ECR2

Specification of communication protocol between Payment terminal and Cash register

Contents

History

2024.10.07 – Pay2Con-Pop
- Added top-up as new transaction type

2024.09.13 – Pay2Con-Pop
- Added cancel transaction use-case

Pay2Con-Anušjak
- Complete redesign of the document
- Reviewed all comments and changes

2020.09.08 – MPAS-Čapo:
- Translated to English
- Added a note about fields content limitations

2020.06.23 – MPAS-Čapo:
- Added chapter „Accepted meal cards"
- Added field „Control Flag" to TRANS messages for operations: Cancellation, Cash advance, MO/TO, End of day and Subtotals.
- Added field „Merchant Receipt" and „Customer Receipt" to RESPV messages for operations Cancellation, Cash advance, MO/TO, End of day and Subtotals.
- Added chapter „Examples" that includes all content related chapters

2020.06.01 – MPAS-Čapo:
- Added field „Meal Amount" to TRANS messages for the operation Payment
- Added field „Control Flag" to TRANS messages for the operation Payment, Refund and „Last transaction cancellation"
- Added field „Amount Authorized" to RESPV messages for Payment
- Added fields „Merchant Receipt" and „Customer Receipt" to RESPV messages for the operation Payment, Refund and „Last transaction cancellation".
- Added chapter „Control Flag – Transaction progress management".

2018.07.12 – Vaňo:
- Removed field AOSA.
- Added field "DCC Detail" to RESPV package for the operation Payment. (without changing the structure of the ECR2 message, DCC has replaced the unused AOSA)
- Added field "DCC Flag" to TRANS package and "DCC Detail" to RESPV package for the operation Refund.
- Change of the name of the field "Sequence number" to the name "Receipt number" for transactions End of day and Subtotals.
- Expanded fields "Sequence number" and "Receipt number" to 9 symbols.
- Change of structure for packages <trans> and <respv> for the "Cancellation" transaction type.
- Change of content for the chapter "Texts displayed on POS/CR screen on declined transaction"
- Added new chapter "Instructions for validation of the signature on the CR"

2016.03.17 - Čapo: Added field "Counters of non-payment applications" to the RESPV package for operations "End of day and Subtotals".

Legend

POS – POS (Point of sale) terminal
ECR – Electronic Cash Register
AC – Authorization center
EMC – Electronic Meal Card

Communication Parameters

Hardware interface: Asynchronous RS-232C
Package size: 250 bytes (max)

Connection: Rx, Tx,GND
Transmission speed: 9600bps
Character format: 7E1
Flow control: none

or

Connection: Rx,Tx,GND
Transmission speed: 9600bps
Character format: 8N1
Flow control: none

Hardware interface: TCP/IP
Default communication port: 53535 (configurable through terminal menu)

Packet structure

<STX><header><separator><data>...<separator><data><ETX><LRC>
1byte   x bytes   1byte 1byte
   <<--- Longitudinal Redundancy Check   --->>

LRC - Longitudinal Redundancy Check is the result of XOR from „header" to <ETX>
(i.e. LRC=0; for (ch=0;ch<DataLenght;ch++){LRC=LRC^Data[ch];}LRC=LRC^ETX;)

STX	(Start of Text)	02H
ETX	(End of Text)	03H
EOT	(End of Transmission)	04H
ENQ	(Inquiry)	05H
ACK	(Acknowledge)	06H

NAK   (Negative Acknowledge)   15H
END   (End ongoing transaction)   20H

Warning:
All fields may not include separator character

Purchase
POS terminal in the main loop waits for ECR commands. When connected to ECR it is not possible to read a payment card on the terminal in the blocked state. The attendant presses the appropriate button on the ECR for payment by credit card. ECR sends *packet <trans>* to a POS terminal.

Packet <trans>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"TRANS"	5	N	
SEPARATOR	"\"	1		
Trans. Type	"1"	1	N	"1" Purchase
SEPARATOR	"\"	1		
Amount		18	Y	For example "1500.00", contains the amount of cash(if realized) and non-cash part of the transaction
SEPARATOR	"\"	1		
Cashback amount		18	Y	Cash part of the transaction. For example 500.00
SEPARATOR	"\"	1		
Variable symbol	VARCH	20	Y	For example "A1112223334"
SEPARATOR	"\"	1		
Protocol Version	VARCH	20	N	Currently "v116r02"
SEPARATOR	"\"	1		
Meal Amount		18	Y	For example "500.00", represents the amount for the food part of the purchase.
SEPARATOR	"\"	1		
Control Flag		9	N	Control loop (see chapter "Control Flag- transaction progress management")

Notes:
The list of values of ECR2 protocol versions sent within the <trans> packet must be discussed with the bank. The value of the "Protocol Version" field must match the version of the documentation on the

basis of which the implementation is made, as the value of the "Protocol Version" field of the version can directly affect the content of the RESPV packet.

Accepting value of "Variable symbol" (also called "JIP") depends on the POS configuration. If entering is not allowed, on POS will display an error during processing request from ECR.

The "Meal Amount" field allows you to limit the use of meal cards to payment for groceries only. If the field is not present or is empty, the type check of the used card will not be active. (see chapter "Acceptance of meal cards")
The "Control Flag" field allows the ECR to control the progress of the transaction. For example, receipt printing, receipt data source, etc. (see chapter "Control Flag - transaction progress management")

Then the attendant reads the client card on the POS terminal. If a PIN needs to be entered, the POS terminal prompts the client to enter the PIN. The POS terminal prepares a message for the AC.

Packet <respv>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"RESPV"	5	N	
SEPARATOR	"\"	1		
Merchant name	VARCH	40	Y	Supermarket NIS
SEPARATOR	"\"	1		
Address - street	VARCH	20	Y	Test street 1
SEPARATOR	"\"	1		
Address - city	VARCH	20	Y	Bratislava
SEPARATOR	"\"	1		
Address – Postal code	VARCH	5	Y	82106
SEPARATOR	"\"	1		
Card Number	VARCH	19	Y	"************0011", the card number is transmitted already starred according to the settings in the BIN table from the AC
SEPARATOR	"\"	1		
AID	VARCH	20	Y/C	„A0000000043060", the data is sent and printed on the receipt only in the case of a chip transaction
SEPARATOR	"\"	1		
Card type – text (tag E4)	VARCH	30	Y	"DCI", "VISA ELECTRON", etc.
SEPARATOR	"\"	1		

Application Pref. Name	VARCH	30	Y/C	„Maestro", „VISA Credit",... the data is sent and printed on the receipt only in the case of a chip transaction
SEPARATOR	"\"	1		
Card Expiration (tag 04)	N	4	Y	format: YYMM
SEPARATOR	"\"	1		
Terminal ID (tag 84)	N	20	Y	"999996"
SEPARATOR	"\"	1		
Response terminal	N	1	N	„0" transaction rejected „1" transaction complete „2" approved part of the amount (see „Amount Authorized")
SEPARATOR	"\"	1		
PIN Transaction	N	1	N	if "0" transaction without a PIN, if "1" transaction with a PIN if "2" transaction without CVM
SEPARATOR	"\"	1		
Response message	VARCH	undefined	N	„Operation performed", „Limit exceeded" „Operation cancelled" "Use a credit card" etc.
SEPARATOR	"\"	1		
Authorization code	VARCH	8	Y	For example "12345678"
SEPARATOR	"\"	1		
Sequence number	N	9	Y	For example "012345678"..., "0576"...
SEPARATOR	"\"	1		
Line1		undefined	Y	text printed on the receipt without any modifications
SEPARATOR	"\"	1		
Line2		undefined	Y	text printed on the receipt without any modifications
SEPARATOR	"\"	1		
Line3		undefined	Y	text printed on the receipt without any modifications
SEPARATOR	"\"	1		
Variable symbol	VARCH	20	Y	For example "1112223334" - it is sent if the field is also present in the request, otherwise it is not sent
SEPARATOR	"\"	1		

Transaction date and time	Datetime	15	Y	Format: YYYYMMDD hhmmss
SEPARATOR	"\"	1		
DCC Detail	VARCH	undefined	Y	Additional information on the DCC to be printed on the receipt for the DCC transaction. Lines are separated by the ";" character
SEPARATOR	"\"	1		
Amount authorized		18	Y	For example "1500.00", contains the amount of the transaction actually paid
SEPARATOR	"\"	1		
Customer Receipt		undefined	Y	text printed on the receipt without modification. Lines are separated by a ";"
SEPARATOR	"\"	1		
Merchant Receipt		undefined	Y	text printed on the receipt without modification. Lines are separated by a ";"

If the POS does not receive a response from the AC or there is a timeout for data entry, the POS sends a *packet* message *<respv>* for CR so that Response terminal = "0", Response message = "Operation aborted"..

Line1 contains the type of transaction (PAYMENT) together with the amount / amount of Cashback (if this has been executed) and the currency. Line2 and Line3 contain a description of any error that occurred during authorization (e.g. line2 = "INSUFFICIENT", line3 = "FUNDS").

Based on the value of the "PIN Transaction" field, the signature field will / will not be printed on the CR receipt. The value of the "Variable symbol" field must be printed on both the receipt for the customer and for the merchant if the printing of the receipts is performed at the POS.
The "Amount authorized" field will acquire a value according to the amount actually paid.
The "Customer Receipt" and "Merchant Receipt" fields will be filled in depending on the value of the "Control Flag" input parameter.

Purchase process with payment card

a)   Communication with regular control of the connection between the CR and the POS terminal Due to the verification of the connectivity of the CR with the POS terminal in the time between individual transactions, the CR can send ENQ to the POS terminal at regular intervals every default 5 seconds. Receiving an ACK from the POS means that the POS is ready to accept the authorization request.

