ECR-Interface
ZVT-Protocol

Manufacturer Independent Protocol
between Payment Terminals and
Electronic Cash Register Systems / Vending Machines

Commands
Bitmaps
Error Messages

Disclaimer

The following information is based on the current state of knowledge and is provided without guarantee. Modifications and errors excepted.

Revision	13.08
Date	25.05.2018
Status	final

Verband der
Terminal-Hersteller
in Deutschland e.V.

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0 History

Revision	Date	Release Notes	Author
04	5.3.2004	Separation of document into two documents Transport-Protocol/Application-Protocol and Commands/Bitmaps/Error-Messages Change Chapter 2.1 Registration: - Extension of the Config-byte - Status-byte extended - In Completion the currency code is also 2 byte Change Chapter 2.2 Authorisation: - sequence described in more detail - payment with manual card-data possible - Note for Behaviour for failed transfer of the Status-Information inserted - Note for Behaviour for Filling-Station Systems inserted - Note for Behaviour for incorrect PIN-input inserted Change Chapter 2.3 Telephonic Authorisation: - bitmaps inserted Change Chapter 2.4 pre-authorisation: - bitmaps inserted Change Chapter 2.5 Reversal: - bitmaps inserted - removed BMP 01, 02, 05 Change Chapter 2.6 Partial-Reversal: - Removed BMP 19 Change Chapter 2.8 Reversal Pre-Authorisation: - Note supplemented Change Chapter 2.10 Refund: - bitmaps inserted - Removed BMP 01, 02, 05 Change Chapter 2.15 Receipt repeat: - Service-byte inserted Change Chapter 2.16 Read Card: - if chip should be read but the card has no chip then the PT can read the magnet-stripe and send to the ECR. - BMP FC defined in more detail Change Chapter 2.18 Abort: - the PT sends no Abort after the confirmation (80-00-00) Change Chapter 3.1.1 Status-Information after Authorisation, Reversal, Prepaid: - BMP 3B is padded with 00h	K. Höflich

Revision	Date	Release Notes	Author
		Change Chapter 3.1.3 Status-Information after End-of-Day: - bitmap Trace-Number inserted Change Chapter 3.7 Dial-Up: - Description dial-up data inserted Change Chapter 3.11 Transparent-Mode: - error for sequence corrected New Chapter 7 TLV-container Change Chapter 8 Error-Messages: - List extended Change Chapter 10 Overview of bitmaps: Behaviour for unknown bitmaps defined	
05	22.10.2004	Intermediate-Status for Basisterminal extended. Additional-data from pre-authorisation removed. Change Chapter 2.1 Registration: - Definition of the Config-byte improved - Added note to list of permitted Commands Change chapter 2.9 Enquire after available Pre-Authorisations: - BMP 06 inserted Change chapter 2.19 Log-off: - Log-off deactivated TLV-container Change chapter 3.1.1 Status-Information: - TLV-container integrated - BMP 8A card-type extended - BMP 06 inserted Change chapter 3.2 Completion - BMP 06 inserted Change chapter 3.3 Abort - BMP 06 inserted New chapter 3.6 Print Text-Block Change chapter 3.7 Intermediate-Status - BMP 06 inserted Change chapter 7 TLV-container: - new data-objects defined Change chapter 8 Error-Messages	R. Roos K. Höflich K. Höflich K. Höflich K. Höflich K. Höflich K. Höflich K. Höflich K. Höflich K. Höflich

Revision	Date	Release Notes	Author
		- error no. 133 inserted	
06	21.01.2005	Change chapter 2.2 Authorisation: - BMP 22 is padded with 'F' s if even data length Change chapter 10 description of the BMPs to extend and complete format-details. Change chapter 7 TLV-container: - editorial changes and improved explanation of TLV-containers	K. Höflich R. Roos K. Höflich
07	30.03.2005	Change chapter 2.37 change Baudrate: - new Baudrate included Change chapter 6.1 additional-data type 1: - the length the goods-data extended to 11 Change chapter 7.4: - tag 01; length 8 byte - Tags added	K. Höflich K. Höflich K. Höflich
08	06.06.2005	Change chapter 2.16 Read Card: - error for Description BMP FC corrected chapter 2.35 OPT-Out-of-Order included Change chapter 3.1.1 Status-Information after Authorisation, Reversal or Prepaid-Top-Up: - encoding of BMP 3B explained on more detail Change chapter 7.2.2 Transmission of the TLV-container from PT to the ECR: - Note regarding validity-duration of the BMP06 added Change chapter 6.1.3 goods-data information: - encoding of negative amounts added Change chapter 7.4 defined data-objects: - tag 0F (order-number) inserted Change chapter 8 Error-Messages - error-codes the inserted, current error-codes definitions improved Change chapter 9 Terminal-Status - status-code 193, remedy actions extended	K. Höflich K. Höflich K. Höflich K. Höflich K. Höflich K. Höflich K. Höflich K. Höflich
09	2.12.2005	Change chapter 2.1 Registration: - various changes for the Registration and for Completion New chapter 2.2.11 Storing the transaction in PT Change chapter 2.4 pre-authorisation: - Extension for reservation - tag 1F06 added BMP 0B and BMP 3B included	K. Höflich

Revision	Date	Release Notes	Author
		Change chapter 2.6 Partial-Reversal: - Extensions to booking of a reservation - tag 1F06 added - BMP 0B and BMP 3B included Change chapter 2.7 Book Total: - Extensions to booking of a reservation - tag 1F06 added - BMP 0B and BMP 3B included Change chapter 2.12 Diagnosis: - Diagnosis type included - Error correction for Send Date/Time Change chapter 2.15 Repeat Receipt: - tag receipt-ID included Change chapter 2.16 Read Card: - for cards with chip the magnet-stripe data that the PT read during insertion is sent to the ECR - Extension BMP19 - Correction of the Sequence for Read Card Change chapter 2.17 activate card-reader: - Description of behaviour for error added Change chapter 2.29 select language : - language-code „French“ added Change chapter 2.30 Software-Update: - tag order-number added New command „Read File“ 08 11 (chapter 2.31) New command „Delete File“ 08 12 (chapter 2.32) Change chapter 2.40 change Baudrate (08 40): - Baudrate 19.200 Baud added Change chapter 3.5 Print Lines: - TLV-container added (tag 1F07) Change chapter 3.6 Print Textblock: - tag 1F07 added Change chapter 3.7 Intermediate-Status Information: - new Intermediate Status included New chapter 3.13 Menu-Request Change chapter 7.4 Defined data-objects: - new Tags defined; u.a. Extensions for EMV2000	

Revision	Date	Release Notes	Author
		Change chapter 8 error- codes: - error for error- code 221 and 222 corrected Change chapter 9 Terminal-Status: - Status E3 Shutter Closed added - Remedial measures for Status 178 added New chapter 10 list of ZVT-card-type-IDs Change chapter 10 list of ZVT-card-type-IDs: - ZVT-card-type-ID 30 is only meant for Geldkarte, ec-cash Chip counts as ec-card HEM-card added	
10	24.01.2006	Change chapter 10 list of ZVT-card-type-IDs: - 2 cards (Dankort and VISA/Dankort) added	K. Höflich
11	15.03.2007	Change chapter 3.1.1 Status-Information after Authorisation, Reversal, Pre-Authorisation/Reservation or Prepaid-Top-Up: - Note for BMP 22, 3B, 92, BA, AF, 88 and 92 added Change chapter 2.2 Authorisation: - BMP 2D, 23, 24 now sent without Start/End sentinel - BMP 3A added - For Bonus transactions is the inclusion of the Amounts optional. New chapter 2.3 Account Balance Request New chapter 2.4 Book Tip Change chapter 2.5 Telephonic Authorisation: - BMP 3B corrected - BMP 3A added Change chapter 2.6 Pre-Authorisation/Reservation: - Extensions for BMP 0B and 3B Change chapter 2.7 Partial-Reversal of a Pre-Authorisation/Booking of a Reservation: - BMP 3B added Change chapter 2.9 Book Total: - Extension for BMP 0B and 3B Change chapter 2.12 Refund: - Amount is for Bonus-transactions optional Change chapter 2.25 Display Text with Function-Key Input: - key-codes added Change chapter 2.26 Display Text with Function-Key input (old Version):	

Revision	Date	Release Notes	Author
		- key-codes added	K. Höflich
		Change chapter 3.2 Completion: - Parameter for command termination extended	R. Roos
		Change chapter 7.4.3 Tags: - tag 1F0C auto-registration added - tag C1 possible value added	K. Höflich
		Change chapter 10. list of ZVT-card-type-ID: - Mango-card inserted - Payback-card inserted	R. Roos
		English translation	S. Atherton
12	6.7.2007	New chapter 2.4 Activate Card (06 04) Changes chapter 2.13 Refund (06 31): - value '47 4C' added Changes chapter 2.44 Top-Up Prepaid Cards (06 09): - payment type 03 added Changes chapter 3.1 Status Information (04 0F): - extended BMP 8A and BMP 8C Changes chapter 7.4 Tags: - Tag 41 note added - Tag 49 added - Tag C1 optional value added Changes chapter 10. List of ZVT Card-type IDs: various cards added	K. Höflich
	18.10.2007	Changes chapter 2.24 and 2.25 Display Text (06 E0 and 06 85) - Note can be ended prematurely using command „Abort“ (06 B0) Changes chapter 2.26 and 2.27 Display Text with Function Key Input (06 E1 and 06 88) - Note can be ended prematurely using command „Abort“ (06 B0) Changes chapter 2.28 and 2.29 Display Text with Numerical Input (06 E2 und 06 86) - Note can be ended prematurely using command „Abort“ (06 B0) Changes chapter 2.30 und 2.31 PIN-checking for Customer cards (06 E3 und 06 87) - Note can be ended prematurely using command „Abort“ (06 B0)	T. Lilienthal

Revision	Date	Release Notes	Author
	06.11.2007	Changes chapter 3.1.1 Status Information after Authorisation - Extension of BMP 19 (payment type) Changes chapter 7.4 defined data-objects and 7.4.6 for Prepaid (TLV Container). - Tag 83 added New chapter 3.14 Blocked-List Query to ECR (06 E4) Changes chapter 8 Error Messages - Error code 6E (card in blocked-list) added	T. Lilienthal
	14.02.2008	Changes chapter 2.1 Registration (06 00) - TLV-Tag 26 added to Completion command. Changes chapter 2.21 command Abort (06 B0) - Note how and where this command can be used New chapter 2.45 Print Line on PT. New chapter 2.46 Print Text-Block on PT. Changes chapter 3.6 Print Text-Block (06 D3) - Note “Print Text-Block on PT” added. Changes chapter 7.4 defined data-objects and 7.4.1 Miscellaneous (TLV Container). - Tag 1F0D added	T. Lilienthal
	07.03.2008	Changes chapter 2.21 Abort command (06 B0) - Note how and where this command can be used Changes chapter 7.4.1 Miscellaneous Following tags added - 1F0E „date“ - 1F0F „time“ - 1F10 "cardholder authentication" - 1F11 "online flag" - 1F12 "card-technology" - 2E „time-stamp“ - 2F "payment-type" Changes chapter 7.4.4 for EMV (debit/credit and DC POS) - Header extended with „debit/credit and DC POS“ - Tag 40 extended - Tag 46 and 47: note added to tag 66. - 64 „Receipt Header“ added - 65 „Receipt Advertising Text“ added - 66 „Print Data Customer Receipt“ added - 67 „Print Data Merchant Receipt“ added - 68 „Print Text Transaction Outcome“ added 69 „Reference Transaction“ added	T. Lilienthal

Revision	Date	Release Notes	Author
		Changes chapter 10 List of ZVT Card-type IDs - New Card-type ID „5 girocard“ - New Card-type ID „7 EAPS“ - New Card-type ID „9 girocard deutsche Lastschrift“ - New Card-type ID „11 VISA electron“ - New Card-type ID „13 V PAY“ - New Card-type ID „202 Payback (without payment function)“ - Name Card-type ID „6 Eurocard“ changed to „MasterCard“ Changes chapter 7.4.4 for EMV (debit/credit and DC POS) - Tag 47: note to tag 67 corrected	
12a	04.04.2008	copyright changed	T. Lilienthal
13.01	02.06.2008	Changes chapter 10, list of ZVT Card-type IDs New Card-type ID „203 Micromoney“ (Prepaid) New Card-type ID „204 T-Card“ (Prepaid) New Card-type-ID „205 Blau“ (Prepaid) New Card-type-ID „206 BILDMobil“ (Prepaid) New Card-type-ID „207 Congstar“ (Prepaid) New Card-type-ID „208 C3 Bestminutes“ (Prepaid) New Card-type-ID „209 C3 Bestcard“ (Prepaid) New Card-type-ID „210 C3 Callingcard“ (Prepaid) New Card-type-ID „211 EDEKAMOBIL“ (Prepaid) New Card-type-ID „212 XTRA-PIN“ (Prepaid)	T. Lilienthal
	06.03.2009	8-Bit default character set added and set as default New TLV-tags 1F13-1F18 New Card-type-IDs "213 Klimacard" "214 ICP-International-Fleet-Card" New bitmap 2E in status information to read card command New intermediate status codes 0xCB and 0xFF Command 06 E1 optionally responds to card inserts Optional bitmap 8A or TLV tag 41 in payment commands. New commands from ECR to PT Tax Free (06 0A) Send Turnover Totals (06 10) Reset Terminal (06 18) Print System Configuration (06 1A) Set/Reset Terminal-ID (06 1B) Send offline Transactions (06 51) Selftest (06 79) Change Password (06 95) Clarification of the use of tag 09 in container 25 in command Print Text Block (06 D3) to indicate the last block. Clarification of default value for bitmap EA.	R. Roos
13.02	29.01.2010	New key codes for "Display text with Numerical Input" (06 E2, 06 86). Description of "Change Password" (06 1E) corrected. Added tag 2F to "Status-Information" (04 0F). Description of bitmap A0 improved.	R. Roos

Revision	Date	Release Notes	Author
		New ZVT intermediate status code CC – "debit advice not possible, PIN required". Description of ZVT intermediate status code FF corrected. German equivalents to ZVT intermediate status codes added. Reworked description of ZVT intermediate status codes according to DC POS 2.4 requirements. New TLV tags added: 4A - DC POS 2.4 product dispay. 1F19–card acceptance 1F1A–PAN for card acceptance matching 1F1B-markup in % with 2 dezimals 1F1C-card name 1F1D-currency information Type 1F1E-number of decimals 1F20-amount 1F21-ISO currency code 1F22-Inverted rate display unit 1F23-Retrieval ID 1F24-Reference Number 30–card acceptance matching 31–amount information E2-DCC container New FileID for TLV tag 1D 06 "reconcilation data" added. Description of TLV tags 21, 30, 1F04, 1F0C, 1F0D, 1F16 and 1F17 improved. TLV tag 40 extended with request for product display. Description of ZVT error code FF expanded. New Card-type IDs: 21 – "Payeasy“ 127 – "AirPlus" 215 – "ICP-Gutscheinkarte" 216 – "ICP-Bonuskarte" 217 – "Austria Card" 218 – "ConCardis Geschenkkarte" 219 – "TeleCash Gutscheinkarte" 220 – "Shell private label credit card" 221 – "ADAC" 222 – "Shell Clubsmart" 223 – "Shell Pre-Paid-Card" 224 – "Shell Master-Card" 225 – "bauMax Zahlkarte" 226 – "Fiat – Lancia – Alfa Servicecard" 227 – "Nissan – Karte" 228 – "ÖBB Vorteilskarte" 229 – "Österreich Ticket" 230 – "Shopin – Karte" 231 – "Tlapa – Karte" 232 – "Discover Card" 233 – "f+f – Karte"	
		234 – "Syrcon"	

Revision	Date	Release Notes	Author
		Added character 'E' to description of bitmap 22, 23 and 24 to optionally mask of numeric digits for PCI-DSS requirements. Added note to 8 bit character set. Clarified structure of BMP 3C (Additional Data) New command to change the serial protocol (08 02) References to Print Textblock command added. Algorithm-ID for BICA cards fixed. DCC information added to Status-Information. Description of Additional Data type 3 corrected. Description of payment type reworked. Required elements of TA7.0 DC POS receipts added Corrected description and use of tlv tag 15 TLV tag 1F10 expanded for combined CVMs Clarified description of Card-type ID 9	
13.03	17.06.2010	New Card-type IDs: 235 – "Citybike Card“ 236 – "Postfinance Card" 237 – "DAS" 238 – "IKEA FAMILY Bezahlkarte" 239 – "Ikano Shopping Card" 240 – "Intercard Gutscheinkarte" 241 – "Intercard Kundenkarte" 242 – "M&M-Gutscheinkarte" 243 – "Montrada card" 244 – "CP Customer Card" New language code 03 = Italian for Select Language (08 30) Added TLV tag 1F26 for End-of-day mode. Changes for EuroELV including new TLV tags 1F27, 1F28, 1F29, 1F2A.	R. Roos
	16.09.2010	Increase Registration to handle different Iso Tables/ charac-tersets.	U. Liegl
13.04	12.11.2010	New Card-type IDs: 242 – "M&M-Gutscheinkarte" 243 – "Montrada card" 244 – "CP Customer Card" New TLV-Tag 1F2B for trace number (long format)	R. Roos
	03.12.2010	New Card-type ID: 245 – "AmexMembershipReward " Change chapter 2.13 Refund: - BMP 3B included	
	26.01.2011	Optional BMP 3C for Pre-Authorisation/Reservation (06 22)	
	31.01.2011	New Tag 6A for invalid EMV application	R. Roos
	24.02.2011	New Card-type IDs: 246 – "FONIC" 247 – "OTELO DE" 248 – "SIMYO"	
	10.03.2011	New Card-type IDs: 249 – "Schlecker Smobil" 250 – "Schlecker Zusatzprodukte" 251 – "CHRIST Gutscheinkarte" 252 – "IQ-Card"	R. Roos

Revision	Date	Release Notes	Author
	30.06.2011	Merged Changes from Version 13.03 New Card-type ID: 253 – AVS Gutscheinkarte	K. Höflich
	22.07.2011	New TLV-Tag 1F2C	K. Höflich
	24.08.2011	New Card-type ID: 254 – "Novofleet Card" 15 – "REKA Card"	R. Roos
	16.09.2011	New Card-type IDs: 17 – "Happiness Card" 19 – "Transact Geschenkkarte" 23 – "boncard POINTS" 25 – "boncard PAY" New TLV-Tags 1F2D – 1F34, E3 Extended TLV-Tags 25, 1F04 Extended command PIN-Verification for Customer-Card (06 E3 New command MAC calculation (06 E5)	R. Roos
	04.10.2011	Improved description of tags 14, 25, 27 Removed Track 3 for ELV/OLV Transactions New diagnoses type '05' = EP2 configuration in tag 1B	A. Och / R. Roos
	05.10.2011	New Card-type IDs: 27 – "Klarmobil" 29 – "Mobile World" 31 – "Ukash" 33 – "Wallie"	R. Roos
13.05	27.10.2011 29.11.2011 13.12.2011 17.01.2012 18.01.2012	New TLV-Tag 1F34 New Card-type ID: 35 – "MyOne" 37 –"Gutscheinkarte DOUGLAS Gruppe" 39 - "ABO Card" 41 - "BonusCard" 43 - "CCC Commit Card" 45 - "DataStandards" 47 - "GiftCard" 49 - "Jelmoli Card" 51 - "J-Geschenkkarte" 53 - "Jubin" 55 - "ManorCard" 57 - "Power Card" 59 - "Supercard plus" 61 - "SwissBonus Card" 63 - "SwissCadeau" 65 - "Tetora" 67 - "WIRcard" 69 - "Postcard" 70 - "lebara" 71 - "Lyca" 72 - "GT Mobile" Renamed algorithm ID 13 to BICA 2 New algorithm ID 14 for DataStandards CH	R. Roos R. Roos R. Roos R. Roos R. Roos
	23.01.2012	Added new text-IDs for command 04FF: -0x28: “currency selection, please wait...”	A. Och

