Technical Specifications Document

For

e-Dirham POS RS232 Integration

Version 1.12

STS – EFT POS Solutions

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1 Introduction

This document describes POS RS232 integration specifications for e-dirham POS application with a PC.

1.1 Scope

The scope of this document covers all RS232 integration requirements including message specifications and transaction flow.

1.2 Audience

This document is primarily for the POS application developers and RS232 integrators who are planning to provide PC/Web applications to communicate with Hypercom POS using RS232 port.

2 Document Modification History

Revision	Date	Description	Author
Initial Release	03/08/2009	Initial Draft	STS PayOne
Version 0.01	17/01/2010	Changes based on comments from review committee.	STS PayOne
Version 1.00	21/01/2010	First Release	STS PayOne
Version 1.01	08/03/2010	Changes requested by MoF	STS PayOne
Version 1.02	04/04/2010	Added Error Code Table	STS PayOne
Version 1.03	29/09/2010	Add country code, area code and sub-area code to ECR Request message.	STS PayOne
Version 1.04	12/12/2010	Updated Response Code Table to include all supported codes from PayONE server.	STS PayOne
Version 1.05	14/12/2010	Added Field Format and Padding tables.	STS PayOne
Version 1.06	22/06/2011	Added Amounts break-down in response message to PC. Added new message to check last transaction status.	STS PayOne
Version 1.07	14/09/2011	- Add new Response Code	STS PayOne
Version 1.08	14/09/2011	- Add new Response Code	STS PayOne
Version 1.09	03/04/2012	- Add eGuarantee and eAttestation transaction types. - Add 'Merchant ID' field to ECR response. - Change 'Unique TXN Number' to 'ECR ID Number' in the response message. - Add "ECR ID Number" to Check Last Transaction Status request message. - Add new ECR response code "037".	STS PayOne
Version 1.10	14/10/2012	- Add Amount fields with ECR request to be passed to Host. - Add Merchant ID to be verified by POS with its local values. - Add new ECR error code and text "041". - Add ECR version to the PC request. - Add new ECR Error code, for invalid ECR version. - Specify number of eServices as per Terminal Type.	STS PayOne
Version 1.11	10/03/2013	- Add new ECR response code "043". - Add "ECR Application ID" to PC request message. - Add "Terminal ID" to PC request message.	STS PayOne
1.12	2/12/2014	- Support Dynamic Fees.	STS PayOne

3 List of Acronyms

Below table lists all used acronyms in this document

Acronym	Meaning
ACK	Acknowledgement
ECR	Electronic Cash Register
ETX	End of Text
FS	Field Separator
HOST	e-dirham host system
ICC	Integrated chip card
Inq.	Inquiry
kbps	Kilo bit per second
LRC	Longitudinal redundancy check
NAK	Negative acknowledgement
PAN	Personal account number
PC	Personal Computer
PIN	Personal identification number
PN	Part Number
POS	Point of Service
RS232	Serial Communication Port
STX	Start of text
SYNC	Synchronous Communication Type
ASYNC	Asynchronous Communication Type
TXN	Transaction
USB	Universal Serial Bus

4 POS Hardware Types

POS application will be developed to run on Hypercom X4200 family, which includes a variety of models with different connection types.

4.1 T4210 (Dialup only)

This terminal has one connection type, which is a dialup modem supporting different communication protocols (SYNC/ASYNC) running over different speeds and connection properties. This terminal can be connected to PayONE over standard phone line.

More details are available on Hypercom website:
http://www.hypercom.com/products/T4210.asp

4.2 T4220 (LAN, IP-TCP with Dialup backup modem)

In addition to the dialup modem described above, this terminal has an Ethernet communication port which can be connected to standard TCP-IP networks by a standard network cable, Ethernet speed is much faster than dialup modem, this high speed can be utilized for major application updates and big file downloads, in addition to locations where short transaction processing time is required.

More details are available on Hypercom website:
http://www.hypercom.com/products/T4220.asp

4.3 T4230 (GSM/GPRS, IP-TCP and Dialup backup Modem)

A desktop terminal which supports GSM/GPRS connection, just like T4220, but cordless, where GSM network is used to connect to e-dirham host via TCP-IP, in addition to a dialup backup modem, where if GSM network has failed for a reason or another, terminal can still process transactions using its dialup modem.

More details are available on Hypercom website:
http://www.hypercom.com/products/T4230.asp

4.4 M4230 (Mobile POS, GSM/GPRS IP-TCPIP)

When services are required in a remote location, or a mobile service center, this type of terminals can be used, as it is powered by a rechargeable battery which can process hundreds of transaction without requiring a recharge. Unlike other X4200 terminals, this terminal is not equipped with a built in modem or RS232 port, if needed, these two add-ons can be used by using a special docking station, which can be used for charging the battery as well.

More details are available on Hypercom's website:

http://www.hypercom.com/products/M4230.asp

4.5 POS Applications

The same POS application binary file can run on the above models, it has smart functionality which can detect POS hardware type and adjust itself to use the different types of attached hardware/drivers.

