GPE POS terminal simulators
Communication with ECR by GPE interface

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Version	Date	Created by	Comments
1.0	10/01/2014	MD	Basic description
1.1	19/12/2014	PK	English translation

History of changes:

Version 1.0

Basic description.

Contents:

Introduction

1.1 Purpose of document

This is document description of simulator payment terminal and specified to testing of implement a communication protocol of GPE in Electronic Cash Register.

The simulator replaced standard method, which means delivery physical payment terminal of company GPE.

1.2 Used abbreviations, terms and references

Abbreviations / term	Meaning
AC	Authorization center of GPE
ECR	Electronic Cash Register
ECHO	Message from POSTsim to ECR ,which inform ECR to continue waiting on completion authorization on next delay time (60s)
FPOST	Physical payment terminal
HOST	Host server (may by any system , also from third side)
ICT220. ICT250	Payment terminals with integrated printer
IPP320, IPP350, IPP480	Payment terminal without integrated printer
POST	Point Of Sale Terminal
POSTsim	Program simulation of payment terminal
RC	Response Code - retuned code inform result of operation Ordinary POSTsim was sending to ECR result authorization, but can by codes define also other states – example error format message.

1.3 Reference

	Reference	Description
[1]	ecr-pos-base_v_12_17_EN	Description ECRxPOST interface, which are included in POS simulator
[2]	DocICT220_250_s_ECR_B&W_v_01_04 DocIPP320_350_s_ECR_B&W_v_01_04	User's manual of physical terminal by type, which have implemented GPE interface protocol
[3]	CRC-16 CCITT v.41	Calculate CRC using in messages between ECR a POST
[4]	EIA RS-232	Standard's RS232 interface
[5]	ASCII, ANSI X3.4, CCITT (Recommendation V.3)	Controls symbols

Trace convention

In trace the invisible chars (value which are smaller than 0x20) replace by the indication of sign (accordion ASCII) in brackets <>. If message overlap1 line, then are break and continue to next line until meet tab.

General section

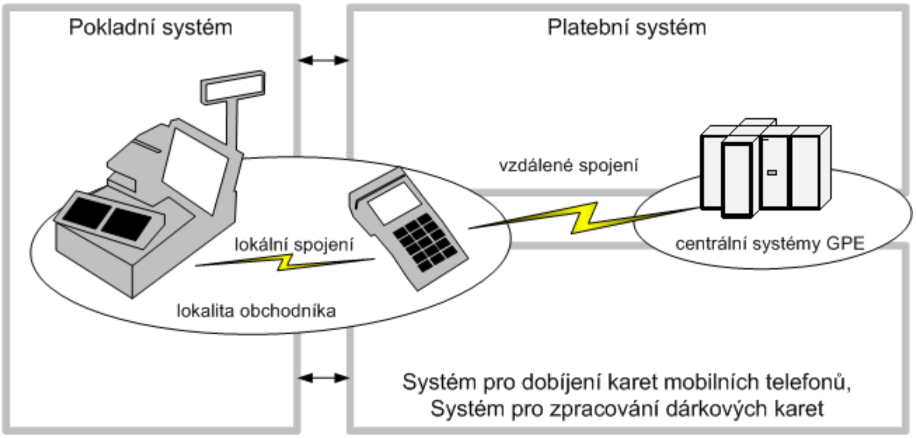
The cash register interface of the payment terminal is the same for all GPE terminals, but is only implemented for terminal types in which its use is prudent (e.g. desk-type terminals)

1.4 Schema involved of perception systems

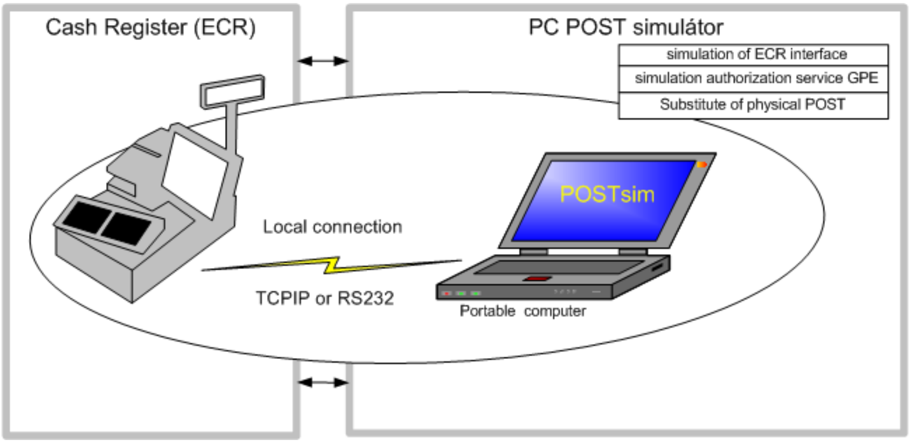
The payment terminal's role in processing transaction lie in ensuring the secure collection of input data, mediation processing of transaction by authorization center of GPE and grant trustworthy information about result of processing.

Integration of the electronic cash register and payment terminal are can't understand as only connection of a new periphery , but rather as a new created accounting relation between the cash register and authorization center.

The operation process of this relation not in mostly cases managed only the participating systems, but can be influence by two pair of humans factors (operator and customer).



For maximal simplification implementation of protocol to ECR was created stand-alone PC base version of payment terminal - simulator (POSTsim), which is replace above mentioned components of GPE (payment system GPE).


Cash Register (ECR)
PC POST simulátor
simulation of ECR interface
simulation authorization service GPE
Substitute of physical POST
POSTsim
Local connection
TCPIP or RS232
Portable computer

The basic version of application POSTsim support only banks cards. In next distribution will be accepted fleet a gift cards, also will be charge cellular phone (service by GPE)

a) Non-cash payment by cards

Implementation of non-cash payment by magnetic or chip card one of the association VISA, MASTERCARD, AMEX, JCB, DINERS CLUB. Deal with only simulation of card, physical card not need.

b) Replenish - GP Mobile

In POSTsim for now not implement.

c) Gift cards - GP Gift

In POSTsim for now not implement.

d) Fleet cards

In POSTsim for now not implement.

Detailed view on the progress processing of individual transaction in POST can be gain in User's Manual for given type of POST or from description of ECRxPOST specification.

1.5 Services offer by POSTsim

1.5.1 Payment services

In scope of payment services, the simulator of terminal offer next transaction:

SALE	Transfer of amount from the card holder's account to account of terminal's operator (merchant) as compensation (paying) for goods, services or cash.
CANCELATION	This operation cancels the previous transaction of SALE (if was finished success). It's an inversion transaction to transaction SALE between merchant and card's holder. Using, for example, when negative result of visual check signature of card's holder (check the signature on ticket in comparison with specimen signature on the card).
REFUND	Transfer amount from account of terminal's operator (merchant) to card's holder account. Using in, for example, warranty goods.
PREAUTHORIZATION	Using mainly in hotels or car rent for verification of the amount on customer's account. Blocking this amount perform according to roles of customer's bank and should by guarantee by bank to merchant in case unsuccessful finishing! In this situation did not transfer many.
PREAUTHOR. COMPLITION	This transaction are closely connect with transaction of Preauthorization and enable it finished, mean transfer many (like as Sale)
CONCLUSION	The purpose of this operation is conclude final accounts (example when change operators) and checked the balance of transactions in cash register (or payment terminal) with balance transaction in authorization center Result of operation (unlike transaction Sub-totals) is always reset transaction's counters all systems.

1.5.2 Services on charge and gift cards

V POSTsim for now not implements.

1.5.3 Services on Fleet cards

V POSTsim for now not implements.

1.6 Reasons and benefits usage POSTsim

The main benefits:

- not need physical terminal
- easily distribution
- easily debug errors of implementation protocol in ECR
- possibility trace communication between ECR and POSTsim
- easily analysis problems (POSTsim inform about errors in interface of ECR)
- can be adjusting in case necessary trace information about transactions and cards

1.7 Risk of using POSTsim

The main risks are belonging:

- maintain update version of POSTsim
- ensuring of functionality on different HW (PC)

1.8 Software environment for POSTsim application

The application was developed on java and for well work, must be run in next required software environment.

Current version of POSTsim v01.00 is required:

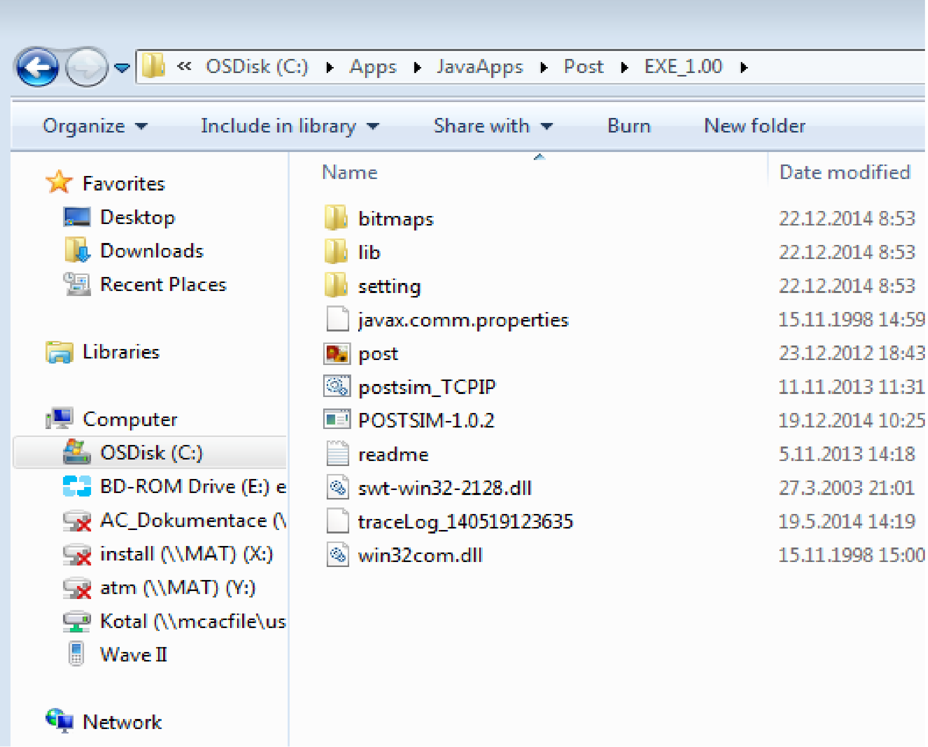
a) Supported OS
   - windows XP
   - windows 7
   - windows 8
   - Linux not support (will be in next release)

b) Supported java (install java on PC, where will be run POSTsim)
   - Version java jre1.6.0_43 or above

1.8.1 Install POSTsim on windows

After download archive POSTsim_1.00.zip from web GPE, unpack archive to target directory (for example - C:\DEST).

