



SOFIE

Detailed Function Specification

Chapter 13

ECR integration

Restricted

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Target group : ECR vendors, terminal vendors and other parties influenced by this specification.

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1 ECR integration specification

1.1 PURPOSE

The purpose of this document is to specify the dialogue of a terminal interfaced with an Electronic Cash Register with respect to the specific requirements of BBS.

1.2 SCOPE

This document will be used as a basis for ITU and ECR software implementation in conjunction with other referenced documentation.

1.3 DOCUMENT STRUCTURE

The first part of this document contains the complete definitions of the protocol and protocol messages used for the ECR/ITU dialogue.

Then the document will go on to address the issues related to special functionality requirements, and also how the ECR will be able to access the ITU menus.

1.4 REVISION RECORD

DATE	VER.	COMMENTS
27.09.93	V-2.0	Version number updated to conform with the version number of the TERMINAL - DFS.
27.01.94	V-2.1	Total revision of the Appendix G. This version of the Appendix corresponds with TERMINAL - DFS V-2.0
2.03.95	V-4.0	Version 2.1 with updated timing considerations and linklayer state even table
2.3.96	V-4.1	Added extra functionality regarding LOCAL MODE and cardnumber.
23.5.96	V-4.2	Added minimum requirements and communication traces. Changed the use of the different hardware handshake signals. Terminal uses only RX-data and TX-data.
19.2.98	V-4.3	Added extra datafield in Transfer Amount
12.3.98	V-5.0	Renamed v 4.3 to 5.0 All correction marks are accepted
13.5.98	V-5.01	Added new usage of OP2 field in Device Attribute. Local Mode is also changed accordingly
26.1.99	V-5.1	Added new usage of OP2 field in Device Attribute. Local Mode is also changed accordingly. Latest revision of Appendix G. New functions will only be added in Chapter 13, New ECR protocol.
1.11.99	V-6.0	Document name changed from Appendix G to Chapter 13 Link layer is changed. Baud rate is changed. Uses 1200 or 9600 baud. Buffer size is increased. Uses 255 or 1024 char. buffer Functions are added/changed <ul style="list-style-type: none">- Data transfer (reconciliation data, report data)- Local Mode is changed- Transfer Amount (Deposit)- Card Data transfer from ECR- Administration (more shortcut commands)- Keyboard Input- Added new datafields in Status Request Response- ECR integration where all printout on local ITU printer is defined
3.3.2000	V-6.01	Added functionality where the ITU can encrypt the card number in use. Transaction type "load purse" is defined. For future use.
24.3.2000	V-6.02	Card Data transfer from ECR is allowed in Local Mode and Bank Mode. There is no state change when this message is sent. Loyalty cards are excluded from encryption function.
12.4.2000	V-6.03	Added a sign in the Send Data amount data record
10.5.2000	V-6.04	Send Data is changed <ul style="list-style-type: none">- cash amounts and deposit amounts is added as new amount description The OPOM (Operator total) function is removed.
25.6.2000	v-6.1	Send data is changed New subfunction includes commands to send data from the ITU to the ECR, which the ECR shall send to the CC.

DATE	VER.	COMMENTS
16.8.2000	V-6.11	LOCAL MODE = H2020 if transaction type was ADMIN. ANNUL. LM: Ver. Method is "0" if reversal transaction Sub functions in Send data regarding CC communication is structured in groups.
5.9.2000	6.12	Sub functions changed as a result of feedback to v. 6.11
13.9.2000	6.13	Included Communication Trace Examples
2.10.2000	6.14	Removed sub function H3132 concerning download of parameter file Added extra comment to note 6 in SEND DATA.
9.1.2001	6.15	Added default values for routing prefix to Collection Centre and Software Centre
14.2.2001	7.0	Document version changed to match Host main version Added a subfunction in Send data to be able to send B2B data. Changed LOCAL MODE to include SystemTraceAuditNumber (STAN) and Authorisation Code (AUTH) from the response message from HOST.
21.6.2001	7.01	Changed the Local Mode to include a flag indicating that the transaction is an off-line transaction. Added new short cut commands in Admin Message.
9.8.2001	7.02	Added a new sub function in send data for B2B data transfer, data from HOST to ECR. Changed the format in sub function B2B data transfer, data transfer from ECR to HOST Changed – simplified - the usage of Response Codes. ITU does additional checks of transfer amount.
12.9.2001	7.03	Changed Local Mode description for Offline Transactions. The Perforate receipt command is removed in Print text. Logging to electronic journal is described in Print text. Changed possible baudrate settings. New function in Administration to perform Sending of offline transactions.
24.9.2001	7.04	ECR cutter supported is added in device attribute Minimum printer width is set to 18 characters, 24 is default
17.12.01	7.05	New short-cut function in ADMIN to support print of stored offline transactions
25.2.02	7.06	Local Mode is changed. Flag to indicate offline transaction is moved from VER.M. to ACC field. A flag is set in Device attribute to ensure backward compatibility.
22.2.03	7.07	Changed the byte counter in send data function, B2B (typing mismatch)
16.6.2003	7.08	Added fields in Local Mode. <SEQ.NO> and <AMOUNT> fields are added due to changed functionality regarding Hotel and Restaurant functions.
16.4.2004	8.00	Added functionality to adapt protocol to terminals without internal printer. Transfer Amount: Special functionality if amount < 100 øre to allow Printer spooler print function on terminal on ECR systems that does not support Administration functions. Added function in Send Data: Encrypt PAN, and add issuer according to ITU Issuer dataset
30.3.2005	8.01	Transfer amount and Local Mode is changed to handle TopUp codes
20.3.2006	8.02	TopUpCode is moved from Local Mode to Send Data Transfer Amount is changed to handle EAN codes

DATE	VER.	COMMENTS
30.3.2006	8.03	Transfer Amount includes purchase and return of Merchandises ART # in transfer amount defines article number and reference to merchandise in reversal
10.7.2006	8.04	Typing mismatch in definition of th RS character. The value is H1E. Changed in Send Data and Transfer Amount. Some comments added in the Transfer Amount function to clarify Mercandise Reversal
5.9.2006	8.05	Added function in Transfer Amount message to include Mercandise Correction Added description for the BAXI Message Router.
7.9.2006	8.06	TopUpCode is deleted in Local Mode. Data type mismatch in messages. The ART#, activation code and serial codes shall be alphanumeric.
18.10.2006	8.07	Operator index is inserted in the Send data function for the TopUp function (online services)

2 REFERENCES

- [1] BANK-AXEPT AS
EFTPOS TERMINAL USER REQUIREMENTS
Version: V-2.0 - 01.11.93
- [2] BBS AS
Detailed Function Specification. The revision of the document reference must be of same
main revision number as this document.
- [3] NOKIA ECR INTERFACE SPECIFICATION VERSION 8,
subset v.1.2 dated 20-10-1988
- [4] NOKIA DATA, INTERFACE SPECIFICATION EFTPOS-ECR
version 9.2 LI/ZX/GY-7049 by Nils-Göran Albinsson

The reference [4] is the original ITU-ECR integration specification. This document is used as a basis, and the command definition in this interface specification uses the reference [4] where suitable. There is no cross reference to the reference [4].

3 DOCUMENT GLOSSARY

BBS	Bankenes BetalingsSentral AS
H	Hexadecimal character, with the actual value following behind.
ECR	Electronic Cash Register.
ITU	Integrated Terminal Unit. Describes a terminal-configuration integrated to an ECR.
PAN	Primary Account Number
Dialogue	A combination of both a request and a response message exchanged between ECR and ITU in any direction.
Transmitter	The device (ECR or ITU) which shall send a message, or has initiated an ECR/ITU dialogue.
Receiver	The device (ECR or ITU) which shall receive a message, or has received an initiation of an ECR/ITU dialogue.
<MSG>	Short for COMMAND message, and is used to indicate the command code assigned for the different application messages. The command code is used by the transmitter.
<RMSG>	Short for RESPONSE message, and is used to indicate the response code assigned for the different application messages. The response code is used by the receiver when returning the response.

4 ECR/ITU PROTOCOL

4.1 INTRODUCTION

All messages used in this ECR/ITU dialogue will be based upon a REQUEST-RESPONSE dialogue. Both the ECR and the ITU will be allowed to initiate an ECR/ITU dialogue. The need to initiate a dialogue will normally arise in four instances.

- A cardholder wants to use a card for a defined transaction
- The operator wants to enter the ITU menus to perform an administrative function
- The ITU will try to initiate a dialogue to communicate with the collection centre/software centre via the ECR
- The ITU wants to send print data commands. If the ECR is unable to handle the ITU initiative to print a message, the ITU will temporarily store this information and try to send it later. This feature is discussed on page 44.

During normal operation of an ECR, the ECR is in 'Local-Mode'. After a dialogue between the ECR and ITU has been initiated, the ECR is in 'Bank-Mode'. These modes are used in the detailed descriptions later in this document. However, the Transfer Card Data shall not result in a state change after the message is sent.

General protocol characteristics:

- i. Character asynchronous transmission.
- ii. Half duplex operation.

4.2 PHYSICAL LAYER PROTOCOL

4.2.1 Mechanical Specification

4.2.1.1 Cable definition

The cable between the ITU and the ECR requires three signal conductors covered by an EMI-protecting shield. The shield is connected to chassis ground at the ECR side if possible.

4.2.1.2 Cable interface at the ITU end

As there is no industry standard how a RS232 connector shall be at the ITU side, the ITU end is specified by the vendor of the ITU. RJ45 is normally used as connector type at this end.

4.2.1.3 Cable interface at the ECR end

The ECR vendors should offer an interface with 9 pin DSUB MALE connector with the following PIN-assignment:

(Popularly known as the 9-pin PC Standard)

- PIN 1	Not used
- PIN 2	RXD Received Data
- PIN 3	TXD Transmitted Data
- PIN 4	Not used
- PIN 5	GND SIGNAL GROUND
- PIN 6	Not used
- PIN 7	Not used
- PIN 8	Not used
- PIN 9	Not used

The signals defined above are the ECR signals.

The connector shall have a shielded metal housing and the cable shield should have direct and firm electrical contact to the cable connector housing providing good EMI shielding.

The cable connector shall, when attached, provide good electrical contact with the apparatus connector housing which shall be firmly connected to chassis ground in ECR.

4.2.2 Electrical Specification

The interface shall comprise the line TXD from ECR to ITU, the line RXD from ITU to ECR and signal ground reference as shown above.

Receivers and transmitters shall conform to

CCITT rec. V24 / ANSI RS 232

4.2.3 Logical Specification

TXD Data in serial format. Data is sent character asynchronous as 11-bit characters consisting of

- 1 start bit
- 8 data bits
- 1 even parity bit
- 1 stop bit.
- The default bit rate is 9600 bits/second. It should be possible to configure the speed on the ITU and the ECR at 1200 baud in case of interference at the POS. Higher baudrates than 9600 bps is an advantage (19,2 kbps and 38,4 kbps).

RXD Data in serial format, the specification for TXD applies.

The receiver buffer can be of different buffer size.

The ITU will not send application message containing <message text> longer than the specified value. The <message text> is excluding control characters and inserted escape characters. The message format is specified on page 13

Please refer to the spec on page 34 concerning the setup of the buffer size.

4.3 LINK LAYER

4.3.1 General

The protocol is half duplex.

The protocol transfer messages enveloped by transmission control characters DLE STX and DLE ETX. The message integrity is verified with a transversal check sum (parity bit) and a longitudinal check sum (LRC character).

The receiver of the message shall respond to the message with ACK or NAK .

The protocol is transparent to all 8-bit codes in the message text.

4.3.2 Character set

ISO R646 7-bit alphabet with national derivatives.

The special characters for Norway Æ, Ø, Å are defined to be

Character	Hex value
Æ	5B
Ø	5C
Å	5D
æ	7B
ø	7C
å	7D

There are no restrictions with respect to the upper case or lower case character values.