Revision	Date	Release Notes	Author
		-0x29: “language selection, please wait...” -0x2A: "for loading please insert card" Extensions for DCPOS 2.5: -Added new description for tag 1F25 (Cashback amount) -Added new tag 1F36 (Tip amount) -Added new tag 1F37 (Receipt information) -Extended description for tag 45 (Receipt-Parameter) according DF25 of DCPOS 2.5 -Added note for BMP19 (chapter Auhorization 0601) -Added new command 040D (Input-Request) -Added new tag 1F38 (Input mode) -Added new tag 1F39 (Timeout) -Added new tag 1F3A (Input result) -Added new tag 32 (Input container) -Added new tag 1F3B (Transaction information) -Fixed some typing errors	
	31.01.2012	New cardholder authentication method for tag 1F10 added. Added partial issue of goods in chapter 2.2.6	R. Roos
	17.02.2012	Added new tag 4B issuer country code Removed card-type IDs 236 and 237 due to duplication with 45 and 69 Added tag 1F3A to input request as initial value	R. Roos
	09.03.2012	New ZVT errorcodes 0x7B and 0x7C. New optional bitmap FA in command 06 0B to PT New value 0B of tag BMP D0 for frei & flott card	R. Roos
	28.03.2012	Chapter 1.3:Allow currency code other than EUR = 978	R. Roos
	04.05.2012	New values for TLV tag 14	R. Roos
	08.05.2012	New TLV tag 1F3E (encrypted cardholder information)	R. Roos
	11.06.2012	Added new text-IDs for command 04FF: -0x2B: "Emergency transaction, please wait" -0x2C: "Application selection, please wait"	R. Roos
	13.06.2012	Add new tag 1F3F (available credit) for Geldkarte, in response for completion	U. Liegl
	27.07.2012	New ZVT errorcode 0xCD for cashback	R. Roos
	08.08.2012	Added status and error code E4/228 to indicate that a terminal activation is required.	H. Bihr
	17.08.2012	Reserved command 0F CA for ChipActivator	R. Roos
	13.09.2012	Added IIN/AID to Card-type ID as known.	R. Roos
13.06	30.11.2012	Add new intermediate status code 0x68	H. Bihr
	28.12.2012	Added description of BMP 3A	R. Roos
	22.01.2013	Addition of Command 08 1A (set terminal configuration)	H. Bihr
	01.02.2013	New ZVT errorcode 0x7B	R. Roos
	07.05.2013	Added TLV tag 41 as possible response to command status information (04 0F)	R. Roos
	08.07.2013	New Commands for transparent APDU communication New Command 04 03 (Send APDU) New Commands 04 04 (Close Card Session)	S. Scheffler
	23.07.2013	Updated use of Status-Information for German electronic purse scheme Added TLV tags for SEPA Direct Debit Scheme	R. Roos

Revision	Date	Release Notes	Author
	29.07.2013	Clarified encoding of TLV tag 07 and attribute values in command print line	R. Roos
	07.08.2013	Added commands for transparent read of contactless cards via ZVT interface - Card poll with authorization (06 E6) Added payment-type 0101 xxxx “All configured payment applications including GeldKarte” Adapted command display text (06 E0) for external displays Added status byte at status enquiry for requesting more status information about the connected devices Added TLV-container to status enquiry completion Added TLV configuration file for using with ZVT file transfer to configure the terminal. Added command Write File (08 13). Added E7 container for transmitting information about the merchant SAM. Editorial changes	S. Scheffler
	14.08.2013	Removed TLV container from command Print Line 06 D1 due to parsing problems. Clarified attribute usage. Improved description of TLV tag 09. Added note to command Change Baudrate in case of ZVT over IP	R. Roos
	19.09.2013	Clarified reason for ZVT error 9A - 154 New Card-type ID: 257 – "myCard4u” Added TLV tags for SEPA Direct Debit Scheme	R. Roos
	11.10.2013	Renamed tag 1F12 card-type to card-technology Renamed command “Write File” to “Change configuration” and reworked its description	M. Franke
	17.10.2013	Removed ec-card specific stuff or replaced it with Girocard where applicable Removed references to Terminalhersteller e.V.	M. Franke
	03.12.2013	Changed some data types in TLV-container to status enquiry completion	K. Evers
	08.01.2014	Added TLV tag 1F61	R. Roos
	31.01.2014	Streamlining contactless card related things	M. Franke
	04.03.2014	New Card-type ID 75 – “epay Gutscheinkarte”	R. Roos
	09.04.2014	New intermediate status 0x69 added	R. Roos
	11.04.2014	Added TLV tag 1F62 and 1F63	M. Franke
	22.04.2014	Additional TLV tags for value added services	H. Bihr
	28.04.2014	New TLV tag 1F6A, New Card-type ID: 77 – " Karstadt Bonus Card”	R. Roos
	21.05.2014	Added TLV tag E9 (container for 1F62, 1F63)	M. Franke
	26.05.2014	New Card-type ID: 79 – "Yapital”	R. Roos
	14.07.2014	Detailed description of “Value added services” TLV tags	H. Bihr
	29.09.2014	New Card-type ID: 81 – "Pay-At-Match” 83 – "Lunch-Check Card”	R. Roos
	07.10.2014	Added languages Hungarian, Slovenian, Spanish, Czech, Swedish, Dutch, Polish, Slovak, Danish, Greek, Portuguese	M. Franke

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	05.01.2015	New card type ID: 85 – Tankstellen-Netz-Deutschland	M. Franke
	10.02.2015	Added partial reversal with transparent APDU mode	S. Scheffler
	25.02.2015	Added intermediate state E2	M. Franke
	27.03.2015	Generally revised the document - deduped several description copies	M. Franke
	29.4.2015	New Card type ID: 87 – Bancontact-MisterCash	M. Franke
	30.4.2015	Integrate comments from VdTH	M. Franke
	06.05.2015	Released 13.06	M. Franke
13.07	19.05.2015	New TLV tag 1F70 for partial approval	H. Bihr
	26.05.2015	Clarified usage of TLV tag 1F06	M. Franke
	09.07.2015	New card type ID 89 - PAYBACK PAY	M. Franke
	15.07.2015	Add age verification (TLV tags 1F6B, 1F6C)	H. Bihr
	07.08.2015	New card type ID 91 – ValueMaster	M. Franke
	27.08.2015	New TLV tag 1F6D for command 06-E6	H. Bihr
	25.02.2016	New command for reversal of external reservation	T. Schmidt
	26.02.2016	New card type ID 93 - Orlen Flottenkarte 95 - Orlen Star-Card	M. Franke
	03.03.2016	New Card type ID 96 - Blauworld	T. Schmidt
	22.04.2016	Chapter 2.2.6: Information about the not reasonable auto reversal in case of a partial issue of goods	D. Ferlings
	01.05.2016	Clarified tag 1F4D	M. Franke
	01.06.2016	New Card type ID 97 – ALIPAY	M. Franke
	07.06.2016	New Card type ID 98 - REA Gutschein- und Bonuskarte Bonus points : added tag C5 to E1	M. Franke
	23.06.2016	New Card type ID 99 - Roth 100 - Roth TP 101 – EuroWAG	M. Franke
	08.07.2016	New Card type ID 102 – Porsche-card 103 – ARBÖ-card 104 – ÖAMTC-card	M. Franke
	15.07.2016	New Card type ID 105 - Netto-App	M. Franke
	21.07.2016	New Card type ID 106 – GroupCard	M. Franke
	22.08.2016	Extended card detection: New TLV tags 1F71 and 1F72	H. Bihr
	30.08.2016	ZVT synchronization (optional) added ZVT TLS encryption (optional) added 06 F0 Display Image added Message Sequence ID 1F 73 added (optional)	D. Ferlings

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		Information about security using the ZVT protocol	
	15.09.2016	Clarified usage of tags 14 and 27 in command 0600	M. Franke
	31.10.2016	Status changed from “draft” to “release”	D. Ferlings
	11.01.2017	New TLV tag 1F74 for large password	V. Serediouk
	02.02.2017	Added new barcode types Code 128 and EAN 128 to TLV tags 1F2E and 1F2F	M. Franke
	13.02.2017	New ZVT errorcode 0xA5 Added tag EA, 9F5A and 9F5B	V. Eim
	14.02.2017	Added new barcode types for QR-Codes to TLV tags 1F2E and 1F2F	V.Eim
	15.02.2017	Cleanup description of Tag 1F32 and 1F33	V.Eim
	24.02.2017	DUKPT Commands 06 E7 Display text with Numerical Input with DUKPT Usage (new) 06 E5 MAC calculation (enhanced) 05 01 Status enquiry (enhanced) Added tags 1F75, 1F76	U.Liegl
	16.03.2017	Added tags 1F77, 33 Set field 22 in command 06 E7 optional to steer PIN format 05 01 delivers tag 33	U.Liegl
	06.04.2017	Use Tag 1F77 instead of D3 in command 06 E7, 06 E5	U.Liegl
	19.05.2017	Summary of Commands: 06F0 Display Image	V.Eim
	20.06.2017	Add ZVT-card-type-ID 258 (hire purchase)	V.Eim
	24.07.2017	Add ZVT-card-type-ID 259 (AVIA Prepaid). Added Tags 84 and 85 (Prepaid Container)	V.Eim
	27.07.2017	Change REA Gutschein- und Bonuskarte BIN Range to 62776412	V.Eim
	28.08.2017	Chapter 5.1: change tag value in example (1F 6B ->1F 73)	V.Eim
	16.10.2017	Added Tags 1F78, 1F79, 34 and 35. Status Poll extension by 24 hour reboot information.	V.Eim
	18.10.2017	Added ZVT card-type ID 260 (BlueCode)	S.Atherton
	11.12.2017	Changed value of length in 2.32.2 from “XX” to “00” New Chapter - 2.41 Write File (08 14) New Chapter – Menu selection with graphic display (06 D0) New TLV tags added 1F80 - Filename optional including path information 1F81 - MIME type of the file Extendended description of bitmaps 72 and 73 Extended descriptions of tags 1D and 2D Changed description of command 08 13 – change configura-tion	T. Zischka
	21.02.2018	Rename ZVT card-type ID 258 to “Ratenkauf”	V.Eim
	15.03.2018	Added card-type IDs • Cheque Dejeuner / UP Slovensko (108) • Callio Gastro (109) • DOXX (110)	M. Franke
	22.03.2018	Added section “Receipt layout recommendation” New Card type ID	T. Zischka

Revision	Date	Release Notes	Author
		111 – InstantPayment 112 – AVIA PrePaid Karte	

1 Introduction

All numerical values, unless otherwise specified, are **hexadecimal**.

1.1 Terms and Abbreviations

Term	Definition
APDU	Application Protocol Data Unit (= a complete request or response)
BMP	Bitmap, pre-defined data field
CC	Currency Code according to ISO 4217, 09 78 = Euro
ECR	Electronic Cash Register. System that transmits the amount to the payment terminal, may also be a vending machine.
PS	Personalisation System Host (= Background-system for OPT-Actions)
PT	Payment Terminal
RC	Return-Code
RFU	Reserved for Future Use
TCS	Terminal Configuration Server (= Server that is responsible for software-updates and other maintenance)
TID	Terminal-ID, 8 character numerical
xx	Any value / undefined / dependent on the data
ZVT	Zahlungsverkehrterminal (= Point-Of-Sale Terminal)
<field>	A parameter shown in angled-brackets is a place-holder.The place-holder is explained in the following text.
[<field>]	A parameter shown in square-brackets is optional.

1.2 Password

Some PTs require a password from the ECR to carry out certain functions. The password consists of 6 digits which are packed as 3 byte BCD

Example: Password “123456” produces 12 34 56.

1.3 Security

Payment terminals can be accessed by the “ECR-Interface ZVT-Protocol” which was initially designed for a dedicated connection between an ECR and a payment terminal. As a consequence, the protocol specification is almost void of security concepts.
It turns out that especially with the introduction of new transport media like TCP/IP for this protocol, more emphasis must be put on implementing access control to the payment terminal.
The only protection provided in the existing protocol is a short password that is transferred in plain text. This is unsuitable for usage in public networks.

Because of the new transport media like TCP/IP a TLS encryption was introduced (see specification “ECR-Interface ZVT-Protocol; PA00P016_04 (revision 04) or newer). Nevertheless because of the missing of special hardware security features in the most ECR systems, certificates can be “stolen” from ECR systems if some unauthorized persons get access to the ECR or network. The server authentication only protects you from

man-in-the-middle attacks, which is a step forward, but client authentication is of course more secure. See specification “ECR-Interface ZVT-Protocol” for detailed information.
However you have to take care, that your ECR access control and network infrastructure is secure from unauthorized access. Ensure that passwords are safe and firewall incl. virus protection of your network infrastructure is setup safely.

The ZVT protocol provides you with commands which you have to take care of. With dedicated connections between ECR and PT (RS232), card data (PAN) were sent back and forth in clear text without having too serious security issues. Those commands still exist, but shall not be used without adaption any more, especially with TCP/IP connections.
The terminal vendors have to take care that e.g. with using a CardRead command, only not PCI sensible data are sent from the PT to ECR. Whitelists for example solve those issues. On the other hand the ECR integrators have to take care that no PCI sensible data like the PAN is sent from ECR to PT.
If you take a look at the receipts from credit card transactions, it is possible (and recommended) to mask the card PAN. Please talk to your terminal vendor and/or net provider to setup the terminal for a PCI secure data transmission.

Always try to avoid sending and storing sensible data, your terminal vendor, terminal supplier or net provider can help you.

1.4 Currency Code

The currency code (CC) has a length of 2 bytes.
The currency code is checked by the PT as follows to ensure maximum compatibility:

- no CC — OK (interpreted as amount in currency ‘EUR’)
- CC = 09 78 — OK (= ’EUR’)
- All other CCs — OK if PT supports multiple currencies, otherwise error

The PT only sends a currency code to the ECR if the ECR had also sent a currency code in its request.

2 Commands from ECR to PT

2.1 Registration (06 00)

Using the command Registration the ECR can set up different configurations on the PT and also control the current status of the PT.

An Authorisation on the PT can also take place without previously registering the PT with the ECR.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	00	xx	<password><config-byte>[<CC>[03<service-byte>][06<TLV-container>]]

Data block:

- <password>: 3 byte BCD.
- <config-byte>: Bit-field, 1 byte, see Table 1: Definition of <config-byte>.
- <CC>: 2 byte.
- 03<service-byte>: Bit-field, 1 byte. If <service-byte> is sent, <CC> must also be present. See values Table 2: Definition of <service-byte>.
- 06<TLV-container>: Possible tags are 10, 11, 12, 14, 1A, 26, 27, 28, 29, 2A, 40, 1F04, 1F05.
  - As long as the ECR supports TLV-container it is strongly recommended that the ECR sends the list of permitted commands. If <TLV-container> is sent, then <CC> must also be sent.
  - The tag 14 allows configuring a different character set to the PT. Only if this tag is echoed in the Completion command, the character set is accepted by the terminal. If no tag is echoed, the standard character set is used. If the same value for tag 14 is echoed, all commands for printing and all commands for displaying text use the selected character set. See definition of tag 27 for details.

Config-byte	Definition
0000 000x	RFU
0000 0010	ECR assumes receipt-printout for payment functions (see also “ECR Printing – ECR print-type”) 0: payment receipt not printed by ECR 1: payment receipt printed by ECR Payment functions are: Payments, Reversal, Refund, Pre-Authorisation, Partial-Reversal, Book Total, Telephonic Authorisation, Prepaid Charge-up, Repeat-Receipt
0000 0100	ECR assumes receipt-printout for administration functions (see also “ECR print-type”) 0: administration receipt not printed by ECR 1: administration receipt printed by ECR Administration functions are: All other functions which are not payment functions.
0000 1000	ECR requires intermediate status-Information. The PT sends no intermediate status-information if not logged-on.
0001 0000	ECR controls payment function 0: Amount input on PT possible 1: Amount input on PT not possible
0010 0000	ECR controls administration function 0: Start of administration function on PT possible 1: Start of administration function on PT not possible
0100 0000	RFU
1000 0000	ECR print-type (see also “ECR assumes receipt-printout for payment functions” and “ ECR assumes receipt-printout for administration functions “): 0: ECR compiles receipts itself from the status-information data 1: Receipt-printout via ECR using command *Print Lines” (06D1) This field is only used if the option “ECR assumes receipt-printout for payment functions” and/or “ECR assumes receipt-printout for administration functions” is set. Receipts which are not printed by the ECR must be printed by the PT’s own printer.

Table 1: Definition of <config-byte>

If the ECR generates the receipt using the PT-command **Print Lines** (06D1) or **Print Textblock** (06D3) it can inform the PT about its maximum line-width in the request. This is done by sending a TLV-container containing the line-width in tag12. The PT then delivers the line-width actually used also in tag 12 of the Completion command.

The PT formats the receipt accordingly, where technically possible. The PT informs the ECR correspondingly which line-width the receipt is actually formatted with. The ECR can then add leading spaces to the print-line, to allow it to be centered when printed on the ECR printer.

Examples of receipt-printout over ECR:

config-byte	Result
0xxx x00x	Receipt-printout on PT
0xxx x11x	Receipt-printout on the ECR, whereby the ECR constructs the receipt itself from the status-information; the PT prints nothing
0xxx x01x	Payment receipt-printout on the ECR, whereby the ECR constructs the receipt itself from the status-information; the PT prints the administration receipts
0xxx x10x	Administration receipt-printout on the ECR, whereby the ECR constructs the receipt itself from the status-information; the PT prints the payment receipts
1xxx x00x	Receipt-printout on PT
1xxx x11x	Receipt-printout on ECR using command “Print Lines” (06D1)
1xxx x01x	Payment receipt-printout on ECR using command “Print Lines” (06D1); the PT prints the administration receipts, provided a printer is integrated in the PT
1xxx x10x	Administration receipt-printout on ECR using command “Print Lines” (06D1); the PT prints the payment receipts, provided a printer is integrated in the PT

Special case: ECR prints payment receipts and no receipts should be printed for administration functions (neither on PT nor on ECR). In this case config-byte 0xxx x11x or 1xxx x11x is used, whereby the ECR does not execute the administration receipt-printout.

Service-byte	Definition
xxxx xxx1	The PT service-menu may not be assigned to PT function-key.
Xxxx xxx0	The PT service-menu may be assigned to PT function-key (= default if BMP03 omitted).
Xxxx xx1x	The display texts for the Commands Authorisation, Pre-initialisation and Reversal will be displayed in capitals.
Xxxx xx0x	The display texts for the Commands Authorisation, Pre-initialisation and Reversal will be displayed in standard font (= default if BMP03 omitted).
Remainder	RFU

Table 2: Definition of <service-byte>

Note:
Bit 1 (font-size) has no influence on the font-size for the commands Text-Display, Text-Display with Function-Key Input, Text-Display with numerical input and Text-display with Customer-card PIN-verification. For these commands the font-size is switched via control-character (see relevant chapter).

If the currency-code is correct the PT answers with:

Response of PT:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case (=incorrect currency code) the PT answers with:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	1E	xx	6F[<CC>]

Data block:

- The PT only sends a currency code to the ECR, if the ECR had also sent a currency code in its request.

If the currency code check is positive, the **Completion** takes place whereupon the ECR receives the "master-rights" back:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	xx	[19<status-byte>] [29<TID>] [49<CC>][06<TLV-container>]

Data block:

- 19<status-byte>: Bit-field, 1 byte. See Table 3: Definition of <status-byte>.
- 06<TLV-container>: Possible tags are 10, 11, 12, 14, 1A, 26, 27, 28, 1F71. Using tag 26 and 1F71 the PT can communicate its implementation level to the ECR.

Status-byte	Definition
xxxx xxx1	PT initialisation necessary
xxxx xx1x	Diagnosis necessary
xxxx x1xx	OPT action necessary
xxxx 1xxx	PT functions in filling station mode
xxx1 xxxx	PT functions in vending machine mode
xx1x xxxx	RFU
x1xx xxxx	RFU
1xxx xxxx	RFU

Table 3: Definition of <status-byte>

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.2 Authorization (06 01)

This command initiates a payment process and transmits the amount from the ECR to PT. The result of the payment process is reported to the ECR after completion of the booking process.

Caution:
If the receipt printout shall be carried out by the ECR, this may only send the command to the PT if the ECR printer is ready and enough paper for the receipt is available.

The following is an example of an authorisation sequence. Here are the particular features of the **Pre-Authorisation** (see also chapter Pre-Authorisation / Reservation (06 22)) detailed.

Authorisation sequence:

1. Start via call from ECR (amount-transfer, possibly payment-type or card-data).
2. The PT reads the card, if the ECR did not send card-data with the start.
3. The PT executes the transaction.
4. Depending on the configuration the PT sends **Intermediate Status-Information** during the transaction to the ECR, so that the ECR knows that the transaction is still running.
5. Release Card.
6. The PT sends a **Status-Information** with the transaction result (successful or not successful).
7. For vending machines:
   - For vending machines: issue of goods.
   - For filling station systems: start filling.
8. Response to Status-Information with the following function.
   - For normal PTs: contains transaction result.
   - For vending machines: result of issue of goods (goods issued or goods not issued).
   - For filling station systems: start filling took place.
9. Payment Reversal via PT if the issue of goods was not successful.
10. Receipt-printout (for filling station system the receipt-printout takes place during the partial-reversal).
11. Completion.

