Electronic
Cash Registrar
«ICS-E810T»

COMMANDS LIST
AND
EXTERNAL DEVICES
EXCHANGE PROTOCOLS DESCRIPTION

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Introduction

Electronic Cash Registrar ICS-E810T provides receiving, processing, storage, sending to printing of fiscal information in corpore, specified by technical requirements for electronic cash devices, by technical requirements for electronic cash registrars for different applications, by ДСТУ 3915 - 99.

Main terms and abridgements:

ECR – electronic cash registrar ICS-E810T;
PC – external device under which control, ECR runs;
SW – software preinstalled at PC as user and ECR interface;
Receipt (check) – account document of fixed form and content, verifying the fact of selling goods (service) or money payout (returning);
Character (Symbol) – byte in accordance with table ASCII (encoding PC866), including command characters.

Registration of ECR fiscal data is executed automatically when the fact of equality or exceeding of payment total sum in check towards sells total sum is discovered. After that it's impossible to cancel the receipt, to return or cancel command. The steps to close receipt are: registration of payment by command from PC, detection of equality or exceeding payment sum toward sells sum, recording of receipt turnover to daily turnover, cancelation of "open-receipt" attribute, installation of attribute of "open-session", printing of receipt with installation and cancelation when printing finished the attribute of unfinished (pending) receipt.

ECR operation modes

1. Initialization mode. ECR enters the mode when turn on with closed initialization contacts (X1 – see. technical description ECR) and future disconnection after turn-on. In so doing, daily counters shift, registrations of current receipt parameters, passwords, code of abnormal unfinished command, free lines of receipt, receipt header (in case if ECR is not fiscalized), tax rates (in case if ECR is not fiscalized), cashier list are cleared and speed of data exchange installs to 9600 baud. In case if ECR is fiscalized, record of initialization enters in fiscal memory. After initialization, ECR blows interrupted beep. Connection is absent. Exit – turn-off ECR.
2. Lock mode by exceeding of quantity of initializations. ECR enters the mode during turning-on, in case if quantity of initializations after fiscalization exceeds 100 times. In this mode ECR to establish state of error of fiscal memory. Exit from the mode is possible only after replacement of fiscal memory.
3. Off-line mode. ECR enters in the mode in case if when ECR turns-on to make double press to key «ПЧС». In this mode ECR performs reports, tests and verification under controlling of its own keyboard. Massages outputs at customer display or printing. Connection is absent. Exit – turn-off ECR.
4. Main mode. ECR enters in the mode after turn-on, check-up and initialization of printing device, fiscal memory, customer display, registers and counters RAM, finishing of interrupted receipt printing. ECR operates in connection with PC. Main mode subdivides into pre-modes:

- non-fiscal or «training» mode: message «NON-FISCAL RECEIPT» is printed at all receipts, manufacturer's logo is absent, no records to fiscal memory, reports from fiscal memory are empty;
- fiscal mode: message «FISCAL RECEIPT» and manufacturer logo are printed in the receipts, fiscal number, receipt header with tax number, changes of tax rates, daily reports and records of ECR initialization record (put) to fiscal memory;
- mode of prior programming: commands of programming of ECR parameters are performed, commands should include parameter – password of programming;
- mode of reports: commands of reports printing are performed, commands should include parameter - password of reports;
- mode of registrations: the rest of commands are performed;
- mode of ECR's lock: commands are not performed, reason of lock is indicated in ECR response.

Mode can have attribute of unfinished command, which will be automatically finished after elimination of locking reasons.

Physical level of communication protocol of ECR with PC

Physical level of communication protocol with ECR is based at point-to-point communication channel, operating in anisochronous mode in accordance with standard RS-232. Signals Rx, Tx, Gnd are used.

Transmission occurs with data exchange speed at 9600, 19200 or 38400 bauds with 8 data bits without parity and 1 stop-bit.

Transport level of communication protocol of ECR with PC

At transport level transferable (sending) massage should be included among combination of command characters DLE STX and DLE ETX, creating burst massage.

All bytes inside massage, which concur with code of character DLE, redouble and can't create command combinations DLE ETX and DLE STX.

The initiator of connection is PC, sending burst massage, included command for ECR. In 40 mc all batches of PC are confirmed from ECR by character ACK or cancelled by character NAK, in case of error in control sum of batch or exceeding of max acceptable waiting time (40mc) among bytes of batch, or cancelled by character SYN when ECR is busy.

In case if batch (ACK) is confirmed, ECR sends character SYN every 200mc, until batch of response at received command will be ready. After command performed, ECR transfer batch of response with result of command performance, which should not be acknowledged by characters ACK or NAK from PC. In case if in 200 mc character SYN or correct batch of response wasn't received, it is recommended for the SW to resend message several times, and after send the message about error of connection with ECR to upper level.