Hypercom X4200 POS Terminals

5 ECR Integration

Unlike stand alone POS implementation, with an ECR (PC-Application) integrated with the POS, the transaction is initiated from the PC by sending information to the POS over the RS232 cable.

5.1 ECR Interface Specifications

ECR protocol between POS and PC Application will be based on a fixed length protocol with Field separators, any unused field should be filled with spaces.

5.2 Physical Interface

The physical interface between the POS and the PC will be a direct RS232 connection from POS RS232 port to the PC serial port using Hypercom cable PN: 810356-001.

Data transmission is Asynchronous up to 115200 kbps, with 8 data bits, no parity, and 1 stop bits.

It is recommended to use the highest baud rate, unless PC application requires slower rates to operate properly.

If the PC doesn't have an RS232 port, USB to Serial converter can be used to provide this communication port to the PC.

5.3 Link Level Protocol

Like most standard devices working with ECR-RS232 port, Hypercom POS uses standard communication setup with a PC.

5.3.1 Message Block Format

The table below describes the messaging block format between POS and PC.

<STX>	Length	Data	<ETX>	<LRC>
<0x02>	Length	Txn Type<FS>Txn ID<FS>Txn Amount<FS>…..	<0x03>	<0xHX>

- **Length** = length of DATA, number of bytes to follow (excluding ETX and LRC).
- **LRC** = the result of XORing all data bytes of [Length, Data, ETX].

5.3.2 Communication characters

Standard communication characters listed in below table are used.

Character	Hex Value	Meaning
STX	02	Start of text
ETX	03	End of text
ACK	06	Positive Acknowledgment
NAK	15	Negative Acknowledgment
FS	1C	Field Separator
Length	2-bytes	Data size in bytes excluding STX, ETX and LRC

5.4 Message Flow

Message flow consists of Request message, Response message and control characters.

Transaction is always initiated by a request message from PC.

5.4.1 Normal Message Flow

Normal message flow consists of the below steps:

1- PC sends initial request message.

2- POS validates request and sends <ACK> to PC if message was valid, <NAK> otherwise.

3- POS prompts user to swipe/insert the card.

4- POS calls e-dirham Host for service charge inquiry.

5- POS validates host response, constructs the financial request and sends it to e-dirham host.

6- POS validates host response and prints a receipt (only if Transaction was approved)

7- POS sends response message to PC.

8- PC sends <ACK> if response is valid, <NAK> otherwise.

PC	Flow	POS	Flow	e-dirham host
Request Message	→	POS Process Request		
	←	<ACK>		
		Service inq. Request	→	Host process Request
		POS Process Response	←	Inq. Response
		Authorization Request	→	Host process Request
		POS Process Response	←	Authorization Response
PC Process Response	←	Response		
<ACK>	→	Transaction End		

5.4.2 Message Flow with Repeats

If there was any problem during message flow or a timeout has happened, <NAK> will be sent instead of <ACK> which causes the message to be sent again, if retry counter reaches the configured retry limit without success, transaction will be terminated.

5.4.2.1 Initial Request Message

During initial request message from PC, some communication problems might happen, like POS is turned off, or cable is not connected, in such cases, PC will not get any response from POS and request will be times out, or if the request from PC wasn't successfully verified by the POS or the LCR was incorrect, in this case an <NAK> will be sent back to PC from POS indicating something wrong with the request message.

PC	Flow	POS	Flow	e-dirham Host
Request Message	→	POS Process Request		
	←	<NAK>		
Request Message	→	POS Process Request		
	←	<NAK>		
Request Message	→	POS Process Request		
	←	<NAK>		
Transaction End				

In the above case, no reversals are generated, since no communication was done with the host, POS will simply show a failure message on screen and might print a receipt showing the cause of the error.

5.4.2.2 After Host Communication

Communication errors might happen also after POS has talked to e-dirham host, this could be due to several reasons. In this case, POS will try to retransmit response details to PC as show in below diagram.

PC	Flow	POS	Flow	e-dirham Host
Request Message	→	POS Process Request		
	←	<ACK>		
		Service inq. Request	→	Host process Request
		POS Process Response	←	Inq. Response
		Authorization Request	→	Host process Request
		POS Process Response	←	Authorization Response
PC Process Response	←	Response		
<NAK>	→			
PC Process Response	←	Response		
<NAK>	→			
PC Process Response	←	Response		
<NAK>	→			
Transaction End		User to complete transaction manually on PC.		

If the transaction was approved by e-dirham host, but the response wasn't sent successfully to the PC, User should complete the transaction manually and enter approval details on PC application. POS will show a screen asking the user to do this.