ENQ	-------->	
	<--------	ACK

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If necessary, the client enters a PIN
Transaction authorization

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

b)   Communication without regular control of the connection between the CR and the POS terminal
If the above method of verifying the connectivity of the CR - POS is not applicable, the CR sends the ENQ to the POS before each transaction. After receiving the ACK from the POS, the CR then sends a <trans> packet and further communication is already in progress by default.

Cash register		POS
ENQ	-------->	
	<--------	ACK
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If necessary, the client enters a PIN
Transaction authorization

	<--------	ENQ
ACK	-------->	

	<--------	<respv>
ACK	-------->	
	<--------	EOT

- The process of transaction can be cancelled calling END.

	<--------	**ENQ**
ACK	**-------->**	
	<--------	**END**
ACK / NAK	**-------->**	

If terminal responds with ACK, transaction was successfully interrupted without processing with payments. Otherwise END was unsuccessful.

The process of "purchase" with a payment card - treatment of error conditions
(further description of the communication is based on variants a) described above)

Failed to load card
If, after verifying the receipt of the <trans> packet and sending the ACK to the CR, the client card is not read within 60 seconds after the POS prompt is displayed, the terminal will sound the problem with an audible signal. The operation is aborted without the possibility to continue. In this case, the attendant must repeat the attempt to execute the transaction from the beginning. The display of the POS terminal shows information about the interruption of the operation. In the <respv> packet from the POS terminal, the Response Terminal value will be = 0.

Cash register		POS
<trans>	-------->	
	<--------	ACK
	The card is not inserted within 60 seconds.	OPERATION CANCELED
	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

No PIN

If within 90 sec. since the prompt is displayed on the POS terminal display, no PIN is entered (in the case of a PIN transaction), the operation is aborted without the possibility to continue. The corresponding error message appears on the terminal display. If you enter the wrong PIN, the transaction is automatically rejected, without the possibility of re-entering. In this case, the attendant must repeat the attempt to execute the transaction from the beginning. In the <respv> packet from the POS terminal, the Response Terminal value will be = 0.

Cash register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal.	

If necessary, the client enters a PIN

PIN not entered within 90 seconds   OPERATION CANCELED

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

Failure to receive ACK from CR after authorization of the transaction

After the purchase is authorized, the POS terminal sends the ENQ to the CR. If it does not receive an ACK from the CR within 7 seconds, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an acoustic signal will sound at the same time. **The POS terminal automatically generates a technical cancellation for the original transaction.** In this case, the attendant must repeat the attempt to execute the transaction from the beginning.

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If necessary, the client enters a PIN

Transaction authorization

	<--------	ENQ

ACK	The POS does not receive an ACK from the CR within 7 seconds.	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatic generation of technical cancellation

Failure to receive ACK from CR after sending packet <respv>

If the POS terminal does not receive ACK packet from the CR within 7 seconds, after sending the packet <respv>, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an audible signal will sound. **The POS terminal automatically generates a technical cancellation for the original transaction.** In this case, the attendant must repeat the attempt to execute the transaction from the beginning.

Cash register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If necessary, the client enters a PIN

Transaction authorization

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	The POS does not receive an ACK from the CR within 7 seconds.	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatic generation of technical cancellation

Receiving inconsistent data (unexpected data, incomplete packet, incorrect LRC checksum ...)

In case when an inconsistent / incomplete / unexpected data are received during the communication, an incorrect LRC checksum is found, or another state, which does not allow correct evaluation and standard continuation of communication, is sent by the receiving party NAK (byte 0x15). After receiving the NAK, the communicating party repeats the sending of the original packet (max. 3 times). If even after the third iteration, the data is not evaluated as correct by the receiving party, the operation is aborted without the possibility to continue, an informative error message will be displayed. A technical cancellation for the original transaction is automatically generated. If re-transmission solves the problem of erroneous data, communication continues by default.

Cash register		POS
<trans>	------>	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	------>	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	------>	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	------>	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	------>	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatic generation of technical cancellation
	<--------	EOT

or

Cash Register		POS
<trans>	------>	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	------>	
Inconsistent/incomplete data detected	<--------	<respv>

NAK	-------->		
	<--------		<respv>
ACK	-------->		
	<--------		EOT

Refund (Merchant return)

In the main loop the POS terminal awaits orders from the CR. When connected to ECR it is not possible to read a payment card on the terminal in the blocked state. The attendant presses an appropriate key for "Refund" operation on the CR and type in an amount. Then according to the protocol (see below) the CR will send a *packet <trans>* to the POS terminal.

Packet <trans>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"TRANS"	5	N	
SEPARATOR	"\"	1		
Trans. Type	"2"	1	N	"2" Merchant return
SEPARATOR	"\"	1		
Amount		18	Y	e.g. "158.20"
SEPARATOR	"\"	1		
Variable symbol	VARCH	20	Y	e.g. "A1112223334"
SEPARATOR	"\"	1		
Protocol Version	VARCH	20	N	Currently "v116r02"
SEPARATOR	"\"	1		
DCC Flag	N	1	N	„1" refund with DCC „0" refund without DCC (note: must be set according to the original payment)
SEPARATOR	"\"	1		
Control Flag		9	N	Control loop (see chapter "Control Flag-transaction progress management")

Notes:
The list of values of ECR2 protocol versions sent within the <trans> packet must be discussed with the bank. The value of the "Protocol Version" field must match the version of the documentation on the basis of which the implementation is made, as the value of the "Protocol Version" field of the version can directly affect the content of the RESPV packet.

Accepting value of "Variable symbol" (also called "JIP") depends on the POS configuration. If entering is not allowed, on POS will display an error during processing request from ECR.

The "Control Flag" field allows the ECR to control the progress of the transaction. For example, receipt printing, receipt data source, etc. (see chapter "Control Flag - transaction progress management")

The attendant enters the password for Refund and inserts the client card into the card reader.
If a PIN needs to be entered, the POS terminal prompts the client to enter the PIN. The POS terminal prepares a message for the AC. If a PIN needs to be entered, the POS terminal prompts the client to enter the PIN. The POS terminal prepares a message for the AC.

Packet <respv>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"RESPV"	5	N	
SEPARATOR	"\"	1		
Merchant name	VARCH	40	Y	Supermarket NIS
SEPARATOR	"\"	1		
Address - street	VARCH	20	Y	Test Street 1
SEPARATOR	"\"	1		
Address - city	VARCH	20	Y	Bratislava
SEPARATOR	"\"	1		
Address – Postal code	VARCH	5	Y	82106
SEPARATOR	"\"	1		
Card Number	VARCH	19	Y	"************0011", i.e. PAN is already transferred in the above mentioned format, due to the setting of BIN table in AC
SEPARATOR	"\"	1		
AID	VARCH	20	Y/C	„A0000000043060", only sent and printed on the receipt in case of a chip transaction.
SEPARATOR	"\"	1		
Card type – text (tag E4)	VARCH	30	Y	"DCI", "VISA ELECTRON", etc…
SEPARATOR	"\"	1		
Application Pref. Name	VARCH	30	Y/C	„Maestro", „VISA Credit",…",only sent and printed on the receipt in case of a chip transaction.
SEPARATOR	"\"	1		
Card Expiration (tag 04)	N	4	Y	format: YYMM
SEPARATOR	"\"	1		

Terminal ID (tag 84)	N	20	Y	"999996"
SEPARATOR	"\"	1		
Response terminal	N	1	N	„0" transaction rejected „1" transaction executed
SEPARATOR	"\"	1		
PIN Transaction (tag 08)	N	1	N	"0" NON-PIN transaction, "1" PIN transaction (note: any code other than 0 transferred in tag 08 from the AC will be converted to 1 for the message sent to the CR) "2" NoCVM (no signature line)
SEPARATOR	"\"	1		
Response message	VARCH	undefined	N	"Operation executed", "Overstepped limit", "Operation interrupted" etc...
SEPARATOR	"\"	1		
Authorization code	VARCH	8	C	e.g. "12345678"
SEPARATOR	"\"	1		
Sequence number	N	9	Y	e.g. "0001",.., "0576",...
SEPARATOR	"\"	1		
Line1		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Line2		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Line3		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Variable symbol	VARCH	20	Y	e.g.. "1112223334" - it is sent if the field is also present in the request, otherwise it is not sent
SEPARATOR	"\"	1		
Transaction date and time	Datetime	15	Y	Format: YYYYMMDD hhmmss
SEPARATOR	"\"	1		
DCC Detail	VARCH	undefined	Y	Additional information for DCC, which must be printed on a receipt in case of DCC transaction. Rows are separated with ";"
SEPARATOR	"\"	1		

Customer Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with "；"
SEPARATOR	"\"	1		
Merchant Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with "；"

If the POS does not receive a response from the AC or there is a timeout for data entry, the POS sends a packet message <respv> for CR so that Response terminal = "0", Response message = "Operation aborted"..

Line1 contains the type of transaction (REFUND) together with the amount and the currency. Line2 and Line3 contain a description of any error that occurred during authorization (e.g. line2 = "INSUFFICIENT", line3 = "FUNDS").

Based on the value of the "PIN Transaction" field, the signature field will / will not be printed on the CR receipt. The value of the "Variable symbol" field must be printed on both the receipt for the customer and for the merchant if the printing of the receipts is performed at the POS.
The "Amount authorized" field will acquire a value according to the amount actually paid.
The "Customer Receipt" and "Merchant Receipt" fields will be filled in depending on the value of the "Control Flag" input parameter.

Processing of "Refund" on POS terminal:

    a)   Communication with regular check of connectivity between CR and POS terminal
To check the connectivity check between CR and POS between particular transactions, it is recommended to send ENQ from CR to POS on regular basis, default interval of 5secs should be sufficient. Receipt of ACK from POS is sign of POS readiness.