4.3.3 Control Characters

STX	(Hex 02)	Start of text. A transmission control character used as the first character of a heading of an informative message.
ETX	(Hex 03)	End of text. A transmission control character which terminates a text.
EOT	(Hex 04)	End of transmission. A transmission control character used to indicate the conclusion of a message transfer.
ACK	(Hex 06)	Acknowledge. A transmission control character transmitted by a receiver as an affirmative response to the transmitter.
DLE	(Hex 10)	Data Link Escape. Used as an escape character before the occurrence of DLE as a data character in a message.
NAK	(Hex 15)	Negative acknowledge. A transmission control character transmitted by a receiver as a negative response to the transmitter.

4.3.4 Message Format

DLE STX < message text> DLE ETX LRC

<message text> = arbitrary string of characters. If the <message text> contains DLE (hex 10) as data, an extra DLE is inserted in the message as an escape character.

LRC = longitudinal check sum character calculated as characterwise addition modulo 2 (XOR) over <message text> and DLE ETX (i.e. DLE STX not included). Note that LRC may be a control character and is defined only by its position, i.e. following ETX.

If the message contains a DLE as data, and an extra DLE is inserted by the transmitter, this extra DLE shall NOT be a part of the LRC calculations.

4.3.5 Link Level State Diagrams

A received character sequence shall be considered as a message when it contains DLE STX followed by DLE ETX and shall not cause any action or state transition until LRC is received.

All other received characters or character sequences shall be disregarded in order to prevent undefined recovery sequences to occur.

The state diagrams in Fig. 1 and Fig. 2 defines the behaviour of the transmitter and receiver respectively in detail.

Only those control characters specified in the state diagrams, including DLE STX and DLE ETX which defines a message, shall cause any actions or state transitions.

The state diagrams define when a message shall be considered correctly sent or received.

4.3.6 Error Recovery

The receiver shall respond to a message with either ACK or NAK within a timeout period defined in chapter Timing Considerations

The transmitting device shall retransmit the message as soon as the NAK character is received, or timeout. There are in total 4 efforts to send a message, before the message is impossible to send for the time being. When a receiver/transmitter has reported an erroneous line, it shall return to idle state and report an error condition to the application.

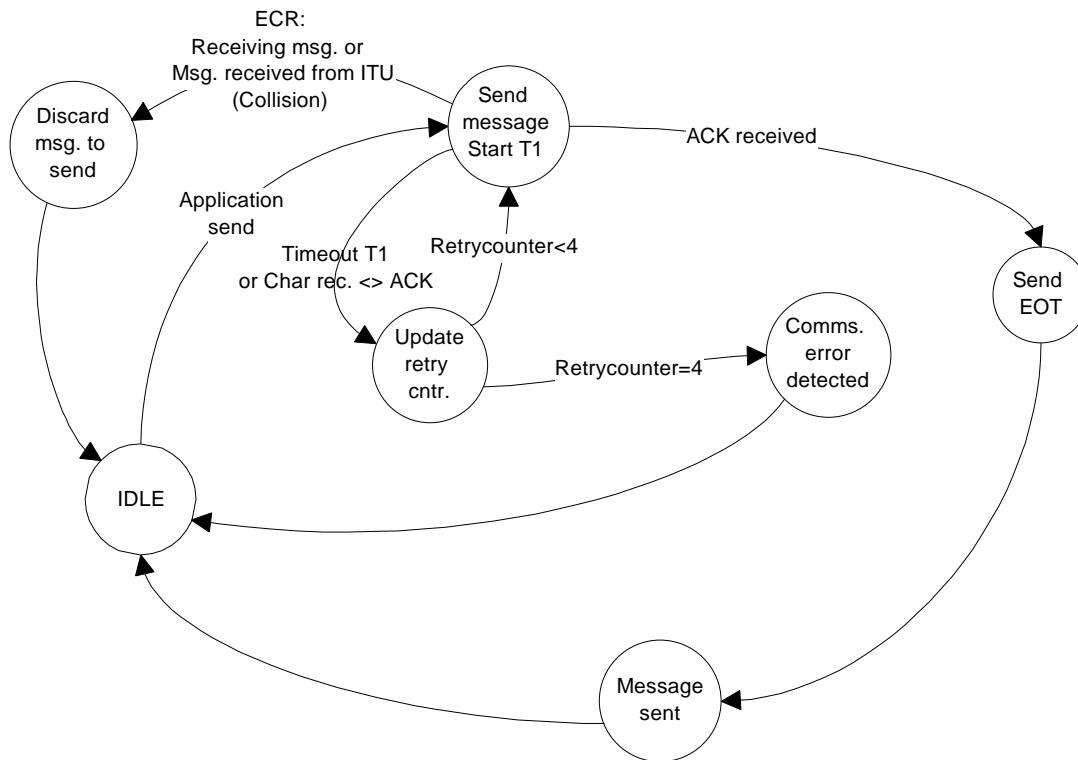


Fig.1 State even table for the transmitting device, both ECR and ITU

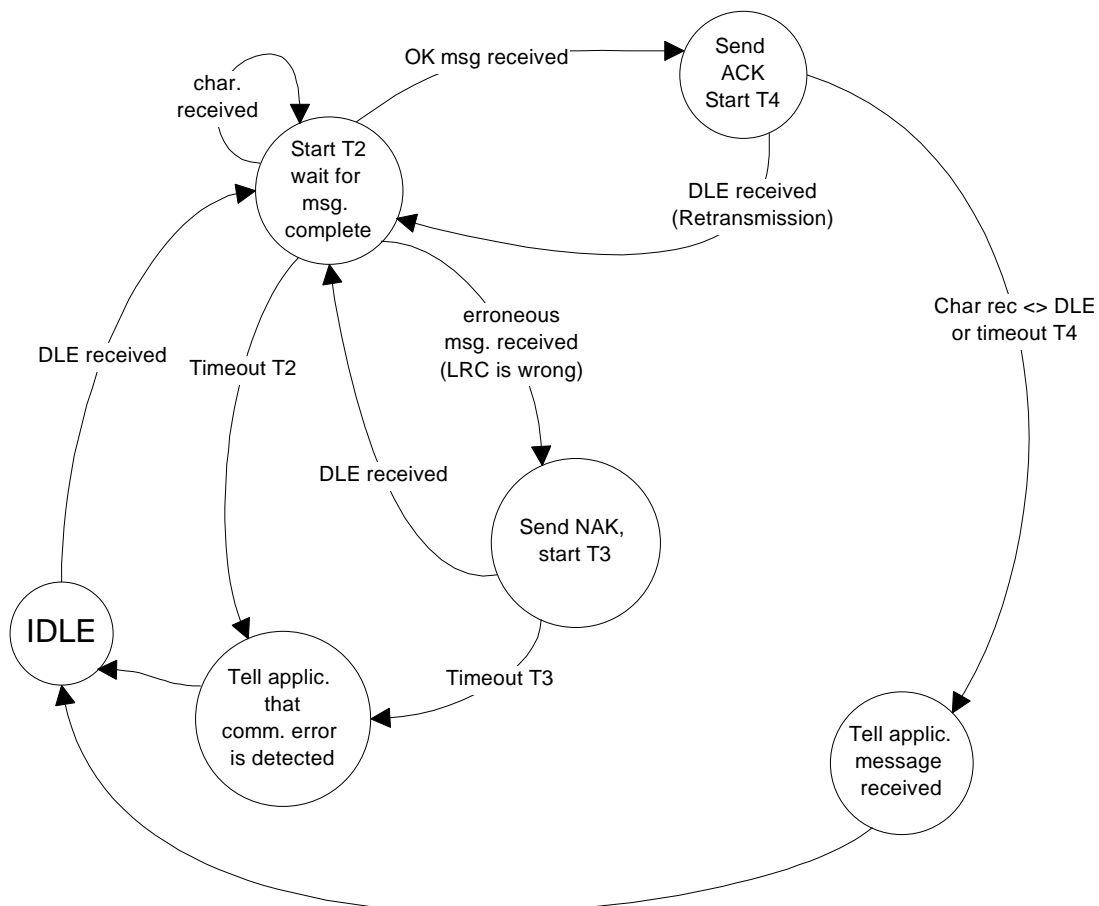


Fig. 2 State even table for the receiving device, both ECR and ITU

4.3.7 Timing Considerations

This table shows the different timeouts ACK/NAK control characters, which shall be configurable in the ITU.

Timer	T1 (m.sec)	T2 (m.sec)	T3 (m.sec)	T4 (m.sec)
Value in milliseconds	1000	100	1500	2000
Started	After LRC byte is sent	When a character in a message is received	After NAK is sent due to wrong LRC byte	After ACK is sent as confirmation to received message.

The timers have the following functions:

1. The T1 timer defines the time between a message is sent, and retransmission starts. i.e. no ACK/NAK is received
2. The T2 timer is the inter character timer. Defines how long the receiver shall wait for the next character in a message. Used to detect noise or broken line during communication
3. The T3 timer defines how long the receiver shall wait for a new message after NAK is sent.
4. The T4 timer defines how long the receiver shall wait for EOT or possible retransmissions when a message is received and answered with ACK

4.3.8 Link Layer using BAXI Message Router

As an alternative to the link layer described in chapter 4.3 Link Layer, BAXI (BBS ActiveX Interface) Message Router can be used.

The Message Router must be installed on a Windows PC, and the message Router will receive messages on TCP/IP. The Router will receive the number of bytes sent from the sender, and send the application message to the ITU using the Link Layer described in chapter 4.3.

The application message format is the same as described in this document.

The BAXI Message Router is available on request.

The BAXI Message Router format is

- <LENGTH> 2 byte unsigned short integer. MSB first. The length of the application message to send. The length of <LENGTH> field is not included.
- <MESSAGE> Variable field length. The message format is described in this document.

4.4 APPLICATION LAYER MESSAGES

4.4.1 Simple REQUEST-RESPONSE dialogue

As described earlier, this protocol is based upon a REQUEST-RESPONSE dialogue between the ECR and ITU. The following list will show the correspondence between the request messages (<CMMSG> in the detailed descriptions), and the response messages (<RMSG> in the detailed descriptions) as used in this protocol.

Initiation by	CMMSG	RMSG	Response by	Description
ITU	H41	H5B	ECR	Display text on ECR display.
ITU	H42	H5B	ECR	Print text on ECR printer.
ITU	H43	H5B	ECR	Reset application timer in ECR.
ITU	H44	H5B	ECR	Local Mode. ITU will instruct ECR to return to 'local mode' with given result.
ITU	H46	H55	ECR	Keyboard Input. ITU will instruct ECR to get keyboard input from the ECR and return the data to the ITU for further processing.
ITU or ECR	H49	H5B	ECR or ITU	Send Data. Send different kind of data fields to the other device
ECR	H51	H5B	ITU	Transfer Amount. ECR initiates 'Bank-Mode'.
ECR	H52	H5B	ITU	Transfer Card Data. If card is swiped or manually entered at the ECR
ECR	H53	H5B, or <CMMSG>	ITU	Administration. ECR initiates 'Bank Mode', and ITU will respond based upon the administration code.
ECR or ITU	5B	NONE!!	NONE!!	Response Message. The response message is an application answer to the message received.
ITU	H60	H61	ECR	ITU request an exchange of DEVICE ATTRIBUTE.
ECR	H61	H62	ITU	ECR exchanging DEVICE ATTRIBUTE.

The complete dialogue used for a normal processing of a card or an ITU menu-function is listed later in this document.

The dialogue for some of the most common error-situations are also listed later in this document.

4.4.2 Display Text

Purpose This function is started from the ITU and will show a text on the ECR-display. This message will normally only be used when the ECR is in 'Bank-Mode'. The exception is related to the need to the completion of the function 'Reconciliation'. The text is formatted according to the information given in DEVICE ATTRIBUTE command.