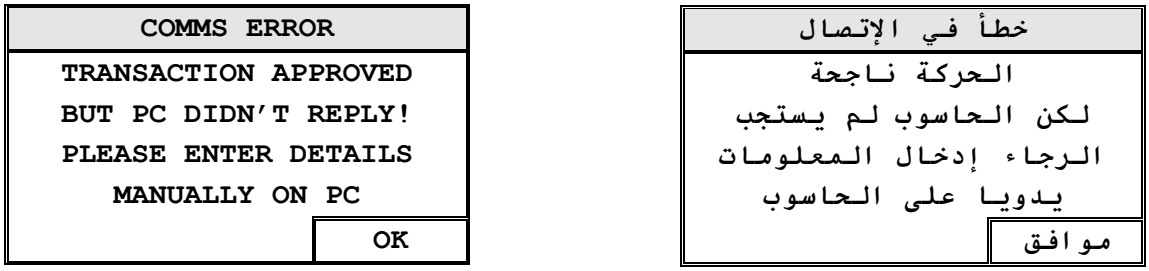

Fig. 5.4.2.2 POS Error Message

POS will always try to send host response to PC, even if the transaction was declined. There are some cases with Chip cards, where a transaction is approved by Host but declined by the Chip, in this case, POS will decline the transaction also and generate a reversal, and a response with the transaction result will be sent to PC.

5.4.3 Terminal Interaction

Terminal can interact with PC application requests only if it was at idle state and showing a status message of “Waiting for PC Request”, if the terminal is busy doing another transaction, or closing its batch, or no user is logged on, it will send an error message to the PC.

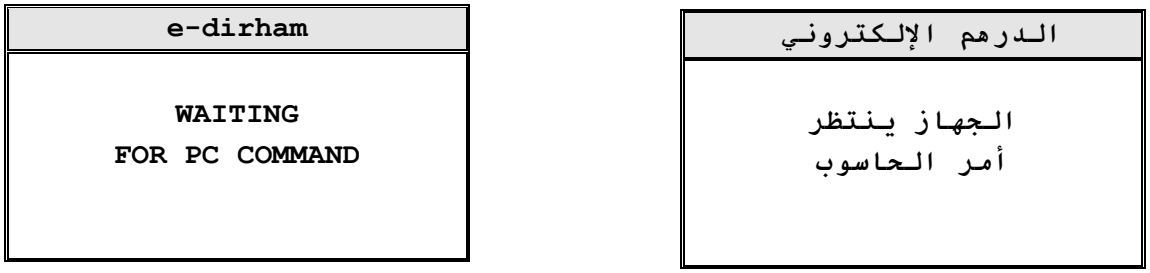

Fig. 5.4.3.1 Integrated POS Idle Screen

Pressing “Enter” key on POS keypad will open the Main Menu, from which the user can access other functionalities like Reports, Batch Review, Settlement… etc.

After receiving a successful initial request from PC, POS will prompt the user to swipe or insert the client card.

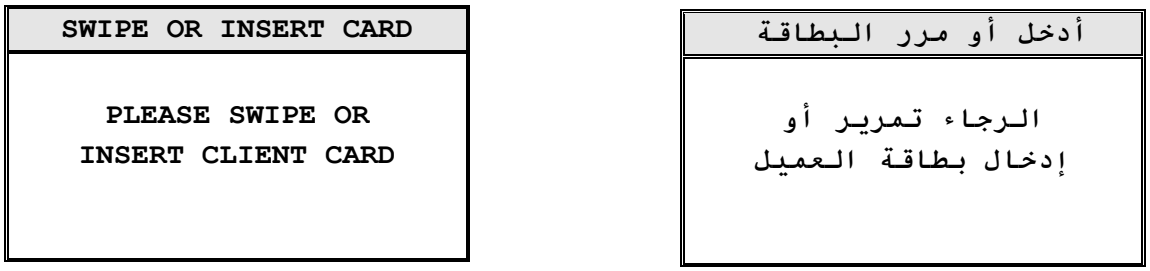

Fig. 5.4.3.2 Integrated POS Idle Screen

If cancel was pressed, or long time has passed, or there was a problem with the card, POS will terminate the transaction and send an error message to the PC.

5.5 Transaction Termination Messages

POS might send error messages to PC during transaction process to tell what the error reason was, these errors are encapsulated with the standard serial control characters as described before, these errors are:

Code	Error Description
001	No user is logged on POS
002	POS is not connected to host (Check Phone Line) or IP
003	POS Batch is full, please settle batch
004	Settlement was attempted, batch should be settled first
005	Used card is expired
006	Card is not readable
007	Card Swipe/Insertion Timed Out
008	Card range is not supported on POS
009	Card Track I is not readable
010	User Canceled Transaction on POS
011	POS wasn't able to reach host
012	Transaction is not allowed on POS
013	Original Transaction not found in POS batch
014	User pressed Cancel for PIN, PIN Bypass is not allowed
015	User Failed to Verify Transaction Password
016	Chip Card Was Removed From POS
017	Transaction Declined by Chip Card
018	Fall back from ICC to Magnetic stripe has failed
019	Message LRC is not correct
020	Message length in header doesn't match physical length
021	Requested transaction type is not recognized
022	Parsing error, message is not formatted correctly
023	PC response wasn't received in time
024	Card Mismatch
025	Change Password Required
026	Paper Out
027	Invalid PAN, MOD-10 check
028	Manual PAN entry not allowed
029	Settlement was attempted, batch is empty
030	Service Code Check, Chip card swiped
031	Service Code Check, no PIN verification available
032	Service Code Check, Reject
033	Service Code Check, wrong value
034	Manual not Allowed By Issuer
035	Swipe not Allowed By Issuer
036	Chip not Allowed By Issuer
037	Requested eServices exceed the maximum
038	ECR ID Number Mismatch
039	"SERVICE PROCESS FAILED"
040	General ECR Error "INCOMPLETE ECR TRANSACTION"
041	INVALID MERCHANT ID
042	INVALID ECR VERSION
043	INVALID TERMINAL ID
044	INVALID ECR APPLCIATION ID
H01	Referral - Call card issuer
H02	Call card issuer, special condition
H03	Call Help
H04	Pickup Card
H05	Transaction declined, don't honor
H06	Pickup Card
H07	Invalid transaction amount
H12	Invalid Transaction
H15	Card unknown