ENQ	-------->	
	<--------	ACK

Cash Register		**POS**
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	\<respv>
ACK	-------->	
	<--------	EOT

b) Communication without regular check of connectivity between CR and POS terminal

If the above mentioned connectivity check between CR and POS terminal cannot be applied, CR sends ENQ to POS before every transaction only. After receipt of ACK from POS terminal, the CR sends \<trans> packet and further communication is realized in a standard way.

Cash Register		POS
ENQ	-------->	
	<--------	ACK
\<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	\<respv>
ACK	-------->	
	<--------	EOT

- The process of transaction can be cancelled calling END.

	<--------	**ENQ**
ACK	-------->	
	<--------	**END**
ACK / NAK	-------->	

If terminal responds with ACK, transaction was successfully interrupted without processing with payments. Otherwise END was unsuccessful.

Processing of "Refund" on POS terminal – Troubleshooting (further description is based on the option a) of the communication between CR and POS):

Failed to load card

If, after receiving the <trans> packet and sending the ACK to the CR, the client card is not read within 60 seconds after the POS prompt is displayed, the terminal will indicate the problem with an error signal. The operation is aborted without the possibility to continue. In this case, the attendant must repeat the attempt to execute the transaction from the beginning. The display of the POS terminal shows information about the interruption of the operation. In the <respv> packet from the POS terminal, the Response Terminal value will be = 0.

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	The card is not inserted within 60 seconds.	OPERATION CANCELED
	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

No PIN

If within 90 sec. since the prompt is displayed on the POS terminal display, no PIN is entered (in the case of a PIN transaction), the operation is aborted without the possibility to continue. The corresponding error message appears on the terminal display. If you enter the wrong PIN, the transaction is automatically rejected, without the possibility of re-entering. In this case, the attendant must repeat the attempt to execute the transaction from the beginning. In the <respv> packet from the POS terminal, the Response Terminal value will be = 0.

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into terminal card reader	
	PIN is not inserted within 90 seconds	OPERATION CANCELED
	<--------	ENQ

ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

Failure to receive ACK from CR after authorization of the transaction

After the refund is authorized, the POS terminal sends the ENQ to the CR. If POS terminal does not receive an ACK from the CR within 7 seconds, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an audio signal will sound at the same time. beginning. A**In this case receipt must be automatically printed on POS terminal.**

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	The POS does not receive an ACK from the CR within 7 seconds	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatic printing receipt

Failure to receive ACK from CR after sending packet <respv>

If the POS terminal does not receive ACK packet from the CR within 7 seconds, after sending the packet <respv>, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display beginning. N

and an audio signal will sound at the same time. **In this case receipt must be automatically printed on POS terminal.**

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	The POS does not receive an ACK from the CR within 7 seconds	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatic printing receipt

Receiving inconsistent data (unexpected data, incomplete packet, incorrect LRC checksum ...)
In the event that inconsistent / incomplete / unexpected data are received during the communication, an incorrect LRC checksum is found, or another state, which does not allow correct evaluation and standard continuation of communication, is sent by the receiving party NAK (byte 0x15). After receiving the NAK, the communicating party repeats the sending of the original packet (max. 3 times). If even after the third iteration, the data is not evaluated as correct by the receiving party, the operation is aborted without the possibility to continue, an informative error message will be displayed. A technical cancellation for the original transaction is automatically generated. If re-transmission solves the problem of erroneous data, communication continues by default.

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	ERROR OF COMMUNICATION WITH THE CASH REGISTER
	<--------	EOT

Or

Cash Register		POS
<trans>	------>	
	<------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<------	ENQ
ACK	------>	
Inconsistent/incomplete data detected	<------	<respv>
NAK	------>	
	<------	<respv>
ACK	------>	
	<------	EOT

Reversal of a last authorized transaction

In the main loop the POS terminal awaits orders from the CR. The attendant presses an appropriate key for "Reversal_last" operation on the CR. Then according to the protocol (see below) the CR will send a *packet <trans>* to the POS terminal.

Packet <trans>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"TRANS"	5	N	
SEPARATOR	"\"	1		
Trans. Type	"3"	1	N	"3" Reversal_last
SEPARATOR	"\"	1		
Amount		18	Y	e.g. "158.20"
SEPARATOR	"\"	1		
Protocol Version	VARCH	20	N	Currently "v116r02"
SEPARATOR	"\"	1		
Control Flag		9	N	Control loop (see chapter "Control Flag-transaction progress management")

Note:
The list of values of ECR2 protocol versions sent within the <trans> packet must be discussed with the bank. The value of the "Protocol Version" field must match the version of the documentation on the basis of which the implementation is made, as the value of the "Protocol Version" field of the version can directly affect the content of the RESPV packet.

The "Control Flag" field allows the ECR to control the progress of the transaction. For example, receipt printing, receipt data source, etc. (see chapter "Control Flag - transaction progress management")

The POS terminal will prepare a request message for the AC. After receiving a response from the AC, the POS will send a report *packet <respv>* to the CR.

Packet <respv>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"RESPV"	5	N	
SEPARATOR	"\"	1		
Merchant name	VARCH	40	Y	Supermarket NIS
SEPARATOR	"\"	1		
Address – street	VARCH	20	Y	Test Street 1
SEPARATOR	"\"	1		
Address – city	VARCH	20	Y	Bratislava
SEPARATOR	"\"	1		
Address – Postal code	VARCH	5	Y	82106
SEPARATOR	"\"	1		
Terminal ID (tag 84)	N	20	Y	"999996"
SEPARATOR	"\"	1		
Date of orig. transaction	Date	10	Y	DD/MM/YYYY
SEPARATOR	"\"	1		
Orig. terminal ID	N	20	Y	"999996"
SEPARATOR	"\"	1		
Orig. Sequence number	N	9	Y	e.g. "0001",.., "0576",...
SEPARATOR	"\"	1		
Orig. trans. amount	N	18	Y	e.g. "158.20"
SEPARATOR	"\"	1		
Response terminal	N	1	N	"0" transaction rejected "1" transaction executed

SEPARATOR	"\"	1		
Response message	VARCH	undefined	N	"Operation interrupted" etc...
SEPARATOR	"\"	1		
Authorization code	VARCH	8	Y	e.g. "12345678"
SEPARATOR	"\"	1		
Sequence number	N	9	Y	e.g. "0001",.., "0576",...
SEPARATOR	"\"	1		
Line1		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Line2		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Line3		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Transaction date and time	Datetime	15	Y	format: YYYYMMDD hhmmss
SEPARATOR	"\"	1		
Customer Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"
SEPARATOR	"\"	1		
Merchant Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"

If the POS does not receive a response from the AC or there is a timeout for data entry, the POS sends a packet message <respv> for CR so that Response terminal = "0", Response message = "Operation aborted"..

Line1 contains the type of transaction (REVERSAL) together with the amount / amount of Cashback (if this has been executed) and the currency. Line2 and Line3 contain a description of any error that occurred during authorization (e.g. line2 = "INSUFFICIENT", line3 = "FUNDS").

The "Customer Receipt" and "Merchant Receipt" fields will be filled in depending on the value of the "Control Flag" input parameter.

Processing of "Reversal of last authorized transaction":

    a.   Communication with regular check of connectivity between CR and POS terminal

To check the connectivity check between CR and POS between particular transactions, it is recommended to send ENQ from CR to POS on regular basis, default interval of 5secs should be sufficient. Receipt of ACK from POS is sign of POS readiness.

ENQ	-------->	
	<--------	ACK

Cash Register		**POS**
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

    b.   Communication without regular check of connectivity between CR and POS terminal

If the above mentioned connectivity check between CR and POS terminal cannot be applied, CR sends ENQ to POS before every transaction only. After receipt of ACK from POS terminal, the CR sends <trans> packet and further communication is realized in a standard way.

Cash Register		**POS**
ENQ	-------->	
	<--------	ACK
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	

	<--------	<respv>
ACK	-------->	
	<--------	EOT

Processing of "Reversal of last authorized transaction" - troubleshooting (further description is based on the option a) of the communication between CR and POS):

Failure to receive ACK from CR after authorization of the transaction
After the reversal of last transaction is authorized, the POS terminal sends the ENQ to the CR. If it does not receive an ACK from the CR within 7 seconds, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an acoustic signal will sound at the same time. The POS terminal automatically generates a technical cancellation for the original transaction. In this case, the attendant must repeat the attempt to execute the transaction from the beginning.

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	The POS does not receive an ACK from the CR within 7 seconds.	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatically printing receipt

Failure to receive ACK from CR after sending packet <respv>
If the POS terminal does not receive ACK packet from the CR within 7 seconds, after sending the packet <respv>, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an audible signal will sound. The POS terminal automatically generates a technical cancellation for the original transaction. In this case, the attendant must repeat the attempt to execute the transaction from the beginning.

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

Cash Register		POS
	<--------	ENQ
ACK	------->	
	<--------	<respv>
ACK	The POS does not receive an ACK from the CR within 7 seconds	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatically printing receipt

Receiving inconsistent data (unexpected data, incomplete packet, incorrect LRC checksum ...)
In the event that inconsistent / incomplete / unexpected data are received during the communication, an incorrect LRC checksum is found, or another state, which does not allow correct evaluation and standard continuation of communication, is sent by the receiving party NAK (byte 0x15). After receiving the NAK, the communicating party repeats the sending of the original packet (max. 3 times). If even after the third iteration, the data is not evaluated as correct by the receiving party, the operation is aborted without the possibility to continue, an informative error message will be displayed. A technical cancellation for the original transaction is automatically generated. If re-transmission solves the problem of erroneous data, communication continues by default.