After unpack archive will be created folder C:\DEST\POSTSIM_1.00, where will copied all need files for start application.



Name	Date modified
bitmaps	22.12.2014 8:53
lib	22.12.2014 8:53
setting	22.12.2014 8:53
javax.comm.properties	15.11.1998 14:59
post	23.12.2012 18:43
postsim_TCPIP	11.11.2013 11:31
POSTSIM-1.0.2	19.12.2014 10:25
readme	5.11.2013 14:18
swt-win32-2128.dll	27.3.2003 21:01
traceLog_140519123635	19.5.2014 14:19
win32com.dll	15.11.1998 15:00

In order to the application POSTsim work well, are need

- **At PC install java (virtual machine) minimum version are jre1.6.0_43.**

- file: **javax.comm.properties** copy to directory of runtime java (exam. "C:\Program Files\Java\jre1.6.0_26\lib\"). Without this step the application can't work with COM PORT (type of interface a RS232).

- Have correct setting properties of application POSTsim (POSTSIM _1.00\setting\ appdata.xml).

  Recommendation is not changer the file appdata.xml, because in original version have correct setting!

  This is file **appdata.xml** can changed only for testing, if need testing special result of simulation, particular the specific behavior of ECR in case of critical situation (treatment state).

  Description of **appdata.xm in** appendix: Parameters of application – appdata.xml.

1.9 Transaction flow

Description of iteration between ECR and POST is decrypt in specification Ref [1].

However the flow is always from POSTsim view the same:

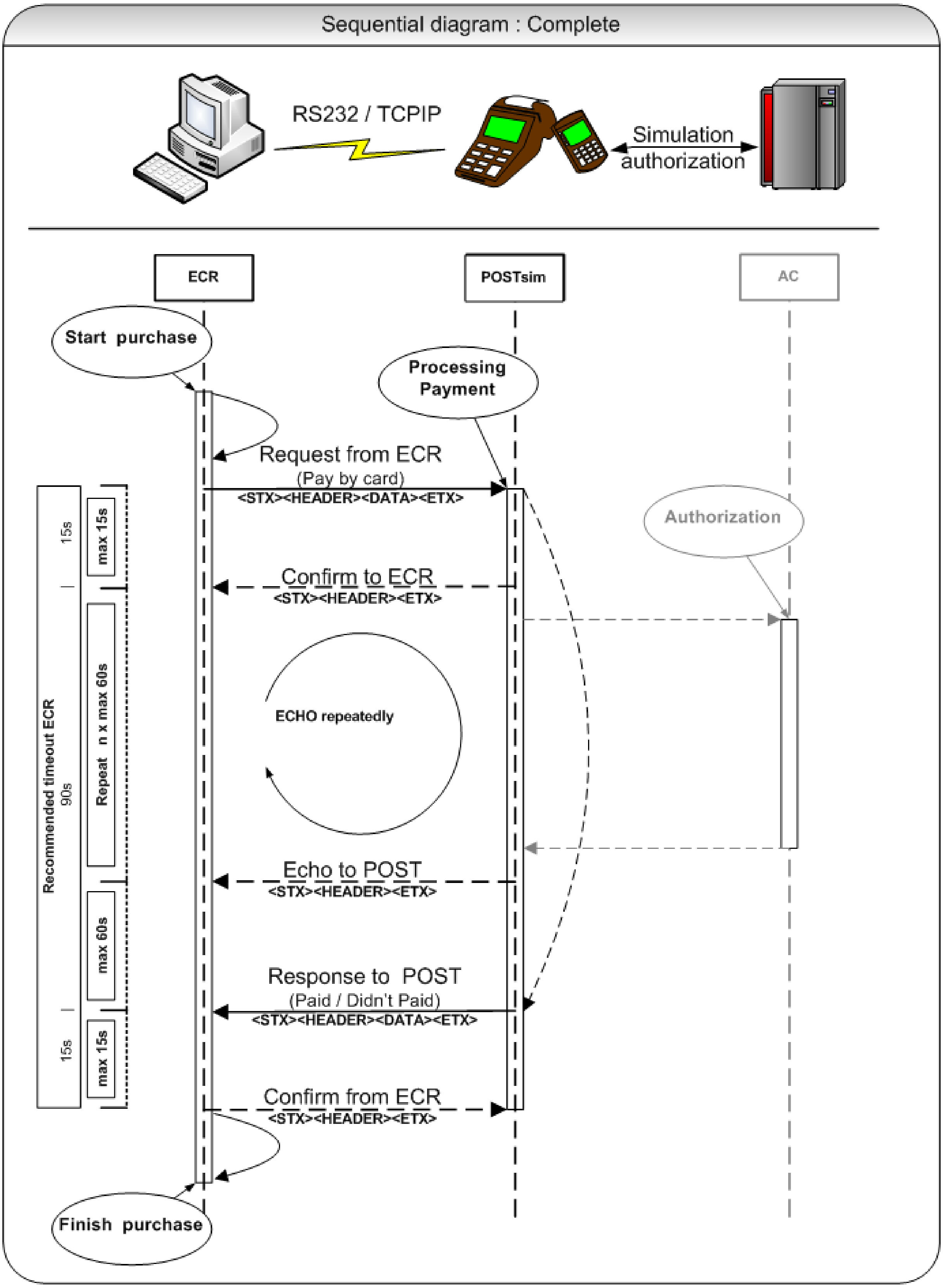
- Every transaction is atomic, which mean always separated from others transaction.
- Transaction is always starting from ECR
- Transaction should be always also finished from ECR. In others case deal with critical state, which POSTsim (FPOST) solve either Reversal or other appropriate resources. The POSTsim Reverse transaction physical not execute, but only inform, what will be real terminal will did - inform operator (developer or tester).

1.9.1 Description transaction flow

POSTsim

- In idle state and waiting stating request from ECR
- After receive and check request
    a) confirm received and accepted rightful request
    b) or inform ECR about errors in request
    – error of format, length or CRC message
    – missing mandatory fields in data part of message
- turn on required transaction and executed it simulation according to Setting transaction parameters.
- Sending requested result to ECR
- Waiting on final confirmation
- Finished transaction or response on did not receive final confirmation repeat sending requested result or inform about necessity executed Reverse.

1.9.2 Diagram of Payment transaction flow



Payment terminal his own architecture belong at category specific design device. Its own HW and SW equipment cannot enable parallel execute more task. IF is payment terminal processing task that assign by user’s interface of terminal , cannot possible launch processing a new task assign by ECR interface of terminal or other. This is property that true for POSTsim application, too. So the only one task will be in given time processing.

1.10 Difference between POSTsim and physical Payment terminal

The application POSTsim is design so that its one’s behavior as much possible was similar to physical terminal. But still talk only about simulation, which serve only for development and simplification of tests.
In any case can’t this SW replace closing tests and certification of cash interface, perform with physical production terminal!

Main differences:

- The POSTsim application have not card reader, all card can selected manually from list of choice, which setting by application from configuration file(appdata.xml)

- The POSTsim application have not connection to authorization system of GPE and thus, all results of authorization are selected from list of choice, which setting by application from configuration file (appdata.xml)

- The POSTsim application cannot run as multi-threads. In case more requests at first processed first request and after finish get next request. Physical terminal FPOST on duplicate request refuse request by response message with code 108 (terminal busy). POSTsim this code can return too ,if was setting in parameters of transaction (info in chapter : Configuration of transaction parameters)

1.11 Description of protocol ECRxPOSTsim

Protocol is identical as ECRxFPOST protocol (ref [1]]. In this guide POSTsim was not description this protocol. Complex description specification of protocol is in ref [1] (current version is *ecr-pos-base_v_12_17_EN.pdf*).

POSTsim support 2 type of interface for communication with ECR.

- RS232 – standard serial interface (in detail description in Ref [1])
  - Connection of cable in appendix: Connection of serial cable

- TCPIP – standard network interface (using with SSL)

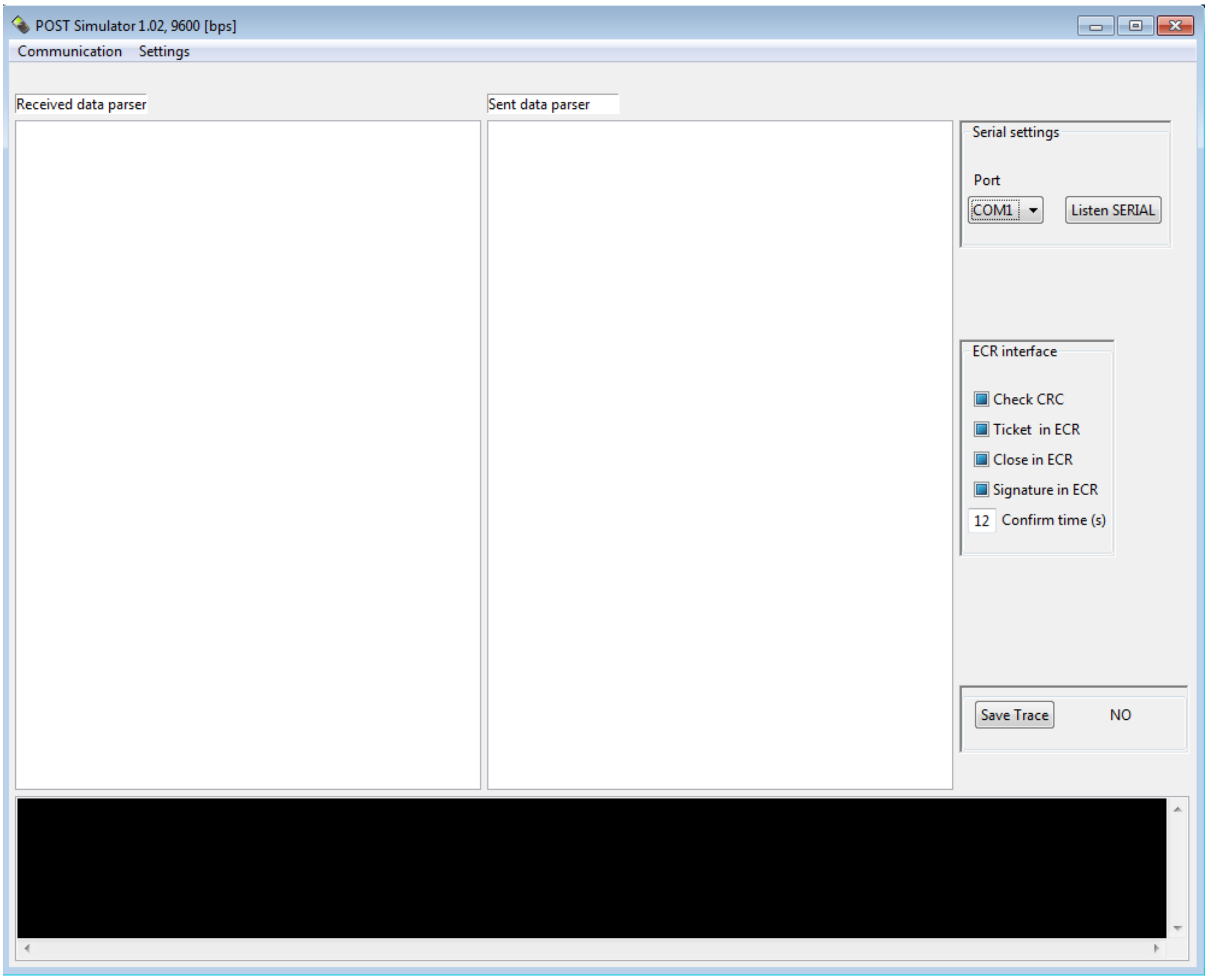
1.12 Description of POSTsim application

In order to the application correct work, is need properly setting environment (more find up in chapter: Software environment for POSTsim application).