2.2.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	01	xx	[04<amount>] [49<CC>] [19<payment-type>] [2D<track 1 data>] [0E<expiry-date>] [22<card-number>] [23<track 2 data>] [24<track 3 data>] [01<timeout>] [02<max. status-infos>] [05<pump no.>] [3A<CVV/CVC>] [3C<additional-data>] [8A<card type>] [06<TLV-container>]

Data block:

- 04<amount>: Optional for bonus-transactions. In this case the tag E1 with subtag C2 can be sent instead of amount.
- 19<payment-type>: Bit-field, 1 byte. See Table 4: Definition of <payment-type>.
- 0E<expiry-date>: Used for payment with manual card-data entry.
- 22<card-number>: Used for payment with manual card-data entry. If the card-number contains an odd number of digits, it is padded with an 'F'.
- 01<timeout>: Supplies the time in seconds that the PT waits during issue of goods for a response from the ECR. The default value is 30 seconds.
- 02<max. status-infos>: Defines the maximum number of times that ECR may request the result of the issue of goods from the PT via Status-Information. The default value is infinite.
- 05<pump no.>: Used for the display (e.g. "Please fill-up, pump 2") following a successful authorisation on when using a filling station. If this field is omitted, the PT in the filling station displays the text without a pump number (e.g. "Please fill-up").
- 3A<CVV/CVC>: Used for Mail-Order.
- 3C<additional-data>: Depending on the ECR-system and application different additional-data can be transmitted (see chapter Additional Data).
- 06<TLV-container>: Possible tags are 15, 20, 30, 41, 43, E1 (for C1 value '4D 45' or '4D 53' is possible), E8, 1F04, 1F05, 1F15, 1F25, 1F36, 1F5B.
- For cards which can't identified by the BIN, like CUP, the card type has to be sent with the command. Therefor the field 8A or TLV tag 41 is used.
- All other data are ignored by the PT.

Background:
If the ECR cannot complete the issue of goods within time <timeout>, the ECR responds to the PT a **Status-Information** with "84-9C". In this case the PT waits 2 seconds and sends then a **Status-Information** again. The parameter <max. status-infos> prevents this sequence from running in an infinite-loop.

Payment-type	GiroCard	DC POS related cards	other cards
xxxx xxx1	RFU		
xxxx xx1x	The PT should execute the payment using the data from the previous „Read Card“ command. If no card-data is available, the PT sets the corresponding return-code in the Status-Information.		
Xxxx x1xx	Printer ready (mainly used for evaluation tests)		
xxxx 1xxx	Tippable transaction (since DCPOS 2.5: ignored for EMV tip/tippable transactions)		
0000 xxxx	ELV or EuroELV, if only EuroELV is supported by PT	Ignored	offline transaction
0001 xxxx	Geldkarte	Ignored	Ignored
0010 xxxx	Online without PIN (OLV or EuroELV, if only EuroELV is supported by PT)	Ignored	online transaction
0011 xxxx	Girocard transaction according to TA7.0 rules for TA 7.0 capable PTs	DC POS transaction for DC POS capable PTs. Ignored or refused for non DC-POS capable PTs.	PIN based transaction
0100 xxxx	Payment according to PTs decision excluding GeldKarte		
0101 xxxx	Payment according to PTs decision including GeldKarte		

Table 4: Definition of <payment-type>

Notes:

- If the payment-type is not specifically defined, for example payment-type = ‘0100xxxx’, the PT selects the payment-type itself. For a girocard, selection of “GeldKarte” is only possible via pre-selection of the payment-type.
- If the payment-type selected by the ECR is inhibited in the PT, the PT either responds with an error-message in the Status-Information or ignores the payment-type.
- If fields 23 or 24 (= track-data) or 0E and 22 (= manual card-data) are contained in the data for command Authorisation, it is attempted to complete the payment using this data without requesting further insertion of the card.

The PT answers immediately with:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.2.2 Read Card

If the ECR has not sent any card data (track data or manually entered data) then the PT waits for a card from the customer. The PT ascertains whether chip or magnet-stripe shall be used for the payment, depending on possible pre-determined payment-type, the card-type, the limits in PT and the merchant procedure-selection whether chip or magnet-stripe shall be used for the payment.

- For swipe-reader:
  The magnet-stripe is read during swiping of the card. Reading of the chip is not possible.
- For chip-reader:
  The chip is read after inserting the card. Reading of the magnet-stripe is not possible.
- For manual-insertion reader with hybrid-reader function:
  If the customer inserts the card in the reader, the PT locks the card (depending on the reader-type). If the PT determines that the payment will be carried out using magnet-stripe, the PT releases the card immediately to allow the magnet-stripe to be read during removal.
  - For chip-transactions the card remains locked for the whole transaction.
  - For PTs with manual-insertion readers without locking-function the customer take care that the card is not removed too early from the card-reader.
- For motor-insertion reader:
  The PT reads chip and magnet-stripe and makes the technology selection (chip or magnet) according to the pre-determined payment-type and / or the limits set in the PT. The card remains in the card-reader.

2.2.3 Transaction

After reading the card-data, or manual card-data input, the PT begins with the payment. If necessary the PT connects online to the host. This takes place, depending on the configuration of the PT and ECR, either via the communications-module of the PT or via a communications-module connected to the ECR (see chapter Transmit Data via Dial-Up (06 D9) and chapter Receive Data via Dial-Up (06 DA)).

2.2.4 Intermediate Status-Information

If the ECR requested **Intermediate Status-Information** during **Registration**, the PT regularly sends intermediate status to the ECR while processing the transaction.

2.2.5 Release Card

If the card is still in the card-reader, the PT releases it.

2.2.6 Status-Information

The PT responds after the payment procedure with the **Status-Information**. An additional **Status-Information** may be sent after the final completion of the transaction (e.g. GeldKarte, girogo) to return final transaction data:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0F	xx	[27<result-code>] [<transaction-data>] [06<TLV-container>]

Data block:

- For <result-code> and <transaction-data> see chapter Status-Information after Authorisation, Reversal, Pre-Authorisation/Reservation, DCC or Prepaid-Top-Up.
  For result-code decimal 55 “PIN incorrect” the PT can repeat the prompt for PIN, depending on the payment-type, and re-start the payment. In this case the PT sends the commands for Intermediate Status-Information, Dial-Up, Print and Status-Information once again. Alternatively the PT can also abort the payment with an error-code.
- 06<TLV-container>: see chapter Status-Information (04 0F).

Issue of goods / filling
If the ECR is an automatic vending-machine it starts the issue of goods or enables filling after receiving <result-code> = ‘00’.

Response to Status-Information
The ECR answers after the issue of goods, after start of filling (for **Pre-Authorisation**) or if it is a “normal” ECR immediately with:

d) ECR response following successful issue of goods (for vending machines), start of filling (for **Pre-Authorisation**) or if not supported, no issue of goods is carried-out (ECRs):

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Alternative:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	00	00	

Both ECR responses have the same meaning: issue of goods succeeded or filling started.

b) ECR response, if issue of goods cannot be completed within the timeout sent as part of the command **Authorisation** (see parameters for request Authorization (06 01)) or if the customer has not yet begun filling:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	9C	00	

The response **84-9C-00** implies that the PT shall send the **Status-Information** again after a wait-time of 2 seconds because the ECR has not yet completed the issue of goods.

c) ECR response for unsuccessful issue of goods or for filling not yet started:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	yy (any value, excepting 00 and 9C)	xx	xx

The response **84-yy-xx-xx** with 'yy' as any value (except '00' or '9C') implies that the issue of goods was not successful or filling was not yet started. In this case the PT reverses the payment.

Notes:
- If the ECR sends 84-9C-00 so often, that <max. status-infos> (see parameters for request Authorization (06 01)) is exceeded (= <max. status infos> + 1), the PT reverses the payment and afterwards sends a Status-Information with error-**message 04-0F-03-27-6C**.
- If no response from the ECR is received within **<timeout>** (see parameters for request Authorization (06 01)), then the PT reverses the payment.

Example of <max. status-infos>:
For this example a parameter '3' is passed. The ECR may respond to the **Status-Information** up to three times with "84-9C-00". The issue of goods must be successful (the ECR response to **Status-Information** is then "80-00-00" or "84-00-00") on the fourth **Status-Information** (= <max. status-infos> + 1). However, if the ECR responds to the fourth request with "84-9C-00", then the PT carries out a **Reversal** and afterwards sends the **Status-Information** 04-0F-02-27-6C.

d) ECR response for partial issue of goods:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	9D	7	04<amount>

If only a partial issue of goods was possible the ECR responds with APRC 9D and sends the price of the issued goods back in the data block.
Caution: Due to an erroneous receipt printout in case of a partial issue of goods, an auto reversal on the total amount is not reasonable and must not be processed!

2.2.7 Receipt-Printout

Subsequently the receipt printout takes place – also for failed Authorisations. If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using "Print Line"-Commands (see chapter Print line (06 D1)) or Print Textblock-Commands (06 D3).

There is no receipt printout for a successful pre-authorisation (instead it is done during Partial-Reversal after filling) – otherwise the receipt printout is only carried out here if pre-authorisation is unsuccessful.

2.2.8 Store Transaction in PT

The final storage of the transaction in the PT may only be carried out following the acknowledgement from the ECR! If the ECR sends no acknowledgement or a transmission-error occurs which cannot be solved by repeated sending of Status-Information, the PT must execute an Auto-Reversal. The definitive acknowledgement from the ECR for storage of the transaction is either the response to the Status-Information (if the ECR generates the Receipt itself and the PT therefore sends no receipt) or otherwise the response to the Status-Information AND the responses to all Print line or Print Text-Block commands and not the response to Intermediate Status-Information from card-removal.

If the ECR does not send a response or the PT does not receive the response, then the PT executes an Auto-Reversal, possibly requiring an additional Dial-Up. The Auto-Reversal itself carried out only after the card has been removed.

Afterwards, Auto-Reversal is no longer possible.

2.2.9 Completion

If transaction and issue of goods were successful, (or filling was started) the PT sends command **Completion** whereupon the ECR is given back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

The ECR closes with Completion.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

If transaction and/or issue of goods failed (or filling was not started), the PT sends command **Abort** whereupon the ECR is given back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
06	1E	xx	<result-code> [<CC>] [06<TLV-container>]

Data block:

- The possible result-codes are described in chapter Error-Messages.
- The currency code of the PT is only sent with result-code 6F. The PT only sends a currency code to the ECR, if the ECR had also sent a currency code in its request.
- 06<TLV-container>: Possible tags are 1F16, 1F17.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

As soon as the PTs Status-Information is acknowledged by the ECR the payment is successfully completed. Even if an error occurs during command **Completion**, the payment is judged to be successful and not to be reversed. If in doubt the ECR can attempt to resynchronise using the command **Repeat-Receipt**. A reversal only takes place if the ECR does not acknowledge the Status-Information.

2.3 Account Balance Request (06 03)

This command starts an Account Balance Request on the PT, e.g. for bonus-points. The credit is reported to the ECR in the Status-Information.

Caution:
If the receipt printout shall be carried out by the ECR, this may only send the command to the PT if the ECR printer is ready and enough paper for the receipt is available.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	03	xx	[22<card-number>] [0E<expiry-date>] [2D<track 1 data>] [23<track 2 data>] [24<track 3 data>] [06<TLV-container>]

Data block:

- 22<card-number>: see chapter Authorization (06 01)
- 0E<expiry-date>: see chapter Authorization (06 01)
- 2D<track 1 data>: see chapter Authorization (06 01)
- 23<track 2 data>: see chapter Authorization (06 01)
- 24<track 3 data>: see chapter Authorization (06 01)
- 06<TLV-container>: Possible Tags are E1 (for C1 value ‘4D 55’ is possible), 63 (with Tags 84 and 85) and 1F5B.
- All further data will be ignored by the PT.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

The further sequence of events is – apart from checking the issue of goods or filling – identical to Authorization (06 01).

2.4 Activate Card (06 04)

This command activates a card. Depending on the card-type, the activation may take place on a host system or offline and details are out of the scope of the ECR-Interface document.

Caution:
If the receipt printout shall be carried out by the ECR, this may only send the command to the PT if the ECR printer is ready and enough paper for the receipt is available.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	04	xx	[04<amount>] [49<CC>] [2D<track 1 data>] [0E<expiry-date>] [22<card-number>] [23<track 2 data>] [24<track 3 data>] [3A<CVV/CVC>] [06<TLV-container>]

Data block:
- 04<amount>: If included the PT may execute a top-up function if necessary. Otherwise top-up is handled via command Refund.
- 06<TLV-container>: Possible tags are 15, 20, 41, 43, E1, 1F04, 1F05, 1F5B.
- All other data will be ignored by the PT.

The further sequence of events is – apart from checking the issue of goods – identical to the Authorization (06 01).

2.5 Procurement (06 05)

This command initiates a money procurement transaction in order to top-up e.g. a GeldKarte.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	05	xx	04<amount>] [49<CC>] [19<payment-type>] [2D<track 1 data>] [0E<expiry-date>] [22<card-number>] [23<track 2 data>] [24<track 3 data>] [01<timeout>] [02<max. status infos>] [3A<CVV/CVC>] [3C<additional-data>] [8A<card type>] [06<TLV-container>]

Data block:
- See chapter Authorization (06 01).

For further sequence of events for the transaction see Authorization (06 01).

2.6 Book Tip (06 0C)

This command initiates a tip-booking.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0C	xx	04<amount> 87<receipt-no> [49<CC>] [19<payment-type>] [2D<track 1 data>] [0E<expiry-date>] [22<card-number>] [23<track 2 data>] [24<track 3 data>] [3B<AID>] [06<TLV-container>]

Data block:
- 04<amount>: Tip amount.
- 87<receipt-no>: See chapter Status-Information (04 0F).
- 3B<AID>: Must be sent for telephonic tip booking. See Status-Information (04 0F).
- Remaining bitmaps see Authorization (06 01).
- All other data will be ignored by the PT.

For further sequence of events for the transaction see Authorization (06 01).

2.7 Telephonic Authorisation (06 21)

This command initiates a telephonic authorisation and transmits the amount from the ECR to PT. The authorization number is either sent by the ECR, otherwise it is requested during the payment procedure on the PT.

The result of the payment procedure is reported to the ECR after Completion of the booking procedure.

Telephonic Authorisation is only possible with credit-cards.

Caution:
If the receipt printout shall be carried out by the ECR, this may only send the command to the PT if the ECR printer is ready and enough paper for the receipt is available.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	21	xx	<password> 04<amount> [49<CC>] [19<payment-type>] [2D<track 1 data>] [0E<expiry-date>] [22<card-number>] [23<track 2 data>] [24<track 3 data>] [01<timeout>] [02<max. status infos>] [05<pump no.>] [3C<additional-data>] [3B<AID>] [3A<CVV/CVC>] [8A<card type>][06<TLV-container>]

Data block:
- 3B<AID>: See chapter Status-Information (04 0F).
- 3C<additional-data>: See chapter Additional Data.
- 06<TLV-container>: Possible tags are 20, 41, 43, E1, E8, 1F15, 1F5B.
- Remaining bitmaps see Authorization (06 01).
- For cards which can not identified by the BIN, like CUP, the card type has to be sent with the command. Therefor the BMP 8A or TLV tag 41 is used.

For further sequence of events for the transaction see chapter Authorisation (06 01).

2.8 Pre-Authorisation / Reservation (06 22)

Using the command Pre-Authorisation/Reservation the ECR can request the PT to reserve a certain payment-amount for the sales-process. This is particularly necessary when the final payment-amount is only established after the authorisation (e.g. service-stations, hotels). In this case the ECR firstly reserves an amount (= maximal Possible payment-amount) and then, after the sales-process, releases the unused amount via a Partial-Reversal of a Pre-Authorisation / Booking of a Reservation (06 23) or Book Total (06 24).

Caution:
If the receipt printout shall be carried out by the ECR, this may only send the command to the PT if the ECR printer is ready and enough paper for the receipt is available.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	22	xx	[04<amount>] [49<CC>] [19<payment-type>] [0E<expiry-date>] [22<card-number>] [2D<track 1 data>] [23<track 2 data>] [24<track 3 data>] [01<timeout>] [02<max. status infos>] [05<pump no.>] [0B<trace-number>] [3B<AID>] [3C<additional-data>] [8A<card type>] [06<TLV-container>]

Data block:

- 04<amount>: If not sent, then the PT uses the default amount stored as pre-authorisation amount for that particular card-type.
- 06<TLV-container>: Possible tags are 15, 20, 41, 43, E1, E8, 1F06, 1F15, 1F2B, 1F5B.
- 0B<trace-number>: See Status-Information (04 0F).
  - For telephonic extensions BMP 0B or TLV tag 1F2B are optional.
- 3B<AID>: See Status-Information (04 0F). Must be sent for a reservation extension, a telephonic reservation or a telephonic extension. See tag 1F06.
- 3C<additional-data>: Depending on the ECR-system and application different additional-data can be transmitted. See chapter Additional Data.
- If the reservation type is not explicitly specified by tag 1F06 a reservation extension is assumed in case of a provided trace-number (specificed by 0B<trace-number> or by tag 1F2B) and a primary reservation is assumed in the absence of a trace-number.
- For cards which can not identified by the BIN, like CUP, the card type has to be sent with the command. Therefor the BMP 8A or TLV tag 41 is used.
- Remaining bitmaps see Authorization (06 01).
- All other data will be ignored by the PT.

For further sequence of events for the transaction see Authorization (06 01).

2.9 Reversal (06 30)

This command reverses a payment-procedure and transfers the receipt-number of the transaction to be reversed from the ECR to PT. The result of the reversal-process is sent to the ECR after Completion of the booking-process.

Caution:
If the receipt printout shall be carried out by the ECR, this may only send the command to the PT if the ECR printer is ready and enough paper for the receipt is available.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	30	xx	<password> 87<receipt-no> [04<amount>] [49<CC>] [19<payment-type>] [2D<track 1 data>] [0E<expiry-date>] [22<card-number>] [23<track 2 data>] [24<track 3 data>] [3C<additional-data>] [06<TLV-container>]

Data block:
- All other data will be ignored by the PT.

The reversal is only carried-out if a payment with the supplied receipt-number is found in the turnover-storage and amount (optional) as well as card-data (optional) match that payment.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

The further sequence of events is – apart from checking the issue of goods or filling – identical to the Authorization (06 01).

2.10 Partial-Reversal of a Pre-Authorisation / Booking of a Reservation (06 23)

This command executes a Partial-Reversal for a Pre-Authorisation to release the unused amount of the reservation. This command is also used for the Booking of a Reservation.

Caution:
If the receipt printout shall be carried out by the ECR, this may only send the command to the PT if the ECR printer is ready and enough paper for the receipt is available.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	23	xx	[87<receipt-no>] [04<amount>] [49<CC>] [3C<additional-data>] [0B<trace-number>] [3B<AID>] [06<TLV-container>]

Data block:
- 87<receipt-no>: Is only sent for Partial-Reversal.
- 04<amount>: Unused partial-amount of the pre-authorised transaction. Default is 0.
- 3C<additional-data>: See chapter Additional Data.
- 06<TLV-container>: Possible tags are 1F06, 1F2B (see also chapter Pre-Authorisation / Reservation (06 22)).
- 0B<trace-number>: See chapter Status-Information (04 0F).

- BMP 0B or TLV tag 1F2B must be sent for a reservation booking or reservation extension or partial reversal.
- For telephonic extensions the BMP 0B or TLV-Tag 1F2B are optional.

- 3B<AID>: See chapter Status-Information (04 0F). BMP 3B must be sent for a reservation booking or reservation extension or for a telephonic reservation booking or telephonic reservation extension. See tag 1F06.
- All other data will be ignored by the PT.

The Partial-Reversal is only carried-out if a Pre-Authorisation with the passed receipt number is found in the turnover-records.

The further sequence of events is identical to the Reversal (06 30).

2.10.1 Enquire if Pre-Authorisations exist (06 23)

With this command the ECR checks whether the PT contains Pre-Authorisations without an associated Partial-Reversal / Book Total.