Cash Register		POS
<trans>	------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	------->	ERROR OF COMMUNICATION WITH THE CASH REGISTER
	<--------	EOT

or:

Cash Register		POS

<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

Resend

The attendant presses an appropriate key for "Resend" operation on the CR, which will cause re-sending of *<respv>* packet from the last authorized transaction. Then according to the protocol (see below) the CR will send a *packet <trans>* to the POS terminal.

Packet <trans>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"TRANS"	5	N	
SEPARATOR	"\"	1		
Trans. Type	"4"	1	N	"4" Resend
SEPARATOR	"\"	1		
Protocol Version	VARCH	20	N	Currently "v116r02"

Note: the list of values of the ECR2 protocol version to be sent within <trans> packet should by previously discussed with the bank.
Value of the "Protocol Version" field must match the version of the documentation on the basis of which the implementation is made, as the value of the "Protocol Version" field of the version can directly affect the content of the RESPV packet.
The POS terminal resends *<respv>* packet from the previously authorized transaction to the CR.

Processing of "Resend":

    a)   Communication with regular check of connectivity between CR and POS terminal
To check the connectivity check between CR and POS between particular transactions, it is recommended to send ENQ from CR to POS on regular basis, default interval of 5secs should be sufficient. Receipt of ACK from POS is sign of POS readiness

ENQ	-------->	
	<--------	ACK

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	<--------	<respv>
ACK	-------->	
	<--------	EOT

    b)   Communication without regular check of connectivity between CR and POS terminal

If the above mentioned connectivity check between CR and POS terminal cannot be applied, CR sends ENQ to POS before every transaction only. After receipt of ACK from POS terminal, the CR sends <trans> packet and further communication is realized in a standard way.

Cash Register		POS
ENQ	-------->	
	<--------	ACK
<trans>	-------->	
	<--------	ACK
	<--------	<respv>
ACK	-------->	
	<--------	EOT

Processing of "Resend" - troubleshooting (further description is based on the option a) of the communication between CR and POS):

No data for <RESPV> packet resending on POS available

In case that the POS terminal is unable to resend the request *respv* packet, e.g. no data available on POS due to any internal POS failure, the POS sends an alternative *respv* packet with the following structure.

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"RESPV"	5	N	
SEPARATOR	"\"	1		
Terminal ID (tag 84)	N	20	N	"999996"
SEPARATOR	"\"	1		
Response message	VARCH	undefined	N	"No data found"

Cash Advance

In the main loop the POS terminal awaits orders from the CR. When connected to ECR it is not possible to read a payment card on the terminal in the blocked state. The attendant presses an appropriate key for "Cash advance" operation on the CR . After entering the transaction amount, according to the protocol (see below) the CR will send a *packet <trans>* to the POS terminal.

Packet <trans>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"TRANS"	5	N	
SEPARATOR	"\"	1		
Trans. Type	"5"	1	N	"5" Cash Advance
SEPARATOR	"\"	1		
Amount		18	Y	e.g. "500.00"
SEPARATOR	"\"	1		
Protocol Version	VARCH	20	N	Currently "v116r02"
SEPARATOR	"\"	1		
Control Flag		9	N	Control loop (see chapter "Control Flag-transaction progress management")

Note: the list of values of the ECR2 protocol version to be sent within <trans> packet should by previously discussed with the bank. The value of the "Protocol Version" field must match the version of the documentation on the basis of which the implementation is made, as the value of the "Protocol Version" field of the version can directly affect the content of the RESPV packet.
The "Control Flag" field allows the ECR to control the progress of the transaction. For example, receipt printing, receipt data source, etc. (see chapter "Control Flag - transaction progress management")

Then the attendant reads the client card on the POS terminal. If a PIN needs to be entered, the POS terminal prompts the client to enter the PIN. The POS terminal prepares a message for the AC.

Packet <respv>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"RESPV"	5	N	
SEPARATOR	"\"	1		
Merchant name	VARCH	40	Y	Supermarket NIS
SEPARATOR	"\"	1		
Address – street	VARCH	20	Y	Test Street 1

SEPARATOR	"\"	1		
Address – city	VARCH	20	Y	Bratislava
SEPARATOR	"\"	1		
Address – Postal code	VARCH	5	Y	82106
SEPARATOR	"\"	1		
Card Number	VARCH	19	Y	"************0011",PAN is already transferred in the above mentioned format, due to the setting of BIN table in AC
SEPARATOR	"\"	1		
AID	VARCH	20	Y/C	„A0000000043060",only sent and printed on the receipt in case of a chip transaction
SEPARATOR	"\"	1		
Card type – text (tag E4)	VARCH	30	Y	"DCI", "VISA ELECTRON", etc…
SEPARATOR	"\"	1		
Application Pref. Name	VARCH	30	Y/C	„Maestro", „VISA Credit",…only sent and printed on the receipt in case of a chip transaction
SEPARATOR	"\"	1		
Card Expiration (tag 04)	N	4	Y	format: YYMM
SEPARATOR	"\"	1		
Terminal ID (tag 84)	N	20	Y	"999996"
SEPARATOR	"\"	1		
Response terminal	N	1	N	"0" transaction rejected "1" transaction executed "2" authorized amount
SEPARATOR	"\"	1		
PIN Transaction (tag 08)	N	1	N	"0" NON-PIN transaction, "1" PIN transaction (note: any code other than 0 transferred in tag 08 from the AC will be converted to 1 for the message sent to the CR) "2" NoCVM (no signature line)
SEPARATOR	"\"	1		
Response message	VARCH	undefined	N	"Operation executed", "Overstepped limit", "Operation interrupted" etc...
SEPARATOR	"\"	1		

Authorization code	VARCH	6	Y	e.g. "123456"
SEPARATOR	"\"	1		
Sequence number	N	9	Y	e.g. "0001",.., "0576",...
SEPARATOR	"\"	1		
Line1		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Line2		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Line3		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Transaction date and time	Datetime	15	Y	format: YYYYMMDD hhmmss
SEPARATOR	"\"	1		
Amount authorized		18	Y	e.g. "1500.00",contains the amount of the transaction actually paid
SEPARATOR	"\"	1		
Customer Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"
SEPARATOR	"\"	1		
Merchant Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"

If the POS does not receive a response from the AC or there is a timeout for data entry, the POS sends a packet message <respv> for CR so that Response terminal = "0", Response message = "Operation aborted"..

Line1 contains the type of transaction (CASH ADVANCE) together with the amount / amount of Cashback (if this has been executed) and the currency. Line2 and Line3 contain a description of any error that occurred during authorization (e.g. line2 = "INSUFFICIENT", line3 = "FUNDS").

Based on the value of the "PIN Transaction field", the signature field will / will not be printed on the CR receipt. The value of the "Variable symbol" field must be printed on both the receipt for the customer and for the merchant if the printing of the receipts is performed at the POS.
The "Amount authorized" field will acquire a value according to the amount actually paid.
The "Customer Receipt" and "Merchant Receipt" fields will be filled in depending on the value of the "Control Flag" input parameter.

Processing of "Cash advance" on POS terminal:

    a)   Communication with regular check of connectivity between CR and POS terminal

To check the connectivity check between CR and POS between particular transactions, it is recommended to send ENQ from CR to POS on regular basis, default interval of 5secs should be sufficient. Receipt of ACK from POS is sign of POS readiness.

ENQ	-------->	
	<--------	ACK

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

    b)   Communication without regular check of connectivity between CR and POS terminal

If the above mentioned connectivity check between CR and POS terminal cannot be applied, CR sends ENQ to POS before every transaction only. After receipt of ACK from POS terminal, the CR sends <trans> packet and further communication is realized in a standard way

Cash Register		POS
ENQ	-------->	
	<--------	ACK
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	------->	
	<--------	<respv>
ACK	------->	
	<--------	EOT

Processing of "Cash advance" on POS terminal – Troubleshooting (further description is based on the option a) of the communication between CR and POS):

Failed to load card

If, after verifying the receipt of the <trans> packet and sending the ACK to the CR, the client card is not read within 60 seconds after the POS prompt is displayed, the terminal will sound the problem with an audible signal. The operation is aborted without the possibility to continue. In this case, the attendant must repeat the attempt to execute the transaction from the beginning. The display of the POS terminal shows information about the interruption of the operation. In the <respv> packet from the POS terminal, the Response Terminal value will be = 0.

Cash Register		POS
<trans>	------->	
	<--------	ACK
	The card is not inserted within 60 seconds.	OPERATION CANCELED
	<--------	ENQ
ACK	------->	
	<--------	<respv>
ACK	------->	
	<--------	EOT

No PIN

If within 90 sec. since the prompt is displayed on the POS terminal display, no PIN is entered (in the case of a PIN transaction), the operation is aborted without the possibility to continue. The corresponding error message appears on the terminal display. If you enter the wrong PIN, the transaction is automatically rejected, without the possibility of re-entering. In this case, the attendant must repeat the attempt to execute the transaction from the beginning. In the <respv> packet from the POS terminal, the Response Terminal value will be = 0.

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
PIN is not inserted within 90 seconds.
OPERATION CANCELED

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

Failure to receive ACK from CR after authorization of the transaction
After the purchase is authorized, the POS terminal sends the ENQ to the CR. If it does not receive an ACK from the CR within 7 seconds, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an acoustic signal will sound at the same time. The POS terminal automatically generates a technical cancellation for the original transaction. In this case, the attendant must repeat the attempt to execute the transaction from the beginning.

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	The POS does not receive an ACK from the CR within 7 seconds	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatic generation of technical cancellation

Failure to receive ACK from CR after sending packet <respv>
If the POS terminal does not receive ACK packet from the CR within 7 seconds, after sending the packet <respv>, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an audible signal will sound. The POS terminal automatically generates a technical cancellation for the original transaction. In this case, the attendant must repeat the attempt to execute the transaction from the beginning.