NOTE! It will be the responsibility of the ECR to perform any padding of the text, if necessary, to make sure any old text is overwritten in the ECR-display.

Detailed description

<CMMSG> H41 = command code DISPLAY TEXT

<DU.NO> H30 = operator display
H31 = customer display (option).
If the ECR does not support a customer display, the information should not be shown elsewhere either. ECR should respond normally to indicate normal usage.

<TYPE> H30 = normal text
H31 = prompter text.
For H31, the ECR will be expected to send an ADMINISTRATION message with information about a keyboard entry (a single keypress)

<MODE> H30 = normal text

<TEXT> Normal text, ASCII-characters.
The ITU will always be using default setting according to
DEVICE ATTRIBUTE COMMAND page 34.

Response message

<RMSG> Normal response, H5B (see page 36).

4.4.3 Print Text

Purpose This function is started from the ITU and will print a text on the ECR-printers. This message will normally only be used when the ECR is in 'Bank-Mode'. The exception is related to the need to complete the function 'Reconciliation'. The text is formatted according to the information given in DEVICE ATTRIBUTE command.

NOTE! All text strings must be printed with left alignment on the ECR.

NOTE! Even if the ECR receives a printer message when it indicates 00 in printer width in Device Attribute, it must respond to the message with Response Message OK.

Detailed description

<CSMG> H42 = command code PRINT TEXT

<SUB> H20 = A formatted printtext follows.

<MEDIA> H20 = print on receipt (option).

H21 = print on journal (option).

H22 = print on receipt and journal.

If H20 or H21 is not supported by ECR, the ECR must always print on both receipt and journal. All print command that includes a print to the journal must be logged to an electronic journal if supported on the ECR.

<MODE> H2A = normal text.

<TEXT> Normal text, ASCII-characters.

The ITU will always be using default setting according to DEVICE ATTRIBUTE COMMAND page 34. For formatting purposes, the text-separators listed below will be included in the print text. The number of characters transferred in one message is dependent upon the size of the receive buffer in the ECR. The size information is returned from the ECR in the DEVICE ATTRIBUTE COMMAND page 34

H0A = separator. Will be used throughout the TEXT string to allow correct formatting of the receipts.

H0C = Separator. Will be used at the very end of every TEXT string to indicate the end of text.

H0E = separator (option) Will be used anywhere in the TEXT string to indicate a request to cut the receipt. The Cut command is sent to the ECR to indicate a start of a Stub Receipt. The ECR must feed the paper and adjust the cutter to do the cut/perforate on the correct position.

If the receipt is to be cut an H0E must be sent in front of the H0C (end of text) to be valid.

If the ECR does not support such functions, the separator H0E should be ignored.

Response message

<RMSG> Normal response, H5B (see page 36).

4.4.4 Reset Timer

Purpose This function is started from the ITU to make sure that the ECR does not get a timeout while the ITU is performing a task. This message may only be used when the ECR is in 'Bank-Mode'.

NOTE! The application timer in the ECR will be reset after every new message to/from the ECR. Therefore, it is suggested to always use default 60 seconds, and send this message again if the ITU needs more time to perform a particular task.

Detailed description

<CMMSG> H43 = command code RESET TIMER

<SEC> H303630 = 60 seconds Default is H303630 which will give 60 seconds as the standard application-level timer in the ECR.

Response message

<RMSG> Normal response, H5B (see page 36).

4.4.5 Local Mode

Purpose This function is started from the ITU to indicate to the ECR that the processing of a function or a transaction has come to an end. The ECR will then be able to continue processing in 'LOCAL-MODE', dependent upon the <RESULT> parameter in this message. This message may only be used when the ECR is in 'Bank-Mode'.

Detailed description

<CMMSG> H44 = command code LOCAL MODE

<RESULT> H20 = indicates transaction OK.
H21 = indicates transaction/operation rejected.

<ACC> H20 = indicates standard update of accumulator.
H21 = Not used in current software in the ITU.
H22 = indicates transaction is finalised as Offline transaction.
H23 .. H2F = Reserved for future use. The ECR shall finalise the transaction as OK.
Accumulator type is uncertain for the time being.
H30 = indicates no update of accumulator.

<Id> 2 digit issuer number is indicating the card issuer according to reference [2], Appendix E. Used if the transaction was accepted. As long as the data is available, the data shall be sent regardless if transaction is rejected or accepted.

<PAN> Variable field length, Max. 19 digit if present. The Primary Account Number from the card holder. The PAN shall not be sent if some parts of the card number is replaced with "*" in the printout. The PAN field is of restricted use, due to security regulations.

<SEPARATOR> H3b, ASCII ";;"

<TIMESTAMP> 14 byte numeric data. Timestamp in format YYYYMMDDHHMMSS. The timestamp shall be the same data as received from the Host to the terminal in the response message.

<SEPARATOR> H3b, ASCII ";;"

<VER. M.> 1 byte numeric data. Cardholder Verification Method.
H30 = Transaction is PIN based, also to be used if reversal transaction
H31 = Transaction is signature based
H32 = No CVM. Only amount is verified by cardholder.
H33 = Transaction is a Loyalty Transaction. Used for data capture transactions. No accounts are debited or credited.

<SEPARATOR> H3b, ASCII ";;"

<SESSION Nr.> 3 byte, numeric data. The current session number received from the HOST. The session number is uncertain in case that the transaction is an Offline transaction. This number is changed on reconciliation.

<SEPARATOR> H3b, ASCII ";;"

<STAN_AUTH> 12 byte, Alphanumeric data (H20-H7F). The STAN_AUTH and the TIMESTAMP will identify the transaction.
On-line: The STAN (System Trace Audit Number) is the 6 first bytes, and the Authorisation Code is the 6 last bytes.
Off-line: STAN=9xxxx9 where x is the message number for the actual transaction
AUTH = <H20H20H20H20H20H20>

<SEPARATOR> H3b, ASCII ";"
<SEQ.NO> 4 bytes numeric data (H30 .. H39). This is the customer number if the transaction was Pre-Auth transaction. Must be used as reference in Transfer Amount - Adjustment transaction.
<SEPARATOR> H3b, ASCII ";"
<AMOUNT> 11 bytes numeric data (H30 .. H39). Normally not used. Only used in Restaurant or Hotel environmet where TIP is added to the purchase amount on the ITU. Used in the Purchase or Adjustment transaction.

Response message

<RMSG> Normal response, H5B (see page 36).

The combinations of <RESULT> and <ACC> parameters are shown in the table below.

NOTE: All occurrences of ACC < H30 indicates that the transaction is successful and accumulator is updated. If bit B0 is NOT set in OP3 in Device Attribute, page 34, the ACC field is either H20 or H30, hence the different update of accumulator as described below is undefined.

RESULT	ACC	Description
H20	H20	ITU indicate a successful completion of a TRANSFER AMOUNT transaction. ECR must update its amount accumulators. Host accumulator is updated. The H2020 should also be used if the transaction has been successfully completed by using the ADMINISTRATION message for annulment (H3134).
H20	H21	This value is not used in the current software in the ITU! Is used if the transaction is finalised as a <u>Manual</u> Offline Backup Solution (paper based backup solution). The ECR can use a dedicated accumulator for the backup procedures to ensure better routines in reconciliation phase. Host accumulator IS NOT and WILL NOT be updated automatically. Accounts are debited/credited by use of manual routines.
H20	H22	Used if transaction is a successful offline transaction. Transaction will be sent automatically to HOST for processing later. Transaction must be registered as an OK transaction in the ECR.
H20	H23.. H2F	Reserved for future use. If received, the ECR must finalise the transaction as an OK transaction.
H20	H30	Transaction is OK, and NO update of accumulator is typically used in the following instances: a) ITU has completed the processing of an operator-function (i.e. menu-function/Administration message other than card transaction). No amounts have been transferred between ECR and ITU in this dialogue. b) ITU has successfully completed a non-financial transaction towards the host (i.e. PRE-AUTHORISATION, BALANCE INQUIRY or a LOYALTY CARD). Amounts have been transferred, but the amounts are not financial transactions in the ITU.
H21	H30	This combination is typically used in the following situations: a) The Host or the ITU has rejected a card transaction because the card is not accepted by host, or the transaction is manually cancelled on the ITU. b) ITU indicate that payment is not possible at the time being, because ITU is in a state that does not allow it to process any card transaction, or the ITU is busy in a dialogue with a host. ECR should return to 'Local Mode' in SUBTOTAL status and continue with normal processing. The Local Mode message shall only contain the <RESULT> and <ACC> parameters if the transaction is rejected (H2130).

4.4.6 Keyboard Input

Purpose This function is started from the ITU. The command is used to enter data via the ECR-keyboard and to send the data to the ITU for further processing. It is the application of the ECR that controls the edit functions of the data.

Detailed description

<CMMSG> H46 = command code KEYBOARD INPUT
<ECHO > Indicates if the entered chars shall be echoed on the ECR display or not.
H20= echo
H21=No echo
<MIN> 2 bytes indicating minimum number of characters to be entered
<MAX> 2 bytes indicating maximum number of characters to be entered

Response message

<RMSG> Keyboard input characters H55
<DATA> The entered characters. If the operator chooses to abort the operation, <DATA> field must be filled with H20
<DELIM > A character indicating which delimiter was used to conclude the input
H30= Enter
H39=Cancel, Interrupt

NOTE: If ECR responds to the Keyboard Input message with standard respons H5B, this indicates that the function is not implemeted in the ECR or there are no data present for the time being.

NOTE: If the ITU sends another message (typically a display or printmessage) before the ECR has sent the Keyboard input respons message, the ECR must abort the keyboard input and respond to the message from the ITU as specified.

4.4.7 Send Data

Purpose This function is started either from the ITU or from the ECR. The Send Data function is optional. The ECR and the ITU shall not change state with respect to Local Mode vs. Bank Mode when the Send Data message is in use. The exception to the rule is the Sub Function H3038, H3039, H303A, H303B

Detailed description

<CMMSG> H49 = command code SEND DATA
<CODE > 2 bytes indicating sub function, i.e. which data type will be sent.
<BLOCK> 1 byte Information, if it is the last block of data, or if it is more to come
H31 = More data blocks pending. See Note 7!
H32 = Last data block See Note 7!
<SEQ> 4 bytes, Not used. "0000"
<LEN> 3 bytes, Not used. "000"
<DATA> The data bytes. Refer to layout below.

Response message

<RMSG> Normal response, H5B (see page 36).

Detailed usage of the subfunction and description of the data content to the associated function.