Caution:
This is special-case of the command Partial-Reversal of a Pre-Authorisation / Booking of a Reservation (06 23). Also valid for credit-cards and fleet-cards for which typically Book Total (06 24) instead Partial-Reversal of a Pre-Authorisation / Booking of a Reservation (06 23) is executed.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	23	03	87 FF FF

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

The PT terminates the process with:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	04xx	B8 [87<receipt-no>] [06<TLV-container>]

Data block:
- B8 is the error-code decimal 184.
- 87<receipt-no>: States the receipt-number of the first pre-authorisation not yet reversed. If no pre-authorisations exist in the PT, <receipt-no> is set to 'FFFF'.
- 06<TLV-container>: Possible tags are 23.
  - Instead of a single receipt-number the PT can also transmit a receipt-number list as a TLV-container. However, for this the ECR must have sent a BMP 06 in the triggering command or in the registration.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.11 Reversal of external transaction (Reservation) (06 26)

This command reverses a reservation or reservation extension previously executed on same or another terminal providing all necessary (mandatory) parameter to the payment device. Command is to be distinguished from generic reversal (06 30) by mandatory presence of trace-number, amount, currency and authorization number (AID) bitmap. The type of the reservation is to be provided in the TLV Container, Tag 0x1F06. Allowed values are 2 (Reservation) or 3 (Extension of Reservation). All other settings are rejected.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	26	xx	04<amount> 49<CC> 0B<trace-number> 3B<AID> [0E<expiry-date>] [22<card-number>] [23<track 2 data>] 06<TLV-container>

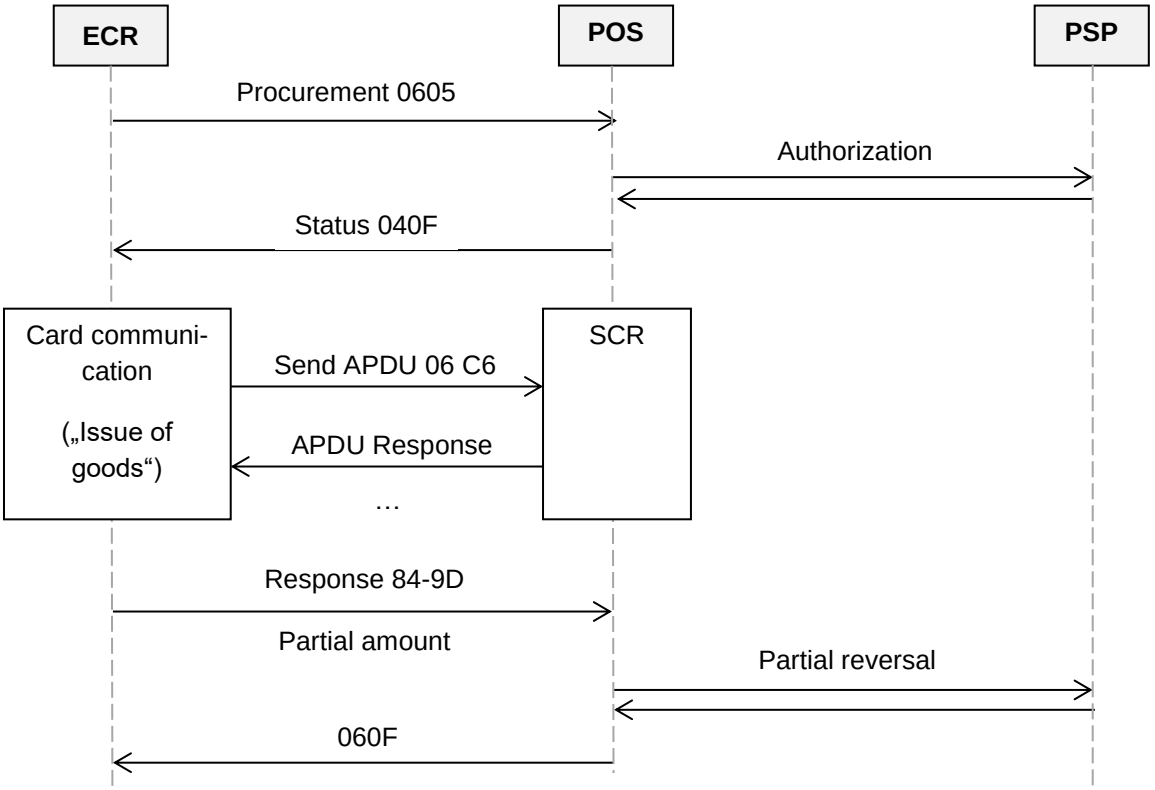
For Response and further execution, see generic reversal description Reversal (06 30).

2.12 Partial Reversal with transparent APDU mode

This chapter describes the process of partial reversal in combination with the transparent APDU mode.
The figure below shows the communication between ECR, POS and the PSP.

When using the partial reversal with transparent APDU mode the following conditions should be respected.

- Partial reversal with APDU mode can only be used in combination with the procurement command (06 05). When using the procurement command, the card will be locked in the reader after processing the authorization. It is not possible to change the card in this sequence.
- When the vending machine is processing card communication (“Issueing of goods”) it is possible to send several APDU commands (Send APDU 06 C6).



2.13 Book Total (06 24)

This command executes booking of the total amount for a Pre-Authorisation / Reservation (06 22). The portion of the amount from the Pre-Authorisation / Reservation (06 22) that was used up is booked.

Difference between Partial-Reversal and Book Total:

- Partial-Reversal transmits the unused amount, whilst Book Total transmits the used amount.

Caution:
If the receipt printout shall be carried out by the ECR, this may only send the command to the PT if the ECR printer is ready and enough paper for the receipt is available.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	24	xx	87<receipt-no> [04<amount>] [49<CC>] [19<payment-type>] [3C<addi-tional-data>] [0B<trace-number>] [3B<AID>] [8A<card type>] [06<TLV-container>]

Data block:

- 06<TLV-container>: Possible tags are 15, 41, 1F06 (see also Pre-Authorisation / Reservation (06 22)).
- 0B<trace-number>: See Status-Information (04 0F).

- BMP 0B or TLV tag 1F2B must be sent for a reservation booking or reservation extension or partial reversal.
- For telephonic extensions the BMP 0B or TLV-Tag 1F2B is optional.

- 3B<AID>: See Status-Information (04 0F). BMP 3B must be sent for a reservation booking or reservation extension or for a telephonic reservation booking or telephonic reservation extension. See tag 1F06.
- For cards which can not identified by the BIN, like CUP, the card type has to be sent with the command. Therefor the BMP 8A or TLV tag 41 is used.

The further sequence of events is identical to the Partial-Reversal of a Pre-Authorisation / Booking of a Reservation (06 23).

2.14 Pre-Authorisation Reversal (06 25)

This command executes a reversal of a Pre-Authorisation in the case of a null-filling.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	25	xx	87<receipt-no> [04<amount>] [49<CC>] [19<payment-type>] [06<TLV-container>]

The further sequence of events is – apart from checking the issue of goods or filling – identical to the Partial-Reversal of a Pre-Authorisation / Booking of a Reservation (06 23).

Note:
The command Pre-Authorisation Reversal cannot be carried out with ec-cash and Maestro cards. For these cards types an Auto-Reversal is executed instead.

2.15 Refund (06 31)

This command starts a Refund on the PT. The result of the Refund is reported to the ECR after completion of the booking-process.

Caution:
If the receipt printout shall be carried out by the ECR, this may only send the command to the PT if the ECR printer is ready and enough paper for the receipt is available.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	31	xx	<password> [04<amount>] [49<CC>] [19<payment-type>] [2D<track 1 data>] [0E<expiry-date>] [22<card-number>] [23<track 2 data>] [24<track 3 data>] [3B<AID>] [3C<additional-data>] [8A<card type>] [06<TLV-container>]

Data block:

- 04<amount>: For bonus-transactions the amount is optional. In this case the tag E1 with subtag C2 can be sent instead of the amount.
- 3B<AID>: Is used in refunds after an encashing transaction of bonus-points, using the BMP 3B from the Status-Information (04 0F) of this transaction.
- 06<TLV-container>: Possible tags are 15, 20, 30, 41, 43, E1 (for C1 values '47 4C' and '4D 57' possible), E8.
- For cards which can not identified by the BIN, like CUP, the card type has to be sent with the command. Therefore the BMP 8A or TLV tag 41 is used.
- Remaining bitmaps see Authorization (06 01).
- All other data will be ignored by the PT.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

The further sequence of events is identical to the Authorization (06 01).

2.16 End-of-Day (06 50)

With this command the ECR induces the PT to transfer the stored turnover to the host.

Caution:
If the receipt printout shall be carried out by the ECR, this may only send the command to the PT if the ECR printer is ready and enough paper for the receipt is available.

2.16.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	50	03	<password> [06<TLV-container>]

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.16.2 Transaction:

Following the response the PT begins with the transaction.
For this purpose the PT makes an online-connection to the host. This takes place – depending on configuration of the PT and ECR – either over a communication module in the PT or over a communication module connected to the ECR (see chapter Transmit Data via Dial-Up (06 D9) and chapter Receive Data via Dial-Up (06 DA)).

2.16.3 Intermediate Status-Information

If the ECR requested Intermediate Status-Information during Registration, the PT regularly sends Intermediate Status to the ECR during preparation of the turnover records in order to re-start the timeouts.
Only during the actual data-transfer is no Intermediate Status transmitted.

2.16.4 Status-Information

The PT responds following successful End-of-Day with the **Status-Information after End-Of-Day / Send Turnover Totals**:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0F	xx	[27<result-code>] [<transaction-data>]

Data block:
- 27<result-code>: 1 byte. See chapter Error-Messages.
- <transaction-data>: See chapter Status-Information (04 0F).

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Following the Status-Information, if the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line“ Commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block“ Command (see chapter Print line (06 D3)).

2.16.5 Receipt-Printout

After the transaction the Receipt-Printout takes place. If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line“ commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block“ command (see chapter Print line (06 D3)).

2.16.6 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort**:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<error-code>

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.17 Diagnosis (06 70)

With this command the ECR forces the PT to send a diagnostic message to the host.

2.17.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	70	xx	[06<TLV-container>]

Data block:

- 06<TLV-container>: Possible tags are 1B.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.17.2 Transaction:

Following the response the PT starts the transaction.

For this purpose the PT makes an online-connection to the host. This takes place – depending on configuration of the PT and ECR – either over a communication module in the PT or over a communication module connected to the ECR (see chapter Transmit Data via Dial-Up (06 D9) and chapter Receive Data via Dial-Up (06 DA)).

2.17.3 Intermediate Status-Information

If the ECR requested Intermediate Status-Information during Registration, the PT regularly sends Intermediate Status to the ECR during preparation of the turnover records in order to re-start the timeout.
Only during the actual data-transfer is no Intermediate Status transmitted.

2.17.4 Transmit Date

If the transaction was successful the PT transmits system-date received from the host on to the ECR (see chapter Set Date and Time in ECR (04 01)).

2.17.5 Receipt-Printout

After the transaction the Receipt-Printout takes place. If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line“ Commands (see chapter Print line (06 D1)) or Print Textblock-Commands (06 D3).

2.17.6 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort**:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

- <result-code>: 1byte, definded in chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.18 Initialisation (06 93)

With this command the ECR forces the PT to send a initialisation message to the host.

2.18.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	93	03	<password>

Data block:

- <password>: See chapter Password.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.18.2 Transaction:

Following the response the PT begins with the transaction.
For this purpose the PT makes an online-connection to the host. This takes place – depending on configuration of the PT and ECR – either over a communication module in the PT or over a communication module connected to the ECR (see chapter Transmit Data via Dial-Up (06 D9) and chapter Receive Data via Dial-Up (06 DA)).

2.18.3 Intermediate Status-Information

If the ECR requested Intermediate Status-Information during Registration, the PT regularly sends Intermediate Status to the ECR during the transaction in order to re-start the timeouts.
Only during the actual data-transfer is no Intermediate Status transmitted.

2.18.4 Receipt-Printout

After the transaction the Receipt-Printout takes place. If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line“ commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block“ command (see chapter Print line (06 D3)).

2.18.5 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the "master-rights":

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort**:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:<Result-code>:

- 1 byte, defined in chapter Error-Messages

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.19 Reprint Receipts (06 12)

This command serves to print payment-receipts over a certain receipt-number range.

2.19.1 Start

ECR → PT

APDU			
Control field		Length	Data block
CLASS	INSTR		
06	12	xx	<password> <from> [<to>]

Data block:

- <password>: See chapter Password.
- <from>: 2 byte, BCD. Receipt number the printing should start from.
- <to>: 2 byte, BCD. Receipt number the printing should end at (including this receipt). If omitted the PT only prints the receipt given in <from> (i.e. <from> = <to>).

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.19.2 Receipt-Printout

If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line“ Commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block“ Command (see chapter Print line (06 D3)).

2.19.3 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.20 Repeat Receipt (06 20)

This command serves to repeat printing of the last stored payment-receipts or End-of-Day-receipt.

2.20.1 Start

ECR → PT

APDU			
Control field		Length	Data block
CLASS	INSTR		
06	20	03	<password> [03<service-byte>][06<TLV-container>]

Data block:

- <password>: See chapter Password.
- 03<service-byte>: Bit-field, 1 byte; default = '00'. See Table 5: Definition of <service-byte>.
- 06<TLV-container>: Possible tags are 1F01, 1F02, 1F03.

Service-byte	Definition
xxxx xxx1	1: ECR requires Status-Information (as in the original transaction) 0: Do not send Status-Information
xxxx xx1x	1: No print receipt (neither Print line commands sent from PT nor printed on PT itself) 0: Print receipt (either Print line commands sent from PT or printed on PT itself)
Rest	RFU

Table 5: Definition of <service-byte>

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.20.2 Status-Information

Depending on the service-byte the PT sends the Status-Information of the last transaction executed. This ensures that the ECR can resynchronise in case of an inconclusive ending of a transaction.

2.20.3 Receipt-Printout

If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line" Commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block" Command (see chapter Print line (06 D3)). Alternatively the PT prints the receipt on its own printer.

2.20.4 Completion

Subsequently the PT terminates the process via Completion whereupon the ECR receives back the "master-rights":

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT

APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.21 Read Card (06 C0)

With this command the PT reads a chip-card/magnet-card and transmits the card-data to the ECR.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	C0	xx	[<timeout>[19<card-type>][FC<dialog-control>][06<TLV-container>]]

Data block:

- <timeout>: 1 byte. The time in seconds the PT waits for the card. <timeout> = '00' means infinite. If <timeout> is omitted the default-value of the PT is used. This timeout overrides the T3 timeout.
- 19<card-type>: 1 byte. If <card-type> and TLV tag 1F60 are omitted the magnet-stripe will be read. For a motor-insertion reader both chip and magnet-stripe are read. See Table 6: Definition of <card-type>.
- If <card-type> is provided then <timeout> must also be provided.
- FC<dialog-control>: Bit-field, 1 byte. See Table 7: Definition of <dialog-control>.
- 06<TLV-container>: Possible tags are 1F15, 1F60 (overrides field 19), 1F6B.

card-type	Definition
0001 xxxx	chip card
0010 xxxx	chip card
0101 xxxx	chip-card and magnet-card
all others	magnet-card

Table 6: Definition of <card-type> (only for non-motor-insertion reader relevant)

dialog-control	Definition
xxxx xxx1	PT controls display prompts for insertion and removal of the card (default).
xxxx xxx0	ECR controls display prompts for insertion and removal of the card. That means the PT does not display its own text for command Read Card, therefore the ECR must send its own text via command text to the PT.
all others	RFU

Table 7: Definition of <dialog-control>

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Flow for manual-insertion reader:

- If chip is to be read:
  The card remains in the card-reader after reading the chip. If the card has no chip the PT can release the card and read the magnet-stripe.
- If magnet-stripe is to be read:
  After card-insertion the PT requests the customer to remove the card, whereby the PT reads magnet-stripe.
- If chip and magnet-stripe are to be read:
  If the card has a chip and the magnet-stripe was already read during insertion, the PT shall also send the magnet-stripe data to the ECR. The card remains in the reader.

Flow for motor-insertion reader:
After card-insertion the PT reads chip and magnet-stripe.

If the ECR requested **Intermediate-Status** from the PT during registration, these commands are sent between PT and ECR. See Intermediate Status Information (04 FF).

The PT responds after the read-process with the **Status-Information** transferring the card-data. Thereby an implicit master-rights change to the ECR takes place, i.e. there is no Completion command. A full description can be found in Status-Information (04 0F).

Note:
Using the command **Abort** the ECR can release a retained card from the PT without waiting for a release via timeout.

Caution:
A protocol-conflict can occur if the ECR sends an **Abort** command during transmission of the card-data from the PT. Example: Another customer inserts a card whilst **Partial-Reversal** after a completed Filling-process is taking place.

If the ECR sends an Abort command to the PT whilst the PT is also transmitting data to the ECR (e.g. because a Partial-Reversal has to be executed), both commands (from ECR and PT) result in an error since the required responses from the partner are not correctly answered – at transport-protocol level each partner must send an ACK, and at application-protocol level a 80-00-00, but instead only one command is sent.
This results in both messages being repeated twice (which causes further collisions), and the PT falls-back into its basic-state. Therewith is the ECR master again and can repeat the Abort command (to release the card), which the PT will then execute correctly.

For new implementations the ECR should not send the command Read-Card with infinite timeout, but rather should use command Status-Readout until a card is inserted. Following this the card can be read.

2.22 Activate Card-Reader (08 50)

With this command the ECR can activate the insertion-mechanism of a motor-insertion on the PT. Only after sending this commands is it possible to insert a card in motor-insertion reader.

ECR → PT

APDU			
Control field		Length	Data block
CLASS	INSTR		
08	50	xx	[FA<card-reader-activation>]

The PT responds after successful activation with:

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

On unsuccessful activation the PT sends:

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	xx	00	

xx = corresponding error-code. See chapter Error-Messages.

Following the 80-00-00, the PT sends no Completion command.

2.23 Abort (06 B0)

With this command the ECR can instruct the PT to abort execution of a command. Additionally, a card which remained in the PT after a Read-Card command will be released or extracted using this command.

The Abort command may only be sent from the ECR when the ECR is the master, or when the command explicitly allows that the ECR can send an Abort command (e.g. in command “Read Card” or the text-display commands).

Depending on the implementation of the PT, transaction steps and other actions within the PT may be aborted if pre-defined states have not been reached.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	B0	xx	[D2<card-output-direction>][FA<card-reader-activation>]

Data block:

- FA<card-reader-activation>: This option can be used to optimize the number of ZVT commands by omitting the Activate Card-Reader (08 50) command after the Abort (06 B0) command.

For motor-readers which can park the card in a second position, the Abort command without parameter <card-output-direction>, or with <card-output-direction> not equal to 02 results in the card in the reading-area being rejected and the parked card being transported to the reading-area.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

If a card-revision error occurs, the PT responds with:

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	<result-code>	00	

.The <result-code> is defined in chapter Error-Messages

2.24 Log-Off (06 02)

The command **Log-Off** has the following consequences:

- the PT resets the **Registration** config-byte to '86'
- the PT may not send any more TLV-containers

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	02	00	

The PT always responds with:

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.25 Set Date and Time in PT (06 91)

With this command the ECR can set the system-time in the PT.

2.25.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	91	0B	<password> AA<date> 0C<time>

Data block:

- <password>: See chapter Password.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.25.2 Completion

After setting the new system-time the PT sends a **Completion** command:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.26 Display Text (06 E0)

With this command the ECR can cause the PT to display a certain text on the PT-display.

This command can be terminated prematurely using the command Abort (06 B0).

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	E0	xx	[F0<display-duration>] [F1<text line 1>] [F2<text line 2>] [F3<text line 3>] [F4<text line 4>] [F5<text line 5>] [F6<text line 6>] [F7<text line 7>] [F8<text line 8>] [F9<beep-tones>] [FD<display-device>]

Data block:
- F0<display-duration>: The display duration overrides the T3 timeout.
- Text encoding: 7-bit ASCII ZVT-Characterset, e.g. F0 F3 01 23 45 (F0 F3 means 3 byte length, followed by the ASCII-Codes). Character codes > 127 are displayed according to the 8-bit ZVT-Characterset (CP437, OEM-US)
- Note: The encoding of the display text in BMP F1-F8 must match to current character set of the PT that can be configured by ECR with tag 14 in Registration command.
- Switch to larger font: each line can be individually switched to a larger font (height +width) via a pre-fix control-character '14' (ASCII-Code). This reduces the number of lines it is possible to display and also the number of characters per line.
  Each line can be controlled individually. On each line only one font-type can be used.
- The bitmaps are optional.
- The illustrated order is variable.

Notes:
- Omitted text-lines are displayed empty.
- If all text-lines are omitted the display is left off.
- If the ECR sends a new Display-text command or another command which influences the PT display, the PT displays the new text immediately, before the display-duration of the initial command has expired.
- If the ECR sends a command which does not influence the PT display, the PT displays the original text until the display-duration of the initial command has expired.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

A **Completion** command is not sent

2.27 Display Text (old version) (06 85)

With this command the ECR can cause the PT to display a certain text on the PT-display.
Following an optional timeout, a further text can be displayed.

Caution:
This command is included to retain downwards-compatibility, for new implementations use Display Text (06 E0)!

This command can be terminated prematurely using the command Abort (06 B0).