1.12.1 Starting up POSTsim application

After started application „POSTSIM-1.0.0.exe“appears window of application, where will be take place all process. In default application's window start with setting communication with ECR over RS232 interface.

RS232 window



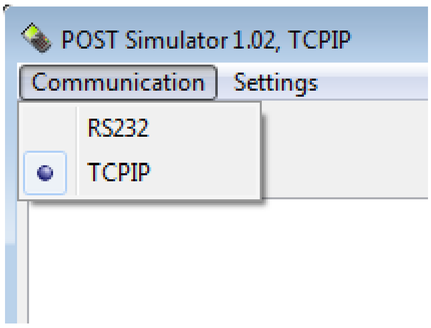
Port COM1

12 Confirm time (s)

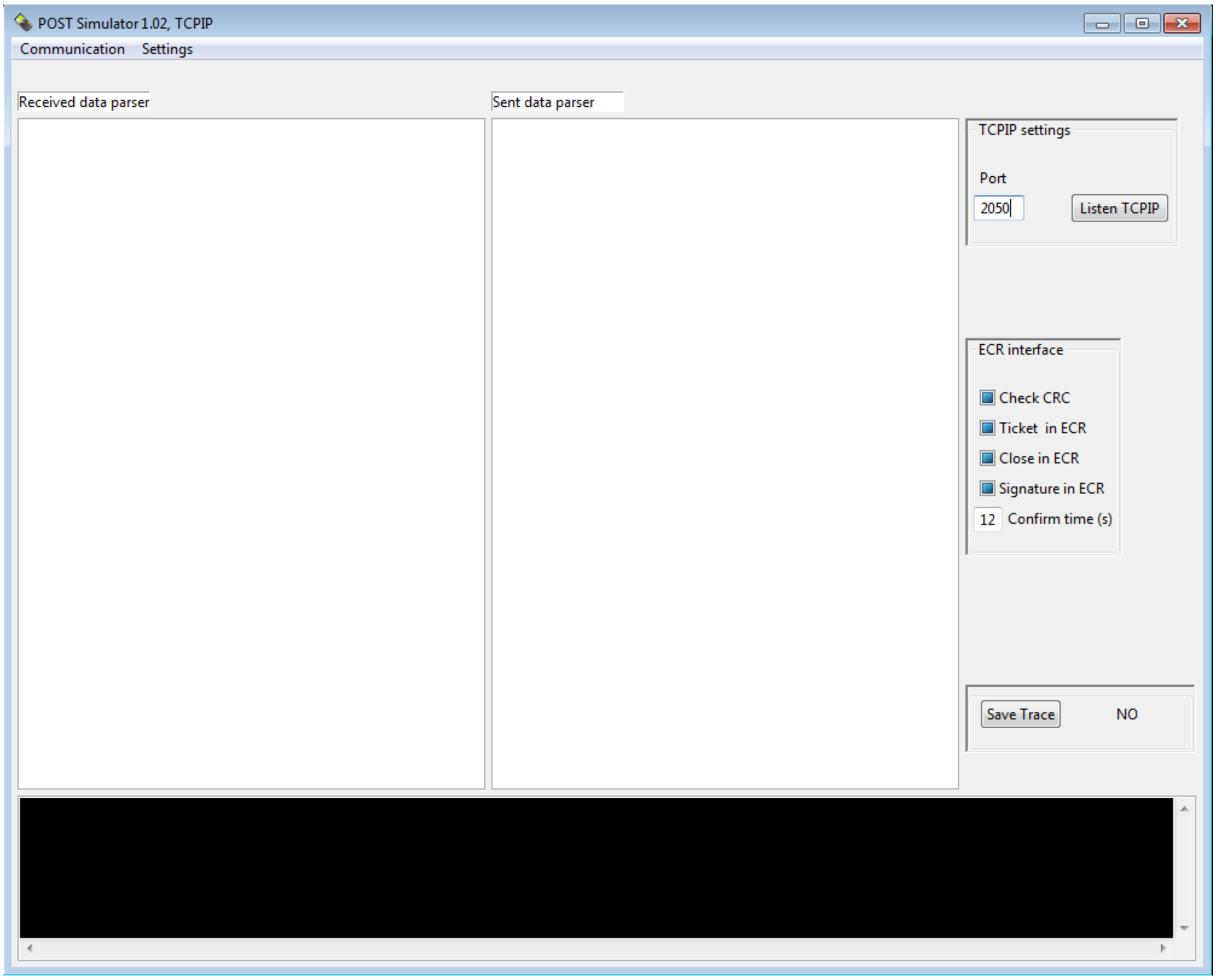
NO

The second supported option of communication interface is over TCP/IP. This communication interface can be switch over either from menu Communication and select TCPIP or starting up application with parameters: „POSTSIM-1.0.0.exe TCPIP“ .

Select TCP/IP from MENU



Window with TCP/IP



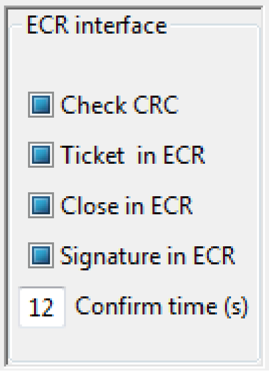
Port: 2050

□ Check CRC
□ Ticket in ECR
□ Close in ECR
□ Signature in ECR
12 Confirm time (s)

Save Trace: NO

1.12.2 Setting of ECR protocol

This setting performs for all type communication interface (RS232/TCPIP).Must be set before switch on monitoring income messages on given interface (POSTsim is always server, ECR client).



ECR interface

☑ Check CRC

☑ Ticket in ECR

☑ Close in ECR

☑ Signature in ECR

12 Confirm time (s)

Can be set next parameters:

a) Check CRC – POSTsim and ECR must be calculate check sum (CRC) date part of message . This is mandatory parameter and FPOS cannot switch off this checking, but for testing purpose and maximum comfort, acceleration development on side of ECR, can be this parameter temporarily off.
Attention – production version of ECR must be on control of CRC!
Method of calculate in appendix: Algorithm for calculation of CRC16.
Default is on.

b) Ticket in ECR – This parameter simulated request for print ticket of transaction by ECR (on) or print by terminal/POSTsim (off).
Default is ON

c) Close in ECR – This parameter simulated request starting Close from ECR. Switch off closing in ECR is special case of solution.
Standard request is starting closing from ECR!
Default if ON

d) Signature in ECR – this parameter simulated request to perform check signature of card's holder in ECR.
Check of signature in FPOST is special case solution and can be require only at terminals with internal printer(iCT220, iWL220) and request print ticket.
Standard request is Checking signature in ECR!
Default is ON

e) Finish time – this parameter is very important for problem-free communication. Using in moment, when POSTsim send to ECR authorization message (result of authorization) and responsibility of ECR is confirm received and
rightness this answer (More description in Ref [1].)
Default = 12s.

Warning

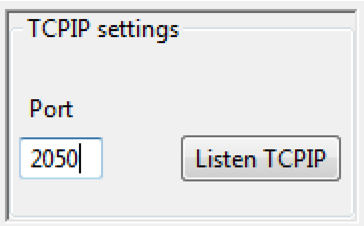
> This setting can be changed in case, that is switch on the monitoring, but changes visible not propagated. Necessary switch off and after that switch on monitoring!

1.12.3 Simulation of transaction over TCPIP

The application POSTsim enables communication with ECR over TCPIP, when POSTsim run as server and ECR as client. POSTsim thus waiting on at define interface, when ECR send request to start transaction.

1.12.3.1 Startup monitoring over TCPIP

At right upper part of window appears information



Port 2050

Where is evident that can be setting number of port TCPIP where server will be listen.
The IP address is the local IP (local host) of PC, on which POSTsim running.

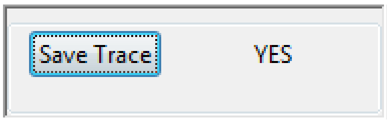
Before switch on monitoring need setting communication protocol in ECR, thus manner, which property is in protocols using (Setting of ECR protocol).

Button starting up TCPIP server, but before that, than start application monitoring on defined interface (set port and local host IP), must be setup parameters of transaction (in appendix: Configuration of transaction parameters). This setting let go always and contain parameters from file *appdata.xml*. It is anytime at during of monitoring between particular transactions changed by choice from MENU→Setting→Transaction data and change setting data.

1.12.3.2 Processing of received requests

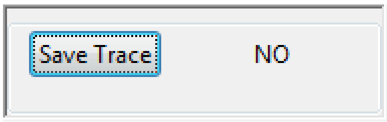
In this moment (monitoring is on) POSTsim waiting on request from ECR. Incoming communication trace is display in editing window, which is before each new transaction clean. IF is want this communication trace save for later analysis, must be switch on saving to file (can be setting too only in basic state, thus at off monitoring).