H19	Re-Enter Transaction
H25	Un-able to locate record on file
H30	Format Error
H31	Bank not supported by switch
H32	Card not Supported
H41	Lost Card
H43	Stolen Card - Pickup Card
H51	No sufficient Funds
H54	Expired Card
H55	Incorrect PIN
H56	Incorrect PassCode
H58	Payment Request is Invalid
H60	Transaction not permitted to terminal
H61	Maximum Sale value reached
H63	Error in Cryptogram
H64	Requested Action Not allowed
H65	Batch Not Found
H66	Branch Not Found
H67	Branch Deleted
H68	Section Not Found
H69	Section Not Active
H70	Section Deleted
H71	Shortcut Not Assigned
H72	Old Password is Empty
H73	New Password is Empty
H74	Password Less than Minimum Length
H75	Password More than Maximum Length
H76	Invalid Product Code
H77	Reconcile Error
H78	Trace Number not Found
H79	Transaction Declined, Wrong CVV
H80	Batch Number not Found
H82	Password Changed Successfully
H85	Batch not Found on Host
H86	Terminal Not Found
H87	Terminal Not Active
H88	Terminal Merchant Error
H89	Terminal ID is not valid
H90	Invalid Terminal IP
H91	Issuer or switch inoperative
H94	Duplicate Transmission
H95	Reconcile Error, Batch upload started
H96	System Malfunction
HA0	Backend Error
HA4	Card Is Not Numeric
HA5	Length Is Invalid
HA6	Card # Is Missing
HA7	Holder Name Missing
HA9	Card Is Banned
HB0	Invalid Card Type
HB2	No Details Found
HB3	Bank Id Missing
HB4	Bank Isn't Available
HB5	Merchant Does Not Exist
HB6	No Active Merchant
HB7	Merchant Not Received
HB8	Inactive Merchant
HB9	Currency Does Not Exist
HC0	Currency Not Supported
HC2	Transaction Not Available
HC3	Transaction Not Validated
HC4	Error Not Available

HC5	Parameter Not Available
HC6	Sign Isn't Verified
HC7	Amount Not Received
HC8	Currency Not Received
HC9	Pun Wasn't Received
HD0	Lang Not Received
HD1	Action not Received
HD2	Date Not Received
HD3	Conf Id Not Received
HD4	Status Not Received
HD5	Stat Msg Not Received
HD6	Action Type Not Avail
HD7	Payment Not Supported
HD8	Parameters Not Received
HD9	Payment Not Safe Pg
HE0	Payment Not Safe
HE1	Missing Signature
HE2	Missing Parameter
HE3	Wrong Account Format
HE4	Amount Is Zero Error
HE5	Amount Exceed Limit
HE6	Pun Already Exists
HE7	Transaction Request Received
HE8	Signature Verification Failed
HE9	Currency Not Supported
HEF	Inquiry Not Found
HES	Inquiry Not Successful
HEV	Inquiry Not Valid
HF0	Missing Parameters - Pc
HF1	Missing Parameters
HF2	Invalid Signature
HF4	Invalid Pay Method
HF6	Invalid Cancel Method
HF7	Cancel Error
HF9	Payment Failed
HH0	Invalid Action
HH2	Invalid Action
HH3	Merchant Validation Error
HH4	Currency Validation Error
HH5	Trans Validation Error
HH6	Invalid Msg Format
HH7	Trans Sign Error
HH8	Trans Corrupted Data
HH9	Trans Not Enough Credit
I0	Request Not Supported
HI1	User Does Not Exist
HI3	Min Amount
HI4	Max Amount
HI5	Ineligible Card Info
HI6	Payment Attempted
HI7	Payment Auth Error
HI8	Payment Auth Failed
HI9	Invalid Err Code
HJ0	Card Enrolled
HJ2	Pay Invalid Response
HJ3	Invalid Response Cert
HJ4	Backend Error
HJ5	Authnet Not Available
HJ7	Action Not Supported
HJ8	IP Not Supported
HJ9	Card Validation Failed
HK0	Invalid Merchant Type Id