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	85	xx	<display-data>

Data block:
- <display-data>:consists of a number of fields, the fields are not prefixed with a bitmap

Definition of the fields <display-data>:

Definition
text 1, length variable
display-duration in seconds, optional, 1 byte (binary, **not** BCD packed), ‚00' means infinite. default-value: ‚05' = 5 seconds, if text 2 is supplied then field display-duration is mandatory
text 2, optional, length variable

- Format of the text-field: <position><text><00>, the text must always be terminated with binary '00'. <position> (BCD encoded) is the start-position on the display, '00' is the first line (from top) left edge; on reaching the right edge a line is automatically wrapped. For 20 characters per line is '20' the left edge of the second line etc.
  The maximum displayable number of characters = max. number of characters per line * max. number of lines, additional characters will not be displayed.
  Text encoding: 7-bit ASCII with umlauts. If the ms-bit of a character is set, this generates a beep-tone, alternatively the character BEL (= '07') can be sent.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

A Completion command is not sent.

2.28 Display Text with Function-Key Input (06 E1)

With this command the ECR can cause the PT to display a certain text on the PT-display and then to wait for a function-key to be pressed. The code for the function-key is returned to the ECR.

This command can be terminated prematurely using the command Abort (06 B0).

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	E1	xx	<display-data> [06<TLV-container>]

Data block:

- <display-data>: See chapter Display Text (06 E0).
- If the ECR sends a new command for which no display on the PT is required then the PT displays this display-text until the end of the display-duration.
- 06<TLV-container>: Possible tags are 1F18.
  - If tag 1F18 equals to 1 or bitmap F9 in the <display data> equals to 'FF' the PT responds to card inserts also.

Text encoding:

- 7-bit ASCII ZVT-Characterset, e.g. F0 F3 01 23 45 (F0 F3 means 3 byte length, followed by the ASCII-Codes). Character codes > 127 are displayed according to the 8-bit ZVT-Characterset (CP437, OEM-US)
- Note: The encoding of the display text in BMP F1-F8 must match to current character set of the PT that can be configured by ECR with tag 14 in Registration command.

After key-entry or timeout the PT sends the key-code to the ECR. The timeout has the value of T3, e.g. 5s.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	01	<key-code>

Data block:

- <key-code>: 1 byte.

Definition of the fields <key-code>:

Value	Definition
0D	Acceptance-key <OK>
18	Correction-key <C>
1B	Abort-key <STOP>
46	Function-/Info-key <F>, <Info> or <?>
55	Function-key <Up> <+>
44	Function-key <Down> <->
6C	Timeout
31	Function-key <F1>
32	Function-key <F2>
33	Function-key <F3>
34	Function-key <F4>
DC	Card present

A Completion command is not sent.

2.29 Display Text with Function-Key Input (old version) (06 88)

With this command the ECR can cause the PT to display a certain text on the PT-display and then to wait for a function-key to be pressed. The code for the function-key is returned to the ECR.

Caution:
This command is included to retain downwards-compatibility, for new implementations use Display Text with Function-Key Input (06 E1)!

This command can be terminated prematurely using the command Abort (06 B0).

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		

06	88	xx	<display-data>

Data block:
- <display-data>: See chapter Display Text (old version) (06 85).
- After key-entry or if timeout the display is cleared.
- If the ECR sends a new command for which no display on the PT is required, then the PT displays this display-text until the end the display-duration.

Text encoding
- 7-bit ASCII with umlauts. If the ms-bit of a character is set, this generates a beep-tone, alternatively the character BEL (= '07') can be sent.

After key-entry or timeout the PT sends the key-code to the ECR.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	01	<key-code>

Data block:
- <key-code>: 1 byte.

Definition of the fields <key-code>:

Value	Definition
0D	Acceptance-key <OK>
18	Correction-key <C>
1B	Abort-key <STOP>
46	Function-/Info-key <F>, <Info> or <?>
55	Function-key <Up> <+>
44	Function-key <Down> <->
6C	Timeout
31	Function-key <F1>
32	Function-key <F2>
33	Function-key <F3>
34	Function-key <F4>

A Completion command is not sent.

2.30 Display Text with Numerical Input (06 E2)

With this command the ECR can cause the PT to display a certain text (text1) on the PT-display and then to wait for a numerical-input. The number entered is returned to the ECR. Optionally a second text (text2) may be sent, which is displayed by the PT after input of the first character. If the character is deleted with <C> the PT displays text1 again.

This command can be terminated prematurely using the command Abort (06 B0).

ECR → PT

APDU			
Control field		Length	Data block
CLASS	INSTR		
06	E2	xx	[F0<display-duration>] [F1<text line 1>] [F2<text line 2>] [F3<text line 3>] [F4<text line 4>] [F5<text line 5>] [F6<text line 6>] [F7<text line 7>] [F8<text line 8>] [F9<beep-tones>] [FB<confirmation>] [E0<min. length>] [E1<text2 line 1>] [E2<text2 line 2>] [E3<text2 line 3>] [E4<text2 line 4>] [E5<text2 line 5>] [E6<text2 line 6>] [E7<text2 line 7>] [E8<text2 line 8>] [E9<max. Length>] [EA<echo>] [EB<MAC>] [06<TLV-container>]

Data block:

Data field	Definition
F0	display-duration in seconds, 1 byte (**not** BCD packed), '00' means infinite. default-value: '00'
F1	text1 line 1
F2	text1 line 2
F3	text1 line 3
F4	text1 line 4
F5	text1 line 5
F6	text1 line 6
F7	text1 line 7
F8	text1 line 8
F9	number the beep-tones, 1 byte
FB	confirmation of the input with <OK> required; '00' = no, otherwise yes, 1 byte ; default: yes
E0	min. length of the input; '00' = input not enforced, 1 byte. default-value: '00'
E1	text2 line 1
E2	text2 line 2
E3	text2 line 3
E4	text2 line 4
E5	text2 line 5
E6	text2 line 6
E7	text2 line 7
E8	text2 line 8
E9	Max. length of the input, 1 byte. default-value: 20 decimal
EA	echo the input yes/no; 'FF' = echo on, '00' echo off, otherwise display "*" for each digit; 1 byte. default-value: '01' = „*"
EB	MAC over text 1 and text 2 (BMPs: F1 - F8 and E1 - E8); 8 byte: **mandatory field !**

- 06<TLV-container>: Possible tags are 1F35.
- Text encoding:
- 7-bit ASCII ZVT-Characterset, e.g. F0 F3 01 23 45 (F0 F3 means 3 byte length, followed by the ASCII-Codes). Character codes > 127 are displayed according to the 8-bit ZVT-Characterset (CP437, OEM-US)
- Note: The encoding of the display text in BMP F1-F8 and E1-E8 must match to current character set of the PT that can be configured by ECR with tag 14 in Registration command.
- Switch to larger font: each line can be individually switched to a larger font (height + width) via a pre-fix control-character '14' (ASCII-Code). This reduces the number of lines it is possible to display and also the number of characters per line.
  Each line can be controlled individually. On each line only one font-type can be used.

- The MAC is a safeguard of the display-text to prevent mis-use of the PT for PIN request. The correct value for each text can be obtained from the hotline.
- The bitmaps are optional.
- The illustrated order is variable.
- Text-lines not received are shown empty on the display.
- If all text-lines are missing the display stays off.

Note:
Depending on the PT, the line used for numerical input may not contain text. If so, the PT ignores the corresponding BMP.

Following key-input or if timeout the PT transmits the key-code to the ECR.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	xx	<key-codes>

Data block:
- <key-codes>

Definition of the fields <key-codes>:

Value	Definition
‚xyz‘	ASCII-code of the input in hex-notation
1B	Abort-key <STOP>
46	Function-/Info-key <F>, <Info> or <?>
31	Function-key <F1>
32	Function-key <F2>
33	Function-key <F3>
34	Function-key <F4>
6C	Timeout

A **Completion** command is not sent.

2.31 Display Text with Numerical Input with DUKPT Encryption (06 E7)

With this command the ECR can cause the PT to display a certain text (text1) on the PT-display and then to wait for a numerical-input. The number entered is returned to the ECR encrypted with the DUKPT engine. If this function is called a new DUKPT session key is generated. The terminal can be loaded with a range of 10 different DUKPT engines. The index 0-9 allows the selection.

This command can be terminated prematurely using the command Abort (06 B0).

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		

06	E7	xx	[F0<display-duration>] [F1<text line 1>] [F2<text line 2>] [F3<text line 3>] [F4<text line 4>] [F5<text line 5>] [F6<text line 6>] [F7<text line 7>] [F8<text line 8>] [F9<beep-tones>] [FB<confirmation>] [E0<min. length>] [E1<text2 line 1>] [E2<text2 line 2>] [E3<text2 line 3>] [E4<text2 line 4>] [E5<text2 line 5>] [E6<text2 line 6>] [E7<text2 line 7>] [E8<text2 line 8>] [E9<max. Length>] [EA<echo>] [EB<MAC>] [22<PAN>] [06<TLV-container>]

Data block:
- See chapter Display Text with Numerical Input (06 E2)
- 22<PAN>: optional PAN for card acceptance matching: if this field is provided PIN format ISO 9564-0 is used, otherwise PIN format ISO 9564-1 is used.
- 06<TLV-container>: Possible tags are 1F35, **Fehler! Verweisquelle konnte nicht gefunden werden.**.

Following key-input or if timeout the PT transmits the key-code to the ECR.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	xx	<key-code> 06<TLV-container>

Data block:
- <key-code>: 1 byte.
- 06<TLV-container>: Possible tags are 1F32, 1F75.
  - Tag 1F75 contains PIN block using format ISO 9564-0 if the provided 22<PAN> is checked against a track whitelist or ISO 9564-1 if 22<PAN> is missing.

Definition of the field <key-code>:

00	OK
1B	Abort-key <STOP>
6C	Timeout

A **Completion** command is not sent.

Response from PT for not successful:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	Xx	00	Error-Codes see capter 10

2.32 Display Text with Numerical Input (old version) (06 86)

With this command the ECR can cause the PT to display a certain text (text1) on the PT-display and then to wait for a numerical-input. The number entered is returned to the ECR. Optionally a second text (text2) may be sent, which is displayed by the PT after input of the first character. If the character is deleted with <C> the PT displays text1 again.

Caution:
This command is included to retain downwards-compatibility, for new implementations use Display Text with Numerical Input (06 E2)!

This command can be terminated prematurely using the command Abort (06 B0).

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	86	xx	<display-data>

Data block:

- <display-data>: Consists of several:

Definition
maximum length of the input, length 1 byte
confirmation required, length 1 byte
confirmation-position, length 2 byte (will be ignored)
start-position for echo of the input, length 1 byte (will be ignored)
text 1, length variable
text 2, length variable
MAC over all previous parameters

- Format of the text-field: <position><text><00>, the text must always be terminated with binary '00'. <position> (BCD encoded) is the start-position on the display, ‚00' is the first line (from top) left edge; on reaching the right edge a line is automatically wrapped. For 20 characters per line is '20' the left edge of the second line etc.
  The maximum displayable number of characters = maximum. number of characters per line * maximum number of lines, additional characters will not be displayed.
- Text encoding: 7-bit ASCII with umlauts. If the ms-bit of a character is set, this generates a beep-tone, alternatively the character BEL (= '07') can be sent.
- The MAC is a safeguard of the display-text to prevent mis-use of the PT for PIN request. The correct value for each text can be obtained from the hotline.
- confirmation = '00' means confirmation the input with <OK> not required; other value means confirmation of the input with <OK> required.

Following key-input or if timeout the PT transmits the key-code to the ECR.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	xx	<key-codes>

Definition of the fields <key-codes>:

Value	Definition
‚xyz‘	ASCII-code of the input in hex-notation
1B	abort-key <STOP>
46	Function-/Info-key <F>, <Info> or <?>
31	Function-key <F1>
32	Function-key <F2>
33	Function-key <F3>
34	Function-key <F4>
6C	timeout

Following the input and its confirmation, or abort or if timeout, the display is cleared.

A Completion command is not sent.

2.33 Display Image (06 F0)

With this command the ECR can cause the PT to display a certain image on the PT-display.

This command cannot be terminated prematurely using the command “Abort” (06 B0).

2.33.1 Start

You have to distinguish between the following cases:

- The image fits into one APDU.
- The image is too big for one APDU and has to be chunked.

Each image data chunk is transmitted in a separate command having the same image-id. This ensures data integrity of the transmitted image.

Image data chunks are numbered in ascending order from 0 to <chunk-count>-1, whereby the <chunk-count> is the total number of image data chunks.

ECR → PT			
APDU			
Control-field		Length	Data-block
CLASS	INSTR		
06	F0	Xx	[70<image-id>] [72<image-mime>] [73<image-encoding>] F0<display-duration> [71<image-size>] [74<chunk-count>] [75<chunk-index>] 06< TLV-container>

Data block:

- 70<image-id> Mandatory for image data that does not fit into a single APDU, not necessary for a single APDU image size
- 71<image-size> Mandatory for image data that does not fit into a single APDU.
- 72<image-mime> Mandatory for the starting request; see Table 8: Definition of <image-mime>
- 73<image-encoding> Mandatory for the starting request; see Table 9: Definition of <image-encoding>
- 74<chunk-count> Mandatory for image data that does not fit into a single APDU, but only for the starting request.
- 75<chunk-index> Mandatory for image data that does not fit into a single APDU.

- 06<TLV-container>: The only possible tag is 1C carrying the image data.
- The restrictions on the <image data> size are:
  - If the APDU data block length is 1 byte long the image-data container can be up to
    - 242 bytes in case of single APDU
    - 228 bytes in case of chunked images (starting APDU)
    - 241 bytes in case of chunked images (follwing APDUs)
  - If the APDU data block length is 2 bytes long the image-data container can be up to
    - 65521 bytes in case of single APDU
    - 65507 bytes in case of chunked images (starting APDU)
    - 65520 bytes in case of chunked images (follwing APDUs)

Notes:

- If the ECR sends a new Display Image command or another command which influences the PT display, the PT displays the new image (or executes the new command) immediately, even before the display-duration of the initial command has expired.

Image MIME type	
Value	**Description**
0	**undefined/unknown** - MIME is not known/set. In this case, the behavior of the receiver of an image is undefined and depends on presentation layer that can examine image content regarding its type. If receiver doesn't accept unknown type or is not able to properly process the image without this information then it shall return 102 error code.
1	**image/gif** • information https://en.wikipedia.org/wiki/GIF • defined https://tools.ietf.org/html/rfc2045 • defined https://tools.ietf.org/html/rfc2046
2	**image/jpeg** • information https://en.wikipedia.org/wiki/JPEG • defined https://tools.ietf.org/html/rfc2045 • defined https://tools.ietf.org/html/rfc2046
3	**image/png** • information https://en.wikipedia.org/wiki/Portable_Network_Graphics • registered http://www.iana.org/assignments/media-types/image/png
4	**image/tiff** • information https://en.wikipedia.org/wiki/Tagged_Image_File_Format • defined https://tools.ietf.org/html/rfc3302
5	**image/x-icon** • information https://en.wikipedia.org/wiki/ICO_%28file_format%29 • registered http://www.iana.org/assignments/media-types/image/vnd.microsoft.icon
6	**image/webp** • information https://en.wikipedia.org/wiki/WebP

Table 8: Definition of <image-mime>

Image encoding type	
Value	**Description**
0	**undefined/unknown**
1	**none** - no special encoding has been applied.

Image encoding type	
2	**base64** • information https://en.wikipedia.org/wiki/Base64

Table 9: Definition of <image-encoding>

2.33.2 Stop previous Display Image

Stops displaying of the previously sent image.

ECR → PT			
APDU			
Control-field		Length	Data-block
CLASS	INSTR		
06	F0	00	

2.33.3 Response

The PT responds after successful operation:

PT response:

PT → ECR			
APDU			
Control-field		Length	Data-block
CCRC	APRC		
80	00	00	

On unsuccessful operation the PT sends:

PT response:

PT → ECR			
APDU			
Control-field		Length	Data-block
CCRC	APRC		
84	xx	00	

xx = corresponding Display Image error-code. See table below:

Error-ID (hexa-deci-mal)	Error-ID (deci-mal)	Definition	Meaning in context of Display Im-age command
66	102	processing-error (also for problems with card-reader mechanism)	Format error or missing mandatory data
6B	107	function deactivated (PT not registered)	Logout
A0	160	receiver not ready	Receiver is busy
FF	255	system error (= other/unknown error)	Unknown failure

Other error codes are described in chapter Error-Messages.

2.34 PIN-Verification for Customer-Card (06 E3)

With this command the PIN-verification for different customer-cards is invoked.

Sequence:
The ECR causes the PT to show a certain text on the display of the PT (text1) and then to wait for a numerical input (customer-card PIN). Afterwards the inputted number is compared to a pre-defined encrypted number from the ECR (encrypted Customer-card-PIN). Optionally a second text (text2) can be supplied which the PT displays after the first digit is inputted. If the digits are deleted <C> the PT displays text1 again.
The inputted digits are shown as ‚*'.

This command can be terminated prematurely using the command Abort (06 B0).

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	E3	xx	<parameter-list>

Data block:

- <parameter-list> consists of several fields, whereby each field is preceded by a bitmap

Definition of the fields <parameter-list>:

Data field	Definition
F0	display-duration in seconds, 1 byte (**not** BCD packed), '00' means infinite. default-value: '00'
F1	text line 1
F2	text line 2
F3	text line 3
F4	text line 4
F5	text line 5
F6	text line 6
F7	text line 7
F8	text line 8
F9	number the beep-tones, 1 byte
FB	confirmation of the input with <OK> required; '00' = no, otherwise yes, 1 byte
E0	Min. length of the input; confirmation required '00' = input not enforced, 1 byte. default-value: '00'
E1	text2 line 1
E2	text2 line 2
E3	text2 line 3
E4	text2 line 4
E5	text2 line 5
E6	text2 line 6
E7	text2 line 7
E8	text2 line 8
E9	Max. length of the input, 1 byte. default-value: 20 decimal

Data field	Definition
EA	echo the input yes/no; 'FF' = echo on, '00' echo off, otherwise display "*" for each digit; 1 byte. default-value: '00' = "*"
D0	algorithm-ID, 1 byte binary
D1	card offset/PIN-data, LLVAR-encoded, binary
D3	DUKPT key identifier, 1 byte

- Text encoding:
- 7-bit ASCII ZVT-Characterset, e.g. F0 F3 01 23 45 (F0 F3 means 3 byte length, followed by the ASCII-Codes). Character codes > 127 are displayed according to the 8-bit ZVT-Characterset (CP437, OEM-US)
- Note: The encoding of the display text in BMP F1-F8 and E1-E8 must match to current character set of the PT that can be configured by ECR with tag 14 in Registration command.
-
- Switch to larger font: each line can be individually switched to a larger font (height +width) via a pre-fix control-character '14' (ASCII-Code). This reduces the number of lines it is possible to display and also the number of characters per line.
  Each line can be controlled individually. On each line only one font-type can be used.
- Algorithm-key: depending on the card used, different algorithms are used for calculating the customern-PIN. These are listed below.

algorithm-ID	fleet-card
0x00	Hectronic
0x01	Venture Card
0x02	UTA
0x03	BICA
0x04	Proeda
0x05	Wayne Dresser
0x06	Shell
0x07	LeasePlan
0x08	DKV classic
0x09	Huth
0x0A	LOMO
0x0B	frei & flott
0x13	BICA 2
0x14	DataStandards CH
0x24	ESSO MK2
0x25	EuroShell
0x38	BFT
0x46	DKV Selection Card
0x56	DEA/DEKRA
0x57	DUKPT

Note:
Depending on the PT, the line used for numerical input may not contain text. If so, the PT ignores the corresponding BMP.

Following customer-card PIN input the PT compares the entered customer-card PIN with the encoded PIN from the command call.

Response from PT for valid PIN:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	xx	[06<TLV-container>]

Data block:

- 06<TLV-container>: Possible tags are 1F31, 1F32.

Response from PT for invalid PIN:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	37	00	

Response from PT for not successful PIN entry:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	xx	xx	06<TLV-container>

Data block:

- 06<TLV-container>: Possible tags are 1F16.

Possible values for APRC:

0x6C	Abort or timeout
0x85	Key missing

Following the input and its confirmation, or abort or if timeout, the display is cleared.

A Completion command is not sent.

2.35 PIN-Verification for Customer-Card (old version) (06 87)

With this command the PIN-verification for different customer-cards is invoked.

Sequence:
The ECR causes the PT to show a certain text on the display of the PT (text1) and then to wait for a numerical input (customer-card PIN). Afterwards the inputted number is compared to a pre-defined encrypted number from the ECR (encrypted Customer-card-PIN). Optionally a second text (text2) can be supplied which the PT displays after the first digit is inputted. If the digits are deleted <C> the PT displays text1 again.
The inputted digits are shown as '*'.