Sub function	Description	Data format
H3031	Reports data header	6 byte SITE number. The 6 rightmost bytes from the merchant ID used in communication to the HOST. 3 byte session number received from the HOST during the last reconciliation 14 byte YYYYMMDDHHMMSS timestamp (TS). TS is from last report message from HOST or TS is from terminal RealTime clock in case of local reports.
H3032	Reconciliation data, amounts	2 byte issuer id, same format as used in LOCAL MODE 4 byte number of transactions 1 byte sign. "+" hex 2b or "-" hex 2d 11 byte total amount, total debits – total credits 11 byte cash amounts 11 byte deposit amounts 1 byte separator, H1C Several issuers can be sent in the same message. See note 3 and 4!
H3033	Turnover data, amounts	Same data definition as reconciliation data. If the terminal accumulators has discrepancies versus the HOST accumulators, the data to the ECR must be the HOST accumulators data
H3034	X-report data, amounts	Same data definition as reconciliation data
H3035	Z-report data, amounts	Same data definition as reconciliation data

Sub function	Description	Data format
H3036	Not used	
H3037	INFO field	Alphanumeric data (H20 .. H7F). The datafield shall be sent to the ECR if the terminal receives such information from the HOST.
H3038	Request encrypted card number	No extra data. Message sent from the ECR to the ITU. Command asks terminal to return card number as encrypted number. Encryption algorithm is a separate specification. See note 1!
H3039	Encrypted card number	max 19 digits, numeric field Loyalty cards shall be returned in clear text. See note 1!
H303A	Request encrypted card number and Issuer ID	1 byte numeric data as index to which Crypto key to be used. Message sent from the ECR to the ITU. Command asks terminal to return card number as encrypted number, preceeded with the Issuer ID according to the ITU Issuer dataset. Encryption algorithm is a separate specification. See note 1!
H303B	Issuer ID and Encrypted card number	2 byte Issuer ID in clear text, numeric data, according to Appendix E Variable max 19 digits numeric field, Encrypted PAN. Loyalty cards shall be returned in clear text. See note 1!
H3130	Data from ITU to HOST through ECR	1 byte Alpha numeric routing prefix. The routing prefix shall be used by the ECR as an alias to determine the address to the HOST. The alias definition file must be downloaded from the CC or other media. Default values: "1" for CC and "2" for SWC 3 byte numeric timeout value in seconds to be used on receive data from the HOST. 1 byte separator, H1C <data> Variable length, Binary data. The <data> must be sent to the HOST from the ECR "as is".
H3131	Data from HOST to ITU through ECR	Data sent from ECR to the ITU. The <data> shall be sent to the ITU "as is" received from the HOST. The link layer control bytes shall not be regarded as a part of the <data>
H3132	Data parameters from ITU to ECR	Not used
H3133	Data parameters from ECR to ITU	Data parameters sent from the ECR to the ITU. H30: max 32 characters (H20-H7E). The connection address to the ECR.
H3134	Disconnect command from ITU to ECR	No data. The ECR shall disconnect the line to the HOST when this command is received.
H3135	Error command from ECR to the ITU	IF the ECR reach an error situation, a single character shall indicate the error condition. The data is H30: Connect error. ECR is unable to send the message. H31: Timeout on receive data. The data from HOST is not

Sub function	Description	Data format
		received in complete until timeout. H32: The ECR is unable to send the data to the HOST. The reason can be too many errors on link layer transmission. <text field> Max. 20 characters. Error text in clear to be sent to the ITU. The ITU shall send the text to the printer device.
H3136	B2B Data from ECR to HOST via ITU	Header: 1 byte data type, '0' (H30). Other values RFU 18 bytes reference Numeric: ssssssYYMMDDHHMMSS ssssss = Stan from response to financial transaction YYM... = Timestamp from response to financial transaction <data> Variable length, Binary data. The <data> must be sent to the HOST as received from the ECR.
H3137	B2B Data from Host to ECR	<data> Variable length, Binary data. The <data> must be sent to the ECR as received from the HOST.
H3138	TopUpCode data from ITU to ECR	<TopUpCode> Variable field Format is "Article EAN num<US>Mnemonic<US>Activation code<US>Serial num<US>Value<RS>" Article EAN num is variable length alphanumeric field. <US> H1F, ASCII "Unit Separator" Merchandise Operator mnemonic <US> H1F, ASCII "Unit Separator" Activation code is variable length alphanumeric field. <US> H1F, ASCII "Unit Separator" Serial num is variable length alphanumeric field. <US> H1F, ASCII "Unit Separator" Value is variable length numeric field. Value is represented in cent without comma notation. <RS> H1E, ASCII "Record Separator", used as a separator between each TopUpCode record Pay attention to Note 8!

Note 1: Sub function type H3038, H3039 H303A and H303B is application dependent, and must be specified in each project.

Note 2: Sub function type H31x uses host communication from ITU through ECR to the Collection Centre. These commands are optional. The message must be sent to the HOST in the agreed format using the agreed communication channels. The protocol used to send the data to the HOST is not a part of this document. This can be specified in each project.

Note 3: The cash amount and deposit amount is included in the total amount in the reconciliation data amounts.

- Note 4: The amount data content shall be sent to the ECR for each issuer that is active, even if an issuer has no registered amounts for the report in use. (No zero skip in the send data function)
- Note 5: If the ECR shall send the message to the HOST, it is the responsibility of the terminal to ensure that all transactions have a proper request-response dialog. If the ECR reach a timeout condition before the data is received from the HOST, the ECR **MUST NOT** try to retransmit the message towards the HOST later (Store and Forward).
- Note 6: The Send Data function can be started from the ITU, even if the ECR is in Local Mode. Therefore, the ECR must be able to receive the SEND DATA function and send this message to the HOST (i.e. software download during night time)
- Note 7: When the ECR is used as a router to send data to the CC, the <BLOCK> indicator shall be set to H32, even if the ITU or the ECR must send/receive more messages. The <BLOCK> indicator shall only be used when the communication is between the ITU and the ECR.
- Note 8: It is essential that the order of the TopUpCodes are the same as the <EAN art.> data in the Transfer Amount function.
The value is the value of the purchased merchandise, not the price paid for it. i.e. you can pay 500,- for a merchandice that has a value of 800,- The 80000 is the value that is used in this field.

4.4.8 Transfer Amount

Purpose The function is started from the ECR and is used to transfer the transaction amount and transaction type details to the ITU. After this command the ECR will enter the defined 'Bank-Mode'. This message is only used when the ECR is in 'Local-Mode'.

Detailed description

<CMMSG> H51 = command code TRANSFER AMOUNT
<YYMMDD> "000000" (not used)
<HHMM> "0000" (not used)
<ID.NO> "000000" (not used)
<SEQ.NO> Normally set to "0000". If set in Pre-Auth, the number is a reference to a previous Pre-auth. If set in Adjustment transaction, the field shall be set to the corresponding number received in the Local Mode from the Pre-Authorisation.
<OPT> Operator identification. A fixed field with 4 characters. ITU usage defined on page 44. If not implemented by the ECR vendor, the field should be filled with zeroes (H30's).
<MODE> H30 (not used, but tested by the ITU because of error prevention)
<TYPE 1> H30 = EFT Authorisation (KJØP) => Purchase amount
H31 = Return of Goods (RETU)
H32 = Reversal (ANNU) => Annulate last amount
H33 = Purchase with Cashback (KONT)
H34 = PRE Authorisation (GAR)
H35 = Adjustment (OPPG)
H36 = Balance Inquiry (DISP)
H37 = Complete Receipt (KVIT)
H38 = Deposit (INN)
H39 = Cash Withdrawal (UT)
H3A = Load e-purse card (LOAD)
H3B = Merchandise Purchase
H3C = Merchandise Reversal
H3D = Merchandise Correction
<AMNT 1> Total amount. 11 ASCII characters right adjusted, including decimals. Please read comments on page 42.
<TYPE 2> H30 (not used, but tested by the ITU because of error prevention)
<AMNT 2> Total purchase amount. 11 ASCII characters right adjusted, including decimals. Only used if
<TYPE 1> = Purchase with Cashback (H33), else it will be filled with H20.
<TYPE 3> H30 (not used, but tested by the ITU because of error prevention)
H31 if TopUp transaction.
<AMNT 3> 11 ASCII char. Total ART # amount. If not used the field is filled with H20.
<DATA> Variable field length, max 40 digits alphanumeric. The data is to be sent to the HOST. The data characters must be in range H20 to H7F. This field is optional.
<Separator> H1c, ASCII "Field Separator"
<ART #> Variable field, alphanumeric data. Each record is separated with H1e, ASCII RS, A maximum of 3 records can be sent in one message, each separated with RS. The field is used to identify dedicated articles or reference to articles. Refer to note!

Response message

<RMSG> Normal response, H5B (see page 36).

NOTE! The amounts must be sent without rounding

NOTE! The ITU must check that the <AMNT 1> in Reversal (H32) is the same as the amount of the transaction that is to be reversed.

NOTE! A TRANSFER AMOUNT message with an amount < 100 should result in a LOCAL MODE message indicating 'Transaction OK, no update of ACCumulator'. The Printer Buffer in the terminal must be sent to the ECR prior to the Local Mode message.
A Transfer Amount message where the amount is in range 10 .. 20 should be mapped by the ITU to perform the corresponding ADMIN function as if the two last digits in the AMNT 1 was ADM. CODE.

NOTE! In order to prevent erroneous amounts to be sent to the terminal from the ECR, the ITU must verify different fields in the Transfer Amount message.

$AMNT1 \geq AMNT2 + AMNT3$

NOTE! ART # must be filled with article numbers in the purchase transaction

ART # must be filled with references to the articles in a reversal transaction and correction transaction. This is application dependent, and must be clarified in each project.

A Merchandise Reversal transaction and Merchandise Correction transaction can only include one article at a time.

The following table describes the relations between the usage of the different amount fields

Payment	Transaction type	Type 1	AMNT1	AMNT2	AMNT3
Cash	Merchandise	H3B	Merch.	Not used	Merch.
	Merchandise +authorisation	n.a.			
Card	Merchandise	H30	Merch.	Not used	Merch.
	Merchandise +authorisation	H30	Merch. + auth.	Auth.	Merch.
Card	Merchandise +Cashback	H33	Merch. + CB	0	Merch.
	Merchandise +authorisation+CashBack	H33	Merch. + CB+auth.	Auth.	Merch.

4.4.9 Transfer Card Data

Purpose This function is started from the ECR and is used to transfer the magnetic stripe content from the card swiped in a card reader attached to the ECR. The card information can be from either track 2, track 3, both track 2 and 3 or manually entered. The ITU shall treat the data as if received from the card reader connected to the ITU and process the data according to the same rules.

USAGE The command can be used when ECR is in “Bank Mode” or “Local Mode”.
From Local Mode: The ECR sends the message and the ITU responds with <RMSG> only.
From Bank Mode: The ECR sends the message, and the ITU responds with <RMSG>. The ITU will then process the data, and send messages to the ECR as described in this document.
In case the ECR reads a combined card, the ECR must send the track 2 content, the <FS> and the track 3 content in the same transfer card data message.

Detailed description

<MSG> H52 = command code TRANSFER CARD DATA
<BLOCK> H30 (not used)
<TRACK> One byte indicating from which track the card information is of origin
H32 = Track 2
H33 = Track 3
H40 = Manually entered, including expiry date and CVC
<DATA> ASCII representation of the card data excluding start sentinel, end sentinel and LRC.
If manually entered the format is <PAN=YYMMCVC>
PAN is Primary Account Number, up to 19 digits, mandatory
= is the separator, H3D, mandatory
YYMM is the expiry date, 4 digits, mandatory
CVC is the Card Validation Code, 3 digits, optional field that can be entered by the operator. Field must be sent if entered.
<FS> The field separator Hex1C is used to separate the content from the two tracks.

Response message

<RMSG> Normal response, H5B (see page 36).

NOTE! The ECR and the ITU shall remain in the same state after the data is sent. If ECR sends the message from LM, the ITU shall not send any other message than <RMSG>. If a card is already swiped in the ITU, the transfer card data message from the ECR shall be discarded at the ITU. If the ECR does not send any other message than the Transfer Card Data message from LM, the card data shall be discarded after a timeout period already used by the ITU (today set to approx. 120 sec). The ITU shall not send any LOCAL MODE message in case of timeout when the TCD message was sent from the ECR in LM.

4.4.10 Administration

Purpose The message is used from the ECR to administer operator functions, or other functionality that requires operator interface.

Detailed description

<CMMSG> H53 = command code ADMINISTRATION

<YYMMDD> "000000" (not used)

<HHMM> "0000" (not used)

<ID.NO> "000000" (not used)

<SEQ.NO> "0000" (not used)

<OPT> Operator identification. A fixed field with 4 characters. ITU usage defined on page 44. If not implemented by the ECR vendor the field should be filled with zeroes (H30's).

<ADM.CODE>

H3030 = not used. Refer to the NOTE for details

.....

H3039 = not used

H3130 = SEND from ECR should be mapped by ITU to perform RECONCILIATION function.