HK1	Inquiry Already Used
HK2	Merchant Not Authorized
HK3	Query Missing
HK4	Query Doesn't Exist
HK5	Query Not Unique
HK6	Terminal Id Mismatch
HK7	Amounts Don't Match
HK8	Method Not Supported
HL0	Service Mismatch
HL1	Invalid URLs
HL2	Merchant Id Mismatch
HL3	Received Parameter Missing
HL4	URLs Incorrect
HL5	Authorization Failed
HL6	Verification Failed
HL7	No Records Found
HL8	Request Reversal
HL9	Trans Not Found
HN0	Trans Previously Voided
HN1	As Not Authorized
HN2	Pay Voucher Generated
HN3	Void Grace Period Finished
HN4	Backend Error
HN5	No Available Trans
HN6	Backend Error
HN7	Unexpected Msg Strc
HN8	Trans Not Marked
HN9	Void Trans Failed
HM0	Pending Trans Error
HM1	Failed Transaction
HM2	Backend Error
HM3	Trans Previously Updated
HM4	Original Trans Missing
HM6	Encryption Error
HM7	Decryption Error
HM8	Failed Conversion
HM9	Card Type Not Supported
HO1	Void Trans Not Found
HO3	Refund Not Pre-Approved
HO4	Trans Previously Refunded
HO5	Acq Server Not Authorized
HO6	Voucher Previously Generated
HO7	Exceeded Refund Grace Period
HO9	Refund Trans Error
HP1	Fraud Authentication Failed
HP2	Account Num Missing
HP3	Id Black List Match
HP4	Bank Black List Match
HP5	Account Black List Match
HP6	Bin Black List Match
HP7	Card Rejection Match
HP8	Country Black List Match
HP9	IP Black List Match
HQ0	Risk Rule Violation
HQ1	Risk Rule Violation
HQ2	Risk Rule Violation
HQ3	Risk Rule Violation
HQ4	Pay Invoice Missing
HQ5	Invoice Item Missing
HQ6	Invalid Xmlpay Tendr
HQ7	Pay Duplicate Payment
HQ8	Pay Merchant Id Missing

HQ9	3ds Check Failed
HR0	Pay Trxn Not Found
HR1	Pay Amount < 1
HR2	Currency Not Found
HR4	Inactive Service Owner
HR5	Inactive Eservice
HR6	Inactive E-Dirham Service
HR7	Exceeding Max #
HR8	Exceeding Max #
HR9	Service Not Assigned
HS0	Wrong Transaction
HS1	Trans Inquiry Failed
HS2	Amounts Differ
HS3	Service With 0 Price
HS4	Service Not Assigned
HS5	Service Not Assigned
HS6	Backend Error
HS7	Trans Not Pre-Auth
HS8	Update Trans Failed
HTO	Session Time Out
HT1	Transaction Started
HT2	Transaction Complete
HT3	Transaction Pending
HT4	Transaction Rejected
HT5	Original Trans Not Found
HTP	Payment Trans Pending
HV1	EOD Settlement Mismatch
HV2	Original Trans Not Auth
HV3	Sale Request Code
HV4	Complete Request Code
HV5	Topup Request Code
HV6	Refund Request Code
HV7	Void Request Code
HV8	Comp IP Not Supported
HV9	Amounts Differ
HW1	Card None Existent
HW2	Query None Existent
HW3	Request None Existent
HW4	Account None Existent
H**	All Other Response Codes

Above response messages can be translated on the PC application into more informative messages to explain the error type to user so the proper action can be taken if required.

Some of the listed errors above require user interaction with the POS to solve the issue, like checking phone line / IP connectivity for example or diagnose other types of errors.

On the other hand, there could be an issue with the communication with PC, in this case POS will display an error message on screen, and try to send (NAK) to the PC.

Codes from H01 to H96 in addition to H** are returned by the host after sending the online request message.

Below sample error screens:

COMMAND FROM PC
INVALID REQUEST CALL FOR HELP - 005

أمر من الحاسوب
خطأ في العملية اتصل للمساعدة - 005

Fig. 5.5.1 Wrong LRC Error Screen

COMMAND FROM PC
INVALID REQUEST CALL FOR HELP - 006

أمر من الحاسوب
خطأ في العملية اتصل للمساعدة - 006

Fig 5.5.2 Wrong Transaction Type Screen

COMMAND FROM PC
INVALID REQUEST CALL FOR HELP - 007

أمر من الحاسوب
خطأ في العملية اتصل للمساعدة - 007

Fig 5.5.3 Format Error Screen

COMMAND FROM PC
INVALID REQUEST CALL FOR HELP - 008

أمر من الحاسوب
خطأ في العملية اتصل للمساعدة - 008

Fig 5.5.4 Original Transaction Not found

5.6 Serial Message Specifications

This section describes request/response messages between POS and PC, it is important to follow the tables below in details to have successful integration between POS and PC.

5.6.1 Request Message from PC

This message initiates the transaction by sending required information to POS.