Caution:
This command is included to retain downwards-compatibility, for new implementations use PIN-Verification for Customer-Card (06 E3)!

This command can be terminated prematurely using the command Abort (06 B0).

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	87	xx	<parameter-list>

Data block:

- <parameter-list> consists of several fields.

Definition
algorithm-Key, length 1 byte
PIN-length, length 1 byte
confirmation PIN required, length 1 byte, 00 = no; otherwise yes
start-position for echo of the input, length 1 byte (will be ignored)
PIN-request text, length variable; format 00<Text>00
driver-code length, length 1 byte, optional
confirmation driver-code required, length 1 byte, 00 = no; otherwise yes, optional
start-position driver-code for echo the driver-code-Input, length 1 byte (will be ignored), optional
driver-code request text, length variable; format 00<Text>00, optional
cards-specific data for checking the customer-card PIN, length variable (see card-issuer specification)

- algorithm-key: dependent of the card used(PIN-verification for customer-card)
- format of the text-field: 00<Text>00, the text must always begin and end with binary '00'.
  Text encoding: 7-bit ASCII with umlauts. If the ms-bit of a character is set, this generates a beep-tone, alternatively the character BEL (= '07') can be sent.
- <position> (BCD encoded) is the start-position on the display, '00' is the first line (from top) left edge; on reaching the right edge a line is automatically wrapped. For 20 characters per line is '20' the left edge of the second line etc.
  The maximum displayable number of characters = max. number of characters per line * max. number of lines, additional characters will not be displayed.
- driver-code: the fields which relate to the driver-code (driver-code length, confirmation driver-code, start-position driver-code, driver-code request-text), are optional (dependent on the card used). However, if the driver-code has to be reuested then all the fields must be present.
- Check-data: the use of check-data is dependent on the card

Note:
Depending on the PT, the line used for numerical input may not contain text. If so, the PT ignores the corresponding BMP.

Following customer-card PIN input the PT compares the entered customer-card PIN with the encoded PIN from the command call.

Response from PT for valid PIN:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	xx	<driver-code>

Data block:

- <driver-code>, optional

Response from PT for invalid PIN:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	37	00	

Response from PT for abort or timeout:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	6C	00	

Following the input and its confirmation, or abort or if timeout, the display is cleared.

A Completion command is not sent.

2.36 Select Language (08 30)

With this command the ECR selects the language in the PT.

2.36.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	30	01	<language >

Data block:

- <language-number>: 1 byte. See Table 10: Definition of <language>.

language	Definition
0x00	German (=factory-setting)
0x01	English
0x02	French
0x03	Italian
0x04	Hungarian

language	Definition
0x05	Slovenian
0x06	Spanish
0x07	Czech
0x08	Swedish
0x09	Dutch
0x0A	Polish
0x0B	Slovak
0x0C	Danish
0x0D	Greek
0x0E	Portuguese
0x0F	Lithuanian

Table 10: Definition of <language>

Notes:

- The chosen language remains set even after an off/on sequence.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.36.2 Completion

Following the language switch the PT sends a **Completion** command:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.37 Software-Update (08 10)

With this command ECR causes the PT to make a connection to the TCS.

2.37.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	10	xx	[06<TLV-container>]

Data block:

- 06<TLV-container>: Possible tags are 0F.
  - Using tag 0F an assignment-number can be given to the PT, which enables further sequence-control during the call from PT to TCS.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.37.2 Data-Transmission:

For this purpose the PT makes an online-connection to the TCS. This takes place – depending on configuration of the PT and ECR – either over a communication module in the PT or over a communication module connected to the ECR (see chapter Transmit Data via Dial-Up (06 D9) and chapter Receive Data via Dial-Up (06 DA)).

Note:
If the PT makes the connection to TCS via a communication module in the PT as opposed to a communication module connected to the ECR, the PT sends the Completion command before the update (depending on implementation before or after the successful connection to TCS). This ensures that the ECR is not blocked during the total time of the software-update.

2.37.3 Completion

Subsequently the PT terminates the process via Completion whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	xx	27<result-code> 0C<time> AA<date>

If the PT switches intermediately into **Transparent-Mode** then no **Completion** command is sent at the end (see chapter Transparent-Mode (06 DD)).

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort**:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Note:
In error-case (i.e. <result-code> is not equal to '00') the ECR can start the sequence once again from the beginning the secure that software-update is successfully carried out.

2.38 Read File (08 11)

With this command the ECR causes the PT to send a file (e.g. the merchant-journal) to the ECR.

2.38.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	11	xx	06<TLV-container>

Data block:

- 06<TLV-container>: Possible tags are 2D (multiple, each with a subtag 1D and optional 1E).

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.38.2 Transmission

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0F	xx	[06<TLV-container>]

Data block:

- 06<TLV-container>: Possible tags are 2D (multiple, each with tags 1C, 1D, and optional 1E, 1F00).

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

ECR response in error-case:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	<result-code>	00	

The <result-code> is defined in chapter Error-Messages.

2.38.3 Completion

Subsequently the PT terminates the process via Completion whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	xx	27<result-code>

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort** instead of Completion (06 0F):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Note:

- In error-case (i.e. <result-code> is not equal to '00') the ECR starts the sequence again from the beginning.

2.39 Delete File (08 12)

With this command the ECR causes the PT to delete a file (e.g. the merchant-journal).

2.39.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	12	xx	[06<TLV-container>]

Data block:

- 06<TLV-container>: Possible tags are 1D (several).

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.39.2 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the "master-rights":

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	xx	27<result-code>

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort** instead of Completion (06 0F):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See Error-Messages

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Note:

- In error-case (i.e. <result-code> is not equal to '00') the ECR starts the sequence again from the beginning.
- The file will only be deleted if the ECR acknowledges the **Completion** with 80-00.

2.40 Change Configuration (08 13)

With this command the ECR provides manufacturer specific configuration information to the PT and may also trigger a re-configuration procedure when applicable.

2.40.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	13	xx	06<TLV-container>

Data block:

- 06<TLV-container>: Possible tags are 2D (multiple, each at least with a tag 1C containing the actual configuration information (representation and meaning are manufacturer-specific)).

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.40.2 Completion

After applying the provided configuration the PT terminates the process via Completion whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	xx	27<result-code>

ECR response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort** instead of Completion (06 0F):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Note:

- In error-case (i.e. <result-code> is not equal to '00') the ECR starts the sequence again from the beginning.

2.41 Write File (08 14)

With this command, the ECR causes the PT to receive one or more files from the ECR.

2.41.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	14	xx	<Service-PW> 06<TLV-container>

Data block:
06<TLV-container>: Possible tags are 2D (**multiple**, each with subtag 1D or 1F80, 1F00 and 1F81)

- Each Tag 2D refers to a single file to be transferred to the PT
  - Subtag 1D specifies a file-ID for which the PT recognizes file name and location for the file.
  - Subtag 1F80 specifies a filename (optional with path information). This subtag can be sent alternatively to 1D.
  - Subtag 1F00 specifies the total byte length of the file.
  - Subtag 1F81 MIME type, optionally

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.41.2 PT request

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0C	xx	06<TLV-container>

Data block:
06<TLV-Container>: Possible tag is 2D (**single**, with subtag 1D and 1E)

- Tag 2D refers to the file to be sent next.
  - Subtag 1D file ID (provided by the ECR in the start request, optional, if only 1 file is transferred)
  - Subtag 1F80 specifies a filename, alternatively to 1D (optional, if only 1 file is transferred)
  - Subtag 1E indicates the byte offset of the next block to be sent by the ECR (mandatory)
  - Subtag 1F00 specifies the total byte length of the file (provided by the ECR in the start request, optional)
  - Subtag 1F81 MIME type, (provided by the ECR in the start request, optional)

2.41.3 Transmission

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
80	00	xx	06<TLV-container>

Data block:
06<TLV-Container>: Possible tag is 2D (single, with subtag 1C, 1D, and optional 1F80, 1E, 1F00)

- Tag 2D refers to the file to be sent next.
  - Subtag 1C specifies a file-block (mandatory)
  - Subtag 1E indicates the byte offset of the block, which is sent by the ECR (mandatory)
  - Subtag 1D file-ID (provided by the ECR in the start request, optional, if only 1 file is transferred)
  - Subtag 1F80 specifies a filename, alternatively to 1D (optional, if only 1 file is transferred)
  - Subtag 1F00 specifies the total byte length of the file (provided by the ECR in the start request, optional)
  - Subtag 1F81 MIME type, optionally (provided by the ECR in the start request, optional)

File data (Subtag 1C) is sent as block starting at requested offset (Subtag 1E).
Block size may by chosen in any size and should be optimized for the reliability of the transport layer. Last block may be truncated to meet the effective length of the file (no padding).

Steps 1.2 and 1.3 as above are repeated until all data blocks have been transferred.

If the PT recognizes a transmission error during block transfer, it may request a repetition of the affected block up to three times. Repetition is indicated by the PT by requesting the same byte offset from the ECR as the previous block had.

ECR must check the block's byte offset for each PT request to recognize block repetition requests.

Command ends up in completion sequence when the PT has received the last block for the last file successfully (offset 1E + data length of 1C = file length 1F00).

2.41.4 Completion

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort** instead of Completion (06 0F):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.42 Tax Free (06 0A)

Tax Free is the elimination of income tax liability on accumulated investment earnings. By issuing this command, the PT prints a cheque for tax refund through Global Refund for Non-EU-citizens. This cheque needs to be filled out and signed by the merchant and the customer in order to be valid. Since this command needs a printout according to the rules of Global Refund, the function can only be used on PTs fitted with a printer and printing on the PT enabled.

2.42.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0A	xx	[04<amount>]

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.42.2 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the "master-rights":

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort** instead of Completion (06 0F):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.43 Send Turnover Totals (06 10)

With this command the ECR causes the PT to send an overview about the stored transactions.

2.43.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	10	03	<password>

Data block:

- <password>: See chapter Password.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.43.2 Status-Information

The PT responds with the **Status-Information after End-Of-Day / Send Turnover Totals**:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0F	xx	[27<result-code>] [<transaction-data>]

Data block:

- <transaction-data>: See chapter Status-Information after End-Of-Day / Send Turnover Totals.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.43.3 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT

APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort** instead of Completion (06 0F):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.44 Reset Terminal (06 18)

With this command the ECR causes the PT to restart.

2.44.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	18	00	

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.44.2 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.45 Print System Configuration (06 1A)

With this command the ECR causes the PT to print its system information to the print target defined in Registration (06 00).

2.45.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1A	00	

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.45.2 Receipt-Printout

If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line“ Commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block“ Command (see chapter Print line (06 D3)). Alternatively the PT prints the receipt on its own printer.

2.45.3 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.46 Set/Reset Terminal-ID (06 1B)

With this command the ECR causes the PT to set or reset the terminal identifier. The command will only be executed, if the turnover storage is empty e.g. after an end of day command.

2.46.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1B	xx	<password>[29<terminal ID>]

Data block:

- <password>: See chapter Password.
- 29<terminal ID: If present the content becomes the new terminal identifier.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.46.2 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort** instead of Completion (06 0F):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.47 Send offline Transactions (06 51)

With this command the ECR causes the PT load off eventually stored offline transactions to the host. It does not imply an end of day command.

2.47.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	51	03	<password>

Data block:

- <password>: See chapter Password.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.47.2 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort** instead of Completion (06 0F):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.48 Selftest (06 79)

With this command the ECR causes the PT start a self test and print it's system information to the print target defined in Registration (06 00).

2.48.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	79	00	

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.48.2 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the "master-rights":

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort** instead of Completion (06 0F):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.49 Change Password (06 95)

With this command the ECR can change the merchant password required for some ZVT commands to the PT (see chapter Password).

2.49.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	95	06	<old password> <new password>

Data block:
- <old password>: 3 bytes, BCD. The old password.
- <new password>: 3 bytes,BCD. The new password to be set.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.49.2 Completion

Subsequently the PT terminates the process via **Completion** whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	xx	27<result-code>

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort** instead of Completion (06 0F):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:
- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Note:

- In error-case (i.e. <result-code> is not equal to '00') the ECR starts the sequence again from the beginning.

2.50 Start OPT Action (08 20)

With this command the ECR causes the PT to make a connection to the Personalisation-System to start an OPT-action.

2.50.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	20	00	

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.50.2 Transaction

Following the response the PT begins with the transaction.
For this purpose the PT makes an online-connection to the PS. This takes place – depending on configuration of the PT and ECR – either over a communication module in the PT or over a communication module connected to the ECR (see chapter Transmit Data via Dial-Up (06 D9) and chapter Receive Data via Dial-Up (06 DA)).

2.50.3 Intermediate Status-Information

If the ECR requested Intermediate Status-Information during Registration, the PT regularly sends Intermediate Status to the ECR in order to re-start the timeouts.
Only during the actual data-transfer is no Intermediate Status transmitted.

2.50.4 Receipt-Printout

After the transaction the Receipt-Printout takes place. If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using

„Print Line“ Commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block“ Command (see chapter Print line (06 D3)).

2.50.5 Completion

Subsequently the PT terminates the process via Completion whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	0A	27<result-code> 0C<time> AA<date>

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort**:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Note:

- In error-case (i.e. <result-code> is not equal to ‘00’) the ECR starts the sequence again from the beginning to ensure that the OPT-action is successfully carried out.

2.51 Set OPT Point-in-Time (08 21)

With this command the ECR sets the point-in-time for the next OPT-Action in the PT.

2.51.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	21	0B	<password> AA<date> 0C<time>

Data block:

- <password>: See chapter Password.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.51.2 Completion

After setting the OPT Point-in-Time the PT sends a **Completion** command:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

If the cannot set the OPT Point-in-Time (e.g. because Pre-Initialisation was not yet executed) the PT responds with command **Abort** instead of **Completion**.

2.52 Start OPT Pre-Initialisation (08 22)

With this command the ECR causes the PT to make a connection to the Personalisation-System to start an OPT Pre-Initialisation.

2.52.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	22	00	

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.52.2 Transaction:

Following the response the PT begins with the transaction.
For this purpose the PT makes an online-connection to the PS. This takes place – depending on configuration of the PT and ECR – either over a communication module in the PT or over a communication module connected to the ECR (see chapter Transmit Data via Dial-Up (06 D9) and chapter Receive Data via Dial-Up (06 DA)).

2.52.3 Intermediate Status-Information

If the ECR requested Intermediate Status-Information during Registration, the PT regularly sends Intermediate Status to the ECR in order to re-start the timeouts.
Only during the actual data-transfer is no Intermediate Status transmitted.

2.52.4 Receipt-Printout

After the transaction the Receipt-Printout takes place. If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line“ Commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block“ Command (see chapter Print line (06 D3)).

2.52.5 Completion

Subsequently the PT terminates the process via Completion whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	0A	27<result-code> 0C<time> AA<date>

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort**:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Note:

- In error-case (i.e. <result-code> is not equal to '00') the ECR starts the sequence again from the beginning to ensure that the OPT-action is successfully carried out.

2.53 Output OPT-Data (08 23)

With this command the ECR can obtain the stored OPT-data from the PT.

2.53.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	23	03	<password>

Data block:

- <password>: See chapter Password.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.53.2 Output of OPT-Data

The PT prints the OPT-Data on the printer. If the PT is configured such that, that OPT-Data should be printes on the ECR then the PT send Print-Line commands.

2.53.3 Completion

Following output of the OPT-Data the PT sends a **Completion** command:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

If the PT has no stored OPT-Data then the PT responds with command **Abort** instead of **Completion**.

2.54 OPT Out-of-Order (08 24)

With this command the ECR causes the PT to start OPT-Out-of-Order.

2.54.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	24	00	

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.54.2 Transaction:

Following the response the PT begins with the transaction.
For this purpose the PT makes an online-connection to the PS. This takes place – depending on configuration of the PT and ECR – either over a communication module in the PT or over a communication module connected to the ECR (see chapter Transmit Data via Dial-Up (06 D9) and chapter Receive Data via Dial-Up (06 DA)).

2.54.3 Intermediate Status-Information

If the ECR requested Intermediate Status-Information during Registration, the PT regularly sends Intermediate Status to the ECR in order to re-start the timeouts.
Only during the actual data-transfer is no Intermediate Status transmitted.

2.54.4 Receipt-Printout

After the transaction the Receipt-Printout takes place. If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line“ Commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block“ Command (see chapter Print line (06 D3)).

2.54.5 Completion

Subsequently the PT terminates the process via Completion whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	0A	27<result-code>

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

In error-case the PT responds with an **Abort**:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	01	<result-code>

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Note:

- In error-case (i.e. <result-code> is not equal to '00') the ECR starts the sequence again from the beginning to ensure that the OPT-action is successfully carried out.

2.55 Activate Service-Mode (08 01)

With this command the ECR switch the PT into Service-Mode. In Service-Mode the PT displays the configuration-menu.

2.55.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	01	xx	[<password>[03<service-byte>]]

Data block:

- <password>: See chapter Password.
- 03<service-byte>: See Table 11: Definition of <service-byte>. If <service-byte> is sent then <password> must also be sent.

Service-byte	Definition
xxxx xxx1	The PT service-menu of the PT may not be displayed against the function-key on the PT.
xxxx xxx0	The PT service-menu of the PT may be displayed against the function-key on the PT.
Rest	RFU

Table 11: Definition of <service-byte>

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.55.2 Service-Mode

Subsequently the PT shows the menu on its display. The operator can now execute different functions on the PT. As long as the PT is in Service-Mode it is the master.

In Service-Mode the PT can send Dial-Up commands, Print-Line commands and Intermediate Status-Information.

Caution:
If the PT does not send any command to the ECR within timeout T4 the ECR assumes that the PT no longer functional and will not react to any further commands from the PT. To avoid this, the PT should periodically send Intermediate Status-Information (where necessary with changed T4 value) to the ECR.

2.55.3 End Service-Mode

As soon as the operator leaves the menu, the Service-Mode will be ended.

Note:
Following long-lasting events (e.g. software-update) the PT sends the Completion command independently so that a service-technician does not have to remain at the PT until the end of the event.

2.55.4 Completion

To terminate the Service-Mode the PT sends a **Completion** command:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

The ending of the Service-Mode causes the PT to exit the Service-Menu and the ECR and PT set timeout T4 back to the default value.

Note:
If the PT makes the connection to TCS via a communication module in the PT as opposed to a communication module connected to the ECR, the PT sends the Completion command before entering the Service-Mode. This ensures that the ECR is not blocked during the total time of the Service-Mode.

2.56 Status-Enquiry (05 01)

With this command the ECR can request the Status of the PT allow the PT to carry out time-controlled events (e.g. OPT-actions or End-of-Day). To allow time-controlled events on the PT to be executed punctually the ECR should send Status-Enquiries as often as possible (every minute or more frequently).

2.56.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
05	01	xx	[<password>[03<service-byte>][06<TLV-container>]]

Data block:

- <password>: See chapter Password.
- 03<service-byte>: SeeTable 12: Definition of <service-byte> Table 11: Definition of <service-byte>. If <service-byte> is sent then <password> must also be sent.

Service-byte	Definition
xxxx xxx1	The PT service-menu of the PT may not be displayed against the function-key on the PT.
xxxx xxx0	The PT service-menu of the PT may be displayed against the function-key on the PT.
xxxx xx1x	Do NOT send SW-Version in Completion command
xxxx xx0x	Do send SW-Version in Completion command, default if no service-byte sent
xxxx x0xx	Do not send further status information in the completion (TLV-container).
xxxx x1xx	Send further status information in the TLV-container of the completion.
All other	RFU

Table 12: Definition of <service-byte>

- 06<TLV-container>: Possible tags are: 1F72, 1F76, 1F78.

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.56.2 Transaction:

If the PT does not wish to start any events it sends a Completion command, otherwise it sends other commands (Dial-Up commands, Print-Line commands and Intermediate Status-Information).

For this purpose the PT makes an online-connection. This takes place – depending on configuration of the PT and ECR – either over a communication module in the PT or over a communication module connected to the ECR (see chapter Transmit Data via Dial-Up (06 D9) and chapter Receive Data via Dial-Up (06 DA)).

Until the Completion command is sent the PT is the Master. If the PT switches intermediately into **Transparent-Mode** then no **Completion** command is sent at the end (see chapter Transparent-Mode(06 DD)).

2.56.3 Intermediate Status-Information

If the ECR requested Intermediate Status-Information during Registration, the PT regularly sends Intermediate Status to the ECR in order to re-start the timeouts.
Only during the actual data-transfer is no Intermediate Status transmitted.

2.56.4 Receipt-Printout

After the transaction the Receipt-Printout takes place. If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line“ Commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block“ Command (see chapter Print line (06 D3)).