Trace is save



YES

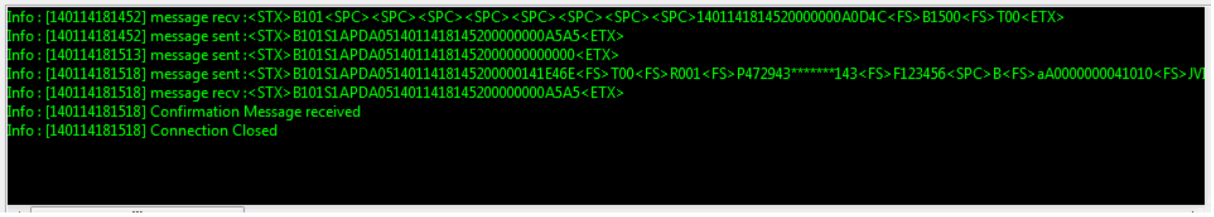
Trace is not save



NO

If saving communication trace turn on, then in root directory (where is placed the application POSTsim) is created file “*Log_RRMMDDHHMMSS*“, where RRMMDDHHMMSS is date and

time of starting saving trace example: traceLog_140113173225 was created 13.01.2014 at 17:32.25.
This time stamp ensues unique of file log. Into this file saving trace until stopped saving (option NO).



```
Info : [140114181452] message recv :<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>14011418145200000000A0D4C<FS>B1500<FS>T00<ETX>
Info : [140114181452] message sent :<STX>B101S1APDA0514011418145200000000A5A5<ETX>
Info : [140114181513] message sent :<STX>B101S1APDA051401141814520000000000000<ETX>
Info : [140114181518] message sent :<STX>B101S1APDA051401141814520000141E46E<FS>T00<FS>R001<FS>P472943*******143<FS>F123456<SPC>B<FS>aA0000000041010<FS>JV
Info : [140114181518] message recv :<STX>B101S1APDA0514011418145200000000A5A5<ETX>
Info : [140114181518] Confirmation Message received
Info : [140114181518] Connection Closed
```

If received request from ECR (standard flow)

Info : [140114181452] message recv :
<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>1401141814520000000A0D4C<FS>B1500<FS>T00<ETX>

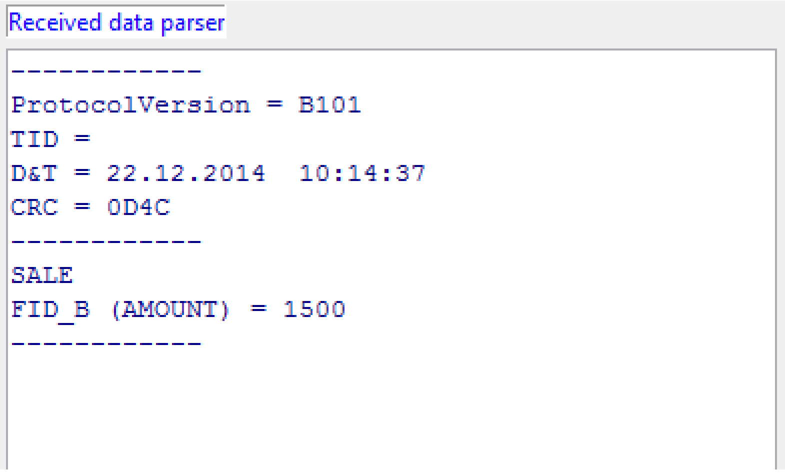
POSTsim on this react follows:

1) Checked, if message is authentic.

- Begin with control char <STX> (hex value is 02h)
- End with control char <ETX> (hex value is 03h)

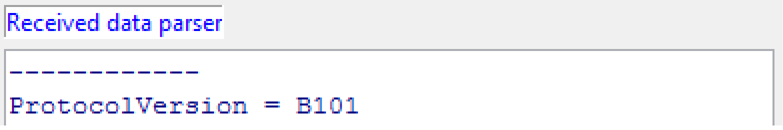
If check not passes, incoming data is discarding.

2) Check content of message and a results is display on window **Received data parser**
According to specification in Ref [1].



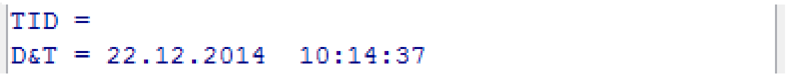
```
------------
ProtocolVersion = B101
TID =
D&T = 22.12.2014  10:14:37
CRC = 0D4C
------------
SALE
FID_B (AMOUNT) = 1500
------------
```

- Perform the check version of protocols (setting in *appdata.xml*) –have not impact on next processing of transaction, only inform, if version is correct



```
------------
ProtocolVersion = B101
```

- display
  - TID (can be only space) – 8 chars
  - Datum a time of transaction

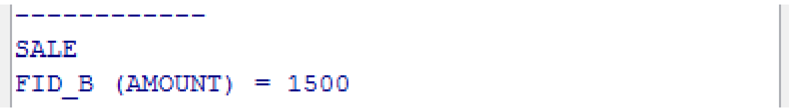


```
TID =
D&T = 22.12.2014  10:14:37
```

- Perform check CRC of data part (if not pass, display CRC FAILED !)

```
CRC = 0D4C
```

- Perform check length of data part (nothing is display)



```
------------
SALE
FID_B (AMOUNT) = 1500
```

- Perform check data fields (define in Ref [1], setting at *appdata.xml*)
  - Type transaction - if transaction is supported?
  - Mandatory fields (*appdata.xml*)
  - Optional fields (*appdata.xml*)

3) Accordion to rules which set at choice Configuration of transaction parameters is prepare response

- Send mandatory confirmation

```
Info : [140114181452] message sent :<STX>B101S1APDA0514011418145200000000A5A5<ETX>
```

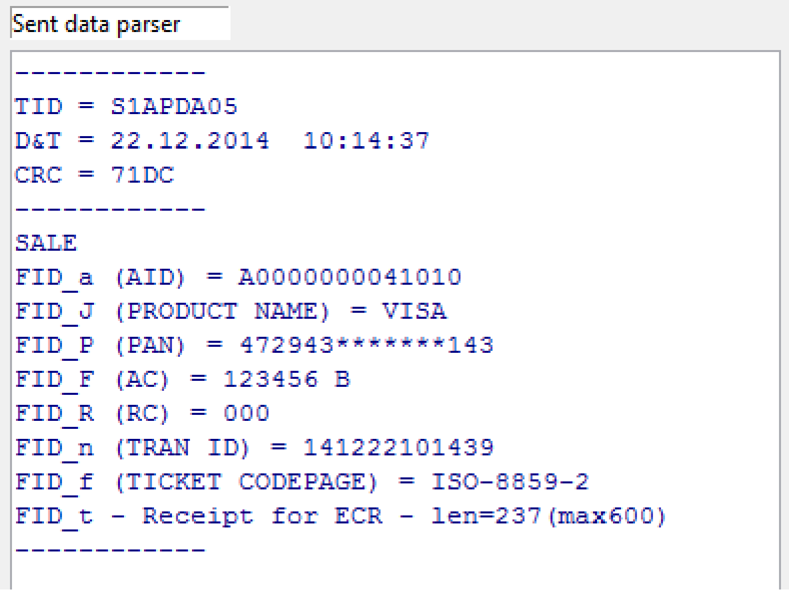
- Send echo (wait next minute), if setting

```
Info : [140114181513] message sent :<STX>B101S1APDA05140114181452000000000000<ETX>
```

- Send awaiting authorization message (resulting data contain fields FID_t , where formatting data for print ticket in ECR)

```
info : [140114181518] message sent
:<STX>B101S1APDA05140114181452000000141E46E<FS>T00<FS>R001<FS>P472943*******143<FS>F123456<SP
C>B<FS>aA0000000041010<FS>JVISA<FS>fISO-8859-2<FS>t14/01/14<SPC><SPC>18:14:52<SPC>001<LF
>#{Z}<LF >${SEPAR}<LF >A0000000041010<LF
>VISA<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><S
PC><SPC>(S)<LF ><SPC>****<SPC>****<SPC>****<SPC>*143<SPC><SPC><SPC><SPC><LF
>PRODEJ<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>
<SPC><SPC><SPC><LF
><xC8><xE1>stka<SPC>CZK<SPC>:<SPC>15.00<SPC><SPC><SPC><SPC><SPC><SPC><LF
>Autoriza<xE8>n<xED><SPC>k<xF3>d:<SPC>123456<SPC>B<LF >${SEPAR}<LF
>Doklad<SPC>uchovejte<SPC>pro<LF >pozd<xEC>j<x9A><xED><SPC>kontrolu<LF >${PAGE}<LF
><FS>n140114181518<ETX>
```

- Display data from authorization massage in window **Sent data parser**

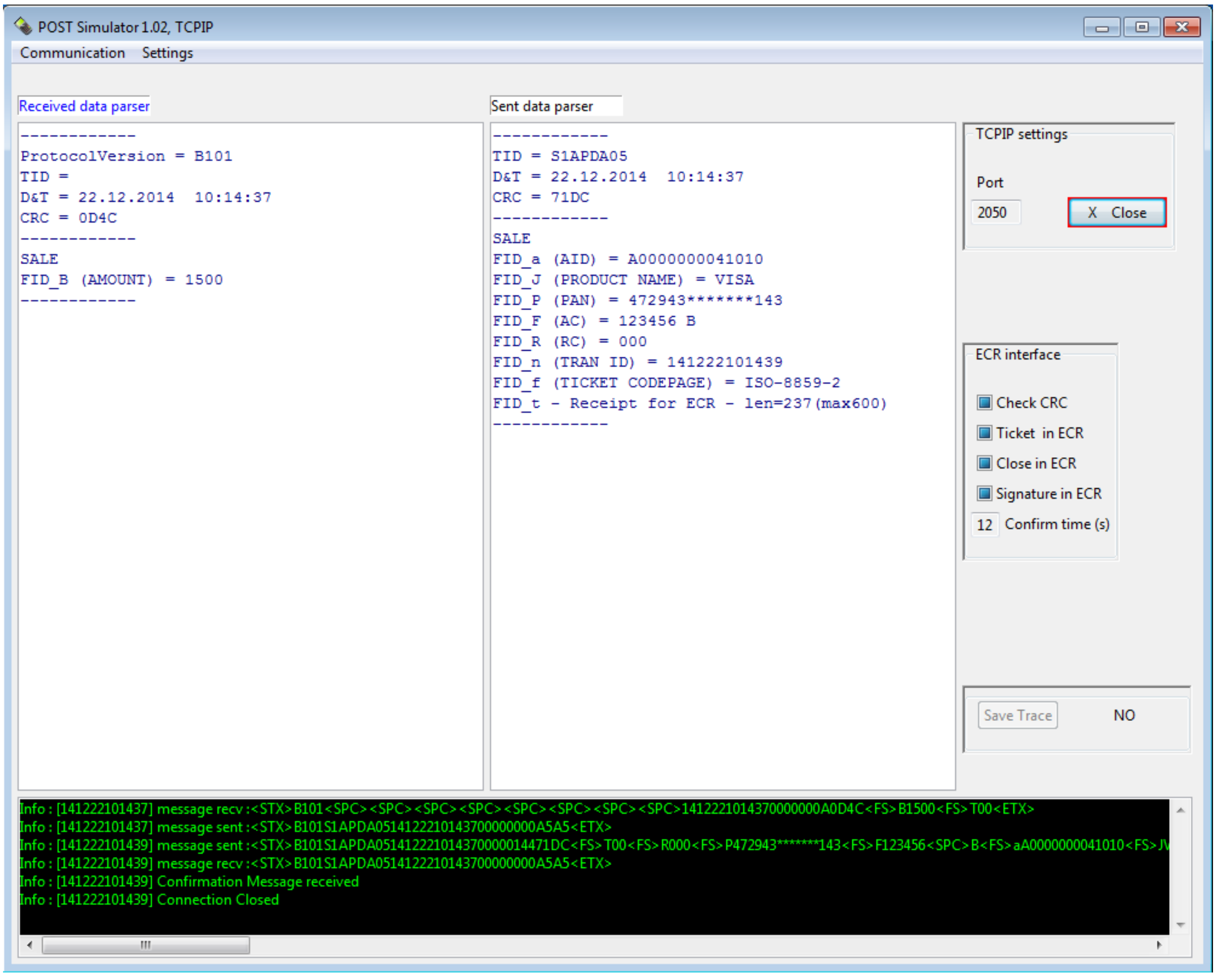


```
------------
TID = S1APDA05
D&T = 22.12.2014  10:14:37
CRC = 71DC
------------
SALE
FID_a (AID) = A0000000041010
FID_J (PRODUCT NAME) = VISA
FID_P (PAN) = 472943*******143
FID_F (AC) = 123456 B
FID_R (RC) = 000
FID_n (TRAN ID) = 141222101439
FID_f (TICKET CODEPAGE) = ISO-8859-2
FID_t - Receipt for ECR - len=237(max600)
------------
```