When batch is rejected (NAK), ECR transmits nothing and switches over waiting condition of next communication session. It is recommended for the SW to resend message several times, and after send the message about error of connection with ECR to upper level.

Rejection of batch (SYN) means that ECR performs previous command and should transmit characters SYN, and when finishing – batch of response. It's recommended to wait till finishing of receiving of characters SYN and batch of response, then to resend message.

Communication session during commands performance from ECR uses fields:

Number	(1 byte) sequence number of command;
Code	code (1 byte) of command (see command description);
Parameters	parameters of command (see command description);
Status	(1 byte) status of ECR or of command;
Data	data from ECR (see command description);
Results	result (1 byte) command performance.
Reserve	reserved 1 byte of response.

In main mode after turn-on and first initialization or after performance of command, ECR is in waiting cycle for combination of characters DLE STX from PC. Receiving of characters involves ECR in communication session with PC in accordance with drawing below:

Session of command performance

PC	**ECR**
(DLE, STX, Number, Code, [Parameters],CS,DLE,ETX[,CRC16lo,CRC16hi])	
---->	
<----	NAK or SYN or
<----	ACK,[SYN or ENQ], (DLE,STX, Number, Code, Status, Result, Reserve,[Data],CS,DLE, ETX[,CRC16lo,CRC16hi])

CS – byte of control sum. Brackets [] – optional fields

Codes of service-characters:

DLE = 10 hex, STX = 02 hex, ETX = 03 hex, ACK = 06 hex, NAK = 15 hex, SYN = 16 hex, ENQ = 05 hex.

Character ENQ is used when receiving of logo of end-user (trade enterprise). See command №45.

When transmitting from PC to ECR, byte of control sum is calculated thus, that lower byte of result of byte-by-byte summation by fields Number, Code, Parameters and byte CS will be equal to zero. When transmitting from ECR to PC, byte of control sum is calculated in the same way by all fields of answerback. And, doubling characters DLE in control sum calculation are disregarded.

Control sum CRC16 use CCITT[2]-polinomial ($x^{16} + x^{12} + x^5 + 1$) and calculate by fields Number, Code, Parameters, CS and ETX without duplicate and enclosing DLE. In reply pack CRC16 calculate similarly.

ECR records received Number and Code in response message. In case if ECR receives message, in which values of fields Number and Code are the same to values of previous message, then it doesn't perform command, but repeats transmitting of previous message.

Example of calculation CRC16 on Ci:

```
void CalcCRC16(BYTE *Buf, WORD Size, WORD *CRC16)
{char V;
  while(Size--) {
    V = *Buf++;
```

```
    INT_HI(*CRC16) ^= V;
    V = (INT_HI(*CRC16) << 4) ^ INT_HI(*CRC16);
    INT_HI(*CRC16) = (V >> 4) ^ (V << 3) ^ INT_LO(*CRC16);
    INT_LO(*CRC16) = (V >> 5) ^ V;
  }
}
```

Example of calculation CRC16 in Pascal:

```
function CalcCRC16(DataByte: Byte; CRC16: word): word;
var
        a:word;
begin
        CRC16 := CRC16 xor DataByte;
        a:=(CRC16 xor (CRC16 shl 4)) and $00FF;
        Result:=(CRC16 shr 8) xor (a shl 8) xor (a shl 3) xor (a shr 4);
end;
```

Commands of ECR main mode

In the main mode (as opposite to off-line mode) ECR operates only under control of application software, preinstalled at PC.

Code of command has binary (bin) format.

Parameters and Data can be in format bin, BCD* or symbolic (sym). Multibyte figures in bin format are transmitted by lower bytes firstly. Numbering of bit fields begins from 0. Characters inside of Parameters and Data have coding within the limits 32..252. (*BCD – binary code decimal lower and high-order decimal digits of figure recorded to lower and high tetrads of byte)

Value of bits of byte Status (ECR is locked).

Bit	Description	Troubleshooting
0	printer not ready	To check printer**
1	Modem Error	Turn-off\turn-on ECR, Call to Service Centre
2	Error or fiscal memory overflow	Call to Service Center
3	Incorrect date or clock error	Call to Service Center
4	Display Error	To connect display
5	Exceeding of working-shift duration	To make z-report
6	Lowering of working supply voltage	To check power supply
7	Command does not exist or is forbidden in current mode	To check the sequence of command performance

Byte of Status indicates the reason of ECR locking (commands are not performing) except:
commands 0, 28, 42, 43, 53 perform always.
Bit 1 = 1 and Status = 2 – all commands are locked, except 0, 1, 2, 28, 21, 22, 42, 43, 53.
Bit 3 = 1 and Status = 8 – all commands are locked, except 0, 1, 2, 28, 42, 43, 53.
Bit 5 = 1 and Status = 32 – all commands are locked, except 0, 13, 28, 42, 43, 53.
** It's recommended to check printing mechanism for self-locking and for closing of covers (must be closed precisely). In case if locking still remains, then it's necessary to reset printer by it turns-off and then turns-on.