H3131 = KLAR, validation key. Refer to the NOTE for details

H3132 = AVBRYT, cancellation key. Refer to the NOTE for details.

H3133 = FEIL, correction key.

H3134 = ANNUL from ECR should be mapped by ITU to perform REVERSAL transaction.

H3135 = Shall be mapped by ITU to perform Balance Inquiry transaction.

H3136 = Shall be mapped by ITU to perform X-report.

H3137 = Shall be mapped by ITU to perform Z-report.

H3138 = Shall be mapped by ITU to perform send Offline Transactions to HOST.

H3139 = Shall be mapped by ITU to perform Turnover report.

H313A = Shall be mapped by ITU to perform print of stored EOT transactions

H313B = not used

H313C = not used

H313D = not used

H313E = not used

H3220 = First single character keyboard input, representing H20 = "space"

H373E = Last single character keyboard input, representing H7E = "~"

<FS> H1C = End of datafield. Must always be present.

Response message

<RMSG> Normal response, H5B (see page 36), or a new command initiating a new REQUEST-RESPONSE dialogue.

NOTE! The ADM.CODES H3030 - H3039 and the code H3131 should all result in a LOCAL MODE message from the ITU indicating 'Transaction OK' after trying to empty any stored receipts (see page 44).

NOTE! <ADM.CODE> = H3132 from the ECR will always be handled as a cancellation request. The ITU shall answer with normal response message H5B with <Response Code> = H3030. Thereafter, the LOCAL MODE message will determine if the transaction/operation actually was cancelled or not in the ITU.

The reports are described as follows:

Reconciliation: A report for the SITE (all terminals in the shop). The reconciliation is the report to use to make the monetary transactions to take place. The accumulators are under control of the HOST. Resets the accumulators after the reconciliation is done.

Turnover: A report for the dedicated terminal in use. Does not make any influence on any accumulators. The accumulators are under control of the ITU. Reset after each reconciliation

Z-report: A report for the dedicated terminal in use. The accumulators are under control of the ITU. Resets the accumulators after the Z report is finished.

X-report: A report for the dedicated terminal in use. Does not make any influence on any accumulators. The accumulators are under control of the ITU. Reset after the Z report is finished.

4.4.11 Device Attribute Request

Purpose This function is started from the ITU and is used to ask the ECR for correct system parameters. The ECR will then respond by sending the DEVICE ATTRIBUTE message.

If there is ever a communication error between the ECR and the ITU, or if the ITU power has been turned off, the DEVICE ATTRIBUTE information will have to be exchanged again. It is the responsibility of the ITU to ensure that the dialogue is executed whenever needed. The ITU shall initiate the Device Attribute dialog during the first “Bank-Mode” state after power up. The ITU shall store the information until power down.

This message may only be used when the ECR is in 'Bank-mode'.

Detailed description

<MSG> H60 = command code DEVICE ATTRIBUTE REQUEST

Response message

<RMSG> Response by command H61, DEVICE ATTRIBUTE (see page 34 Device Attribute).

4.4.12 Device Attribute

Purpose This message is either used as the first message in a dialogue, or as a response to a DEVICE ATTRIBUTE REQUEST sent from the ITU. The ITU will record the information, and later on use it to be able to send correct formats to the printer and display.

Detailed description

<MSG> H61 = command code DEVICE ATTRIBUTE
<TYPE> 16 characters decided by the ECR-manufacturer (left justified).
<MODEL> 6 characters decided by the ECR-manufacturer (left justified).
<ID.NO> 6 characters decided by the ECR-manufacturer (left justified).
<VERS> 13 characters indicating the ECR-software version and date.
The format is **X.XX YY.MM.DD**
Changed when the ECR software is updated.
<STAT> H20 = ECR OK.
H21 = ECR not OK.
<PRINT> H3030 = ECR does not have a printer for EFT-POS purpose. The ITU must use its own printer for all printer messages. Please read note in Print Text command.
H3138 = 18 characters per line. Minimum printer width.
H3234 = 24 characters per line (default)
H3939 = 99 characters per line.
ECR should always indicate actual size. ITU will format the receipts according to the printer width.
<DISPLAY> H3130 = 10 characters per line in the display.
...
H3939 = 99 characters per line in the display.
ECR should always indicate actual size.
<OP1> The size of the receive buffer in the ECR.
H31 = 255 chars
H32 = 1024 chars
<OP2> H20
<OP3> H2x X is bitwise defined. Default value is H20
B0 Must be set for compatibility reasons to control <ACC> position in Local Mode correctly.
B1 Reserved for future use
B2 Reserved for future use
B3 Reserved for future use
<OP4> H20 ECR cutter is NOT supported
H31 ECR cutter is supported

Response message

<RMSG> The ITU should only send a response by command H62, STATUS REQUEST RESPONSE if the DEVICE ATTRIBUTE dialogue was initiated from the ECR (see page 35), followed by a LOCAL MODE message.

4.4.13 Status Request Response

Purpose This message is sent as a response from the ITU to the DEVICE ATTRIBUTE message dialogue initiated from the ECR. This message may only be used when the ECR is in 'Bank-Mode'.

Detailed description

<RMSG> H62 = command code STATUS REQUEST RESPONSE.

<TEST> H20 = internal test in the ITU went OK.
 H21 = internal test in the ITU went wrong.

<STATUS> H20 = bank ONLINE.
 H21 = bank OFFLINE.

<TID> 8 alphanumeric digits, The Terminal ID

<SITE> 6 numeric digits, the 6 rightmost digits of the merchant number

<TERM-VERS>
 4 digits, 2 byte terminal type and 2 digits SW version

4.4.14 Response Codes

Purpose This message is used from both the ECR and the ITU as a response to most other messages defined in the protocol. This message may only be used when the ECR is in 'Bank-Mode'.

Detailed description

<RMSG> H5B = RESPONSE CODE start

<RESPONSE CODE>

H3030 = OK. The Receiver has received and processed the data correctly

H3033 = Not OK. The receiver is not able to process the received data.

H303x = Not OK. Shall be treated as if H3033 is received.

H3131 = ECR display busy, ITU may try again once.

H3132 = ECR printer busy, ITU may try again once.

H3133 = ECR printer out of function.

If the ECR sends H3133, the ITU must interrupt the current transaction, and wait for the next 'Bank-Mode' initiation from the ECR.

<END> H5D = endcode.

NOTE: When the Transmitter sends response code H303x, the Receiver will be expected to continue from previous message received from the ITU, i.e. return to situation before previous message was sent to the ITU.
Example: H303x is used from the ITU when an incorrect/unavailable function-/key-selection has been made by the ECR-operator. The ECR is then expected to automatically keep the previous display-information, and perform a new function-/key-selection by reading a new entry from the keyboard.

4.5 APPLICATION LAYER MESSAGE FLOW

4.5.1 Introduction

Both ITU and ECR are expected to use an application timer with default value of 60 seconds. This timer is typically used to identify a timeout situation when the transmitter sends a message that is never answered (other than at link-level with ACK) by the receiver.

This application timer is temporarily changed in the ECR when the ITU sends the RESET TIMER message. However, this new timer-value is reset to default 60 seconds when a new message has been sent/received by ECR. ITU must ensure that ECR does not have a timeout situation when the ITU is performing a task.

4.5.2 Normal message flow for card processing

The following application layer messages will be used during normal processing of a card:

1. H51 - TRANSFER AMOUNT from ECR to initiate a dialogue.
H5B - RESPONSE from ITU.
2. H43 - RESET TIMER from ITU if needed.
H5B - RESPONSE from ECR.
3. H41 - DISPLAY TEXT from ITU if needed.
H5B - RESPONSE from ECR.
4. H42 - PRINT TEXT from ITU to print receipt.
H5B - RESPONSE from ECR.
5. H44 - LOCAL MODE from ITU to return control to ECR.
H5B - RESPONSE from ECR.

Step 2 above can be repeated if the ITU needs more time before time-out. Steps 3 and 4 can also be repeated.

4.5.3 Normal message flow for ITU menu-functions

The following application layer messages will be used during normal use of ITU menu-functions:

1. H53 - ADMINISTRATION from ECR with ADM.CODE set to initiate the MENU-function wanted. ADM.CODE=H3130 will initiate a dialogue to perform a reconciliation function.
2. H5B - RESPONSE from ITU, or the ITU may continue at 3.
3. H41 - DISPLAY TEXT from ITU to inform the operator.
4. H5B - RESPONSE from ECR.
5. Combination of 3 and 4, as many times as needed to inform the operator of the progress of the function.
6. H42 - PRINT TEXT or H41 - DISPLAY TEXT from ITU if needed.
7. H5B - RESPONSE from ECR.
8. H49 – SEND DATA from ITU to ECR. The ITU send the data as datafield.
9. H5B - RESPONSE from ECR.
- 10.H44 - LOCAL MODE from ITU with RESULT=H20 and ACC=H30 to return the control to the ECR.
- 11.H5B - RESPONSE from ECR.

4.5.4 Message flow during common error-situations

General handling if an error occurs shall be that the ITU should let the ECR-operator know of any errors that relate to the ITU's ability to perform the desired function. When done accordingly, the ITU will allow the ECR-operator to interact with the ECR or ITU to possibly correct the error.

4.5.4.1 Card errors

If a non-permanent read-error occurs when trying to read the card, the ITU must allow the customer to try again without informing the ECR.

If a critical error occurs that will indicate that the card is impossible to use for a card transaction, (i.e. a permanent read-error occurs when trying to read the card) the following dialogue may occur after the ECR has initiated a card transaction:

1. H51 - TRANSFER AMOUNT from ECR.
H5B - RESPONSE from ITU.
2. H41 - DISPLAY TEXT and/or H42 PRINT TEXT from ITU to inform about the critical error.
H5B - RESPONSE from ECR.
3. H44 - LOCAL MODE from ITU with RESULT=H21, and ACC=H30.
H5B - RESPONSE from ECR.

The ITU will automatically clear any information about the card or the transaction that may have already been initiated, and the ECR must start over from the beginning to initiate a new dialogue to process a new card.

4.5.4.2 Communication Error between ITU and host

If a communication error towards host occurs, the following dialogue will normally occur (assuming the ECR has already initiated a 'Bank Mode' dialogue):

1. H41 - DISPLAY TEXT and/or H42 - PRINT TEXT from ITU to inform about the error.
H5B - RESPONSE from ECR.
2. H44 - LOCAL MODE from ITU with RESULT=H21, and ACC=H30.
H5B - RESPONSE from ECR.

4.5.4.3 Communication Error between ITU and ECR

There are typically two types of communication errors that may occur between ITU and ECR:

- a) Link layer errors due to noise on the line. The receiver can't accept the received message due to that the LRC checksum is incorrect. After 4 retries, both the transmitter and receiver shall abort the communication, and tell the application that an error situation has occurred.
- b) Link layer timeout or an application timeout situation.
The state even table defines what shall happen when a link layer timeout occur. An application timeout situation should result in an action whereby the transmitter and receiver must cancel the current operation.

If the ITU is not able to finalise the communication towards the ECR, the ITU must print a copy receipt on the local printer, or the receipt must be temporarily stored (see page 44) and printed after a new dialogue has been initiated.

The ITU is responsible for a new exchange of parameters in the DEVICE ATTRIBUTE message in the first transaction taking place after the error has been resolved.

4.5.4.4 General error recovery in ITU application

The ITU application must try to be operational towards the ECR all the time. This criteria is valid even if the link level indicate that there is a communication error, timeout error, or other error situations at a link level. If the ECR is able to start a new dialogue at a later stage, the ITU must act accordingly, and forget about any previous error-reports (other than for statistical purposes).

In general the ITU should let the ECR-operator know of any errors that relate to the ITU's ability to perform a desired function. If everything else fails, the ITU should always send the LOCAL MODE message to indicate the situation the ITU ended in (even with reported communication error with ECR).