- Waiting on confirm massage from ECR

```
Info : [140114181518] message recv :<STX>B101S1APDA0514011418145200000000A5A5<ETX>
```

Total overview of the simulator



Received data parser:

```
------------
ProtocolVersion = B101
TID =
D&T = 22.12.2014  10:14:37
CRC = 0D4C
------------
SALE
FID_B (AMOUNT) = 1500
------------
```

Sent data parser:

```
------------
TID = S1APDA05
D&T = 22.12.2014  10:14:37
CRC = 71DC
------------
SALE
FID_a (AID) = A0000000041010
FID_J (PRODUCT NAME) = VISA
FID_P (PAN) = 472943*******143
FID_F (AC) = 123456 B
FID_R (RC) = 000
FID_n (TRAN ID) = 141222101439
FID_f (TICKET CODEPAGE) = ISO-8859-2
FID_t - Receipt for ECR - len=237(max600)
------------
```

Port: 2050

☑ Check CRC
☑ Ticket in ECR
☑ Close in ECR
☑ Signature in ECR
12 Confirm time (s)

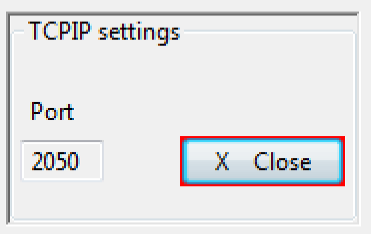
NO

```
Info : [141222101437] message recv :<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>1412221014370000000A0D4C<FS>B1500<FS>T00<ETX>
Info : [141222101437] message sent :<STX>B101S1APDA0514122210143700000000A5A5<ETX>
Info : [141222101439] message sent :<STX>B101S1APDA05141222101437000014471DC<FS>T00<FS>R000<FS>P472943*******143<FS>F123456<SPC>B<FS>aA0000000041010<FS>J\
Info : [141222101439] message recv :<STX>B101S1APDA0514122210143700000000A5A5<ETX>
Info : [141222101439] Confirmation Message received
Info : [141222101439] Connection Closed
```

4) After finished transaction wait POSTsim on next request from ECR.

1.12.3.3 Turn off monitoring over TCPIP

Turn off the monitoring is can be perform by press button Close



and POSTsim is return to basic state.

1.12.4 Simulation of transaction over RS232

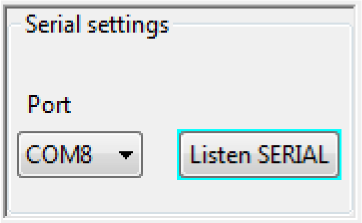
The application POSTsim enable communicated with ECR over serial interface RS232 , where POSTsim run as server and ECR as client. The POSTsim is waiting on selected COM port for transaction request from ECR.

The physical connection is connecting by cable (schematic of connection see chapter Connection of serial cable). Using configuration of interface is:

Transfer mode:	Serial, asynchronous, full-duplex
Format:	8 data bits, 1 stop bit, no parity;
Bit rate:	9600 bps
Control of flow:	NONE

1.12.4.1 Starting monitoring over RS232

At right upper part of window appears information


Serial settings

Port: COM8

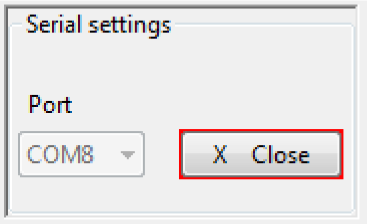
Before switch on monitoring communication need setting communications parameters in ECR, thus manner, which property is in protocols using (Setting of ECR protocol).

The button Listen SERIAL tuner on server, but before this, than start application monitoring on delineated interface(selected serial port), must is setting parameters of transaction (see at appendix Configuration of transaction parameters). This setting is using always when start and container parameters from file appdata.xml. Can be anytime in during of monitoring between transaction changes by choose from MENU→Setting→Transaction data and change data.

Real processing of request after start monitoring is identical as at TCPIP variant (description in chapter Processing of received requests) .

1.12.4.2 Turn off monitoring over RS232

Turn off the monitoring is can make by press button Close


Serial settings

Port: COM8

and POSTsim is return to basic state.

Appendix

1.13 Algorithm for calculation of CRC16 in C language

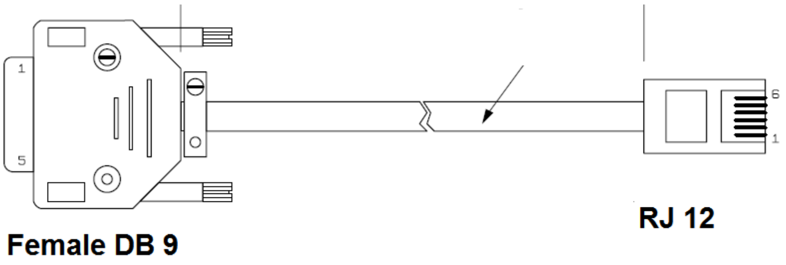
The next source code is using by POST for calculation of CRC16. Standard CCITT v.41 prescribes the polynomial value: `x^16 + x^12 + x^5 + 1.`

```
const unsigned short ccittTable[256] =
{
      0x0000, 0x1021, 0x2042, 0x3063, 0x4084, 0x50A5, 0x60C6, 0x70E7,
      0x8108, 0x9129, 0xA14A, 0xB16B, 0xC18C, 0xD1AD, 0xE1CE, 0xF1EF,
      0x1231, 0x0210, 0x3273, 0x2252, 0x52B5, 0x4294, 0x72F7, 0x62D6,
      0x9339, 0x8318, 0xB37B, 0xA35A, 0xD3BD, 0xC39C, 0xF3FF, 0xE3DE,
      0x2462, 0x3443, 0x0420, 0x1401, 0x64E6, 0x74C7, 0x44A4, 0x5485,
      0xA56A, 0xB54B, 0x8528, 0x9509, 0xE5EE, 0xF5CF, 0xC5AC, 0xD58D,
      0x3653, 0x2672, 0x1611, 0x0630, 0x76D7, 0x66F6, 0x5695, 0x46B4,
      0xB75B, 0xA77A, 0x9719, 0x8738, 0xF7DF, 0xE7FE, 0xD79D, 0xC7BC,
      0x48C4, 0x58E5, 0x6886, 0x78A7, 0x0840, 0x1861, 0x2802, 0x3823,
      0xC9CC, 0xD9ED, 0xE98E, 0xF9AF, 0x8948, 0x9969, 0xA90A, 0xB92B,
      0x5AF5, 0x4AD4, 0x7AB7, 0x6A96, 0x1A71, 0x0A50, 0x3A33, 0x2A12,
      0xDBFD, 0xCBDC, 0xFBBF, 0xEB9E, 0x9B79, 0x8B58, 0xBB3B, 0xAB1A,
      0x6CA6, 0x7C87, 0x4CE4, 0x5CC5, 0x2C22, 0x3C03, 0x0C60, 0x1C41,
      0xEDAE, 0xFD8F, 0xCDEC, 0xDDCD, 0xAD2A, 0xBD0B, 0x8D68, 0x9D49,
      0x7E97, 0x6EB6, 0x5ED5, 0x4EF4, 0x3E13, 0x2E32, 0x1E51, 0x0E70,
      0xFF9F, 0xEFBE, 0xDFDD, 0xCFFC, 0xBF1B, 0xAF3A, 0x9F59, 0x8F78,
      0x9188, 0x81A9, 0xB1CA, 0xA1EB, 0xD10C, 0xC12D, 0xF14E, 0xE16F,
      0x1080, 0x00A1, 0x30C2, 0x20E3, 0x5004, 0x4025, 0x7046, 0x6067,
      0x83B9, 0x9398, 0xA3FB, 0xB3DA, 0xC33D, 0xD31C, 0xE37F, 0xF35E,
      0x02B1, 0x1290, 0x22F3, 0x32D2, 0x4235, 0x5214, 0x6277, 0x7256,
      0xB5EA, 0xA5CB, 0x95A8, 0x8589, 0xF56E, 0xE54F, 0xD52C, 0xC50D,
      0x34E2, 0x24C3, 0x14A0, 0x0481, 0x7466, 0x6447, 0x5424, 0x4405,
      0xA7DB, 0xB7FA, 0x8799, 0x97B8, 0xE75F, 0xF77E, 0xC71D, 0xD73C,
      0x26D3, 0x36F2, 0x0691, 0x16B0, 0x6657, 0x7676, 0x4615, 0x5634,
      0xD94C, 0xC96D, 0xF90E, 0xE92F, 0x99C8, 0x89E9, 0xB98A, 0xA9AB,
      0x5844, 0x4865, 0x7806, 0x6827, 0x18C0, 0x08E1, 0x3882, 0x28A3,
      0xCB7D, 0xDB5C, 0xEB3F, 0xFB1E, 0x8BF9, 0x9BD8, 0xABBB, 0xBB9A,
      0x4A75, 0x5A54, 0x6A37, 0x7A16, 0x0AF1, 0x1AD0, 0x2AB3, 0x3A92,
      0xFD2E, 0xED0F, 0xDD6C, 0xCD4D, 0xBDAA, 0xAD8B, 0x9DE8, 0x8DC9,
      0x7C26, 0x6C07, 0x5C64, 0x4C45, 0x3CA2, 0x2C83, 0x1CE0, 0x0CC1,
      0xEF1F, 0xFF3E, 0xCF5D, 0xDF7C, 0xAF9B, 0xBFBA, 0x8FD9, 0x9FF8,
      0x6E17, 0x7E36, 0x4E55, 0x5E74, 0x2E93, 0x3EB2, 0x0ED1, 0x1EF0
};

//    ======================================================================
//    unsigned short calcCRC16(unsigned char *data, unsigned short len)
//
//    In:         data - pointer to data from which CRC16 is calculated
//                len  - length of data from which CRC16 is calculated
//
//    Out:        -
//
//    Return:     CRC16
```

```
//
//    Test:        calcCRC16((unsigned char*) "123456", 6) => 20E4
//    ==============================================================
unsigned short calcCRC16( unsigned char *data, unsigned short dlen )
{
      unsigned short crc16 = 0x0000;
      unsigned short len = dlen;

      if (!data || !len)
            return crc16;

      while(len --)
            crc16 = (crc16 << 8) ^ ccittTable[(crc16 >> 8) ^ *data ++];

      return crc16;
}
```