Codes of bytes of Results.

0	Correct finishing	31	Exceeding of quantity of registrations in receipt
1	Printer error	32	Exceeding of digit capacity of calculated cost value
2	Paper finished	33	Overflowing of daily turnover register
4	Error of fiscal memory	34	Overflowing of payment register
6	Lowing of supply voltage	35	Sum "given-out" is more than in cash-drawer
8	Fiscal memory is overflowing	36	Date is earlier then date of last z-report
10	There wasn't personalization	37	Receipt of payouts is opened, sale is forbidden
16	Command is forbidden in current mode	38	Receipt of sale is opened, payouts are forbidden
19	Error of logo programming	39	Command is forbidden, receipt isn't opened
20	Incorrect line length	40	Memory articles overflow
21	Incorrect password	41	Command is forbidden till Z-report
22	Nonexistent number of (password, line))	42	Command is forbidden by fiscalization
23	Tax group is not exist or is not fixed, taxes were not input	43	Change from this payment is forbidden
24	Payment type is not exist	44	Command is forbidden, receipt is opened
25	Invalid codes of characters	45	discount/markup is forbidden, there were no sales
26	Exceeding of tax quantity	46	Command is forbidden after payment began

27	Negative sale is more than sum of previous sales of receipt	47	Exceeding sending data more than 72 hours
28	Error in article description	48	Not reply from modem
30	Error of format date/time		

In batch of response from ECR it's possible 4 options of values of bytes Status and Result.
1. Status = 0, Result = 0. Command is performed successfully.
2. Status # 0, Result = 0. ECR is locked. Command wasn't performed (except cases indicated in appendix with description of byte Status). It's recommended to operator to fulfil actions for printer unlocking.
3. Status = 0, Result # 0 (codes 16..46). Command wasn't performed by reason in accordance with code.
4. Status # 0, Result # 0 (codes 1..8). In command performing, ECR was locked by reason indicated in byte Status. Changing of status of session or receipt before and after command performance can be tracked by the byte Reserve. Also when entering the command 0 (SendStatus) flag 13 = 1 indicates if printer will finish command performance after elimination of reason of locking. Otherwise command can be repeated.

Bits of byte Reserve in every batch of response duplicate bits of ECR configuration from command SendStatus (0)..

Description of bits of byte Reserve.

Bit	Description
0	Receipt of service report is opened
1	Status of emergency (command will be finished after correction of error)
2	Paper is absent in case if printer isn't ready
3	Receipt: sale/payment (0/1)
4	Printer is fiscalized
5	Session is opened
6	Receipt is opened
7	ECR is not personalized

Commands of mode of registrations

SendStatus *to read registrar's status*

Code: 0.

Data	Size	Format
Configuration of printer (bits): 0 = 1 - using collection 1 = 1 - mode of registrations of payments in receipt (all registrations are forbidden except payments and comments) 2 = 1 - cash drawer is opened 3 - receipt sale/payout (0/1) 4 - VAT embedded/VAT add-on(0/1) 5 = 1 - session is opened (there were closed receipts; commands of programming mode are forbidden) 6 = 1 - receipt is opened 9 = 1 - printing of end-user logo (trade enterprise) 10 = 1 - paper cutting forbidden 11 = 1 – mode of printing of receipt of service report 12 = 1 - printer is fiscalized 13 = 1 - emergent finishing of last command 14 = 1 - mode OnLine of registrations	2	bin
Serial number and manufacturing date	19	sym
Date of registration in format DD/MM/YY	3	BCD
Time of registration in format HH/MM	2	BCD
Fiscal number	10	sym
Length of line 1 of attributes of taxpayer (= n1)	1	bin
Line 1 of attributes of taxpayer	n1	sym
Length of line 2 of attributes of taxpayer (= n2)	1	bin
Line 2 of attributes of taxpayer	n2	sym
Length of line 3 of attributes of taxpayer (= n3)	1	bin
Line 3 of attributes of taxpayer	n3	sym
Length of line of tax number (= n4)	1	bin
Line of tax number	n4	sym
Version of SW of ECR ("ЕП-08")	5	sym

In non-fiscal (training) mode in fields Date, TIME of registration and Fiscal number are random values.

GetDate ***reading of date from registrar***

Code: 1.

Data	Size	Format
Date in format DDMMYY	3	BCD

SetDate ***setting of date in registrar***

Code: 2.