4.6 ECR MESSAGE HANDLING

4.6.1 Introduction

The ECR will have the following typical functions:

- Start the dialogue necessary to perform a card transaction by using the TRANSFER AMOUNT command message.
- Start administrative ITU menu-functions from the ECR keyboard by using the ADMINISTRATION command message.
- Control of an application level timer that is started after every REQUEST/RESPONSE to/from the ITU, except when ECR sends transfer Card data from Local Mode. The timer shall work as follows:

Length	60 seconds (default)
Started at	REQUEST/RESPONSE to/from ITU
Stopped at	RECEIVE of LOCAL MODE
After timeout	Return to local mode
Restarted at	Receive of RESET TIMER command, or REQUEST/RESPONSE from ITU

4.6.2 Using TRANSFER AMOUNT

The <TYPE 1> field in the TRANSFER AMOUNT message puts different demands on the ECR functionality.

It is impossible to define the ECR functionality to any great detail in this protocol because of the diversity of manufacturers, etc.

However, for the purpose of this protocol, some assumptions have been made about what the ECR's are able to do in terms of functionality.

One of these is that the ECR is able to determine which transaction type to initiate towards the ITU through the use of the TRANSFER AMOUNT message.

Another assumption is that the ECR is able to handle keyboard input after having initiated 'Bank Mode' with the TRANSFER AMOUNT message.

The <TYPE 1> field contains a total of 10 different transaction types that are possible in the ITU.

4.6.2.1 Transactions where only one amount is required

The following transaction types will contain only one amount (in <AMNT 1>) and complete the card transaction with this information:

- H30 - EFT Authorisation: The ECR will transfer total purchase amount in <AMNT 1>. Normal response from ITU will be LOCAL MODE with RESULT=H20, and ACC=H20.
- H32 - Reversal: The ECR will transfer total reversal amount in <AMNT 1>. Normal response from ITU will be LOCAL MODE with RESULT=H20, and ACC=H20. If a communication error occurs between HOST and ITU, the ITU will inform the ECR-operator of this with proper display and printer messages. The ITU will also respond with LOCAL MODE with RESULT=H20, and ACC=H20 to ensure that the customer and ECR may continue as normal. It is the responsibility of the ITU to ensure that the transaction status towards the HOST is correct.
- H35 - Adjustment: The ECR will transfer final purchase amount in <AMNT 1>. Normal response from ITU will be LOCAL MODE with RESULT=H20, and ACC=H20.
- H38 - Deposit: The ECR will transfer the Deposit amount in <AMNT 1>. Normal response from ITU will be LOCAL MODE with RESULT=H20, and ACC=H20.
- H39 - Cash Withdrawal: The ECR will transfer the cash withdrawal amount in <AMNT 1>. Normal response from ITU will be LOCAL MODE with RESULT=H20, and ACC=H20.

4.6.2.2 Transactions requiring special handling

The transaction types requiring special handling are as follows:

- H31 - Return Of Goods: For this function, the ITU must prompt the ECR-operator to also enter additional information such as reference-number and date as listed on the original receipt. The additional functionality will be handled by the ITU and ECR correspondingly through the use of a series of DISPLAY TEXT messages and KEYBOARD INPUT messages.
- H33 - Purchase With Cashback: The ECR is assumed to be able to transfer total amount in <AMNT 1>, and total purchase amount in <AMNT 2>.
- H34 - Pre-Authorisation: The ECR is assumed to be able to enter an amount to be pre-authorised as a non-financial amount. Normal response from ITU will be LOCAL MODE with RESULT=H20, and ACC=H30.
- H36 - Balance Inquiry: The ECR is assumed to be able to initiate a transaction without entering an amount at all. This transaction type is also available to the ECR as an ITU menu-function, Administration function with ADM.CODE = H3135. Normal response from ITU will be LOCAL MODE with RESULT=H20, and ACC=H30.
- H37 - Complete receipt: The ECR is assumed to be able to enter an amount as a non-financial amount. Normal response from ITU will be LOCAL MODE with RESULT=H20, and ACC=H30.

4.6.3 Keyboard input from ECR to ITU

When keyboard input from the ECR is requested by the ITU, this dialogue will be handled through the use of the following three main messages:

- ITU will request keyboard input by the DISPLAY TEXT message
- followed by a KEYBOARD INPUT request message.
- ECR will then return the keyboard entry with the KEYBOARD INPUT message.
- If the ITU sends a message before the keyboard input is finished, the ECR must discard the entered data, abort the keyboard input and process the received message.

5 SPECIAL FUNCTIONALITY REQUIREMENTS

5.1 SPECIAL ITU CONFIGURATION PARAMETERS

The ITU must be configurable for either integrated or stand-alone mode of operation.

When the ITU is configured for an integrated mode of operation, the function PRE-Authorisation will require a special parameter indicating whether to always use a complete receipt, or a partial receipt. If the ITU is configured for a partial receipt, the function Complete receipt will be used to allow the ECR-operator to print a complete receipt used for customer signature.

The value of such a receipt configuration parameter will be decided based upon the typical use of the ITU in either reception-area of a hotel, or in a restaurant.

5.2 OPERATOR IDENTIFICATION

The ITU will use the operator identity (and operator database) found in the ECR. The operator identity is therefore passed from the ECR to the ITU in the TRANSFER AMOUNT message and ADMINISTRATION message (see detailed description of message earlier in this document).

If the ITU is configured to use OPERATOR IDENTIFICATION, the ITU will use special operator accumulators. The checking of the ITU database according to the main document shall be omitted.

Similarly, the ITU will not be responsible for prompting for a new OPERATOR IDENTITY entry as defined in the main document. The changing of OPERATOR IDENTITY is the responsibility of the ECR-application.

5.3 TEMPORARY STORAGE OF RECEIPTS IN ITU

Note: This chapter is only valid if the ITU is installed without a printer

The ITU must always try to print the receipt on the ECR printer first. But there may be situations when the ECR is not ready to print it. Therefore, a scheme for temporary storage of receipts is defined for the handling of two functions.

Temporary storage of receipts may take place for the following functions:

- Reconciliation, and other Administrative functions initiated from the ITU side.
- Communication failure before a complete print message is sent to the ECR (before Local Mode is sent)
- Reversal

The receipt is printed in a FIFO (First In, First Out) spooler, and a display message is displayed if the spooler contains messages that should be printed.

The reconciliation receipt may be printed after a REQUEST-RESPONSE dialogue when the DEVICE ATTRIBUTE message or ADMINISTRATION message (with any of the ADM.CODEs=H3030 - H3039 or H3131 – H3133) has been initiated between the ECR and ITU.

This reconciliation receipt shall under no circumstances be written after a TRANSFER AMOUNT message because there is a risk that the receipt is written together with the customer receipt and accidentally lost that way.

In the case of reversal, the need to temporarily store the receipt is different than for reconciliation. If a communication error occurs, the ITU will inform the ECR-operator of this with display and printer messages as defined in the Terminal Detailed Functional Specification. If such an offline-repeat situation occurs, the ITU must respond with LOCAL MODE with RESULT=H20, and ACC=H20 to ensure that the customer and ECR may continue as normal.

When the next card transaction is initiated from the ECR, the ITU will automatically perform a new dialogue with the host. In this dialogue, ITU will complete the reversal-function by using a function called 'offline repeat' to force a reversal towards the host.

ITU must make sure that the off-line repeat receipt for the reversal is not printed together with the receipt for the current customer. Therefore the off-line repeat receipt generated for the reversal should be temporarily stored, and printed after a REQUEST-RESPONSE dialogue when the DEVICE ATTRIBUTE message or ADMINISTRATION message (with any of the ADM.CODEs=H3030 - H3039) has been initiated between the ECR and ITU.

5.4 SINGLE OR DOUBLE RECEIPTS FROM ITU

The ITU will in most instances have full control of what and how to print on the ECR printer. Accordingly, the ITU must use a single-copy receipt as a default setup for all receipts printed on the ECR printer.

However, when the card being processed in the ITU requires signature validation the ITU will be required to print a double-copy (i.e. two similar copies) receipt on the ECR printer. The second copy containing the customer signature will be kept by the retailer, and the other copy is kept by the cardholder.

The ITU may interpret this as printing a normal receipt to both journal and receipt printers (MEDIA=H22 in PRINT TEXT), and then print a new receipt including a customer signature-line on the receipt printer only (MEDIA=H20 in PRINT TEXT).

6 ECR ACCESSING ITU MENUS

6.1 INTRODUCTION

The ECR can send commands to the ITU to get access to different reports and other special functions.

There are several ways to implement this in the ECR. The following is to be read as a guide line or best practises.

ECR applications on GUI platforms do normally use a dedicated meny for different reports. In daily use, it is very user friendly if all the reports are grouped together. The ECR system needs different reports for cash in drawer, stock control, cashier reports and so on. It is s good idea to implement the possibility to access the different ITU reports from the same meny. Click buttons or similar works fine.

In other type of ECR (ordinary ECRs) it is a good idea to acess the different reports/administrative functions by turning the key lock to X or Z position, enter a code on the numeric keyboard and press a dedicated key (the Card payment key is a good idea). The key command shall be sent to the ITU, without any validity check on the ECR side.

In all situations it is the responsibility of the ITU to receive a command and respond accordingly. If the ECR send a command that is not implemented, the ITU will simply send display or print messages to the ECR to inform the cashier that the function is not implemented.

Why should you access the different ITU reports from the ECR?

It is more userfriendly for the cashier if all transaction types, report functions and printouts of receipts can be done from the ECR keyboard.

In addition, the print commands, the send data and the Local Mode information is valuable information to store on the ECR, and use the information in a report generator, or just for searchable data.

6.2 ITU MENU-FUNCTIONS AVAILABLE TO ECR

The following ITU menu-functions must be made available to the ECR (based upon the Terminal Detailed Functional Specification):

- EFT-Authorisation
- Cash-withdrawal
- Deposit
- Return of goods
- Purchase with cashback
- Balance inquiry
- Reversal
- Pre-authorisation
- Adjustment
- Complete receipt
- X-total and Z-total
- Turnover
- Reconciliation

The menu-functions listed above will be available to the ECR through the use of the TRANSFER AMOUNT or ADMINISTRATION messages. The reversal function and balance inquiry is the only function that can be available by use of both message types depending on the ECR implementation. The details about these command messages are defined earlier in this document.