Field	Attribute		Bytes	Value
<STX>	C	1	1	Start of text (0x02)
Message Length	AN	4	4	Message Length (0436)
ECR Version Number	AN	3	3	ECR version number (111)
<FS>	C	1	1	Field separator (0x01C)
Transaction Type	AN	2	2	Transaction Type (Sale = 01)
<FS>	C	1	1	Field separator (0x01C)
ECR Application ID(***)	AN	8	8	ECR Application Identifier
<FS>	C	1	1	Field separator (0x01C)
Terminal ID	AN	8	8	POS Terminal ID
<FS>	C	1	1	Field separator (0x01C)
Service 1 Code	ANS	20	20	Service 1 Main & Sub Code
<FS>	C	1	1	Field separator (0x01C)
Service 1 Amount	ANS	12	12	Service 1 Amount
<FS>	C	1	1	Field separator (0x01C)
Service 1 Quantity	AN	6	6	Service 1 Quantity (000000-999999)
<FS>	C	1	1	Field separator (0x01C)
Service 2 Code	ANS	20	20	Service 2 Main & Sub Code
<FS>	C	1	1	Field separator (0x01C)
Service 2 Amount	ANS	12	12	Service 2 Amount
<FS>	C	1	1	Field separator (0x01C)
Service 2 Quantity	AN	6	6	Service 2 Quantity (000000-999999)
<FS>	C	1	1	Field separator (0x01C)
Service 3 Code	ANS	20	20	Service 3 Main & Sub Code
<FS>	C	1	1	Field separator (0x01C)
Service 3 Amount	ANS	12	12	Service 3 Amount
<FS>	C	1	1	Field separator (0x01C)
Service 3 Quantity	AN	6	6	Service 3 Quantity (000000-999999)
<FS>	C	1	1	Field separator (0x01C)
Service 4 Code	ANS	20	20	Service 4 Main & Sub Code
<FS>	C	1	1	Field separator (0x01C)
Service 4 Amount	ANS	12	12	Service 4 Amount
<FS>	C	1	1	Field separator (0x01C)
Service 4 Quantity	AN	6	6	Service 4 Quantity (000000-999999)
<FS>	C	1	1	Field separator (0x01C)
Service 5 Code(**)	ANS	20	20	Service 5 Main & Sub Code
<FS>	C	1	1	Field separator (0x01C)
Service 5 Amount(**)	ANS	12	12	Service 5 Amount
<FS>	C	1	1	Field separator (0x01C)
Service 5 Quantity(**)	AN	6	6	Service 5 Quantity (000000-999999)
<FS>	C	1	1	Field separator (0x01C)
Service 6 Code(**)	ANS	20	20	Service 6 Main & Sub Code
<FS>	C	1	1	Field separator (0x01C)
Service 6 Amount(**)	ANS	12	12	Service 6 Amount
<FS>	C	1	1	Field separator (0x01C)
Service 6 Quantity(**)	AN	6	6	Service 6 Quantity (000000-999999)

<FS>	C	1	1	Field separator (0x01C)
Number of Applications	AN	4	4	Number of Applications (0001-0300)
<FS>	C	1	1	Field separator (0x01C)
Additional Amount	AN	12	12	Additional Custom Amount
<FS>	C	1	1	Field separator (0x01C)
Application Number	ANS	20	20	Application Number
<FS>	C	1	1	Field separator (0x01C)
POS Assign Appl. Number	AN	1	1	Flag for POS to auto generate app. number
<FS>	C	1	1	Field separator (0x01C)
Original Invoice Number	ANS	6	6	Original Transaction Invoice Number
<FS>	C	1	1	Field separator (0x01C)
ECR Invoice Number	ANS	6	6	PC Application Invoice Number
<FS>	C	1	1	Field separator (0x01C)
ECR ID Number	ANS	16	16	PC Unique ID Number
<FS>	C	1	1	Field separator (0x01C)
ECR User ID	ANS	8	8	PC User ID
<FS>	C	1	1	Field separator (0x01C)
ECR Transaction Date	AN	6	6	PC Date (DDMMYY)
<FS>	C	1	1	Field separator (0x01C)
ECR Transaction Time	ANS	4	4	PC Time (HHMM) H24 format
<FS>	C	1	1	Field separator (0x01C)
Country Code	ANS	4	4	Country Code
<FS>	C	1	1	Field separator (0x01C)
Main Area Code	ANS	16	16	Main Area Code
<FS>	C	1	1	Field separator (0x01C)
Sub Area Code	ANS	8	8	Sub Area Code
<FS>	C	1	1	Field separator (0x01C)
PAN(*)	ANS	19	19	Card Number
<FS>	C	1	1	Field separator (0x01C)
Expiry Date(*)	ANS	4	4	Card Expiry Date
<FS>	C	1	1	Field separator (0x01C)
Merchant ID	ANS	15	15	Merchant ID
<FS>	C	1	1	Field separator (0x01C)
<ETX>	C	1	1	End of text (0x03)
<LRC>	B	2	1	Message LRC.