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	The POS does not receive an ACK from the CR within 7 seconds	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatic generation of technical cancellation

Receiving inconsistent data (unexpected data, incomplete packet, incorrect LRC checksum ...)
In the event that inconsistent / incomplete / unexpected data are received during the communication, an incorrect LRC checksum is found, or another state, which does not allow correct evaluation and standard continuation of communication, is sent by the receiving party NAK (byte 0x15). After receiving the NAK, the communicating party repeats the sending of the original packet (max. 3 times). If even after the third iteration, the data is not evaluated as correct by the receiving party, the operation is aborted without the possibility to continue, an informative error message will be displayed. A technical cancellation for the original transaction is automatically generated. If re-transmission solves the problem of erroneous data, communication continues by default.

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	ERROR OF COMMUNICATION WITH THE CASH REGISTER
	<--------	EOT

or

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
	<--------	<respv>
ACK	-------->	

	<--------	EOT

Mail Order / Telephone Order

In the main loop the POS terminal awaits orders from the CR. When connected to ECR it is not possible to read a payment card on the terminal in the blocked state. The attendant presses an appropriate key for "MOTO" operation on the CR . Then according to the protocol (see below) the CR will send a *packet <trans>* to the POS terminal

Packet <trans>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"TRANS"	5	N	
SEPARATOR	"\"	1		
Trans. Type	"1"	1	N	"6" MOTO
SEPARATOR	"\"	1		
Amount		18	Y	e.g. "1500.00"
SEPARATOR	"\"	1		
Card Number	VARCH	19	N	"NNNNNNNNNNNNNNNNNNN", unmasked PAN
SEPARATOR	"\"	1		
Card Expiration	N	4	N	Format: YYMM
SEPARATOR	"\"	1		
CVV2/CVC2	N	3	N	NNN
SEPARATOR	"\"	1		
Protocol Version	VARCH	20	N	Currently "v116r02"
SEPARATOR	"\"	1		
Control Flag		9	N	Control loop (see chapter "Control Flag-transaction progress management")

Note: the list of values of the ECR2 protocol version to be sent within <trans> packet should by previously discussed with the bank..
Value of the "Protocol Version" field must match the version of the documentation on the basis of which the implementation is made, as the value of the "Protocol Version" field of the version can directly affect the content of the RESPV packet.

The "Control Flag" field allows the ECR to control the progress of the transaction. For example, receipt printing, receipt data source, etc. (see chapter "Control Flag - transaction progress management")

Fields "Card Number", "Card Expiration" and "CVV2/CVC2" have to be encrypted with 3DES algorithm before sending from ECR to POS.

Then the attendant reads the client card on the POS terminal. The POS terminal prepares a message for the AC. If a PIN needs to be entered, the POS terminal prompts the client to enter the PIN. The POS terminal prepares a message for the AC.

Packet <respv>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"RESPV"	5	N	
SEPARATOR	"\"	1		
Merchant name	VARCH	40	Y	Supermarket NIS
SEPARATOR	"\"	1		
Address - street	VARCH	20	Y	Test Street 1
SEPARATOR	"\"	1		
Address - city	VARCH	20	Y	Bratislava
SEPARATOR	"\"	1		
Address – Postal code	VARCH	5	Y	82106
SEPARATOR	"\"	1		
Card Number	VARCH	19	Y	"************0011",PAN is already transferred in the above mentioned format, due to the setting of BIN table in AC
SEPARATOR	"\"	1		
Card type – text (tag E4)	VARCH	30	Y	"DCI", "VISA ELECTRON", etc…
SEPARATOR	"\"	1		
Card Expiration (tag 04)	N	4	Y	format: YYMM
SEPARATOR	"\"	1		
Terminal ID (tag 84)	N	20	Y	"999996"
SEPARATOR	"\"	1		
Response terminal	N	1	N	"0" transaction rejected "1" transaction executed „2" authorized amount")
SEPARATOR	"\"	1		
PIN Transaction (tag 08)	N	1	N	Default „0"
SEPARATOR	"\"	1		

Response message	VARCH	undefined	N	"Operation executed", "Overstepped limit", "Operation interrupted" etc...
SEPARATOR	"\"	1		
Authorization code	VARCH	6	Y	e.g. "123456"
SEPARATOR	"\"	1		
Sequence number	N	9	Y	e.g. "0001",.., "0576",...
SEPARATOR	"\"	1		
Line1		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Line2		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Line3		undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Variable symbol	VARCH	20	Y	e.g. "1112223334" - it is sent if the field is also present in the request, otherwise it is not sent
SEPARATOR	"\"	1		
Transaction date and time	Datetime	15	Y	Format: YYYYMMDD hhmmss
SEPARATOR	"\"	1		
Amount Authorized		18	Y	e.g. "1500.00", contains the amount of the transaction actually paid
SEPARATOR	"\"	1		
Customer Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"
SEPARATOR	"\"	1		
Merchant Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"

If the POS does not receive a response from the AC or there is a timeout for data entry, the POS sends a packet message <respv> for CR so that Response terminal = "0", Response message = "Operation aborted"..

Line1 contains the type of transaction (PAYMENT) together with the amount / amount of Cashback (if this has been executed) and the currency. Line2 and Line3 contain a description of any error that occurred during authorization (e.g. line2 = "INSUFFICIENT", line3 = "FUNDS").

Based on the value of the "PIN Transaction" field, the signature field will / will not be printed on the CR receipt. The value of the "Variable symbol" field must be printed on both the receipt for the customer and for the merchant if the printing of the receipts is performed at the POS.
The "Amount authorized" field will acquire a value according to the amount actually paid.
The "Customer Receipt" and "Merchant Receipt" fields will be filled in depending on the value of the "Control Flag" input parameter.

Processing of "MOTO" transaction on POS terminal:

    a)   Communication with regular check of connectivity between CR and POS terminal
To check the connectivity check between CR and POS between particular transactions, it is recommended to send ENQ from CR to POS on regular basis, default interval of 5secs should be sufficient. Receipt of ACK from POS is sign of POS readiness.

ENQ	-------->	
	<--------	ACK

Cash Register		POS
<trans>	-------->	
	<--------	ACK
	attendant inserts the card into card reader of the terminal.	

If required, the client enters his PIN
Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

b) Communication without regular check of connectivity between CR and POS terminal

If the above mentioned connectivity check between CR and POS terminal cannot be applied, CR sends ENQ to POS before every transaction only. After receipt of ACK from POS terminal, the CR sends <trans> packet and further communication is realized in a standard way.

Cash Register		POS
ENQ	-------->	
	<--------	ACK
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

Processing of "MOTO" transaction on POS terminal – Troubleshooting (further description is based on the option a) of the communication between CR and POS):

- The process of transaction can be cancelled calling END.

	<--------	**ENQ**
ACK	-------->	
	<--------	**END**
ACK / NAK	-------->	

If terminal responds with ACK, transaction was successfully interrupted without processing with payments. Otherwise END was unsuccessful.

Failure to receive ACK from CR after authorization of the transaction

After the purchase is authorized, the POS terminal sends the ENQ to the CR. If it does not receive an ACK from the CR within 7 seconds, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an acoustic signal will sound at the same time. The

POS terminal automatically generates a technical cancellation for the original transaction. In this case, the attendant must repeat the attempt to execute the transaction from the beginning.

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	The POS does not receive an ACK from the CR within 7 seconds.	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatic generation of technical cancellation

Failure to receive ACK from CR after sending packet <respv>
If the POS terminal does not receive ACK packet from the CR within 7 seconds, after sending the packet <respv>, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an audible signal will sound. The POS terminal automatically generates a technical cancellation for the original transaction. In this case, the attendant must repeat the attempt to execute the transaction from the beginning.

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	The POS does not receive an ACK from the CR within 7 seconds.	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatic generation of technical cancellation

Receiving inconsistent data (unexpected data, incomplete packet, incorrect LRC checksum ...)

In the event that inconsistent / incomplete / unexpected data are received during the communication, an incorrect LRC checksum is found, or another state, which does not allow correct evaluation and standard continuation of communication, is sent by the receiving party NAK (byte 0x15). After receiving the NAK, the communicating party repeats the sending of the original packet (max. 3 times). If even after the third iteration, the data is not evaluated as correct by the receiving party, the operation is aborted without the possibility to continue, an informative error message will be displayed. A technical cancellation for the original transaction is automatically generated. If re-transmission solves the problem of erroneous data, communication continues by default.

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	ERROR OF COMMUNICATION WITH THE CASH REGISTER;
	<--------	EOT

or

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	

Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

Canecellation

In the main loop the POS terminal awaits orders from the CR. The attendant presses an appropriate key for "Cancellation" operation on the CR . Then according to the protocol (see below) the CR will send a *packet <trans>* to the POS terminal. This transaction type can be used for cancellation of purchase or purchase with cashback transactions only.

Packet <trans>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"TRANS"	5	N	
SEPARATOR	"\"	1		
Trans. Type	"8"	1	N	"8" Cancellation
SEPARATOR	"\"	1		
Original trans. amount	N	18	Y	"106.88"
SEPARATOR	"\"	1		
Terminal ID	N	20	Y	"999996"
SEPARATOR	"\"	1		
Date of orig. transaction	YYYMMDD	8	Y	"20180622"
SEPARATOR	"\"	1		
Orig. Sequence number	N	9	Y	e.g. "001047013",...
SEPARATOR	"\"	1		
Last four numbers of the original card transaction	N	4	N	"7791"
SEPARATOR	"\"	1		
Protocol Version	VARCH	20	N	Currently "v116r02"
SEPARATOR	"\"	1		
Control Flag		9	N	Control loop (see chapter "Control Flag-transaction progress management")

Note:
the list of values of the ECR2 protocol version to be sent within <trans> packet should by previously discussed with the bank.