7 Bank-Axcept SOFIE, terminal - ECR dialogue Minimum ECR requirements

Message types that must be implemented

From the ECR

1. Transfer Amount, type1 = purchase
2. Transfer Amount, type1 = purchase with cashback
3. Transfer Amount, type1 = reversal, alternatively use of ADM. CODE for reversal transaction.
4. Administration, ADM.CODE = H3132, cancel request. Used to send a cancel request in payment transactions
5. Administration, Different ADM.CODE's to request reports.
6. Device attribute

From the terminal

1. Local mode
2. Display text
3. Print text
4. Reset timer
5. Device attribute request, Status request response
6. Send Data (receive and discard)

Normal transaction flow

1. **Purchase**
SUBTTL - EFT key
Send amount, type1 = purchase, AMNT1 = purchase amount
Receive print/display messages
Receive and decode Local mode
See trace #1
2. **Purchase with cashback**
SUBTTL - amount tender - EFT key
Send amount, type1 = purchase with cashback , AMNT1 = total amount, AMNT2 = purchase amount
Receive print/display messages
Receive and decode Local mode
See trace #2
3. **Reverse last transaction**
Amount must be the same as the previous.
VOID - SUBBTL - EFT key
Send amount, type1 = reversal, AMNT1 = purchase amount
Receive print/display messages
Receive and decode Local mode
See trace #3
4. **Operator cancel during a transaction**
C key
Send adm. msg with ADM.CODE = H3132
Receive print/display messages
Receive and decode Local mode
See trace #3

8 Communication traces, examples

8.1 Device Attribute dialog started from the ECR

```

-----
DL SX a B A N K - A X E P T S O F I E E C R S I M 1 2
-----
3 4 5 6 1 . 0 0 9 4 . 1 2 . 1 5 2 4 1 6 2 DL
-----
EX u AK DL SX b 7 0 6 0 6 0 2 3 7 0 6 0 2 3 0 3 0 6
ET
-----
DL EX r ET DL SX D 0 DL EX G ET AK
AK DL SX [ 0 0 ] DL EX NK ET
-----

```

8.2 Transaction including Device Attribute dialog

```

-----
                                DL SX Q  0  0  0  9  1  3  1  1  0  9  0  0  0
-----
0  0  0  0  0  0  0  0  1  2  3  4  0  0  0  0  0  0  0  0  1  4  1  3  0
-----
                                0                                DL EX s    AK    DL
-----
SX [  0  0  ] DL EX NK    ET DL SX `  DL EX s    ET    DL SX a  B  A  N  K  -  A
                                AK                                AK
-----
X  E  P  T      S  O  F  I  E  E  C  R  S  I  M  1  2  3  4  5  6  1  .  0  0
-----
9  4  .  1  2  .  1  5      2  4  1  6  2      DL EX u    AK    DL SX A  0  0
                                ET
-----
0  V  E  N  T  E  R      P  ]      K  O  R  T  E  T  DL EX b    ET
                                AK    DL SX [  0  0
-----
] DL EX NK    AK    DL SX A  0  0  0      K  O  D  E      +      K  L  A  R
                                ET
-----
    DL EX x    ET    AK    DL SX A  0  0  0  V  A  R  E
    AK    DL SX [  0  0  ] DL EX NK    ET
-----
K  J  \  P      DL EX o    ET    AK    DL SX [  0  0  ] DL EX NK    AK
                                AK
-----
    DL SX B      "  *  B  A  X  :      7  0  6  0  6  0  2  3  -  7  0  6  0  2  3
ET
-----
LF B  A  N  K  K  O  R  T  :      *  *  *  *  *  *  0  0  0  1  9  -  1  fF DL EX
-----
/      ET    AK    DL SX [  0  0  ] DL EX NK    ET    AK    DL SX A  0  0  0      S  E  N  D
    AK
-----
E  R      1  1      DL EX i    ET    AK    DL SX [  0  0  ] DL EX NK    ET    AK    DL SX
                                AK
-----
A  0  0  0  G  O  D  K  J  E  N  T      +      T  R  U  M  F  DL EX EX    ET    DL SX
                                AK
-----
[  0  0  ] DL EX NK    AK    DL SX B      "  *  1  3  /  0  9  /  2  0  0  0      1
                                ET
-----
1  :  0  8  LF R  E  F  :  4  3  3  1  4  2  9  3  2  6  1  9  LF B  E  L  \  P
-----
=      1  4  .  1  3  LF T  R  U  M  F      R  E  G  I  S  T  R  E  R
-----
T  fF DL EX SO    ET    AK    DL SX D      0  1  ;  2
    AK    DL SX [  0  0  ] DL EX NK    ET
-----
0  0  0  0  9  1  3  1  1  0  8  3  8  ;  0  ;  0  5  6  DL EX d    ET
                                AK    DL SX [
-----
                                AK
0  0  ] DL EX NK    ET
-----

```

8.3 EFTPOS transaction, purchase with cashback

```

-----
DL SX Q 0 0 0 9 1 3 1 3 0 1 0 0 0 0 0 0 0 0 0 0 1 2 3 4
-----
0 3 0 0 0 0 0 0 0 5 0 0 0 0 0 0 0 0 0 0 3 2 0 0 0
-----
                                AK      DL SX [ 0 0 ] DL EX NK      ET DL
                                DL EX i      ET                        AK
-----
SX A 0 0 0 V E N T E R      P ]      K O R T E T DL EX b      ET
                                AK                        DL
-----
                                AK      DL SX A 0 0 0      K O D E      +      K L
SX [ 0 0 ] DL EX NK      ET
-----
A R      DL EX x      ET      AK      DL SX A 0 0 0
                                AK      DL SX [ 0 0 ] DL EX NK      ET
-----
K J \ P      O G      K O N T A N T      DL EX SX      ET
                                AK      DL SX [ 0 0 ]
-----
                                AK      DL SX B      " * B A X :      7 0 6 0 6 0 2 3 - 7 0
DL EX NK      ET
-----
6 0 2 3 LF B A N K K O R T :      * * * * * 0 0 0 1 9 -
-----
1 fF DL EX /      ET      AK      DL SX A 0 0 0
                                AK      DL SX [ 0 0 ] DL EX NK      ET
-----
S E N D E R      7 5      DL EX k      ET
                                AK      DL SX [ 0 0 ] DL EX NK
-----
AK      DL SX A 0 0 0 G O D K J E N T      +      T R U M F DL EX EX
ET
-----
ET      AK      DL SX B      " * 1 3 / 0 9 / 2 0
AK      DL SX [ 0 0 ] DL EX NK      ET
-----
0 0      1 3 : 0 0 LF R E F : 4 3 3 7 3 6 9 2 2 2 5 9 LF B
-----
E L \ P =      3 2 . 0 0 LF K O N T      =
-----
1 8 . 0 0 LF T O T A L =      5 0 . 0 0 LF T R U M
-----
F      R E G I S T R E R T fF DL EX v      ET
                                AK      DL SX [ 0 0 ] DL EX NK
-----
AK      DL SX D      0 1 ; 2 0 0 0 0 9 1 3 1 3 0 0 2 6 ; 0 ;
ET
-----
0 6 0 DL EX d      ET      AK
                                AK      DL SX [ 0 0 ] DL EX NK      ET
-----

```

8.4 Credit Card transaction, Transaction is accepted

```

-----
DL SX Q 0 0 0 9 1 3 1 2 4 6 0 0 0 0 0 0 0 0 0 1 2 3 4
-----
0 0 0 0 0 0 0 0 0 0 4 5 2 1 0
-----
DL EX ~ AK ET DL SX [ 0 0 ] DL EX NK ET DL
AK
-----
SX A 0 0 0 V E N T E R P ] K O R T E T DL EX b ET
AK DL
-----
SX [ 0 0 ] DL EX NK AK ET DL SX A 0 0 0 K U N D E G O D K J
-----
E N N E R DL EX fF ET AK DL SX A 0 0 0
AK DL SX [ 0 0 ] DL EX NK ET
-----
B E L \ P E T DL EX d4 ET
AK DL SX [ 0 0 ]
-----
DL EX NK AK ET DL SX A 0 0 0 V A R E K J \ P
-----
DL EX o AK ET DL SX [ 0 0 ] DL EX NK ET DL SX B " * B A X :
-----
7 0 6 0 6 0 2 3 - 7 0 6 0 2 3 fF DL EX US ET
AK DL SX [ 0 0 ]
-----
DL EX NK AK ET DL SX A 0 0 0 S E N D E R 1 1
-----
DL EX i AK ET DL SX [ 0 0 ] DL EX NK ET DL SX A 0 0 0 G O D K J
-----
E N T DL EX p AK ET DL SX [ 0 0 ] DL EX NK ET
AK
-----
DL SX B " * E U R O C A R D LF 5 4 1 3 0 6 4 7 6 5 0 9
-----
0 1 1 9 LF G y l d i g t i l 0 5 / 2 0 0 1 LF 1 3 /
-----
0 9 / 2 0 0 0 1 2 : 4 5 LF R E F : 4 3 3 7 2 9 9 6 4
-----
0 9 9 LF B E L \ P = 4 5 . 2 1 LF G O D K J E
-----
N T LF LF . . . . . R I V H E R . . . . . fF DL
-----
EX ( AK ET DL SX [ 0 0 ] DL EX NK ET AK DL SX A 0 0 0 H U S K P
-----
] S I G N A T U R DL EX k ET AK DL SX [ 0 0 ] DL EX NK ET DL
AK
-----
SX B * LF B A X : 7 0 6 0 6 0 2 3 - 7 0 6 0 2 3
-----

```

```

-----
LF      LF E U R O C A R D LF 5 4 1 3 0 6 4 7 6 5 0 9 0 1 1
-----
9 LF G y l d i g      t i l      0 5 / 2 0 0 1 LF 1 3 / 0 9 /
-----
2 0 0 0      1 2 : 4 5 LF R E F : 4 3 3 7 2 9 9 6 4 0 9 9
-----
LF B E L \ P =      4 5 . 2 1 LF      LF S I G N A T U
-----
R LF      LF      LF . . . . . . . . . . . . . . . fF
-----
DL EX E      ET      AK      DL SX D      0 4 5 4 1 3
      AK      DL SX [ 0 0 ] DL EX NK      ET
-----
0 6 4 7 6 5 0 9 0 1 1 9 ; 2 0 0 0 0 9 1 3 1 2 4 5 3 2
-----
; 1 ; 0 6 0 DL EX `      ET      AK
      AK      DL SX [ 0 0 ] DL EX NK      ET
-----

```

8.5 Reversal Transaction

```

-----
EX EX      ET      AK      DL SX A 0 0 0 A N N U L L
      AK      DL SX [ 0 0 ] DL EX NK      ET
-----
E R I N G      1      DL EX DL      ET      AK      DL
      AK      DL SX [ 0 0 ] DL EX NK      ET
-----
SX A 0 0 0      S V A R      DL EX t      ET
      AK      DL
-----
SX [ 0 0 ] DL EX NK      AK      DL SX A 0 0 0      S E N D E R      1
      ET
-----
4      DL EX l      ET      AK      DL SX B      " *
      AK      DL SX [ 0 0 ] DL EX NK      ET
-----
B A X :      7 0 6 0 6 0 2 3 - 7 0 6 0 2 3 LF      LF *      A N
-----
N U L L E R I N G      * LF      LF B A N K K O R T :      * * *
-----
* * * 0 0 0 1 9 - 1 fF DL EX f      ET      AK
      AK      DL SX [ 0 0 ] DL EX NK      ET
-----
DL SX A 0 0 0 G O D K J E N T      DL EX p      ET
      AK
-----
DL SX [ 0 0 ] DL EX NK      AK      DL SX B      " * 1 3 / 0 9 / 2 0 0 0
      ET
-----
1 3 : 0 6 LF R E F : 4 3 3 7 3 9 0 0 0 0 0 0 0 LF A N N
-----
U L =      4 4 . 4 4 fF DL EX k      ET
      AK      DL SX [ 0 0 ] DL EX
-----
      AK      DL SX D      0 DL EX G      ET      AK
NK      ET      AK      DL SX [ 0 0 ] DL EX NK      ET
-----

```

8.6 Transaction aborted with Cancel Request key on ECR

```

-----
DL SX Q 0 0 0 9 1 3 1 3 0 3 0 0 0 0 0 0 0 0 0 1 2 3 4
-----
0 0 0 0 0 0 0 0 0 0 2 3 5 0 0
-----
DL EX x AK ET DL SX [ 0 0 ] DL EX NK ET DL
AK
-----
SX A 0 0 0 V E N T E R P ] K O R T E T DL EX b ET
AK DL
-----
DL SX C 0 6 0 DL EX f ET
AK ET DL SX [ 0 0 ]
-----
DL EX NK AK ET DL SX S 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-----
0 0 0 0 0 1 2 FS DL EX _ AK ET DL SX [ 0 0 ] DL EX NK ET DL SX A
AK
-----
0 0 0 A V B R U T T A V DL EX BL ET
AK DL SX [
-----
0 0 ] DL EX NK AK ET DL SX A 0 0 0 O P E R A T \ R
-----
DL EX q AK ET DL SX [ 0 0 ] DL EX NK AK ET DL SX S 0 0 0 0 0
-----
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 2 FS DL EX _ AK ET
-----
DL SX [ 0 0 ] DL EX NK ET DL SX B " * LF B A X : 7 0 6
AK
-----
0 6 0 2 3 - 7 0 6 0 2 3 LF LF 1 3 / 0 9 / 2 0 0 0 1
-----
3 : 0 2 LF LF A V B R U T T A V LF O P E R A T \ R LF
-----
LF F E I L : 1 9 0 0 0 2 0 0 LF fF DL EX F ET DL
AK
-----
DL SX D ! 0 DL EX F ET
AK ET DL SX [ 0 0 ] DL
-----
DL SX [ 0 0 ] DL EX NK ET
AK ET
-----
EX NK ET
-----