Parameters	Size	Format	Values
Date in format DDMMYY	3	BCD	DD=01..31 MM=01..12 YY=02..99

Setting date can't be earlier then date of last Z-report.

GetTime ***reading of time from registrar***

Code: 3.

Data	Size	Format
Time in format HHMMSS	3	BCD

SetTime ***setting of time in registrar***

Code: 4.

Parameters	Size	Format	Values
Time in format HHMMSS	3	BCD	HH=00..23 MM=00..59 SS=00..59

Command is permitted when session is closed only.

SetCod ***setting of password***

Code: 5.

Parameters	Size	Format	Value
Old password	2	bin	
number (0-7 – passwords of cashiers,, 8 – password of programming mode, 9 – password of mode of reports)	1	bin	0..9
New password	2	bin	

After initialization of ECR, values of passwords are equal to zero (0). Quantity of old password's inputs cannot be more then 10.

SetCashier ***registration of cashier (operator) in ECR***

Code: 6.

Parameters	Size	Format	Value
Password	2	bin	
Number	1	bin	0..7
Length of cashier's name (= n)	1	bin	0..15
Cashier name	n	sym	

After ECR initialization passwords values are equal to zero (0). When name length is 0, it is deregistration of cashier. Quantity of password's inputs cannot be more then 10.

PayMoney ***registration of payment***

Code: 8.

Parameters	Size	Format	Value
Quantity or weight	3	bin	
Status (bits 0..3 – number of decimal digits in quantity, bit 6=1 – printing of bar code of goods (EAN13), bit 7=1 – quantity 1 is not printed at receipt)	1	bin	
Price in kop (bit 31 = 1 – negative price)	4	bin	
Tax group	1	sym	A..E (80h..85h)
Length name of payment operation (= n) (n=255 – take name from memory)	1	bin	0..75, 255
Name of payment operation	n	sym	
Code of goods	6	bin	

Data	Size	Format
Cost of goods or service	4	bin

Sum at receipt	4	bin

Command is forbidden if tax rates are not registered. Calculated cost cannot be more then 999.999.99 UAH. When price is negative (for discount, reject of previous registration and etc.) cost must not exceed intermediate sum by previous payments. After receipt is closed, in parameters of articles of corresponding codes values of status change to bigger one (with increasing of capacity of smaller one), it's quantity and cost increase, in case if articles are programmed, or description of article enters completely, in case if they were not programmed. ECR forbids changing of tax group, payment name, but within receipt and price. Group E is non-programmable non-taxable group.

Comment ***registration of comments at fiscal receipt***

Code: 11.

Parameter	Size	Format	Value
Length of line (bit 7 = 1 – opening of payout receipt)	1	bin	0..27
Line	n	sym	

If bit 7 of line length is equal to one (1) in first registration at receipt, then payout receipt is opening, otherwise sales receipt will be opened. **In other cases bit 7 do not install!** When receipt is opened by comment (for example line "ZERO RECEIPT") and closed by command 20, it's possible to print zero-receipt.

LineFeed ***moving of paper at one line***

Code: 14.

ResetOrder ***receipt nulling***

Code: 15.

Avans ***service-input of money to cash-drawer***

Code: 16.

Parameters	Size	Format
Advance sum in kop.	4	bin

Data	Size	Format
Number of receipt package in CPEF	4	bin

Sale ***registration of sale of goods or service***

Code: 18.

Parameters	Size	Format	Value
Quantity and weight	3	bin	
Status (bits 0..3 – number of decimal digits in quantity, bit 6=1 – printing of bar codes of goods (EAN13), bit 7=1 – quantity 1 isn't printed at receipt)	1	bin	
Price in kop (bit 31 = 1 – negative price)	4	bin	
Tax group	1	sym	A..E (80h..85h)
Length of goods or service name (= n) (n=255 – name must be taken from memory)	1	bin	0..75, 255
Name of goods or service (for n # 255)	n	sym	
Code of goods	6	bin	

Data	Size	Format
Cost of goods or service	4	bin
Sum at receipt	4	bin

Command is forbidden if tax rates are not registered. Calculated cost cannot be more then 999.999.99 UAH. When price is negative (for discount, reject of previous registration and etc.) cost must not exceed intermediate sum by previous payments. After receipt is closed, in parameters of articles of corresponding codes values of status change to bigger one (with increasing of capacity of smaller one), it's quantity and cost increase, in case if articles are programmed, or description of article enters completely, in case if they were not programmed. ECR forbids changing of tax group, goods name, but within receipt and price. Group E is non-programmable non-taxable group.

Payment registration of payment and printing of receipt, in case if payment sum is not less than selling sum

Code: 20.