1.14 Connection of serial communication cable

1.14.1 I5100 crossover cable



1.14.1.1 Full connection (POST RS232-1)

Female DB 9		RJ 12 6/6
2	-	2
3	-	3
8	-	4
7	-	5
5	-	6

1.14.1.2 Energy-efficient connection for (POST RS232-2)

Female DB 9		RJ 12 6/6
2	-	2
3	-	3
5	-	6

1.15 Parameters of application – appdata.xml

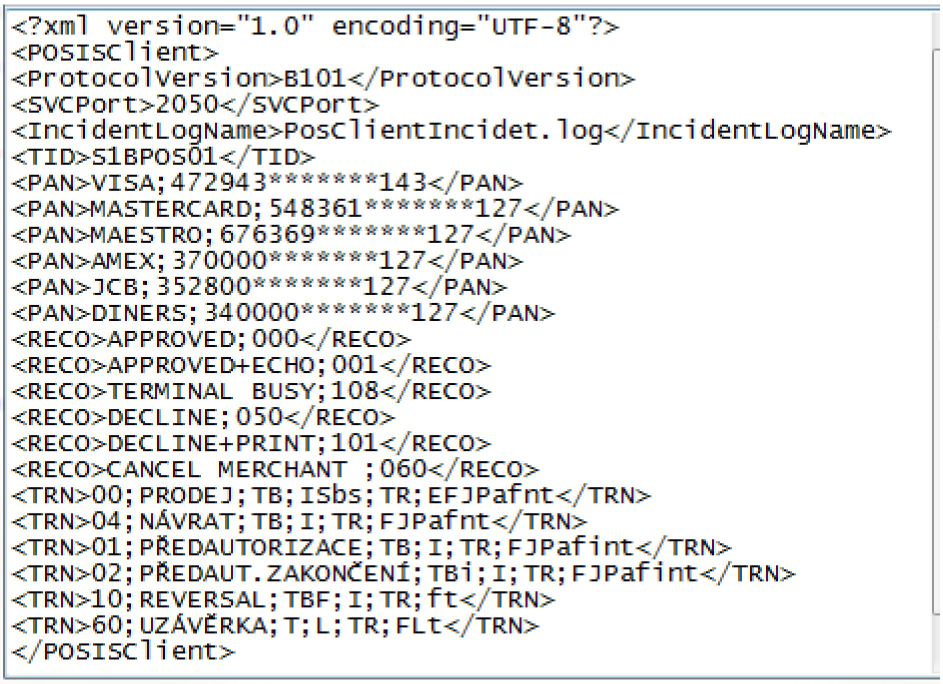
The file is e placed at subdirectory of application's root directory

POSTsim_1.00/setting/appdata.xml

Container information needed to processing of transaction's request from ECR when application POSTsim in state monitoring.

Strictly is recommend in case editing keep structure of file.
Not standards change may cause of incorrect running application.
In case of editing make a backup of original file for recovery of original setting.

In basic file is stated data, which is at startup of POSTsim application was read and using for processing of transactions (Configuration of transaction parameters).



```
<?xml version="1.0" encoding="UTF-8"?>
<POSISClient>
<ProtocolVersion>B101</ProtocolVersion>
<SVCPort>2050</SVCPort>
<IncidentLogName>PosClientIncidet.log</IncidentLogName>
<TID>S1BPOS01</TID>
<PAN>VISA;472943*******143</PAN>
<PAN>MASTERCARD;548361*******127</PAN>
<PAN>MAESTRO;676369*******127</PAN>
<PAN>AMEX;370000*******127</PAN>
<PAN>JCB;352800*******127</PAN>
<PAN>DINERS;340000*******127</PAN>
<RECO>APPROVED;000</RECO>
<RECO>APPROVED+ECHO;001</RECO>
<RECO>TERMINAL BUSY;108</RECO>
<RECO>DECLINE;050</RECO>
<RECO>DECLINE+PRINT;101</RECO>
<RECO>CANCEL MERCHANT ;060</RECO>
<TRN>00;PRODEJ;TB;ISbs;TR;EFJPafnt</TRN>
<TRN>04;NÁVRAT;TB;I;TR;FJPafnt</TRN>
<TRN>01;PŘEDAUTORIZACE;TB;I;TR;FJPafint</TRN>
<TRN>02;PŘEDAUT.ZAKONČENÍ;TBi;I;TR;FJPafint</TRN>
<TRN>10;REVERSAL;TBF;I;TR;ft</TRN>
<TRN>60;UZÁVĚRKA;T;L;TR;FLt</TRN>
</POSISClient>
```

This basic setting is having:

- Version number of protocol(supported variants is B101 or B001)

- Port for TCPIP communication (can its change if need – ECR and POSTsim must using the same)

- IncidentLogName – for the present not using

- TID – number of terminal (Terminal ID). If send ECR empty TID, terminal add to one’s responses this TID

- 6 variant card’s product (name and masking card’s number)

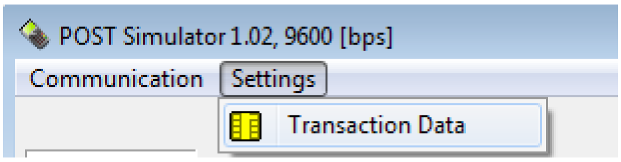
- 6 possible return’s codes – simulated state, how transaction is finished
  - APPROVED (RC=000)
  - APPRVED+ECHO (001)
  - TERMINAL BUSY (108)
  - DECLINE (050)
  - DECLINE+PRINT(101)
  - CANCEL MERCHANT (060)

- 6 supported transactions (in this version of application)

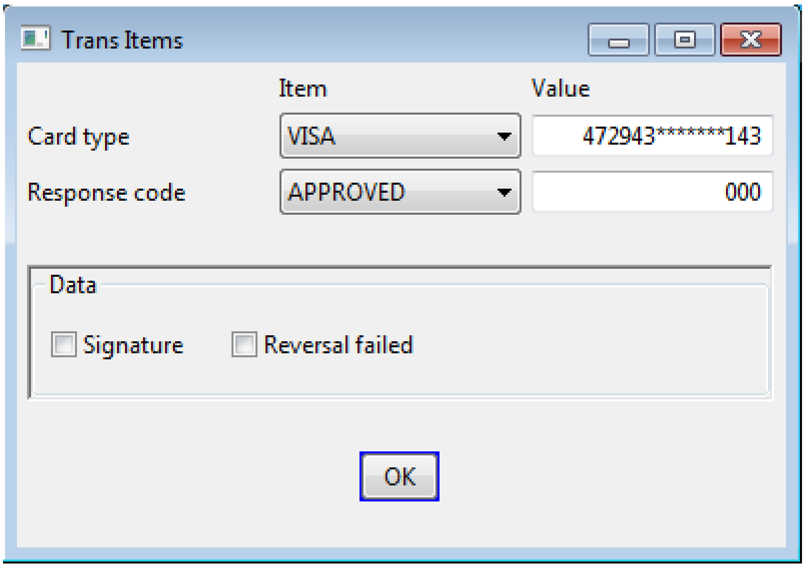
  Structure of record <TRN>00;SALE;TB;ISbs;TR;EFJPafnt</TRN>
  Container the fields separate by mandatory delimiter ‘;‘
  - transaction type (Sale = 00)
  - transaction name for purpose of display in information window(SALE)
  - mandatory fields of request from ECR (TB – desc. in Ref [1])
  - optional fields of request from ECR (ISbs – desc. in Ref [1])
  - mandatory fields of response from POSTsim (TR – Ref [1])
  - optional fields of response from POSTsim (EFJPafnt – Ref [1])

1.16 Configuration of transaction parameters

Before starting monitoring of incoming messages (over RS232 and TCPIP) POSTsim call of operator for assignment parameters of transaction. This step is do always before turn on monitoring, but change can make at during of monitoring by chose from MENU



Itself dialog for setting transaction data it look as follows



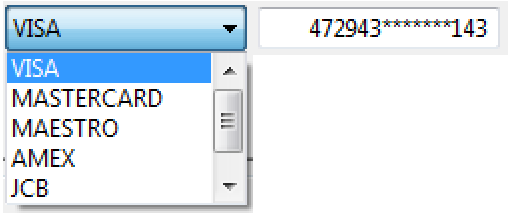
	Item	Value
Card type	VISA	472943*******143
Response code	APPROVED	000

Data

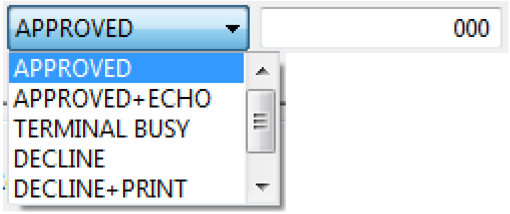
□ Signature □ Reversal failed

Can setting

a) Card type – type of card and it PAN(list write in appdata.xml, attachment Parametry aplikace)


VISA 472943*******143

b) Response code – result of transaction including return code(in appdata.xml)


APPROVED 000

In the application's parameters *appdata.xml* is define 6 variants of authorization.

Suggest is don't change this setting or ask GPE about addition (editing is not but need). Incorrect setting in file *appdata.xml* may cause incorrect work POSTsim application.