(*) It might be required by MoF in future to add Card Number and Expiry date in request message.
(**) The maximum number of services per one transaction is 4 on dialup terminals (T4210) and 6 on IP terminals (T4220/T4230/M4230), user can have up to 4 or 6 services for each sale transaction depends on the terminal type used.

(***)POS terminal can maintain and manage up to (4) ECR\PC applications separately; where each application uses [**ECR Application ID**] to identify its origin to the POS terminal.

Field Attributes:

Attribute	Description
C	Control Character (STX, ETX, FS, LRC)
AN	Alphanumeric, could be numeric only, or numeric & characters
ANS	Alphanumeric and Special characters
B	Binary (Only for LRC)

Transaction Types:

Transaction	Value	Description
Sale	01	Initiates Sale Transaction
Pre-Auth	02	Initiates Pre-Auth Transaction
Completion	03	Initiates Completion Transaction
Refund	10	Initiates Refund Transaction
Void	11	Initiates Void Transaction
Service Charge Inq.	15	Initiates Service Charge Inq. Transaction
Card Balance / Status	16	Initiates Balance Inquiry Transaction
Card Activation	17	Initiates Card Activation Transaction
Close Batch	18	Initiates Settlement Transaction
Last Transaction Status	TS	Checks last processed transaction status
eGuarantee	EG	Initiates eGuarantee Sale Transaction
eAttestation	EA	Initiates eAttestation Sale Transaction

For Completion, Refund Void and Completion, original transaction ID is required to locate the original transaction on POS transaction memory.

If any other values were sent from PC to POS, an error message will be shown on POS screen.

Fields Format and Padding:

Field Name	Format
Service Code & Sub-Code	Left padding with zeros for the first 11 digits, right padding with spaces.
Service Quantity	6-digit number padded with zeros from left.
Number of Applications	0001 – 0300, always padded with zeros.
Additional Amount	Zero filled, right justified.
Application Number	Space filled, left justified.
Original Invoice Number	Zero filled, right justified.
ECR Invoice Number	Zero filled, right justified.
ECR ID Number	Space Filled, left justified.
ECR User ID	Space Filled, left justified.
ECR Transaction Date	DDMMYY, always 6 digits.
ECR Transaction Time	HHMM H24 format, always 4 digits.
Country Code	3-digit ISO 3166-1 Country Code, padded with a zero form left.
Main Area Code	Space Filled, left justified
Sub Area Code	Space Filled, left justified
PAN	Filled with 'F", left justified, All 'F' if not used.
Expiry Date	4-digits expiry date YYMM format, space filled if not used.

5.6.2 Last Transaction Status Request

This message retrieves last processed transaction details from the POS.

POS responds with the same response to Payment Transaction (5.6.3), POS will always respond with the details of last processed transaction even if the batch was settled, the only time it might return an error message (*HB2*) is when the POS is newly deployed and no transactions were processed yet.

Field	Attribute		Bytes	Value
<STX>	C	1	1	Start of text (0x02)
Message Length	AN	4	4	Message Length (0042)
ECR Version Number	AN	3	3	ECR version number (111)
<FS>	C	1	1	Field separator (0x01C)
Transaction Type	AN	2	2	Transaction Type (TS)
<FS>	C	1	1	Field separator (0x01C)
ECR Application ID	AN	8	8	ECR Application Identifier
<FS>	C	1	1	Field separator (0x01C)
Terminal ID	AN	8	8	POS Terminal ID
<FS>	C	1	1	Field separator (0x01C)
ECR ID Number	ANS	16	16	PC Unique ID Number (ID to verify)
<FS>	C	1	1	Field separator (0x01C)
<ETX>	C	1	1	End of text (0x03)
<LRC>	B	2	1	Message LRC.

5.6.3 Response Message from POS

This message is sent from POS to PC after getting e-dirham Host response.