Parameters	Size	Format	Value
status	1	Bin	

(bites 0..3 – type of payment bit 6 = 1 – closing receipt as non-fiscal)			
Payment in kop. (bite 31 = 1 – automatically closing of receipt)	4	bin	
Reserved	1	bin	0
Length of authorization code n	**1**	**bin**	
Authorization code by cashless (by card) payment via payment terminal	**n**	**sym**	

Data	Size	Format
Rest or renting (bite 31 = 1 – renting)	4	bin
Number of receipt package in CPEF	4	bin

Command is forbidden when receipt is closed. Receipt is closing automatically and printing, in case if payment sum is more or equal to sale or payout sum or bit 31 is fixed in payment sum. In last case, sum of current payment is calculated by ECR. In case if cash sum is more than sale sum, so change sum will be printed. Payment with change is permitted for cash only. In payout receipt cash payment must not be more then sum in cash drawer. For non-fiscal receipt (turnovers of receipt are not saved in daily counters and counters of articles) it's recommended to open sales receipt. Zero payment is not printed at receipts. Number of package return in case of closing of receipt. Name of payment type (form): 0 - CARD, 1 - CREDIT, 2 - RECEIPT, 3 – BY CASH, 4 - CERTIFICAT, 5 - VAUCHER, 6 – ELECTRONIC MONEY, 7 – INSURANCE PAYMENT, 8 – OVER PAYMENT, 9 - PAYMENT.

SetString registration of first and last messages of receipt

Code: 23.

Parameters	Size	Format	Value
Line number: 0,2,3 – first message; 1,4,5 – last message 6, 7 – lines of header additions	1	bin	0..7
Length of line n (bits: 6 = 1 – printing of double width; 7 = 1 – printing of double height)	1	bin	0..36 0..20*
Line	n	sym	

* - line length for printing of double width characters.

Give service cash taking-out from cash-drawer

Code: 24.

Parameters	Size	Format
Sum of encashment in kop.	4	bin

Data	Size	Format
Number of receipt package in CPEF	4	bin

SendCustomer to resend line at customer display

Code: 27.

Parameters	Size	Format	Value
Line number: 0 – top line 1 – bottom line	1	bin	0,1
Line length (= n)	1	bin	0..20
Line	n	sym	

When receipt is opened, top line does not send to indicator.

GetMemory to read memory-block of registrar

Code: 28.

Parameters	Size	Format	Value
Address of block	2	bin	
Number of page	1	bin	192..195 for RAM
Size of block (= n)	1	bin	1..127

Data	Size	Format
Memory of block	n	bin

Address 6200h, page 16, size 10x2 – cashiers passwords, programming and reports.

OpenBox ***opening of cash-drawer***

Code: 29.

Parameters	Size	Format
The pulse duration of opening in 2 mc	1	bin

If this parameter absent on cash drawer, pulses 200mc.

PrintCopy ***printing copy from КЛЕФ***

Code: 30.

Parameters	Size	Format
Number of receipt package or report in CPEF	4	bin

Command is forbidden, in case if have open receipt. If parameter absent printing last receipt.

PrintVer ***printing of tax number and version of software***

Code: 32.

Tax number and date of registration ECR are printed in fiscal mode only.

GetBox ***sum of cash in cash-drawer***

Code: 33.

Data	Size	Format
Sum of cash in kop.	5	bin

Discount ***registration of discount or markup***

Code: 35.

Parameters	Size	Format	Value
Operation type: 0 - percentage discount/markup at last goods; 1 – absolute discount/markup at last goods ; 2 - percentage discount/markup at intermediate sum ; 3 – absolute discount/markup at intermediate sum	1	bin	0..3
% or sum of discount/markup (bit 31 = 1 – discount) if %, then bytes 0-2 = value, byte 3 = order (quantity of digits after comma+2)	4	bin	
Length of explanatory line (= n)	1	bin	0..25
Explanation line	n	sym	

Data	Size	Format
Value of discount/markup	4	bin
Sum of receipt	4	bin

Command is forbidden if sale or payouts are not registered. In case if length of explanatory line equal to 0, then “НАЦІНКА” (MARKUP) or “ЗНИЖКА” (DISCOUNT) is substituted. During operations 2 and 3, there is intermediate sum with inscription „ПІДСУМОК” (SUBTOTAL) printed at receipt. Data by discount value or markup value doesn’t definite what it is, discount or markup.

CplOnline ***prohibition/permission of mode of OnLine registrations***

Code: 36.

In mode OnLine registration of sale, payout, payment, comments is followed by printing at receipt.

Command is forbidden when receipt is opened. Call of command changes value of parameter to opposite.

ChangeRate ***changing of communication speed***

Code: 38.