Meaning of individual defined values is description below.
(Is recommend, if not be strictly describe, so that RC codes changed manually).

- **APPROVED** (Response Code RC = 000) - transaction is approved

  It is standard flow (do not sending any ECHO massages from POSTsim)

  ECR → <STX>Transaction request <ETX>
  POSTSIM ← <STX>Confirm<ETX>
  POSTSIM ← <STX>Transaction response <ETX>
  ECR → <STX> Confirm <ETX>

- **APPROVED + ECHO** (RC=001)

  The transaction is approved too, but simulated if exceeding period processing transaction in terminal over 60s, which must POSTsim, inform the ECR by message ECHO. RC can set manually on value 001 – 009 and under its will be ECHO repeat 1- 9 times (around 1 minute delay = 1x ECHO).
  The mechanism is description in Ref [1].

  If RC=001, will be echo send 1x (after 55s delay):
  ECR → <STX>Transaction request<ETX>
  POSTSIM ← <STX>Confirm<ETX>
  POSTSIM ← <STX>**ECHO**<ETX>
  POSTSIM ← <STX> Transaction response <ETX>
  ECR → <STX> Confirm <ETX>

- **TERMINAL BUSY** (RC=108) – transaction is reject

  This is variant simulate state, where the FPOST busy and can't processing the request from ECR. The POSTsim inform ECR about this state by code RC=108.

- **DECLINE** (RC=050) – transaction is reject

  This is common RC, which is using in cases reject transaction and it have not one's RC code in table (appendix: Table of return codes or in Ref [1]).

- **DECLINE+PRINT** (RC=101) – transaction is reject

  Terminal is require(bank), so as print decline ticket
  POSTsim require RC=101, otherwise is did not print.

- **CANCEL MERCHANT** (RC=060) – transaction is cancel by merchant

  The merchant as a rule interrupt transaction in during entering data by press CANCEL.

c) **Signature** – switch on checking a signature – this is simulate situation, when is entering information to case register about necessity perform check signature of card’s holder (introduce in header authorization message). More information in `Ref [1].`

If the parameter is on, the simulation will be behave as choice card was have only magnetic trip and is require check signature. If is off, the card is behave as have chip. The signature not requires, but add field FID_a - AID (Application ID).

d) **Reversal failed** – if required Reverse (Cancellation) previous transaction (example ECR send request in case unsuccessful check signature).

If parameter is off (default), then is performing standard Cancellation and to ECR send information that transaction is cancelled (reject).

If parameter is on, then POSTsim send to ECR information, that the transaction is fail to cancel (response code = 070).

This parameter is addition to setting of Response Code (b), when the set RC is response on transaction Sale and depend on setting those parameter is then response next request a Reverse (Cancellation)

1.17 Responses codes from POSTsim to ECR

The POSTsim can use all this codes too, but not recommend, because some codes are POSTsim application using for simulate of specific situation(example RC=101 for DECLINE+PRINT variant).

Codes can set in file *appdata.xml* or at setting transaction parameters.

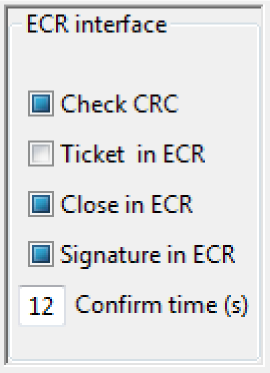
Codes of accepted transactions	
00 - 10	Accepted
Codes of rejected transactions	
050	General processing error
051	Unable to connect with Central Systems
053	A response from the Central System was not delivered
055	Declined by chip card without authorisation
060	Transaction was cancelled by the operator
061	Transaction was cancelled by the customer
062	Customer rejected transaction due to amount
063	Processing exceeded the designated time limit
070	Transaction was not cancelled
071	Currency not supported (Multicurrency)
100	Transaction not supported or not allowed
101	Invalid card
103	Error in message format
106	Error in message CRC
107	Error in MAC
108	Terminal Busy
200	Mandatory field missing in request message
500	Internal application Error

1.18 Communication trace

1.18.1 Sale

Sale variant APPROVED with print in POSTsim (terminal)

The ticket's data not send to ECR, because is print in terminal (POSTsim).



ECR interface

☑ Check CRC

□ Ticket in ECR

☑ Close in ECR

☑ Signature in ECR

12 Confirm time (s)

The variant without check signature of card's holder (POSTsim is simulate the card with chip)

ECR : Transaction request

<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>1401160942290000000A0D4C<FS>B1500<FS>T00<ETX>

POSTsim : Confirm on request

<STX>B101S1APDA0514011609422900000000A5A5<ETX>

POSTsim : Transaction response

<STX>B101S1APDA0514011609422900000049271C<FS>T00<FS>R000<FS>P472943*******143<FS>F123456<SPC>B<FS>aA0000000041010<FS>JVISA<FS>n140116094234<ETX>

ECR : Confirm on response

<STX>B101S1APDA0514011609422900000000A5A5<ETX>

The variant with check signature card's holder (regardless of where is print the ticket in ECR or FPOST).

The POSTsim simulate the card with only magnetic trip and without PIN.
The cash register can make Reversal in case if signature not passes

ECR : Transaction request

<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>1401161004390000000A82EA<FS>B3500<FS>T00<ETX>

POSTsim : Confirm

<STX>B101S1APDA0514011610043900000000A5A5<ETX>

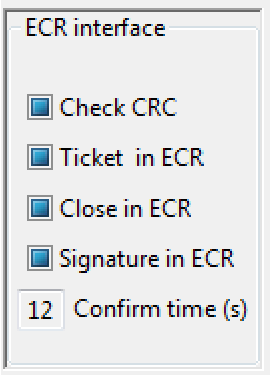
POSTsim : Transaction response

:<STX>B101S1APDA05140116100439000**1**003F7612<FS>T00<FS>R000<FS>P548361*******127<FS>F123456<SPC>B<FS>JMASTERCARD<FS>n140116100444<ETX>

ECR : Confirm

<STX>B101S1APDA0514011610043900000000A5A5<ETX>

Sale variant APPROVED+ECHO(001) with print in ECR



ECR interface

☑ Check CRC

☑ Ticket in ECR

☑ Close in ECR

☑ Signature in ECR

12 Confirm time (s)

ECR : Transaction request

```
<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>1401160945110000000AC539<FS>B2500<FS
>T00<ETX>
```

POSTsim : Confirm message

```
<STX>B101S1APDA05140116094511000000000A5A5<ETX>
```

POSTsim : ECHO message (wait next 60s)

```
<STX>B101S1APDA0514011609451100000000000000<ETX>
```

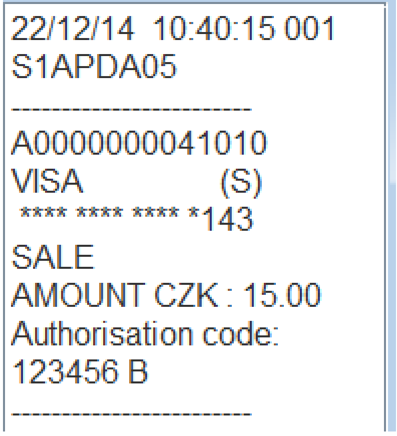
POSTsim : Transaction response

```
<STX>B101S1APDA0514011609451100000001417F17<FS>T00<FS>R001<FS>P472943*******143<FS>F123456<SP
C>B<FS>aA0000000041010<FS>JVISA<FS>fISO-8859-2<FS>t16/01/14<SPC><SPC>09:45:11<SPC>001
<LF>#{Z}<LF>${SEPAR}<LF>A0000000041010<LF>VISA<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><
SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>(S)<LF><SPC>****<SPC>****<SPC>****<SPC>*143
<SPC><SPC><SPC><SPC><LF>PRODEJ<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><S
PC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><LF><xC8><xE1>stka<SPC>CZK<SPC>:<SPC>25.00<SPC>
<SPC><SPC><SPC><SPC><SPC><LF>Autoriza<xE8>n<xED><SPC>k<xF3>d:<SPC>123456<SPC>B<LF>${SEP
AR}<LF>Doklad<SPC>uchovejte<SPC>pro<LF>pozd<xEC>j<x9A><xED><SPC>kontrolu<LF>${PAGE}<LF><FS>
n140116094536<ETX>
```

ECR : Confirm message

```
<STX>B101S1APDA05140116094511000000000A5A5<ETX>
```

ECR print the ticket in this form



```
22/12/14  10:40:15 001
S1APDA05
------------------------
A0000000041010
VISA             (S)
 **** **** **** *143
SALE
AMOUNT CZK : 15.00
Authorisation code:
123456 B
------------------------
```

Sale variant TERMINAL BUSY(108)

In this situation do not send confirm message. The POSTsim (terminal) directly send reject message (RC=108).

ECR : Transaction request

```
<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>1401160957320000000A82EA<FS>B3500<FS
>T00<ETX>
```

POSTsim : Transaction response – Reject

```
<STX>B101S1APDA05140116095732000000009039F<FS>T00<FS>R108<ETX>
```

Sale variant DECLINE (050)

This response code is commonly, but its place can be received any other rejects RC and flow take place the same

Without print in ECR

ECR : Transaction request

```
<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>1401161010280000000A45F2<FS>B4500<FS>
T00<ETX>
```

POSTsim : Confirm

```
<STX>B101S1APDA0514011610102800000000A5A5<ETX>
```

ECR : Transaction response

```
<STX>B101S1APDA0514011610102800000094A52<FS>T00<FS>R050<ETX>
```

ECR : Confirm

```
<STX>B101S1APDA0514011610102800000000A5A5<ETX>
```

Sale variant CANCEL MERCHANT (060)

Simulation Merchant cancelation of transaction on FPOST. In this case in ECR not printed.

ECR : Transaction request

```
<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>1401161017170000000A45F2<FS>B4500<FS>
T00<ETX>
```

POSTsim : Confirm

```
<STX>B101S1APDA0514011610171700000000A5A5<ETX>
```

POSTsim : Transaction response

```
<STX>B101S1APDA0514011610171700000091F01<FS>T00<FS>R060<ETX>
```

ECR : Confirm

```
<STX>B101S1APDA0514011610171700000000A5A5<ETX>
```

Sale variant DECLINE+PRINT (101)

Simulation the state, when the transaction is rejects from AC and terminal require printing decline ticket.