Field	Attribute		Bytes	Value
<STX>	C	1	1	Start of text (0x02)
Message Length	N	4	4	Message Length (0979)
Transaction Type	AN	2	2	Transaction Type (Sale = 01)
<FS>	C	1	1	Field separator (0x01C)
Transaction ID	N	16	16	POS Unique transaction ID
<FS>	C	1	1	Field separator (0x01C)
Services Number	N	1	1	Number of Services (Maximum of 6)
<FS>	C	1	1	Field separator (0x01C)
Service 1 Amount	N	12	12	Service 1 Amount
<FS>	C	1	1	Field separator (0x01C)
Service 1 Fee 1 Amount	N	12	12	Service 1, Fee 1 Amount
<FS>	C	1	1	Field separator (0x01C)
Service 1 Fee 1 Name	ANS	20	20	Service 1, Fee 1 Name
<FS>	C	1	1	Field separator (0x01C)
…				
Service n Amount	N	12	12	Service n Amount
<FS>	C	1	1	Field separator (0x01C)
Service n Fee 1 Amount	N	12	12	Service n, Fee 1 Amount
<FS>	C	1	1	Field separator (0x01C)
Service n Fee 1 Name	ANS	20	20	Service n, Fee 1 Name
<FS>	C	1	1	Field separator (0x01C)
Dynamic Fee Count	N	2	2	Number of Fees (Maximum 10)
<FS>	C	1	1	Field separator (0x01C)
Dynamic Fee 1 Amount	N	12	12	Dynamic Fee 1 Amount
<FS>	C	1	1	Field separator (0x01C)
Dynamic Fee 1 Text	ANS	40	40	Fee 1 Text Description
<FS>	C	1	1	Field separator (0x01C)
…				
Dynamic Fee n Amount	N	12	12	Dynamic Fee n Amount
<FS>	C	1	1	Field separator (0x01C)
Dynamic Fee n Text	ANS	40	40	Fee n Text Description
<FS>	C	1	1	Field separator (0x01C)
Response Code	N	2	2	Host Response Code
<FS>	C	1	1	Field separator (0x01C)
Approval Code	ANS	6	6	Transaction Approval Code
<FS>	C	1	1	Field separator (0x01C)
ECR ID Number	ANS	16	16	PC Unique ID Number (*echo from Request*)
<FS>	C	1	1	Field separator (0x01C)
Reference Number	N	12	12	Retrieval Reference Number
<FS>	C	1	1	Field separator (0x01C)
Invoice Number	N	6	6	POS Invoice Number
<FS>	C	1	1	Field separator (0x01C)
POS User ID	AN	8	8	POS User ID
<FS>	C	1	1	Field separator (0x01C)
Terminal ID	AN	8	8	POS Terminal ID
<FS>	C	1	1	Field separator (0x01C)
Merchant ID	AN	15	15	POS Merchant ID
<FS>	C	1	1	Field separator (0x01C)
Batch Number	N	6	6	POS Current Batch Number

<FS>	C	1	1	Field separator (0x01C)
POS Date	N	6	6	POS Date (DDMMYY)
<FS>	C	1	1	Field separator (0x01C)
POS Time	N	4	4	POS time (HHMM) H24
<FS>	C	1	1	Field separator (0x01C)
Chip Transaction TC	AN	16	16	Chip TC, space filled if not present.
<FS>	C	1	1	Field separator (0x01C)
Chip Transaction TVR	AN	16	16	Transaction TVR, space filled if not present.
<FS>	C	1	1	Field separator (0x01C)
<ETX>	C	1	1	End of text (0x03)
<LRC>	B	2	1	Message LRC.

(*) The maximum number of services per one transaction is 4 on dialup terminals (T4210) and 6 on IP terminals (T4220/T4230/M4230), user can have up to 4 or 6 services for each sale transaction depends on the terminal type used.

(**) PC application is responsible of calculating the totals.

POS will send full transaction information only if the transaction was approved, and response code was “00”.

Any transaction status other than approval will be sent to PC as an error message.

Field	Attribute		Bytes	Value
<STX>	C	1	1	Start of text (0x02)
Message Length	N	4	4	Message Length (0027)
Error Message	ANS	5	5	‘ERROR’
<FS>	C	1	1	Field separator (0x01C)
Error Code	ANS	3	3	3-digit response code as in Error Code Table
<FS>	C	1	1	Field separator (0x01C)
ECR ID Number	ANS	16	16	PC Unique ID Number (*echo from Request*)
<FS>	C	1	1	Field separator (0x01C)
<ETX>	C	1	1	End of text (0x03)
<LRC>	B	2	1	Message LRC.

If the number of applications was more than one (Batch Application), POS will send a separate response to PC for each application processed, and PC should respond with an <ACK> for each message.

Fields Format and Padding:

Field Name	Format
Transaction Type	Always 2 digit value.
Transaction ID	Always 16-digit value.
Transaction Amount	12-digit value, right justified, padded with zeros from left.
Response Code	Always 2 characters and should always be “00” if successful.
Approval Code	Left justified, padded with spaces from right.
Unique TXN Number	Transaction Unique ID number, always 16 characters.
Reference Number	Should always be 12 digits numeric.
Invoice Number	6 digits, right justified, padded with zeros from left.
POS User ID	8 characters, left justified, padded with spaces from right.
Terminal ID	8 characters, left justified, padded with spaces from right.
Batch Number	6 digits, right justified, padded with zeros from right.
POS Date	Always 6 digits, Format DDMMYY.
POS Time	Always 4 digits, Format HHMM H24.

Chip Transaction TC	If chip transaction, 16 characters, if not, space filled.
Chip Transaction TVR	If chip transaction, 16 characters, if not, space filled.

6 Application Specifications Acceptance and Sign off

Please confirm that the above specifications fully cover the required functionalities of the requested features on the POS Application as agreed between Specialized Technical Services (STS) and National Bank of Abu Dhabi (NBAD) / Abu Dhabi Ministry of Finance (MOF)

Specialized Technical Services (STS)	**National Bank of Abu Dhabi (NBAD)**	**Ministry of Finance (MOF)**
Sign: _____	Sign: _____	Sign: _____
Name: _____	Name: _____	Name: _____
Title: _____	Title: _____	Title: _____
Date: _____	Date: _____	Date: _____
Stamp: _____	Stamp: _____	Stamp: _____