Parameters	Size	Format	Value
Speed type (bit/c): 0 – 9600 1 – 19200 2 – 38400	1	bin	0..2

Command answer returns with previous communication speed.

TransPrint printing of line of service report

Code: 40.

Parameters	Size	Format	Value
Line length (= n) (n = 255 – finishing of printing)	1	bin	0..38, 255
Line (n # 255)	n	sym	

Command is forbidden when receipt is opened. When receiving first line, service receipt is opened automatically. It's recommended to use communication speed at 38400 bauds for regular, continuous printing.

GetArticle to read record about article

Code: 41.

Parameters	Size	Format
Code of goods	6	bin

Data	Size	Format
Length of name of goods or service n (bit 7 = 1 – goods of payouts))	1	bin
name of goods or service	n	sym
Quantity or weight	3	bin
Status (bits 0..3 - number of decimal digits in quantity)	1	bin
Price in kop.	4	bin
Tax group	1	sym
Sum of turnover in kop.	5	bin
Quantity or weight of backward operation	3	bin
Status of backward operation	1	bin
Sum of turnover in kop. of backward operation	5	bin

GetDayReport to read data of daily report

Code: 42.

Parameters	Size	Format
tag necessary data	1	bin

Data	Size	Format
No parameters (parameter tag absent)		
Counter of sale receipts	2	bin
Counter of sales by tax groups and types of payment	4*(6+10)	bin
Daily markup by sale	4	bin
Daily discount by sale	4	bin
Daily sum of service cash entering	4	bin
Counter of payout receipts	2	bin
Counters of payout by tax groups and types of payments	4*(6+10)	bin
Daily markup by payouts	4	bin
Daily discount by payouts	4	bin
Daily sum of service cash "giving-out"	4	bin
tag 0		
Current number of Z-report	2	bin
Counter of sales receipt	2	bin
Counter of payment receipt	2	bin
Date of end of shift in format DDMMYY	3	BCD
Time of end of shift in format NNMM	2	BCD
Date of the last daily report in format DDMMYY	3	BCD
Counter of articles	2	bin
tag 1		
Sum of tax by tax groups for overlay VAT	4*(6+6)	bin
tag 2		
Quantity of cancel (annul) sales receipt	2	bin
Quantity of cancel (annul) payment receipt	2	bin
Sum of cancel (annul) sales receipt	4	bin
Sum of cancel (annul) payment receipt	4	bin
Quantity of cancel sales	2	bin
Quantity of cancel payments	2	bin
Sum of cancel sales	4	bin
Sum of cancel payments	4	bin

GetCheckSums ***to read data of current receipt***

Code: 43.

Data	Size	Format
Counters of turnover by tax groups	4*6	bin
Sums of payments by payment types	4*10	bin
Counters of registrations	1	bin

GetTaxRates ***to read tax rates***

Code: 44.

Data	Size	Format
Quantity of tax rates (= n)	1	bin
Date of tax programming	3	BCD
Tax rates (in 0,01 %)	2*n	bin
Status: bits 0..3 – number of decimal digits of money sums bit 4 – type of VAT (0 – embedded, 1 – add-on) bit 5 = 1 – charge rates are present	1	bin
Charge rates (in 0,01 %) (bit 15 = 1 – VAT at charge)	2*n	bin
Rate of charge of group E (in 0,01 %)	2	bin

CplCutter ***prohibition/permission to use of cutter***

Code: 46.

Call of command changes value of parameter to opposite.

SetBarCode ***registration of line of receipt bar-code***

Code: 47.

Parameters	Size	Format	Value
Length of bar-code n	1	bin	1..15
Bar-code	n	sym	

Command is forbidden when receipt is closed. System of bar code is Code128. Type of characters is B. When bar-code length is 0, it's cancelation of printing of bar-code. Printing of bar-code automatically resets when new receipt is opened.

GetPapStat ***to read paper status in printer***

Code: 48.

Data	Size	Format
byte of status of paper in printer (bit 0=1 – error of connection with printer bit 3=1 – receipt paper is almost ended bit 6=1 – receipt paper is finished)	1	bin

ArtBarCode ***registration of bar -code of article in fiscal receipt***

Code: 49.

Parameters	Size	Format
Bar-code	13	sym

Command is forbidden when receipt is closed. System of bar-code is EAN13.

SetIndType ***switch-over of protocol of customer display***

Code: 54.

Parameters	Size	Format	value
Code of protocol: 0 – protocol DSP 1 – protocol Epson 2 – protocol DPD201	1	bin	0..2

Commands of programming mode

Commands of programming mode have following steps: check of password of programming, switching to programming mode, command execution, returning to mode of registrations.

Fiscalization ***registration of ECR***

Code: 21.