Caution:
If the PT does not send any command to the ECR within timeout T4 the ECR assumes that the PT no longer functional and will not react to any further commands from the PT. To avoid this, the PT should periodically send Intermediate Status-Information (where necessary with changed T4 value) to the ECR.

2.56.5 Completion

To terminate the **Status-Enquiry** the PT sends a **Completion** command:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	xx	[<SW-version>] <terminal status-code> [06<TLV-container>]

Data block:

- <SW-version>: LLLVAR, 7-bit ASCII with umlauts. The software-version of the PT, optional in dependency with the service-byte of the calling commands from the ECR.
- <terminal status-code>: 1 byte. See chapter Terminal Status Codes.
- 06<TLV-container>: Possible tags are 1F44, 1F54, 1F55, 1F56, 1F59, E4 (containing subtags 1F40, 1F41, 1F42, 1F43), E7 (containing subtags 1F57, 1F58), multiple 33 (containing subtags **Fehler! Verweisquelle konnte nicht gefunden werden.**, 1F32) for each loaded DUKPT SMID, 1F79, 34 and 35 (containing sub-tags 1F0E and 1F0F)
  - The TLV-container is sent if the service-byte is set to xxxx x1xx.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Following termination of the Status-Enquiry the ECR and PT set timeout T4 back to the default setting.

2.57 Change Baudrate (08 40)

2.57.1 The ECR can change the communication baud rate with this command if a serial connection is used. Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	40	01	<baudrate>

Data block:

- <baudrate>: 1 byte. See Table 13: Definition of <baudrate>.

Baudrate	Definition
0	9600 Baud
1	19200 Baud
2	RFU
3	RFU
4	RFU
5	RFU
6	57600 Baud
7	115200 Baud

Table 13: Definition of <baudrate>

2.57.2 Response

If the PT can change the baud rate it responds using the old baud rate:

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Subsequently the baud rate is changed. The PT can accept commands in the new baud rate 2s after sending the response. If ZVT over IP is used the PT can ignore the command respond with 80 00.

If the PT cannot change the baud rate it responds using the old baud rate with:

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	7D	00	

Or – if incorrect baudrate – with:

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	FD	00	

An explicit Completion does not occur.

2.58 Top-Up Prepaid-Cards (06 09)

With this command the PT is instructed to top-up prepaid-cards.

Sequence of Prepaid Top-Up:

1. Start via call from ECR
2. The PT checks whether the top-up amount is valid for this prepaid-card
3. The PT reads the card, in case of top-up or card-payment
4. The PT executes the transaction
5. Depending on the configuration the PT sends Intermediate Status-Information during the transaction to the ECR, so that it knows that the transaction is still running
6. Release Card (possibly earlier depending on card-reader /payment-type)
7. The PT sends a Status-Information with the result of the card-payment (successful or not successful)
8. The PT sends a Status-Information with the result of the top-up (successful or not successful)
9. Receipt-Printout
10. Completion of the payment/top-up

2.58.1 Start

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	09	xx	<prepaid-card-ID> <payment-mode> 04<amount> [49<CC>] [19<payment-type>] [3D<password>][2D<track 1 data>] [23<track 2 data>] [24<track 3 data>][8A<card type>][06<TLV-container>]

Data block:

- <prepaid-card-ID>: 2 byte, BCD with leading zeros. Specifies the card type identifier of the network operators for the prepaid-card to be charged.
- <payment-mode>: 1 byte. See Table 14: Definition of <payment-mode>.
- 3D<password>: Mandatory for cash-payment, optional for card-payment.
- 06<TLV-container>: Possible tags are 41, 1F15.
- For cards which cannot identified by the BIN, like CUP, the card type has to be sent with the command. Therefor the BMP 8Aor TLV tag 41 is used.

Payment-mode	Definition
01	Top-up via card-payment
02	Top-up via cash-payment
03	Top-up via card-payment, card-payment was completed

Table 14: Definition of <payment-mode>

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

The PT proceeds with the top-up sequence.

2.58.2 Check the Top-Up Amount

If the top-up amount is not permissible for this prepaid-card the PT terminates the process with:

Command vom PT:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
06	1E	xx	6F [49<CC>] <top-up amounts>

Data block:

- 6F: Error number for invalid top-up amount.
- <top-up amounts>: Consists of one or several permissible top-up amount, each specified as 04<amount>.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.58.3 Read Card

If the ECR transferred no card-data and the top-up should take place via card-payment, the PT waits for a card (chip or magnet-strip) from the customer.
The PT ascertains via the possibly pre-determined payment-type, the card-type, the limits in PT and the procedure-selection of the Merchant whether the magnet-stripe or the chip on the card should be used for the payment (sequence see chapter Authorization (06 01)).

2.58.4 Transaction

Subsequently the PT begins with the transaction (top-up or cash-payment) or the transactions (card-payment and top-up).
For this purpose the PT makes an online-connection to the host. This takes place – depending on configuration of the PT and ECR – either over a communication module in the PT or over a communication module connected to the ECR (see chapter Transmit Data via Dial-Up (06 D9) and chapter Receive Data via Dial-Up (06 DA)).

2.58.5 Intermediate Status-Information

If the ECR requested Intermediate Status-Information during Registration, the PT regularly sends Intermediate Status to the ECR.

2.58.6 Release Card

If the card is still in the card-reader, the PT releases it.

2.58.7 Status-Information Card-Payment

The PT responds after the payment-procedure with the **Status-Information** for the card-payment (not for top-up via cash-payment):

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0F	xx	27<result-code> <transaction-data>

Data block:

- <transaction-data>: See chapter Status-Information (04 0F).

The ECR response is carried out according to chapter Authorization (06 01).

2.58.8 Status-Information Top-Up

The PT responds after the **Top-Up** with the **Status-Information** for the **Top-Up**:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0F	xx	27<result-code><transaction-data>

Data block:

- <transaction-data>: See chapter Status-Information (04 0F).

The ECR response is carried out according to chapter Authorization (06 01).

2.58.9 Receipt-Printout

Subsequenty the Receipt-Printout takes place, also if the authorisation failed. If the PT function **ECR-Receipt** is activated (= setting in PT, that the ECR assumes the print-function), then the PT transmits the receipt line-by-line to the ECR using „Print Line“ Commands (see chapter Print line (06 D1)). Alternatively the receipt printout is carried out using the „Print Text-Block“ Command (see chapter Print line (06 D3)).

The Receipt-Printout should not be generated from data of the Status-Information by the ECR itself.

2.58.10 Completion

If card-payment and top-up were successful or for cash-payment the top-up was successful the PT terminates the process via Completion whereupon the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

If the card-payment failed or if the top-up process failed for cash-payment the PT sends the command **Abort** whereby the ECR receives back the “master-rights”:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
06	1E	xx	<result-code> [<CC>]

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.
- <CC>: The currency code of the PT is only sent with result-code ‘6F’. The PT only sends a currency code to the ECR, if the ECR had also sent a currency code in its request.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Notes for Top-Up via card-payment:
For Top-Up via card-payment the command Completion only indicates success of the card-payment. Theoretically the card-payment can be successful but the top-up unsuccessful, which nevertheless results in a Completion command and not an Abort. The negative-result of the top-up is then only indicated by the corresponding contents of the Status-information.
For top-up via card-payment however the command Completion or Abort indicates the result of the top-up.

Recommendation:
Splitting of the two sequences in two separate processes – card-payment (command Authorisation) and top-up via cash-payment (separate card-payment). This is also meaningful because the customer often not only the Top-Up but also buys goods at the same time and therefore top-up amount and card-payment amount are not identical.

2.59 Print Line on PT (06 D1)

If data from the ECR are to be printed on a printer integrated in, or connected to the PT, then the command “Print Line” (06 D1) may be used in the reverse direction.

This command may only be sent from the ECR if the function is implemented in the PT.

2.60 Print Text-Block on PT (06 D3)

If data from the ECR are to be printed on a printer integrated in, or connected to the PT, then the command "Print Text-Block" (06 D3) may be used in the reverse direction.

This command may only be sent from the ECR if the function is implemented in the PT.

2.61 Switch Protocol (08 02)

The command Switch Protocol has the following consequences:

- the PT disables the ZVT protocol

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
08	02	01	<protocol-type>

Data-block:

- <protocol-type>: 1 byte. Specifies the protocol to switch to. See Table 15: Definition of <protocol-type>.

Protocol-type	Definition
01	T=1
02	Serial IFSF

Table 15: Definition of <protocol-type>

The PT always responds with:

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

2.62 MAC calculation (06 E5)

This command can be used to calculate a message access code using DUKPT key stored in pinpad.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	E5	xx	[D3<key-identifier>] 06<TLV-container>

Data-block:

- 06<TLV-container>: Possible tags are 1F32, 1F33, **Fehler! Verweisquelle konnte nicht gefunden werden.**.

- If 1F32 is present this field contains the SMID used for PIN check. The PT shall verify if still the same SMID is active in the pinpad. If 1F32 is not present a new SMID shall be created.

Response from PT for successful MAC calculation:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	xx	06<TLV-container>

Data-block:

- 06<TLV-container>: Possible tags are 1F32, 1F34.

Response from PT for not successful MAC calculation:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	xx	00	

Possible values for APRC:

0x85	Key index missing
0xEC	Processing not possible (SMID mismatch)

A Completion command is not sent.

2.63 Send APDUs (06 C6)

This command provides to the ECR a transparent channel to the card reader. It is possible to combine mulitple APDUs in one command.
The request APDUs are processed as long the card reader returns response APDUs. In case of an exceptional situation (i.e. it does not make sense to continue te APDU processing) the ECR should stop the APDU processing and return the response APDUs retrieved till now along with an error code.

To prevent communication timeout violations the ECR should distribute long running APDUs over several “Send APDUs” commands or appropriately increase the timeout T3.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	C6	xx	06<TLV-container>

Data block:

- 06<TLV-container>: Possible tags are 1F46.
  - Required tags are one or more 1F46 (request APDU).

PT-Response

PT → ECR		
APDU		
Control field	Length	Data block

CCRC	APRC		
80	00	xx	06<TLV-container>

Data block:

- 06<TLV-container>: Possible tags are 1F16, 1F17, multiple 1F46 (response APDU corresponding to the request APDU, same order as in the request), 1F47.

Note:

- Since this command provides a transparent channel to the card the PT neither checks the responses from the card nor stops the APDU processing even when a card command failed (in fact the PT does make any assumptions about positive or negative responses from the card). Thus the ECR is responsible for bundling the request APDUs into reasonable portions that allow a sound failure processing without messing up the card.
- Note also the the PT may reject a command for PCI compliance reasons, e.g. a SELECT command for an application identifier that is not contained on a whitelist.

2.64 Close Card Session (06 C5)

This command is turning off the contactless field.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	C5	00	

Positive PT-Response

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Negative PT-Response

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	1E	00	

2.65 Card Poll with Authorization (06 E6)

This command is used for starting an authorization and additionally poll for functions cards (e.g. MIFARE). If a functional card is presented at the reader, the return value of this command is giving information about it. This command is using the same data blocks as the command Authorization (06 01). This command only differs in command name and the PT response.

ECR → PT

APDU			
Control field		Length	Data block
CLASS	INSTR		
06	E6	xx	[04<amount>] [49<CC>] [19<payment-type>] [2D<track 1 data>] [0E<expiry-date>] [22<card-number>] [23<track 2 data>] [24<track 3 data>] [01<timeout>] [02<max. status infos>] [05<pump no.>] [3A<CVV/CVC>] [3C<additional-data>] [8A<card type>] [06<TLV-container>]

Data block:
The Data block elements that can be used are the same as described at the authorization command (06 01). Please consult this chapter for further information.

- 06<TLV-container>: Possible tags are the same as in command Authorization (06 01) and additionally 1F5B, 1F6D.

If a non-payment card has been detected the PT responds with a specific **Abort**:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
06	1E	xx	<result-code> [06<TLV-container>]

Data block:

- The possible result-codes are described in chapter Error-Messages.
- If the return code is FF, specific information about the error could be found in the TLV tags 1F16 and 1F17.
- If a non-payment card (e.g. a MIFARE card) has been detected, the result-code 7A is sent. Further information about the detected card is provided in the TLV container.
- 06<TLV-container>: Possible tags are 4C, 1F16, 1F17, 1F45, E6 (containing possible tags 1F12, 1F4C, 1F4D, 1F4F, 1F50).

2.66 Other Commands

In response to other commands not described in this specification, or not supported by the PT, the PT always reacts with an error-message. That means the PT must not support all the commands specified in this document; the PT must however respond correctly to commands that are unknown to it.

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
xx	xx	xx	xx

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	83	00	

3 Commands from PT to the ECR

If the ECR hands the PT via a command the master-rights, the following commands may be sent from PT to ECR:

3.1 Status-Information (04 0F)

Via this command the PT can send Status-Information to the ECR.
The following status-information is possible:

- Status-Information after Authorisation, Reversal, Pre-Authorisation/Reservation or PrepaidTop-Up
- Status-Information after Read Card
- Status-Information after End-of-Day

3.1.1 Status-Information after Authorisation, Reversal, Pre-Authorisation/Reservation, DCC or Prepaid-Top-Up

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0F	xx	[27<result-code>] [<transaction-data>] [06<TLV-container>]

Data block:

- <transaction-data>: Consists of several fields, whereby each field is pre-fixed with a bitmap (e.g. 04<amount> 0B<trace-number> 49<CC>...). The individual data-fields have the following format. The bitmaps are each optional depending on the payment-type. The order of the fields is arbitrary.
- 06<TLV-container>: Possible tags are 01, 0B, 0C, 13, 14, 15, 20, 21 (Pre-Authorisation), 22 (Authorisation), 2F, 41, 45, 46, 47, 4C, 4D, 60, 63 (Prepaid Top-Up), E1, 1F08, 1F09, 1F0A, 1F0B, 1F13, 1F14, 1F16, 1F17 (DCC) E2, 1F30 (EPurse).

Note:

- The PT only sends a currency code to the ECR, if the ECR had also sent a currency code in its request.
- For some transaction types e.g. GeldKarte or GiroGo the Status-Information can be repeated after the delivery of goods has been confirmed containing more details on the transaction

Definition of transaction-data:

BMP number	Name	Format
04	<amount>	6 byte BCD packed (payment-amount or total of the End-of-Day)
0B	<trace>	trace-number, 3 byte BCD, for long trace numbers with more than 6 digits, the bitmap is set to 000000 and TLV tag 1F2B is used instead.
37	<orig. trace>	only for Reversal: Trace-number of the original payment, 3 byte BCD
0C	<time>	3 byte BCD HHMMSS
0D	<date>	2 byte BCD MMDD
0E	<exp. date>	expiry-date, 2 byte BCD in Format YYMM
17	<seq-no>	card sequence-number, 2 byte BCD packed
19	<CC/payment-type>	payment-type: 40 = offline 50 = card in terminal checked positively, but no Authorisation carried out 60 = online 70 = PIN-payment (also possible for EMV-processing, i.e. credit cards, ecTrack2, ecEMV online/offline). If the TLV-container is active, this information can be specified in tag 2F (see chapter TLV-container).
22	<PAN / EF_ID>	PAN for magnet-stripe or EF_ID for ec chip, LLVAR (2 byte counter [FxFy], data BCD packed, D = separator), e.g. F0 F3 01 23 45 (F0 F3 means 3 bytes follow) receipt-data of the EF_ID: - card-number: byte 5-9 from EF_ID - expiry-date: byte 11-12 from EF_ID The transfer of the PAN for girocard transactions (ecTrack2, ecEMV online/offline) is in BCD format (analogous to credit card payments).
29	<terminal-ID>	terminal-ID, 4 byte BCD packed
3B	<AID>	authorisation-attribute. The length of the bitmaps is always 8 byte. contents: 1) Maestro-cards (BMP8A = 46): used-data max. 6 byte ASCII. The bitmap is filled with trailing zeros. 2) Girocard-cards (ectrack2, ecEMV online/offline): 8 byte ASCII padded with trailing zeros. 3) other cards: used-data max. 8 byte ASCII. The bitmap is filled, where possible, with trailing zeros.
49	<CC>	2 byte BCD packed. Value: 09 78 = EUR

BMP number	Name	Format
4C	<blocked goods-groups>	List of blocked goods-groups LLVAR (2 byte counter [FxFy], data BCD packed),
87	<receipt no.>	receipt-number, 2 byte BCD packed. Valid only for non-Geldkarte transactions.
8A	<card-type>	card-type (= ZVT card-type ID), 1 byte binary; see chapter ZVT-card-type-ID. Via BMP 8A can only cards within the first 255 card-type-IDs be transferred. For cards ID 256 upwards tag 41 must be used. If the ZVT card-type ID is larger than decimal 255 then BMP 8A should contain 'FF' and tag 41 should be used (see chapter TLV-container), providing the ZVT Card-Type ID is to be sent to the ECR. Alternatively BMP 8A can be omitted.
8C	<card-type ID>	card-type-ID of the network operator; 1 byte binary. If the network operator card-type ID is larger than decimal 255 then BMP 8C should contain 'FF' and tag 49 should be used (see chapter TLV-container), providing the network operator card-type ID is to be sent to the ECR. Alternatively BMP 8C can be omitted.
9A	<Geldkarte payment-/ failed-payment records>	LLLVAR payment-record from Geldkarte with certificate according to "Schnittstellenspezifikation für die ZKA-Chipkarte - GeldKarte Version 5.2". 100 bytes binary (103 byte incl. LLLVAR); (only for Geldkarte). This BMP is not available before the delivery of goods was confirmed.
BA	<AIDpar>	AID-parameter, 5 byte binary Only Maestrocard.
2A	<VU-number>	contract-number for credit-cards, 15 byte, ASCII, not null-terminated.
3C	<additional text>	additional text for credit-cards, LLLVAR, ASCII, not null-terminated.
A0	<result-code-AS>	the result-code, the AS is set if the host sends a result-code which can't be encoded in BCD . 1 byte, binary.
88	<turnover-no>	analogous to receipt-number, <turnover-no> is however valid for all transactions. 3 byte BCD-packed. Not supported by all terminals.
8B	<card-name>	name of the card-type, LLVAR, ASCII, null-terminated. For EMV-applications the product name is provided here. This must be printed on the receipt.
06	<additional-data>	TLV-container; see chapter Defined Data-Objects e.g. lists the forbidden goods-groups

Note: There may still exist old ECR implementations which rely on the order of BMPs given in the table above.

Definition and structure of **BMP 9A** (payment-record Geldkarte):

Length	Sub-field
3	LLLVAR, always: F1 F0 F0
100	payment-record according to specification Geldkarte 3.0

Definition and structure of **BMP 4C** (blocked goods-groups):

Length	Sub-field
2	LLVAR
3	product-code according to goods-groups-table in PT, BCD encoded with leading zeros
...	...
3	product-code according to goods-groups-table in PT, BCD encoded with leading zeros

Note BMP 4C:
If the PT has received goods-groups information from ECR and not all product-codes can be authorised with the used card, the PT sends in BMP 4C a list of the blocked product-codes. The payment is in this case to be completely aborted, i.e. the PT does not execute an authorisation, even for the permitted product-codes.
The individual product-codes are placed in the BMP consecutively, without separators.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

alternative:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	00	00	

alternative:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	9C	00	

alternative:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	yy (any value, except-ing 00 and 9C)	xx	xx

Note:

- The responses 80-00-00 and 84-00-00 are positive acknowledgements of the ECR.
- For vending-machines 80-00-00 and 84-00-00 mean that the **issue of goods** has succeeded.
- The response 84-9C-00 implies that the PT the should repeat Status-Information after 2s.
- A response 84-yy-xx-xx with ‚yy' not equal to ‚00' and not equal to ‚9C' implies that the **issue of goods** has not succeeded. If issue of goods did not succeed the PT reverses the payment.

3.1.2 Status-Information after Read Card

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0F	xx	[27<result-code>] [<cardsdata>] [06<TLV-container>]

Data block:

- The <result-code> is sent in error-case. Definition of <result-code> in chapter Error-Messages, length 1 byte.
- The individual data-fields within <cardsdata> are marked via the ISO-bitmap position and have the following formats. Each bitmap is optional and the order is arbitrary.
- 06<TLV-container>: Possible tags are 21, 4C, 4D, 61, 62 (and subtags), E6, 1F0B, 1F14, 1F16, 1F17, 1F3F

BMP-number	Notation	Structure
2D	<track 1>	LLVAR unpacked, track 1 data / card number from EF_ID
23	<track 2>	LLVAR BCD packed, track 2 data
24	<track 3>	LLLVAR BCD packed, track 3 data
A7	<EF_ID>	LLVAR structure as in “Schnittstellenspezifikation für die ZKA-Chip-karte - GeldKarte Version 5.2”
2E	<chip data>	LLLVAR binary data from synchronous chip cards

Note:
- If the tracks have an even-length, no padding (e.g. „1F“ or „F0“) is allowed.
- Start- and End-sentinels are not sent.
- If masking of track data is enabled, the character "E" is used.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

3.1.3 Status-Information after End-Of-Day / Send Turnover Totals

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0F	xx	[27<result-code>] [<transaction-data>]

Data block:

- The <result-code> is defined in chapter Error-Messages, length 1 byte.
- <transaction-data> consists of several fields, whereby each field is prefixed with a bitmap (e.g. 04<amount>0B<trace-number>49<CC>...). The individual data-fields have the following formats. Each bitmap is optional. The order of the fields is arbitrary.

