow commands that are not related with the operation)
0x060B	Cancellation: there is nothing cancel
0x070B	Receipt copy is not available
0x080B	There is insufficient cash to run operation
0x090B	This payment type is not allowed in this receipt
0x0A0B	This change is not allowed in this payment type
0x0B0B	Discount value is out of the range
0x0C0B	Total by receipt overflow
0x0D0B	Overflow by payments
0x0E0B	Exceed the bounds of the buffer
0x0F0B	Sale: quantity error
0x100B	Sale: price error
0x110B	Cancellation: sequence is lock
0x00C0	TMPBuff: incorrect header
0x01C0	TMPBuff: data is not match
0x02C0	TMPBuff: out of range
0x00D0	SIM: sequence error
0x01D0	SIM: sign do not valid
0x02D0	SIM: public key do not valid
0x00D1	MMC: have to format
0x01D1	MMC: file name is exited
0x02D1	MMC: file out range
0x03D1	MMC: file operation
0x04D1	MMC: file do not fount
0x00F0	FString: parameter
0x01F0	FString: data type
0x02F0	FString: font

Code	Interpretation
0x03F0	FString: alignment
0x04F0	FString: position in string
0x05F0	DBF: format error
0x06F0	DBF: field count overflow
0x07F0	DBF: row is not exit
0x08F0	DBF: field type
0x09F0	DBF: field value
0x0AF0	DBF: no value for find
0x0BF0	DBF: do not open
0x00F1	Input: value is out range
0x01F1	Input: cannot change value