Parameters	Size	Format
Password of programming	2	bin

When switching from non-fiscal mode to fiscal mode, recording of fiscal number to fiscal memory is realized after registration of taxpayer attributes. Otherwise command will be illegal. Fiscal number must be entered without **preamble „ФН" (FN).**

SetHeadLine ***registration of taxpayer attributes***

Code: 22.

Parameters	Size	Format	Value
Password of programming	2	bin	
Length of line 1 of attributes of taxpayer (= n1) (bits: 6 = 1 – printing of double width; 7 = 1 – printing of double height)	1	bin	0..30 0..20*
line 1 of taxpayer attributes	n1	sym	
Length of line 2 of taxpayer attributes (= n2) (bits: 6 = 1 – printing of double width; 7 = 1 – printing of double height)	1	bin	0..30 0..20*
line 2 of taxpayer attributes	n2	sym	
Length of line 3 of taxpayer attributes (= n3) (bits: 6 = 1 – printing of double width; 7 = 1 – printing of double height)	1	bin	0..30 0..20*
line 3 of attributes of taxpayer	n3	sym	
Length of line of tax number (= n4) (bit 7 = 0/1 – ECR adds to beginning of line "ПН"/"ІД" ("FN"/"ID"))	1	din	12
Line of tax number	n4	sym 48..252	

* length of line when printing characters of double width.

In case if before registration of attributes it was registration of fiscal number in non-fiscal mode, then fiscalization will be done with recording of fiscal number and attributes in fiscal memory and printing of receipt of fiscalization. In this case previous registration of tax rates resets. It's necessary to input tax number without preamble **„ПН" ("FN")** or "ІД" ("ID").

SetTaxRate ***to fix tax rates***

Code: 25.

Parameters	Size	Format	Value
Password of programming	2	bin	
Quantity of tax rates (= n)	1	bin	1..5
Tax rate (in 0,01 %)	2*n	bin	
Status: bits 0..3 – quantity of decimal digits of money sum bit 4 – VAT type (0 – embedded, 1 – add-on) bit 5 = 1 – to program charge rates	1	bin	
Charge rates (in 0,01 %) (bit 15 = 1 – VAT at charge)	2*n	bin	
Charge rate of group E (in 0,01 %)	2	bin	

Mixed tax is for embedded VAT only. Tax rate or sum of tax rate and charge rate should not to be more then 99,99%.

ProgArt ***programming of goods description***

Code: 34.

Parameters	Size	Format	Value
Password of programming	2	bin	
Number of decimal digits in quantity	1	bin	0..3
Price in kop. (bit 31 = 1 – goods of payouts)	4	bin	

Tax group	1	sym	A..E (80h..85h)
Length of name of goods or service (= n)	1	bin	0..75
Name of goods or service	n	sym	
Code of goods	4 or 6	bin	

Group E is non-programmable non-taxable group.

LoadBMP to load logo of trade enterprise

Code: 45.

Parameters	Size	Format	Value
Password of programming	2	bin	
Status (permit/forbid – 1/0)	1	bin	
Quantity of dots by width X	2	bin	0,8…416
Quantity of dots by height Y	2	bin	0,1…1050

In case if dots quantity is equal to 0, then status fixes. In case if ECR transmits ENQ (code 5), then logo with size (X/8)*Y byte is transmitted by blocks (64 byte + byte of control sum). At every block, ECR sends ACK or NACK. Then it sends ENQ, in case if wait for next block, or batch of response (DLE STX…), in case if receiving is finished.

Personaliz personalization ECR

Code: 52.

Parameters	Size	Format	Value
Passport of programming	2	bin	

Data	Size	Format
Code of result of personalization: 0 personalization run successful 1-999 error State Tax Administration (STA). Determine STA. 10001 not setup TCP-connection with processing center (Acquier) 10002 damaged teleprogram answer STA 10003 ID_SAM or ID_DEV rejected by Acquier 10004 internal error of modem 10005 timeout TCP-connection 10006 TCP-connection unexpectedly close by processing center (Acquier) 10007 received incorrect answer from processing center (Acquier) 10008 exceed max. quantity attempt transmission of teleprogram 10009 connection interrupted by processing center (Acquier) (EXC_BREAK) 10010 received teleprogram have incorrect sign 10011 in answer of STA no the code result of personalization 10012 timeout of object SAM-module 10013 error of reading of registration information of ECR 10014 error of package creation of CPEF 10015 error of package of CPEF 10016 internal error of personalization object 10017 error of generation of XML-document 10018 SAM-module interrupt by other problem 10019 general error SAM-module 10020 modem interrupt by other problem	2	bin

ModemPar transmission or reading modem parameters

Code: 53.