Value of the "Protocol Version" field must match the version of the documentation on the basis of which the implementation is made, as the value of the "Protocol Version" field of the version can directly affect the content of the RESPV packet.

The "Control Flag" field allows the ECR to control the progress of the transaction. For example, receipt printing, receipt data source, etc. (see chapter "Control Flag - transaction progress management")

The POS terminal will prepare a request message for the AC. After receiving a response from the AC, the POS will send a report *packet <respv>* to the CR.

Packet <respv>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"RESPV"	5	N	
SEPARATOR	"\"	1		
Merchant name	VARCH	40	Y	Supermarket NIS
SEPARATOR	"\"	1		
Address – street	VARCH	20	Y	Test Street 1
SEPARATOR	"\"	1		
Address – city	VARCH	20	Y	Bratislava
SEPARATOR	"\"	1		
Address – Postal code	VARCH	5	Y	82106
SEPARATOR	"\"	1		
Terminal ID	N	20	Y	"999996"
SEPARATOR	"\"	1		
Date of orig. transaction	Date	10	Y	(20180622)
SEPARATOR	"\"	1		
Orig. terminal ID	N	20	Y	(it doesn't fill)
SEPARATOR	"\"	1		
Orig. Sequence number	N	9	Y	(it doesn't fill)
SEPARATOR	"\"	1		
Orig. trans. Amount	N	18	Y	e.g. "158.20"
SEPARATOR	"\"	1		
New amount	N	18	Y	e.g. "58.20";
SEPARATOR	"\"	1		
Response terminal	N	1	N	"0" transaction rejected "1" transaction executed
SEPARATOR	"\"	1		
Response message		undefined	N	"Operation interrupted"

				etc...
SEPARATOR	"\"	1		
Authorization code	VARCH	8	Y	(it doesn't fill)
SEPARATOR	"\"	1		
Sequence number	N	9	Y	e.g. "000104576",...
SEPARATOR	"\"	1		
Line1		Undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Line2		Undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Line3		Undefined	Y	text printed on a receipt without modification
SEPARATOR	"\"	1		
Transaction date and time	Datetime	15	Y	format: YYYYMMDD hhmmss
SEPARATOR	"\"	1		
Customer Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"
SEPARATOR	"\"	1		
Merchant Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"

If the POS does not receive a response from the AC or there is a timeout for data entry, the POS sends a packet message <respv> for CR so that Response terminal = "0", Response message = "Operation aborted"..

Line1 contains the type of transaction (CANCELLATION) together with the amount / amount of Cashback (if this has been executed) and the currency. Line2 and Line3 contain a description of any error that occurred during authorization (e.g. line2 = "INSUFFICIENT", line3 = "FUNDS").

The "Customer Receipt" and "Merchant Receipt" fields will be filled in depending on the value of the "Control Flag" input parameter.

Processing of "CANCELLATION" transaction:

a) Communication with regular check of connectivity between CR and POS terminal

To check the connectivity check between CR and POS between particular transactions, it is recommended to send ENQ from CR to POS on regular basis, default interval of 5secs should be sufficient. Receipt of ACK from POS is sign of POS readiness.

ENQ	-------->	
	<--------	ACK

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

b)   Communication without regular check of connectivity between CR and POS terminal

If the above mentioned connectivity check between CR and POS terminal cannot be applied, CR sends ENQ to POS before every transaction only. After receipt of ACK from POS terminal, the CR sends <trans> packet and further communication is realized in a standard way.

Cash Register		POS
ENQ	-------->	
	<--------	ACK
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

Processing of "Cancellation" transaction - troubleshooting
(further description is based on the option a) of the communication between CR and POS):

Failure to receive ACK from CR after authorization of the transaction

After the cancellation is authorized, the POS terminal sends the ENQ to the CR. If it does not receive an ACK from the CR within 7 seconds, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an acoustic signal will sound at the same time. The POS terminal automatically generates a technical cancellation for the original transaction. In this case, the attendant must repeat the attempt to execute the transaction from the beginning.

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	The POS does not receive an ACK from the CR within 7 seconds	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatically printing receipt

Failure to receive ACK from CR after sending packet <respv>
If the POS terminal does not receive ACK packet from the CR within 7 seconds, after sending the packet <respv>, the corresponding error message (COMMUNICATION ERROR WITH CASH REGISTER) will appear on the POS terminal display and an audible signal will sound. The POS terminal automatically generates a technical cancellation for the original transaction. In this case, the attendant must repeat the attempt to execute the transaction from the beginning.

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>

ACK	The POS does not receive an ACK from the CR within 7 seconds	ERROR OF COMMUNICATION WITH THE CASH REGISTER; automatically printing receipt

Receiving inconsistent data (unexpected data, incomplete packet, incorrect LRC checksum ...)
In the event that inconsistent / incomplete / unexpected data are received during the communication, an incorrect LRC checksum is found, or another state, which does not allow correct evaluation and standard continuation of communication, is sent by the receiving party NAK (byte 0x15). After receiving the NAK, the communicating party repeats the sending of the original packet (max. 3 times). If even after the third iteration, the data is not evaluated as correct by the receiving party, the operation is aborted without the possibility to continue, an informative error message will be displayed. A technical cancellation for the original transaction is automatically generated. If re-transmission solves the problem of erroneous data, communication continues by default.

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	ERROR OF COMMUNICATION WITH THE CASH REGISTER
	<--------	EOT

or

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

Closure

In the main loop the POS terminal awaits orders from the CR. The attendant presses an appropriate key for "Closure" operation on the CR . Then according to the protocol (see below) the CR will send a *packet <trans>* to the POS terminal.

Packet <trans>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"TRANS"	5	N	
SEPARATOR	"\"	1		
Trans. Type	"9"	1	N	"9" Closure
SEPARATOR	"\"	1		
Protocol Version	VARCH	20	N	Currently "v116r02"
SEPARATOR	"\"	1		
Control Flag		9	N	Control loop (see chapter "Control Flag-transaction progress management")

Note: the list of values of the ECR2 protocol version to be sent within <trans> packet should by previously discussed with the bank.

Value of the "Protocol Version" field must match the version of the documentation on the basis of which the implementation is made, as the value of the "Protocol Version" field of the version can directly affect the content of the RESPV packet.

The "Control Flag" field allows the ECR to control the progress of the transaction. For example, receipt printing, receipt data source, etc. (see chapter "Control Flag - transaction progress management")

The POS terminal will prepare a request message for the AC. After receiving a response from the AC, the POS will send a report *packet <respv>* to the CR.

Packet <respv>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"RESPV"	5	N	
SEPARATOR	"\"	1		
Merchant name	VARCH	40	Y	Supermarket NIS
SEPARATOR	"\"	1		
Address – street	VARCH	20	Y	Test Street 1
SEPARATOR	"\"	1		
Address – city	VARCH	20	Y	Bratislava
SEPARATOR	"\"	1		
Address – Postal code	VARCH	5	Y	82106
SEPARATOR	"\"	1		
Transaction date	Date	8	Y	"DDMMYYYY"
SEPARATOR	"\"	1		
Transaction time (tag 62)	N	6	Y	"HHMMSS"
SEPARATOR	"\"	1		
Receipt number	N	9	Y	e.g. "0001",.., "0576",…
SEPARATOR	"\"	1		
Terminal ID (tag 84)	N	20	Y	"999996"

SEPARATOR	"\"	1		
Response terminal	N	1	N	"0" transaction rejected "1" transaction executed
SEPARATOR	"\"	1		
Response message	VARCH	undefined	N	"Operation executed", "Operation interrupted"
SEPARATOR	"\"	1		
Number of cash trans. (tag FD09)	N	10	Y	e.g. "1"
SEPARATOR	"\"	1		
Amount of cash trans (tag FD09)		18	Y	text printed on a receipt without modification, e.g. "500.00"
SEPARATOR	"\"	1		
Number of cashless trans. (tag FD09)	N	10	Y	e.g. "1"
SEPARATOR	"\"	1		
Amount of cashless trans. (tag FD09)		18	Y	text printed on a receipt without modification, e.g. "500.00"
SEPARATOR	"\"	1		
Currency code (tag FD0B)	VARCH	3	Y	text printed on a receipt without modification, e.g. "EUR"

SEPARATOR	"\"	1		
Previous transaction date	Date	8	Y	"DDMMYYYY" – date of previously performed Closure
SEPARATOR	"\"	1		
Previous transaction time	N	6	Y	"HHMMSS" – time of previously performed Closure
SEPARATOR	"\"	1		
Counters of non-payment applications	VARCH	512	Y	<APLIKACIA>.<PRODUKT>:<number>,<amount in cents>. Delimiter ,;'. e.g. : KLUB.CALLIOGASTRO:1,2000;TOPUP.EASY7:2,1400;TOPUP.EASY16:1,1600; If there were not products of non-payment applications, field will be empty
SEPARATOR	"\"	1		
Customer Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"
SEPARATOR	"\"	1		
Merchant Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"

If the POS does not receive a response from the AC or there is a timeout for data entry, the POS sends a packet message <respv> for CR so that Response terminal = "0", Response message = "Operation aborted"..

The "Customer Receipt" and "Merchant Receipt" fields will be filled in depending on the value of the "Control Flag" input parameter.

Processing of "Closure":

    a)   Communication with regular check of connectivity between CR and POS terminal
To check the connectivity check between CR and POS between particular transactions, it is recommended to send ENQ from CR to POS on regular basis, default interval of 5secs should be sufficient. Receipt of ACK from POS is sign of POS readiness.

ENQ	------->	
	<--------	ACK

Cash Register		**POS**
<trans>	------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	------->	
	<--------	<respv>
ACK	------->	
	<--------	EOT

b) Communication without regular check of connectivity between CR and POS terminal

If the above mentioned connectivity check between CR and POS terminal cannot be applied, CR sends ENQ to POS before every transaction only. After receipt of ACK from POS terminal, the CR sends <trans> packet and further communication is realized in a standard way.