So as the print propagate to ECR, must be switch on ■ Ticket in ECR in POSTsim

ECR : Transaction request

```
<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>140116170722000000A0D4C<FS>B1500<FS
>T00<ETX>
```

POSTsim : Confirm

```
:<STX>B101S1APDA05140116170722000000000A5A5<ETX>
```

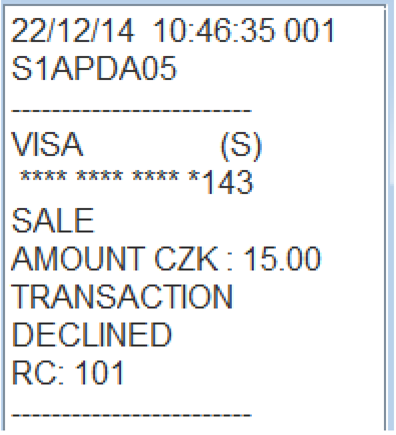
POSTsim : Transaction response

```
<STX>B101S1APDA051401161707220000010C6234<FS>T00<FS>R101<FS>P472943*******143<FS>JVISA<FS>fI
SO-8859-2<FS>t16/01/14<SPC><SPC>17:07:22<SPC>001<LF >#{Z}<LF >${SEPAR}<LF
>VISA<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><S
PC><SPC>(S)<LF ><SPC>****<SPC>****<SPC>****<SPC>*143<SPC><SPC><SPC><SPC><LF
>PRODEJ<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>
<SPC><SPC><SPC><LF
><xC8><xE1>stka<SPC>CZK<SPC>:<SPC>15.00<SPC><SPC><SPC><SPC><SPC><SPC><LF
>TRANSAKCE<SPC>ZAM<xCD>TNUTA<LF >RC:<SPC>101<LF >${SEPAR}<LF
>Doklad<SPC>uchovejte<SPC>pro<LF >pozd<xEC>j<x9A><xED><SPC>kontrolu<LF >${PAGE}<LF ><ETX>
```

ECR : Confirm

```
:<STX>B101S1APDA05140116170722000000000A5A5<ETX>
```

The ECR print ticket in form



```
22/12/14  10:46:35 001
S1APDA05

------------------------
VISA              (S)
 **** **** **** *143
SALE
AMOUNT CZK : 15.00
TRANSACTION
DECLINED
RC: 101

------------------------
```

1.18.2 Reversal – cancel transaction

Reverse with print in ECR

If disagree the signature of card’s holder (check by merchant).
The ECR may in transaction request Reverse used the whole of message, but enough message with only mandatory fields T, B a F.

ECR : Transaction request (full request not need)

```
<STX>B101S1APDA05140116103926000101 47AF7C<FS>B1500<FS>F123456<SPC>B<FS>P472943*******143<FS
>R000<FS>T10<FS>JVISA<FS>t16/01/14<SPC><SPC>10:39:26<SPC>001<LF >#{Z}<LF >${SEPAR}<LF
>VISA<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><S
PC><SPC>(C)<LF ><SPC>****<SPC>****<SPC>****<SPC>*143<SPC><SPC><SPC><SPC><LF
>PRODEJ<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>
<SPC><SPC><SPC><LF
><xC8><xE1>stka<SPC>CZK<SPC>:<SPC>15.00<SPC><SPC><SPC><SPC><SPC><SPC><LF
><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>
<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><LF >........................<LF >Podpis<LF
>Autoriza<xE8>n<xED><SPC>k<xF3>d:<SPC>123456<SPC>B<LF >${SEPAR}<LF
>Doklad<SPC>uchovejte<SPC>pro<LF >pozd<xEC>j<x9A><xED><SPC>kontrolu<LF >${PAGE}<LF ><ETX>
```

ECR : Transaction request (mandatory request – recommend – incorrect CRC)

```
<STX>B101S1APDA0514011610392600010014AF7C<FS>B1500<FS>F123456<SPC>B<FS>T10<ETX>
```

POSTsim : Confirm

```
<STX>B101S1APDA0514011610392600010000A5A5<ETX>
```

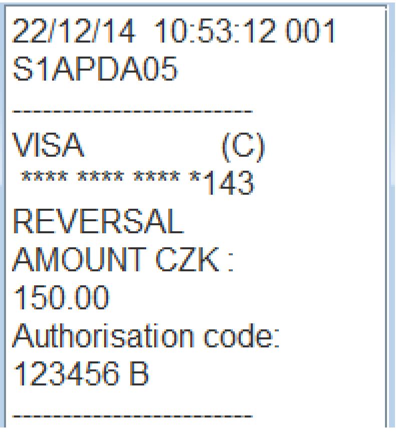
POSTsim : Transaction response

```
<STX>B101S1APDA05140116103926000001 2299FC<FS>T10<FS>R000<FS>P472943*******143<FS>F123456<SP
C>B<FS>JVISA<FS>fISO-8859-2<FS>t16/01/14<SPC><SPC>10:39:26<SPC>001<LF>#{Z}
<LF>${SEPAR}<LF>VISA<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC
><SPC><SPC><SPC><SPC>(C)<LF ><SPC>****<SPC>****<SPC>****<SPC>*143<SPC><SPC><SPC><SPC><LF
>REVERSAL<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SP
C><SPC><LF ><xC8><xE1>stka<SPC>CZK<SPC>:<SPC>15.00<SPC><SPC><SPC><SPC><SPC><SPC><LF
>Autoriza<xE8>n<xED><SPC>k<xF3>d:<SPC>123456<SPC>B<LF>${SEPAR}<LF>Doklad<SPC>uchovejte<SPC>
pro<LF >pozd<xEC>j<x9A><xED><SPC>kontrolu<LF >${PAGE}<LF ><FS>n140116103939<ETX>
```

ECR : Confirm

```
<STX>B101S1APDA0514011610392600000000A5A5<ETX>
```

The ECR print ticket in form



```
22/12/14  10:53:12 001
S1APDA05
------------------------
VISA          (C)
 **** **** **** *143
REVERSAL
AMOUNT CZK :
150.00
Authorisation code:
123456 B
------------------------
```

1.18.3 Refund

Refund with print in ECR

ECR : Transaction request

```
<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>140116103209000000A4DC8<FS>B1500<FS
>T04<ETX>
```

POSTsim : Confirm

```
<STX>B101S1APDA05140116103209000000000A5A5<ETX>
```

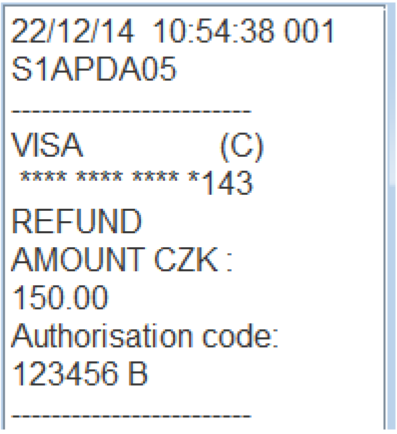
POSTsim : Transaction response

```
<STX>B101S1APDA051401161032090000122C673<FS>T04<FS>R000<FS>P472943*******143<FS>F123456<SP
C>B<FS>JVISA<FS>fISO-8859-2<FS>t16/01/14<SPC><SPC>10:32:09<SPC>001<LF>#{Z}
<LF>${SEPAR}<LF>VISA<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC
><SPC><SPC><SPC><SPC>(S)<LF ><SPC>****<SPC>****<SPC>****<SPC>*143<SPC><SPC><SPC><SPC><LF
>N<xC1>VRAT<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>
<SPC><SPC><SPC><SPC><LF><xC8><xE1>stka<SPC>CZK<SPC>:<SPC>15.00<SPC><SPC><SPC><SPC><SP
C><SPC><LF>Autoriza<xE8>n<xED><SPC>k<xF3>d:<SPC>123456<SPC>B<LF>${SEPAR}<LF>Doklad<SPC>uc
hovejte<SPC>pro<LF >pozd<xEC>j<x9A><xED><SPC>kontrolu<LF >${PAGE}<LF ><FS>n140116103215<ETX>
```

ECR : Confirm

```
<STX>B101S1APDA05140116103209000000000A5A5<ETX>
```

The ECR print ticket in form



```
22/12/14  10:54:38 001
S1APDA05

------------------------
VISA             (C)
 **** **** **** *143
REFUND
AMOUNT CZK :
150.00
Authorisation code:
123456 B

------------------------
```

1.18.4 Close totals

Close totals

ECR : Transaction request

```
<STX>B101<SPC><SPC><SPC><SPC><SPC><SPC><SPC><SPC>1401161143090000003AE9E1<FS>T60<FS>L0
010010004+0000000000000060000001+000000000000001500<ETX>
```

POSTsim : Confirm

```
<STX>B101S1APDA0514011611430900000000A5A5<ETX>
```

POSTsim : Transaction response

```
<STX>B101S1APDA051401161143090000003F13E3<FS>T60<FS>R200<FS>L0010010004+000000000000006000
0001+000000000000001500<ETX>
```

ECR : Confirm

```
<STX>B101S1APDA0514011611430900000000A5A5<ETX>
```

1.19 Form - contacts data's of authors specification

Company		
Contact (commercial, engineering)		
Name	email	Telephone

1.20 Form - testing of configuration

ECR		
HW facilities		
SW facilities (version)		
POST		
HW facilities		
SW facilities (version)		
Configuration		
Payment services		
Support ECR	ANO	NE
Check signature	POST	ECR
Manual close	ANO	NE
Services for replenishing and gift cards		
Support ECR	ANO	NE
Allowed service replenish	ANO	NE
Allowed services for Gift card	ANO	NE
Activation transaction	POST	ECR
print fiscal document for Replenish	ANO	NE
print validation ticket of Replenish	ANO	NE
print activation ticket of Gift cards	ANO	NE
Ending of Confirmation	ANO	NE

1.21 Tests of implementation cash register's interface

Implementation of cash register interface POST in ECR may be certified following tests:

Tests of functionality

- all implement types of transaction at regular operation condition
  (with using as positive and negative result of authorization transactions).

- tests of checking signature card's holder, if verification is implement in ECR

- proper generation "Identification of cash register account" for replenish and gift cards

- all selected transactions with maximum time delay for input from user.

Tests of treatment incorrect state

- treatment of receive message with incorrect CRC.
- treatment of receive message with unknown identification of data’s field.
- treatment processing of transaction, which was not finish at POST.

1.22 Hints and advices

Couple hints, tricks and advices in closing

1	Between single messages sending from ECR is recommendation insert time delay about 2s (example between closing and logout or payment by card and confirm services) in order to come immediately after oneself.
2	Some version of POS’s application distinguish Confirm and request messages that, the sending Confirm with CRC value A5A5 and for Request message value 0000. Both value CRC may have only information character and not need check it. In both cases talk about empty data in given message and right calculation value is 0000.
3	
4	
5	
6	
7	

- finish document -