Parameters	Size	Format	Value
Reserved	2	bin	
Length of parameters n	2	bin	
tag parameter	1	bin	1..8
*tag = 1 – initiate exchange with processing center (*Acquier*)*			n = 1
*tag = 2 – initiate definite exchange with processing center (*Acquier*)*			n = 1
tag = 3 – receive package КСЕФ (Control Strip in Electronic Form (KSEF))			n = 7

Number of data package	4	bin	
Number of data block	2	bin	
tag = 4 – state of modem (structure)			n = 1
tag = 5 – state of modem (text)			n = 1
tag = 8 – check the package of КСЕФ КСЕФ (Control Strip in Electronic Form (KSEF))			n = 5
Number of data package	4	bin	
tag = 9 – receive package number of КСЕФ (Control Strip in Electronic Form (KSEF))			
number Z-report (0 – current)	2	bin	
Receipt type: 0 – Z-report 1 – fiscal receipt 2 – payment receipt	1	bin	0..3
Receipt number	2	bin	
tag = 10 – current object of modem			

Data	Size	Format	Value
Code of result	1	bin	
Length of data result n	2	bin	128, if таг 3 4, if таг 9 1, if таг 10
Data result	n	bin	

If the code of result #0, data not transmit (n = 0).

Code of modem errors:

0 objects finalized successfully
1 general modem error
2 timeout of object start
3 no record of personalization in CSEF
4 error of BCP of CSEF
5 error of record of CSEF
6 error of package creation of CSEF
7 error of reading of package CSEF
8 ECR not fiscalized or fiscal parameters incorrect
9 data error, received from fiscal block
10 CSEF is fill up
11 incorrect number of package of CSEF
12 signatures error of package of CSEF
13 SAM-module is busy of other object
14 error of SAM-module
15 data of CSEF damaged
16 indefinite code of command
17 parameter value 1 incorrect
18 parameter value 1 incorrect
19 parameter value 1 incorrect
251 the command can't be realize at present
252 modem is busy
253 internal error of modem
254 timeout of fiscal block data reading object
255 general error of modem

Code of current object of modem:

0 not object
1 session of technical registration
2 personalization
3 data reading CSEF
4 exchange with processing center (Acquier)
5 underwriting of package of CSEF
255 lockup

Commands of mode of reports

Commands of mode of reports has following steps: check password of reports, switching to mode of reports, command executing, returning to mode of registrations.

ArtReport printing of report by articles

Code: 10.

Parameters	Size	Format
Password of reports	2	bin
Beginning code	6	bin
Finishing code	6	bin

When beginning and finishing codes of articles are absent, it's printing report by all articles.

DayReport printing of daily report by financial operations

Code : 9.

Printing of X-report

Parameters	Size	Format
Password of report	2	bin

DayClrReport printing and registration of daily report by financial operations with nulling of daily registers

Code : 13.

Printing of Z-report.

Parameters	Size	Format
Password of reports	2	bin

Descriptions of all articles canceled (report by articles is nulling).

Data	Size	Format
Number of receipt package in CSEF	4	bin

PeriodicReport report from fiscal memory for period

Code : 17.

Parameters	Size	Format	Value
Password of reports	2	bin	
First date in format DDMMYY	3	BCD	DD=01..31 MM=01..12 YY=02..99
Last date in format DDMMYY	3	BCD	DD=01..31 MM=01..12 YY=02..99

PeriodicReportShort recurrent report from fiscal memory, short

Code : 26.

Parameters	Size	Format	Value
Password of reports	2	bin	
First date in format DDMMYY	3	BCD	DD=01..31 MM=01..12 YY=02..99
Last date in format DDMMYY	3	BCD	DD=01..31 MM=01..12 YY=02..99

PeriodicReport2 recurrent report from fiscal memory by numbers

Code : 31.

Parameters	Size	Format
Password of report	2	bin
First number of report	2	bin
Last number of report	2	bin

Communication protocol of ECR with customer display

Physical level of communication protocol with customer display is realized in accordance with standard RS-232. Display is connected to socket X7.

Communication protocol:

Speed: 9600 bit per sec.;
Data format: 8 bit + 1 stop-bit;
Parity control is absent.

Communication protocol with display is based on protocol DSP-T. In accordance with this protocol, all characters with codes from 32 to 255 input at display to current position with automatically relocation of current position pointer to next position.

Session of command execution

ECR		**Customer display**
(EOT, SOH, Command, ETB)	---->	
	<----	ACK or NAK

Codes of service characters:
EOT = 04h, SOH = 01h, ETB = 17h, ACK = 06h, NAK = 15h.
ECR uses command of fixing of current position of display, which consists of code of command (50h) and code of current position (31h..58h).
As response, display should transmit byte-confirmation (ACK) not later than 100 mc. Otherwise ECR locks it's operating with error attribute "Display error".