Cash Register		**POS**
ENQ	------->	
	<--------	ACK
<trans>	------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	------->	
	<--------	<respv>
ACK	------->	
	<--------	EOT

Processing of "Closure" on POS terminal – troubleshooting
(further description is based on the option a) of the communication between CR and POS):

Receiving inconsistent data (unexpected data, incomplete packet, incorrect LRC checksum …)

In the event that inconsistent / incomplete / unexpected data are received during the communication, an incorrect LRC checksum is found, or another state, which does not allow correct evaluation and standard continuation of communication, is sent by the receiving party NAK (byte 0x15). After receiving the NAK, the communicating party repeats the sending of the original packet (max. 3 times). If even after the third iteration, the data is not evaluated as correct by the receiving party, the operation is aborted without the possibility to continue, an informative error message will be displayed. A technical cancellation for the original transaction is automatically generated. If retransmission solves the problem of erroneous data, communication continues by default.

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	ERROR OF COMMUNICATION WITH THE CASH REGISTER
	<--------	EOT

or

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>

NAK	------->	
	<--------	<respv>
ACK	------->	
	<--------	EOT

Subtotal

In the main loop the POS terminal awaits orders from the CR. The attendant presses an appropriate key for "Subtotal" operation on the CR . Then according to the protocol (see below) the CR will send a *packet* *<trans>* to the POS terminal.

Packet <trans>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"TRANS"	5	N	
SEPARATOR	"\"	1		
Trans. Type	"0"	1	N	"0" - Subtotal
SEPARATOR	"\"	1		
Protocol Version	VARCH	20	N	Currently "v116r02"
SEPARATOR	"\"	1		
Control Flag		9	N	Control loop (see chapter "Control Flag-transaction progress management")

Note: the list of values of the ECR2 protocol version to be sent within <trans> packet should by previously discussed with the bank.
Value of the "Protocol Version" field must match the version of the documentation on the basis of which the implementation is made, as the value of the "Protocol Version" field of the version can directly affect the content of the RESPV packet.
The "Control Flag" field allows the ECR to control the progress of the transaction. For example, receipt printing, receipt data source, etc. (see chapter "Control Flag - transaction progress management")

The POS terminal will prepare a request message for the AC. After receiving a response from the AC, the POS will send a report *packet <respv>* to the CR.

Packet <respv>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"RESPV"	5	N	

SEPARATOR	"\"	1		
Merchant name	VARCH	40	Y	Supermarket NIS
SEPARATOR	"\"	1		
Address – street	VARCH	20	Y	Test Street 1
SEPARATOR	"\"	1		
Address – city	VARCH	20	Y	Bratislava
SEPARATOR	"\"	1		
Address – Postal code	VARCH	5	Y	82106
SEPARATOR	"\"	1		
Transaction date (tag 02)	Date	8	Y	"DDMMYYYY"
SEPARATOR	"\"	1		
Transaction time (tag 62)	N	6	Y	"HHMMSS"
SEPARATOR	"\"	1		
Receipt number	N	9	Y	e.g. "0001",.., "0576",…
SEPARATOR	"\"	1		
Terminal ID (tag 84)	N	20	Y	"999996"
SEPARATOR	"\"	1		
Response terminal	N	1	N	"0" transaction rejected "1" transaction executed
SEPARATOR	"\"	1		
Response message	VARCH	undefined	N	"Operation executed", "Operation interrupted"
SEPARATOR	"\"	1		
Number of cash trans (tag FD09)	N	10	Y	e.g. "1"
SEPARATOR	"\"	1		
Amount of cash trans. (tag FD09)		18	Y	text printed on a receipt without modification, e.g. "500.00"
SEPARATOR	"\"	1		

Number of cashless trans. (tag FD09)	N	10	Y	e.g. "1"
SEPARATOR	"\"	1		
Amount of cashless trans. (tag FD09)		18	Y	text printed on a receipt without modification, e.g. "500.00"
SEPARATOR	"\"	1		
Currency code (tag FD0B)	VARCH	3	Y	text printed on a receipt without modification, e.g. "EUR"
SEPARATOR	"\"	1		
Previous transaction date	Date	8	Y	"DDMMYYYY" – date of previously performed Subtotal
SEPARATOR	"\"	1		
Previous transaction time	N	6	Y	"HHMMSS" – time of previously performed Subtotal
SEPARATOR	"\"	1		
Counters of non-payment applications	VARCH	512	Y	<APLIKACIA>.<PRODUKT>:<number>,<amount in cents>. Delimiter ,;'. e.g. : TOPUP.EASY7:2,1400;TOPUP.EASY16:1,1600; If there were not products of non-payment applications, field will be empty
SEPARATOR	"\"	1		
Customer Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"
SEPARATOR	"\"	1		
Merchant Receipt		undefined	Y	text printed on a receipt without modification Lines are separated with ";"

If the POS does not receive a response from the AC or there is a timeout for data entry, the POS sends a packet message <respv> for CR so that Response terminal = "0", Response message = "Operation aborted".

The "Customer Receipt" and "Merchant Receipt" fields will be filled in depending on the value of the

"Control Flag" input parameter.

Processing of "Subtotal":

    a)   Communication with regular check of connectivity between CR and POS terminal

To check the connectivity check between CR and POS between particular transactions, it is recommended to send ENQ from CR to POS on regular basis, default interval of 5secs should be sufficient. Receipt of ACK from POS is sign of POS readiness.

ENQ	-------->	
	<--------	ACK

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

    b)   Communication without regular check of connectivity between CR and POS terminal

If the above mentioned connectivity check between CR and POS terminal cannot be applied, CR sends ENQ to POS before every transaction only. After receipt of ACK from POS terminal, the CR sends <trans> packet and further communication is realized in a standard way.

Cash Register		POS
ENQ	-------->	
	<--------	ACK
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	

	<--------	<respv>
ACK	------->	
	<--------	EOT

Processing of "Subtotal" on POS terminal - troubleshooting
(further description is based on the option a) of the communication between CR and POS):

Receiving inconsistent data (unexpected data, incomplete packet, incorrect LRC checksum …)
In the event that inconsistent / incomplete / unexpected data are received during the communication, an incorrect LRC checksum is found, or another state, which does not allow correct evaluation and standard continuation of communication, is sent by the receiving party NAK (byte 0x15). After receiving the NAK, the communicating party repeats the sending of the original packet (max. 3 times). If even after the third iteration, the data is not evaluated as correct by the receiving party, the operation is aborted without the possibility to continue, an informative error message will be displayed. A technical cancellation for the original transaction is automatically generated. If retransmission solves the problem of erroneous data, communication continues by default.

Cash Register		POS
<trans>	------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	------->	ERROR OF COMMUNICATION WITH THE CASH REGISTER
	<--------	EOT

or

Cash Register		POS
<trans>	-------->	
	<--------	ACK

Authorization of transaction

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

Top-up

POS terminal in the main loop waits for ECR commands. The attendant presses the appropriate button on the ECR for top-up transaction by cash. ECR sends *packet <trans>* to a POS terminal.

WARNING: Reversals for top-up transactions are not possible.

Available providers with amount:

Provider	Amount (EUR)
Telekom	7
Telekom	9
Telekom	10
Telekom	12
Telekom	16
Telekom	25
Telekom	50
Orange	9
Orange	12
Orange	15
Orange	20
Orange	30
Orange	50
O2	6
O2	8
O2	10
O2	15

O2	20
Funfon	5
Funfon	7
Funfon	9
Funfon	12
Funfon	15
Funfon	20
Funfon	30
Funfon	50
4ka	4
4ka	8
4ka	12
4ka	16
4ka	20

Packet <trans>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"TRANS"	5	N	
SEPARATOR	"\"	1		
Trans. Type	"1"	1	N	"12" Top-up
SEPARATOR	"\"	1		
Amount		18	Y	For example "15.00", For possible values refer to Top-up amounts
SEPARATOR	"\"	1		
Telephone number		14	Y	Telephone number in format +421999999999
SEPARATOR	"\"	1		
Provider	VARCH	16	Y	Possible values (separated with ;) Telekom;O2;Orange;4ka;Funfon • Always only one value per transaction
SEPARATOR	"\"	1		
Protocol Version	VARCH	20	N	Currently "v116r02"
SEPARATOR	"\"	1		
Pay by card		1	N	Y / N – **currently only cash is possible**
SEPARATOR	"\"	1		

		9	N	Control loop (see chapter "Control Flag- transaction progress management")
Control Flag		9	N	Control loop (see chapter "Control Flag- transaction progress management")

Notes:

The list of values of ECR2 protocol versions sent within the <trans> packet must be discussed with the acquirer. The value of the "Protocol Version" field must match the version of the documentation on the basis of which the implementation is made, as the value of the "Protocol Version" field of the version can directly affect the content of the RESPV packet.