```

8.7 Normal transaction, negative result

```

-----
DL SX Q 0 0 0 9 1 3 1 2 4 9 0 0 0 0 0 0 0 0 0 1 2 3 4
-----
0 0 0 0 0 0 0 0 0 0 1 9 9 9 0
-----
DL EX { AK ET DL SX [ 0 0 ] DL EX NK ET DL
AK
-----
SX A 0 0 0 V E N T E R P ] K O R T E T DL EX b ET
AK DL
-----
SX [ 0 0 ] DL EX NK AK ET DL SX A 0 0 0 K U N D E G O D K J
-----
E N N E R DL EX fF AK ET DL SX [ 0 0 ] DL EX NK AK ET DL SX A 0 0 0
-----
B E L \ P E T DL EX d4 ET
AK DL SX [ 0 0 ]
-----
DL EX NK AK ET DL SX A 0 0 0 V A R E K J \ P
-----
DL EX o AK ET DL SX [ 0 0 ] DL EX NK AK ET DL SX B " * B A X :
-----
7 0 6 0 6 0 2 3 - 7 0 6 0 2 3 fF DL EX US ET
AK DL SX [ 0 0 ]
-----
DL EX NK AK ET DL SX A 0 0 0 S E N D E R 1 1
-----
DL EX i AK ET DL SX [ 0 0 ] DL EX NK AK ET DL SX C 0 6 0 DL EX f ET
AK
-----
DL SX [ 0 0 ] DL EX NK AK ET DL SX A 0 0 0 K O N T A K T V I
-----
S A DL EX SI AK ET DL SX [ 0 0 ] DL EX NK AK ET DL SX B "
-----
* V I S A LF 4 0 1 5 5 0 7 2 1 3 5 0 1 7 3 6 LF G y l d
-----
i g t i l 0 2 / 2 0 1 9 LF S t e d : 1 5 9 8 7
-----
LF LF 1 3 / 0 9 / 2 0 0 0 1 2 : 4 8
-----
LF R E F : 4 3 3 7 3 2 LF R E S P : 0 1 LF
-----
LF U G Y L D I G LF K V I T T E
-----
R I N G LF K O N T A K T V I S A LF F O R M A
-----
N U E L L LF A U T O R I S A S J O N LF T L F : 2 2 0
-----
1 3 4 1 0 LF fF DL EX eC ET AK DL SX
AK DL SX [ 0 0 ] DL EX NK ET
-----
D ! 0 DL EX F AK ET AK
AK DL SX [ 0 0 ] DL EX NK ET
-----

```


8.8 Loyalty Card Transaction

```

-----
DL SX Q 0 0 0 9 1 3 1 2 4 3 0 0 0 0 0 0 0 0 0 1 2 3 4
-----
0 0 0 0 0 0 0 0 0 0 1 9 0 0 0
-----
DL EX q AK ET DL SX [ 0 0 ] DL EX NK ET DL
AK
-----
SX A 0 0 0 V E N T E R P ] K O R T E T DL EX b ET
AK DL
-----
SX [ 0 0 ] DL EX NK AK ET DL SX A 0 0 0 B O N U S K O R T
-----
DL EX EQ AK ET DL SX [ 0 0 ] DL EX NK AK ET DL SX B " *
-----
B A X : 7 0 6 0 6 0 2 3 - 7 0 6 0 2 3 fF DL EX US ET
AK DL
-----
SX [ 0 0 ] DL EX NK AK ET DL SX A 0 0 0 R I N G E R O
-----
P P DL EX BS AK ET DL SX [ 0 0 ] DL EX NK AK ET DL SX A 0 0 0
-----
S V A R DL EX t ET AK DL SX [ 0 0 ]
-----
DL EX NK AK ET DL SX A 0 0 0 S E N D E R 5 0
-----
DL EX l ET AK DL SX [ 0 0 ] DL EX NK AK ET DL SX A 0 0 0 T R U M F
-----
- K O R T DL EX NK ET AK DL SX [ 0 0 ] DL EX NK ET
-----
DL SX A 0 0 0 H U S K B E T A L I N G DL EX y ET
AK
-----
DL SX [ 0 0 ] DL EX NK AK ET DL SX B " * T R U M F K O R T LF
-----
5 0 4 4 1 9 2 9 0 1 0 0 4 6 3 8 2 2 7 LF S t e d : 9 5
-----
5 9 7 8 LF 1 3 / 0 9 / 2 0 0 0 1 2
-----
: 4 2 LF R E F : 9 2 7 1 7 9 4 3 3 7 2 6 LF B E L \ P =
-----
1 9 . 0 0 LF T R U M F R E G I S T R E R T
-----
LF K L A R T I L B E T A L I N G fF DL EX AK ET AK DL SX [
-----
0 0 ] DL EX NK AK ET DL SX D 0 1 2 5 0 4 4 1 9 2 9 0 1 0 0
-----
4 6 3 8 2 2 7 ; 2 0 0 0 0 9 1 3 1 2 4 2 2 0 ; 3 ; 0 6
-----
0 DL EX M ET AK DL SX [ 0 0 ] DL EX NK ET
-----

```

8.9 Reconciliation started from ECR

```

-----
DL SX S 0 0 0 9 1 3 1 3 1 5 0 0 0 0 0 0 0 0 0 0 1 2 3 4
-----
1 0 FS DL EX T AK DL SX [ 0 0 ] DL EX NK ET DL SX A 0 0 0 A V
S T E M M I N G 1 DL EX f ET AK DL SX [ 0 0 ] DL EX
-----
AK DL SX A 0 0 0 R I N G E R O P P DL EX
NK ET
-----
BS ET AK DL SX A 0 0 0 S
AK DL SX [ 0 0 ] DL EX NK ET
-----
V A R DL EX t ET AK DL SX [ 0 0 ] DL EX NK AK DL SX
AK ET
-----
A 0 0 0 S E N D E R 6 0 DL EX o ET AK DL SX
-----
[ 0 0 ] DL EX NK AK DL SX A 0 0 0 A V S T E M M I N G 1
ET
-----
DL EX f ET AK DL SX A 0 0 0
AK DL SX [ 0 0 ] DL EX NK ET
-----
S E N D E R 6 0 DL EX o ET AK DL SX [ 0 0 ] DL
-----
AK DL SX A 0 0 0 A V S T E M M I N G 1 DL
EX NK ET
-----
EX f ET AK DL SX [ 0 0 ] DL EX NK ET DL SX A 0 0 0 S E N
AK
-----
D E R 6 0 DL EX o ET AK DL SX [ 0 0 ] DL EX NK AK DL
AK
-----
SX A 0 0 0 A V S T E M M I N G 1 DL EX f ET AK DL
AK
-----
SX [ 0 0 ] DL EX NK AK DL SX A 0 0 0 S E N D E R 6
ET
-----
0 DL EX o ET AK DL SX [ 0 0 ] DL EX NK AK DL SX A 0 0 0
AK ET
-----
A V S T E M M I N G 1 DL EX f ET AK DL SX [ 0 0 ]
AK
-----
AK DL SX A 0 0 0 S E N D E R 6 0
DL EX NK ET
-----
DL EX o ET AK DL SX [ 0 0 ] DL EX NK AK DL SX A 0 0 0 A V S T E
AK
-----
M M I N G 1 DL EX f ET AK DL SX [ 0 0 ] DL EX NK AK ET
AK
-----
DL SX A 0 0 0 S E N D E R 6 0 DL EX o ET
AK
-----

```

```

-----
DL SX [ 0 0 ] DL EX NK AK ET DL SX A 0 0 0 A V S T E M M I N G
-----
1 DL EX f ET AK DL SX [ 0 0 ] DL EX NK ET AK DL SX A 0 0
-----
0 S E N D E R 6 0 DL EX o ET AK DL SX [ 0 0
-----
] DL EX NK AK ET DL SX A 0 0 0 A V S T E M M I N G 1
-----
DL EX f ET AK DL SX [ 0 0 ] DL EX NK ET AK DL SX A 0 0 0 S
-----
E N D E R 6 0 DL EX o ET AK DL SX [ 0 0 ] DL EX NK AK
-----
DL SX A 0 0 0 A V S T E M M I N G 1 DL EX f AK
ET
ET DL SX [ 0 0 ] DL EX NK ET AK DL SX A 0 0 0 S E N D E R
-----
6 0 DL EX o ET AK DL SX [ 0 0 ] DL EX NK ET AK DL SX B
-----
" * J o n A n d e r s 6 . 0 fF DL EX 9 ET AK DL SX [ 0 0
-----
] DL EX NK AK ET DL SX A 0 0 0 U T S K R I F T P ] G ] R
-----
DL EX eB ET AK DL SX [ 0 0 ] DL EX NK ET AK DL SX B " * LF B A
-----
X : 7 0 6 0 6 0 2 3 - 7 0 6 0 2 3 LF LF 1 3 / 0 9 /
-----
2 0 0 0 1 3 : 1 4 LF LF A V S T E M M I N G fF DL EX 4
-----
ET AK DL SX [ 0 0 ] DL EX NK ET AK DL SX B " * LF O V E R F :
-----
0 6 0 LF LF B A N K K O R T
-----
4 LF B e l | p 1 2 4 .
-----
5 0 LF H e r a v k o n t 1 8 . 0 0
-----
LF LF E U R O C A R D 1
-----
LF B e l | p 4 5 . 2 1 LF
-----
LF - - - - - - - - - - - - - - - - - LF I
-----
N N S A M L E T 5 LF T o t
-----

```

```

-----
a l 1 6 9 . 7 1 LF H e r a v
-----
k o n t 1 8 . 0 0 LF LF K O R T A
-----
V T A L E R U T E N LF O M S E T N I N G S K R I V
-----
E S LF I K K E U T . LF fF DL EX L ET
AK DL SX [ 0 0 ] DL EX
-----
AK DL SX I 0 1 1 0 0 0 0 0 0 7 0 6 0 2 3 0 6 0 2 0
NK ET
-----
0 0 0 9 1 3 1 3 1 4 0 1 DL EX c ET AK
AK DL SX [ 0 0 ] DL EX NK
-----
DL SX I 0 2 2 0 0 0 0 0 0 0 0 0 1 0 0 0 4 + 0 0 0 0 0 0
ET
-----
1 2 4 5 0 0 0 0 0 0 0 0 0 1 8 0 0 0 0 0 0 0 0 0 0 0
-----
FS 0 3 0 0 0 0 + 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-----
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 FS 0 4 0 0 0 1 + 0 0 0 0 0
-----
0 0 4 5 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-----
0 FS 0 6 0 0 0 0 + 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-----
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 FS 0 9 0 0 0 0 + 0 0 0 0
-----
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-----
0 0 FS 1 0 0 0 0 0 + 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-----
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 FS 1 2 0 0 0 0 + 0 0 0
-----
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-----
0 0 0 FS 1 5 0 0 0 0 + 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-----
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 FS 1 7 0 0 0 0 + 0 0
-----
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
-----
0 0 0 0 FS DL EX X ET AK DL SX [ 0 0 ] DL EX NK AK DL SX B " *
AK ET
-----
fF DL EX U ET AK DL SX [ 0 0 ] DL EX NK ET DL SX D 0 DL EX G AK
-----
ET AK
DL SX [ 0 0 ] DL EX NK ET
-----

```