The "Control Flag" field allows the ECR to control the progress of the transaction. For example, receipt printing, receipt data source, etc. (see chapter "Control Flag - transaction progress management")

Packet <respv>

DATA	CHAR	MAX LENGTH	PRINT ON RECEIPT	NOTES
Header	"RESPV"	5	N	
SEPARATOR	"\"	1		
Merchant name	VARCH	40	Y	Supermarket
SEPARATOR	"\"	1		
Address - street	VARCH	20	Y	Test street 1
SEPARATOR	"\"	1		
Address - city	VARCH	20	Y	Bratislava
SEPARATOR	"\"	1		
Address – Postal code	VARCH	5	Y	82106
SEPARATOR	"\"	1		
Terminal ID (tag 84)	N	20	Y	"999996"
SEPARATOR	"\"	1		
Response terminal	N	1	N	„0" transaction rejected „1" transaction complete
SEPARATOR	"\"	1		
Response message	VARCH	undefined	N	„Top-up successfully performed", „Wrong phone number format" „Operation cancelled" "Provider declined" etc.
SEPARATOR	"\"	1		
Authorization code	VARCH	8	Y	For example "12345678"
SEPARATOR	"\"	1		
Sequence number	N	9	Y	For example "012345678"…, "0576"…
SEPARATOR	"\"	1		

Line1		undefined	Y	text printed on the receipt without any modifications
SEPARATOR	"\"	1		
Line2		undefined	Y	text printed on the receipt without any modifications
SEPARATOR	"\"	1		
Line3		undefined	Y	text printed on the receipt without any modifications
SEPARATOR	"\"	1		
Telephone number		14	Y	Telephone number in format +421999999999
SEPARATOR	"\"	1		
Provider	VARCH	16	Y	Possible values (separated with ;) Telekom;O2;Orange;4ka;Funfon
SEPARATOR	"\"	1		
Transaction date and time	Datetime	15	Y	Format: YYYYMMDD hhmmss
SEPARATOR	"\"	1		
Amount authorized		18	Y	For example "15.00", contains the amount of the top-up transaction
SEPARATOR	"\"	1		
Customer Receipt		undefined	Y	text printed on the receipt without modification. Lines are separated by a ";"
SEPARATOR	"\"	1		
Merchant Receipt		undefined	Y	text printed on the receipt without modification. Lines are separated by a ";"

If the POS does not receive a response from the AC or there is a timeout for data entry, the POS sends a *packet* message *<respv>* for CR so that Response terminal = "0", Response message = "Operation aborted"..

Line1 contains the type of transaction (PAYMENT) together with the amount and the currency. Line2 and Line3 contain a description of any error that occurred during authorization (e.g. line2 = "Connection", line3 = "error").

The "Customer Receipt" and "Merchant Receipt" fields will be filled in depending on the value of the "Control Flag" input parameter.

In case of any problem during communication or not receiving response from terminal, please use command for resending results or check transaction on POS Transaction History section.

Receiving inconsistent data (unexpected data, incomplete packet, incorrect LRC checksum ...)
In case when an inconsistent / incomplete / unexpected data are received during the communication, an incorrect LRC checksum is found, or another state, which does not allow correct evaluation and standard continuation of communication, is sent by the receiving party NAK (byte 0x15). After receiving the NAK, the communicating party repeats the sending of the original packet (max. 3 times). If even after the third iteration, the data is not evaluated as correct by the receiving party, the operation is aborted without the possibility to continue, an informative error message will be displayed.

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	ERROR OF COMMUNICATION WITH THE CASH REGISTER;
	<--------	EOT

Or

	<--------	ENQ
ACK	-------->	
Inconsistent/incomplete data detected	<--------	<respv>
NAK	-------->	
	<--------	<respv>
ACK	-------->	
	<--------	EOT

ECR messages displayed in case of a rejected transaction

The authorization code and error description in text form are generated by the AC and the POS terminal sends them in the <respv> packet, in the fields "Authorization code" and "Response message" to the CR. The textings defined in previous versions of the ECR2 Protocol since version 115 are out of date and not used.

Instructions for the signature verification process on the CR

Print of receipts on the POS terminal in case of connection with CR can be set by changing the configuration as follows:

A) Default setting: receipts are printed on the POS terminal .
B) Receipts are not printed on the POS terminal with the exception of the signature CVM (verification of the cardholder by signing the receipt).
C) No receipts are printed on the POS terminal, even in the case of a signature CVM

The configuration is set by the service organization in the TMS based on the request of the merchant / acquirer.

An alternative and preferred method of configuration is to use the "Control Flag" parameter (see chapter "Control Flag - transaction progress management").

With settings A) and B), it is not necessary to make any adjustments on the CR side regarding signature verification. The prompt to verify the signature for the operator is displayed on the POS terminal, which also prints a receipt with the signature strip for verification.

When setting C), this obligation must be taken over by the CR and the following procedure must be implemented:

- The obligation to display a dialog asking for signature verification is displayed by the CR if in the response (<respv> packet) the value of the "PIN Transaction" field is 0. In this case, the attendant is obliged to obtain and verify the signature.
- The CR must prompt the operator to verify the signature (e.g. display the message "Does the signature agree?").
- Subsequently, the CR must print a receipt containing the space for signature, hand it over to the cardholder and ask him to sign this receipt.
- The operator verifies the signature with the signature pattern indicated on the back of the card (a card that does not have the signature on the back is considered invalid).
- If the signature agrees, the CR does not have to do any activity towards the terminal. The receipt with the signature must be kept for a possible complaint
- If the signature does not match, the CR must call the Reversal of last transaction function as described in this document and consider the payment as not made.

Control Flag-transaction progress management

The preferred way to configure the course of the transaction is to use the "Control Flag" parameter where:

0x01 → print receipt on ECR

0x02 → ECR signature verification

0x04 → receipt formatted to POS and ECR prints without modification

For example, the scenarios according to the chapter "Instructions for the signature verification process on the CR" have the following values:

        A) "Control Flag" = 0 (or no value)

        B) "Control Flag" = 1

        C) "Control Flag" = 3 (0x01 + 0x02)

Acceptance of meal cards

Meal cards can only be used for payment only in accordance with the law. For payment for foodstuffs.
The following processing is recommended:

The cashier invokes the standard "Payment" operation. The request from the ECR will contain, among other data, the total amount and the amount to be paid by the ESK, "Meal Amount" field (sum of items allowed to be paid with ESK). The request must not contain a cash amount of so-called Cashback amount. Initially, the use of a payment card is assumed. The total amount is used first and appears on the POST screen when prompted to load the card. When card is loaded POST evaluates the data read from the card and recognizes the type of used card.

        1. If an ESK card has been identified and the amount to be paid for the ESK is non-zero and at the same time less than the total amount, processing will be interrupted. The customer will be notified that he can only pay a lower amount with the given card.

        a) After confirming the amount, the transaction continues. In the case of a chip card, the card remains in the reader and its processing is resumed. In the case of a contactless card, the customer will re-attach the card. In the case of a card with a magnetic stripe, no further action is required with the card. The transaction will be sent for authorization and the reply to the cashier will contain information about the card used as well as the amount actually authorized.

        b) In the event that the lower amount is rejected by the customer (pressed the "Cancel" button), or the dialogue timeout expires, the transaction will be canceled.

        2. If the ESK has been identified and the amount to be paid for the ESK is zero, processing shall be interrupted. The transaction will be canceled.

        3. If an ESK has been identified and the "Cashback amount" is non-zero, processing will be interrupted. The transaction will be canceled.

        4. Processing of the standard payment card remains unchanged, but the reply to the cashier will also contain the amount actually authorized.

EXAMPLES

a.   Message extended with DCC information

request:

<STX>TRANS\1\9.15\0.00\\v115<ETX><LRC>

respons:

<STX>RESPV\Printec\Elektrarenska 4\Bratislava\80000\541333######0037\\MC\MC\\S1APPTC4\1\0\TRANSAKCIA   VYKONANA 005526\005526 \001047019\Purchase 9.15 EUR\\\\20180625 145213\Transaction Amount: 10.32 USD;Transaction Currency: USD;Exchange Rate: 1EUR=1.12841USD;Commission:0.00%;I have been offered a choice of currencies and have chosen to accept DCC and pay in USD at the exchange rate provided by Global Payments s.r.o.;<ETX><LRC>

b. Examples of new form of cancellation transaction

request:

<STX>TRANS\8\9.15\S1APPTC4\20180625\001047019\0037\v115<ETX><LRC>

respond:

<STX>RESPV\Printec\Elektrarenska 4\Bratislava\80000\S1APPTC4\\\\0.00 EUR\9.15 EUR\1\TRANSAKCIA VYKONANA 005526\\001047019\Cancellation 9.15 EUR\\\20180625 145632<ETX><LRC>

c. Examples of RESPV messages with receipts

request:
<STX>TRANS\1\0.25\0.00\123456\v116r01\\7<ETX><LRC>

response:
<STX>RESPV\GP   TEST\\Bratislava************9606\A0000000031010\Visa   Prepaid\Visa Prepaid****\11100375\1\2\TRANSAKCIA VYKONANA 939746\939746   \001051018 \PAYMENT 0.25 EUR\\Visa Contactless\123456\20200623162216\\0.25\   GP TEST;   Bratislava;----------------------- --------------;051   23.06.2020 16:22:14   1166;   RECEIPT FOR CUSTOMER;-------------------------------- ---;   PAYMENT;;MERCHANT ID: 7399000099;TERMINAL: 11100375;;Card: [L] ************9606;Visa Prepaid;AID: A0000000031010;;Amount EUR   0.25;;;Visa Contactless;Invoice number: 123456;Approval code: 939746;Sequence number: 001051018;;RC: 001;;   TRANSAKCIA VYKONANA 939746;------------------------------------;   Thank you; Keep the receipt for later checking;   Version: KS 01.02 (048);\   GP TEST;   Bratislava;----------------------------------- -;051   23.06.2020 16:11:46   1165;   RECEIPT FOR MERCHANT;------------------------------------; PAYMENT;;MERCHANT ID: 7399000099;TERMINAL: 11100375;;Card: [L] ************9606;Visa Prepaid;AID: A0000000031010;;Amount EUR   0.22;;;Visa Contactless;Approval code: 558998;Sequence number: 001051017;;RC: 001;;   TRANSAKCIA VYKONANA 558998;------------------------------------;   Thank you; Keep the receipt for later checking; Version: KS 01.02 (048);<STX><LRC>