Definition the transaction-data:

BMP number	Notation	Structure
04	<total-amount>	6 byte BCD packed total of the End-of-Day
60	<single amounts>	LLLVAR BCD packed: 2 byte BCD receipt-number start (N4) 2 byte BCD receipt-number end (N4) 1 byte binary number of Girocard 6 byte BCD, total turnover Girocard 1 byte binary number of JCB 6 byte BCD, total turnover JCB 1 byte binary number of Eurocard 6 byte BCD, total turnover Eurocard 1 byte binary number of Amex 6 byte BCD, total turnover Amex 1 byte binary number of VISA 6 byte BCD, total turnover VISA 1 byte binary number of Diners 6 byte BCD, total turnover Diners 1 byte binary number of remaining cards 6 byte BCD, total turnover remaining cards
0B	<trace>	trace-number, 3 byte BCD
0C	<time>	3 byte BCD HHMMSS
0D	<date>	2 byte BCD MMDD
9A	<total-record Geldkarte>	LLLVAR 100 byte (ref. “Schnittstellenspezifikation für die ZKA-Chipkarte - GeldKarte Version 5.2”) Note: - only sent if Geldkarte-turnover available

Note:
The PT only sends a currency code (data-field 49) to the ECR, if the ECR had also sent a currency code in its request.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

3.2 Completion (06 0F)

Certain commands must be completed with a separate command:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	0F	xx	[27<result-code>] [0C<time>] [AA<date>] [19<status-byte>] [29<TID>] [49<CC>] [06<TLV-container>]

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Commands which require Completion are explicitly noted within the command description.

3.3 Abort (06 1E)

If a command was not successfully terminated the PT sends this command to the ECR.

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	1E	xx	<result-code> [06<TLV-container>]

Data block:

- <result-code>: 1 byte. See chapter Error-Messages.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

3.4 Set Date and Time in ECR (04 01)

If the PT sends this command to the ECR, the ECR sets its system-time to the value sent in Data block.

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	01	08	AA<date> 0C<time>

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

3.5 Print Line (06 D1)

With this command a printer integrated in or attached to the ECR can be used to print a line from the transferred data. The text contains no CR LF. Empty lines are transferred as print-commands with an empty text-field. The command is only sent from the PT if function ECR-receipt is active on the PT (see command Registration).

If implemented in the PT, this command can be used in the reverse direction to allow data from the ECR to be printed by the PT's printer.

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	D1	xx	<attribute> <text>

Data block:

- <attribute>: Bit-field, 1 byte. With this field the PT can control text-formatting. See Table 16: Definition of <attribute>.
- <text> is the text to be printed.
  - If 'FF' is sent as attribute, <text> contains 1 byte with the number of the linefeeds.
  - If <text> is missing one linefeed is executed.

Attribute	Definition
1000 0000	RFU
1xxx xxxx (not equal to 80h)	this is the last line
1111 1111	Linefeed, count of feeds follows
01xx nnnn	centred
0x1x nnnn	double width
0xx1 nnnn	double height
0000 nnnn	normal text

Table 16: Definition of <attribute>

Notes:

- nnnn = number of characters to indent from left (0-15).
- Attribute „1xxx xxxx“ (not equal to 80) indicates also that a switch between customer-receipt and merchant-receipt takes place, or vice-versa. It is required for ECRs
  - that first collect all print-lines in a buffer and then print them together on a page-printer
  - which use a printer with a cutter.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

If no printer is connected to the ECR, or the printer is not ready, or the ECR cannot print for any other reason it responds with:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	CC	00	

3.6 Print Text-Block (06 D3)

With this command a printer integrated in or attached to the ECR can be made to print data from the PT.
In comparison to the command "Print Lines" the command "Print Text-Block" can send several lines simultaneously. Thereby the throughput is increased. The texts and attributes are transferred as a TLV-container. The text contains no CR LF. Empty lines are created via the tag "text-lines" without further contents.

The command is only used by PT if the ECR requests this command via the list of permitted ZVT-commands or if the PT is configured to use it, otherwise the PT uses the command "Print Lines".

If implemented in the PT, this command can be used in the reverse direction to allow data from the ECR to be printed by the PT’s printer.

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	D3	xx	06<TLV-container>

Data block:

- 06<TLV-container>: Possible tags are 14, 25, 1F07, 1F37.
  - The last line of a receipt has to be followed by tag 09with contents 1xxx xxxx (not equal to 80), to allow the ECR to concatenate several blocks to a single receipt and separate receipts from each other.

The further sequence is comparable to that of command Print Line (06 D1).

3.7 Intermediate Status Information (04 FF)

With this command the ECR can display status-information about the state of the PT. The command is only sent by the PT if the function for registration of the ECR was requested in the config-byte.

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	FF	xx	<intermediate-status> [<timeout>] [06<TLV-container>]

Data block:

- <intermediate-status>: 1 byte. See Table 17: Definition of <intermediate-status>.
- <timeout>: 1 byte BCD, minutes. Sets the timeout T4. Altering timeout T4 is especially important for lengthy actions on the PT (e.g. software-update).
- 06<TLV-container>: Possible tags are 24. If the <TLV-container> is sent, then the PT must also send <timeout>.

value hex.	value dec.	1)	Definition	Bedeutung
00	0		PT is waiting for amount-confirmation	BZT wartet auf Betragbestätigung
01	1	x	Please watch PIN-Pad	Bitte Anzeigen auf dem PIN-Pad beachten
02	2	x	Please watch PIN-Pad	Bitte Anzeigen auf dem PIN-Pad beachten
03	3	x	Not accepted	Vorgang nicht möglich
04	4		PT is waiting for response from FEP	BZT wartet auf Antwort vom FEP
05	5		PT is sending auto-reversal	BZT sendet Autostorno
06	6		PT is sending post-bookings	BZT sendet Nachbuchungen
07	7	x	Card not admitted	Karte nicht zugelassen
08	8	x	Card unknown / undefined	Karte unbekannt / undefiniert
09	9	x	Expired card	Karte verfallen
0A	10	x	Insert card	Karte einstecken
0B	11		Please remove card!	Bitte Karte entnehmen!
0C	12	x	Card not readable	Karte nicht lesbar
0D	13	x	Processing error	Vorgang abgebrochen
0E	14	x	Please wait...	Vorgang wird bearbeitet bitte warten...

value hex.	value dec.	1)	Definition	Bedeutung
0F	15		PT is commencing an automatic end-of-day batch	BZT leitet einen automatischen Kassenabschluss ein
10	16	x	Invalid card	Karte ungültig
11	17		Balance display	Guthabenanzeige
12	18	x	System malfunction	Systemfehler
13	19	x	Payment not possible	Zahlung nicht möglich
14	20	x	Credit not sufficient	Guthaben nicht ausreichend
15	21	x	Incorrect PIN	Geheimzahl falsch
16	22		Limit not sufficient	Limit nicht ausreichend
17	23	x	Please wait...	Bitte warten...
18	24	x	PIN try limit exceeded	Geheimzahl zu oft falsch
19	25	x	Card-data incorrect	Kartendaten falsch
1A	26		Service-mode	Servicemodus
1B	27	x	Approved. Please fill-up	Autorisierung erfolgt. Bitte tanken
1C	28	x	Approved. Please take goods	Zahlung erfolgt. Bitte Ware entnehmen
1D	29	x	Declined	Autorisierung nicht möglich
26	38		PT is waiting for input of the mobile-number	BZT wartet auf Eingabe der Mobilfunknummer
27	39		PT is waiting for repeat of mobile number	BZT wartet auf Wiederholung der Mobilfunknummer
28	40		Currency selection, please wait...	Währungsauswahl, bitte warten...
29	41		Language selection, please wait...	Sprachauswahl, bitte warten...
2A	42		For loading please insert card	Zum Laden Karte einstecken
2B	43		Emergency transaction, please wait	Offline-Notbetrieb, bitte warten
2C	44		Application selection, please wait	Auswahl Debit/Kredit, bitte warten
41	65		Please watch PIN-Pad Please remove card!	Bitte Anzeigen auf dem PIN-Pad beachten Bitte Karte entnehmen!
42	66		Please watch PIN-Pad Please remove card!	Bitte Anzeigen auf dem PIN-Pad beachten Bitte Karte entnehmen!
43	67	x	Not accepted Please remove card!	Vorgang nicht möglich Bitte Karte entnehmen!
44	68		PT is waiting for response from FEP Please remove card!	BZT wartet auf Antwort vom FEP Bitte Karte entnehmen!
45	69		PT is sending auto-reversal Please remove card!	BZT sendet Autostorno Bitte Karte entnehmen!
46	70		PT is sending post-booking Please remove card!	BZT sendet Nachbuchungen Bitte Karte entnehmen!
47	71	x	Card not admitted Please remove card!	Karte nicht zugelassen Bitte Karte entnehmen!
48	72	x	Card unknown / undefined Please remove card!	Karte unbekannt / undefiniert Bitte Karte entnehmen!
49	73	x	Expired card Please remove card!	Karte verfallen Bitte Karte entnehmen!
4A	74			
4B	75		Please remove card!	Bitte Karte entnehmen!
4C	76	x	Card not readable Please remove card!	Karte nicht lesbar Bitte Karte entnehmen!

value hex.	value dec.	1)	Definition	Bedeutung
4D	77	x	Processing error Please remove card!	Vorgang abgebrochen Bitte Karte entnehmen!
4E	78	x	Please wait Please remove card!	Vorgang wird bearbeitet bitte warten... Bitte Karte entnehmen!
4F	79		PT is commencing an automatic end-of-day batch Please remove card!	BZT leitet einen automatischen Kassenabschluss ein Bitte Karte entnehmen!
50	80	x	Invalid card Please remove card!	Karte ungültig Bitte Karte entnehmen!
51	81		Balance display Please remove card!	Guthabenanzeige Bitte Karte entnehmen!
52	82	x	System malfunction Please remove card!	Systemfehler Bitte Karte entnehmen!
53	83	x	Payment not possible Please remove card!	Zahlung nicht möglich Bitte Karte entnehmen!
54	84		Credit not sufficient Please remove card!	Guthaben nicht ausreichend Bitte Karte entnehmen!
55	85	x	Incorrect PIN Please remove card!	Geheimzahl falsch Bitte Karte entnehmen!
56	86		Limit not sufficient Please remove card!	Limit nicht ausreichend Bitte Karte entnehmen!
57	87	x	Please wait... Please remove card!	Bitte warten... Bitte Karte entnehmen!
58	88	x	PIN try limit exceeded Please remove card!	Geheimzahl zu oft falsch Bitte Karte entnehmen!
59	89	x	Card-data incorrect Please remove card!	Kartendaten falsch Bitte Karte entnehmen!
5A	90		Service-mode Please remove card!	Servicemodus Bitte Karte entnehmen!
5B	91	x	Approved. Please fill-up Please remove card!	Autorisierung erfolgt. Bitte tanken Bitte Karte entnehmen!
5C	92	x	Approved. Please take goods Please remove card!	Zahlung erfolgt. Bitte Ware entnehmen Bitte Karte entnehmen!
5D	93	x	Declined Please remove card!	Autorisierung nicht möglich Bitte Karte entnehmen!
66	102		PT is waiting for input of the mobil-number Please remove card!	BZT wartet auf Eingabe der Mobilfunknummer Bitte Karte entnehmen!
67	103		PT is waiting for repeat of the mobil-number Please remove card!	BZT wartet auf Wiederholung der Mobilfunknummer Bitte Karte entnehmen!
68	104		PT has detected customer card insertion	BZT hat Einstecken der Kundenkarte erkannt
69	105		Please select DCC	Bitte DCC auswählen
C7	199		PT is waiting for input of the mileage	BZT wartet auf Eingabe des Kilometerstands
C8	200		PT is waiting for cashier	BZT wartet auf Kassierer
C9	201		PT is commencing an automatic diagnosis	BZT leitet eine automatische Diagnose ein

value hex.	value dec.	1)	Definition	Bedeutung
CA	202		PT is commencing an automatic initialisation	BZT leitet eine automatische Initialisierung ein
CB	203		Merchant-journal full	Händlerjournal voll
CC	204		Debit advice not possible, PIN required	Lastschrift nicht möglich, PIN notwendig
D2	210		Connecting dial-up	DFÜ-Verbindung wird hergestellt
D3	211		Dial-up connection made	DFÜ-Verbindung besteht
E0	224		PT is waiting for application-selection	BZT wartet auf Anwendungsauswahl
E1	225		PT is waiting for language-selection	BZT wartet auf Sprachauswahl
E2	226		PT requests to use the cleaning card	BZT fordert auf, die Reinungskarte zu benutzen
F1	241		Offline	Offline
F2	242		Online	Online
F3	243		Offline transaction	Offline-Transaktion
FF	255		no appropriate ZVT status code matches the status. See TLV tags 24 and 07	

Table 17: Definition of <intermediate-status>

1) the texts marked with x are of particular relevance for certification of unattended basis-terminals and must displayed word-for-word on the customer-display.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

3.8 Dial-Up (06 D8)

If the PT has received the master-rights from the ECR it can request with this command that the ECR makes a dial-up connection, e.g to host or maintenence-system, for the PT. To be able to utilise this function the ECR must be configured accordingly, since most ECRs do not provide dial-up support.

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	D8	xx	<dialing-data>

Data block:

- <dialing-data>: Specifies the dialing parameters to be used, 7-bit ASCII encoded.

Structure of <dialing-data>:

Connection-type	Parameter
modem and ISDN without user-data	F <baud> : <target call number>

modem and ISDN with user-data	P <baud> : <target call number> [, <user-data>]

- <baud>: Desired baudrate between dial-up module and remote station (e.g. host, TCS); standard-values = 9600 or 2400 Baud
- <target call number>: Call number of the remote station
- <user-data>: Routing information. Separated from the call number via ",". The ECR has to decide whether the user-data are sent in the dialing-string or after the connect.

Encoding of <baud>, <target call number> and <userdata>:
7-bit ASCII with umlauts, e.g. F0 F3 01 23 45 (F0 F3 means 3 ASCII bytes follow)

The data described above must be agreed from case-to-case with the network operator.

The ECR forwards the received data to the dial-up module and responds after the connect with:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
80	00	00	

Or if connection failed, with an error-message.

3.9 Hang-Up (06 DB)

With this the PT causes the ECR to disconnect a dial-up connection:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	DB	00	

The ECR terminates the connection and responds with:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
80	00	00	

3.10 Transmit Data via Dial-Up (06 D9)

If the PT has received the master-rights from the ECR it can request with this command that the ECR transmits data via a dial-up module on the ECR:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	D9	xx	<dial-up data>

Data block:

- <dial-up data> is the data to be transmitted.

The ECR forwards the received data to the dial-up module and responds after the connect with:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
80	00	00	

3.11 Receive Data via Dial-Up (06 DA)

With this command the PT receives data via a dial-up module connected to the ECR:

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	DA	00	

The ECR receives the data from the dial-up module and responds with:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
80	00	xx	<dial-up data>

Data block:

- <dial-up data>: The data received from the dial-up module. Order FIFO – the first received byte is relayed first to the PT.

The ECR waits for approximately 0.5s for the reception of data. If no data is received after this timeout it responds with 80-00-00.

3.12 Transparent-Mode (06 DD)

This command serves to make transparent connection between PT and a third-party (e.g. Terminal-Configuration-Server TCS) after the dial-up connection has been made.

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	DD	00	

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CLASS	INSTR		
80	00	00	

All messages between the third-party and the PT are transmitted transparently further by the ECR. **Therefore no checking of the data takes place by the ECR (e.g. no ACK/NAK or 80-00-00).**

The ECR ends the Transparent-Mode automatically if the connection between the dial-up module and the third-party is terminated. There is no Completion command for the command Transparent-Mode.

Sequence – transmit transparent data:
1. The PT makes a connection to the TCS via command „Dial-Up“.
2. The PT switches the ECR into Transparent-Mode.
3. TKS and PT communicate directly“.
4. The TCS terminates the connection. The ECR must monitor the status the of the dial-up module to recognize the hang-up. Then the ECR terminates the Transparent-Mode. Timeout T4 also terminates the Transparent-Mode if no communication takes place between PT and TKS within the timeout period.

Sequence – Remote-Maintenance:
1. Terminal-Supervisor calls the ECR.
2. The ECR relays data between Terminal-Supervisor and PT transparently.
3. The Terminal-Supervisor terminates the connection. The ECR must monitor the status the of the dial-up module to recognize the hang-up. Then the ECR terminates the Transparent-Mode. Timeout T4 also terminates the Transparent-Mode if no communication takes place between PT and TKS within the timeout period.

3.13 Menu-Request (04 0E)

With this command the PT requests to display a menu on the ECR.

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0E	xx	[06<TLV-container>]

Data block:
- 06<TLV-container>: Possible tags are 2B.

Note:

This command may only be used if the ECR has noted during Registration (06 00) that it supports this command.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	xx	06<TLV-container>

Data block:
- 06<TLV-container>: Possible tags are 19.

Alternative:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	00	xx	06<TLV-container>

Data block:
- 06<TLV-container>: Possible tags are 19.

Alternative:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	yy (any value, except-ing 00)	xx	xx

Note:
- The responses 80-00 and 84-00 are positive acknowledgements from the ECR.
- A response 84-yy with ‘yy’ not equal to ‘00’ implies that the **Menu-Request was aborted with an error** (See chapter Error-Messages).

3.14 Blocked-List Query to ECR (06 E4)

With this command the PT can send a blocked-list query to the ECR after reading the card. The ECR checks the BLZ / account number / PAN or other relevant card parameter and returns the result to the terminal. Depending on the outcome the terminal either proceeds with the transaction or aborts. In any event there follows a Completion (06 0F) or an Abort (06 1E) from the PT to the ECR.

This command may only be sent by the PT to the ECR if the ECR listed it as a supported command in the TLV container during registration.

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	E4	xx	<card data>

Data block:

- <card data> contains numerous fields, whereby each field is prefixed by a bitmap (i.e 22<PAN / EF_ID>0E<exp-date>…). The individual bitmaps are defined as follows, and are optional depending on the payment-type. The order of fields is arbitrary.

Card-data definition:

BMP	Name	Format
0E	<exp-date>	expiry date, 2 byte BCD, format YYMM
17	<seq-no>	card sequence-number, 2 byte BCD packed
22	<PAN / EF_ID>	PAN for magnet-stripe or EF_ID for chip LLVAR (2 byte counter [FxFy], data BCD packed, D = separator), e.g. F0 F3 01 23 45 (F0 F3 means 3 bytes follow) receipt-data of the EF_ID: • - card-number: byte 5-9 from EF_ID • - expiry-date: byte 11-12 from EF_ID The transfer of the PAN for girocard transactions (ecTrack2, ecEMV online/offline) is in BCD format (analogous to credit card payments).
8A	<card-type>	card-type (= ZVT card-type ID), 1 byte binary; see chapter ZVT-card-type-ID. Via BMP 8A can only cards within the first 255 card-type-IDs be transferred. For cards ID 256 upwards tag 41 must be used. If the ZVT card-type ID is larger than decimal 255 then BMP 8A should contain 'FF' and tag 41 should be used (see chapter TLV-container), providing the ZVT Card-Type ID is to be sent to the ECR. Alternatively BMP 8A can be omitted.

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Alternative:

ECR response:

ECR → PT
APDU

Control field		Length	Data block
CCRC	APRC		
84	00	00	

Alternative:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	9C	00	

Alternative:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	yy (any value, except-ing 00 and 9C)	xx	xx

Note:

- The responses 80-00-00 and 84-00-00 are positive acknowledgements from the ECR (card is not in the blocked-list).
- Response 84-9C-00 states that the PT should resend the blocked-list request after 2s.
- Response 84-yy-xx-xx with ‘yy’ not equal to ‘00’ or ‘9C’ or ‘6E’ implies that an error occurred whilst checking the blocked-list.
- Response 84-6E-00 states that blocked-list request was completed successfully and the card is con-tained in the blocked-list.

3.15 Input-Request (04 0D)

The PT sends an Input-Request to prompt for a string, a number or an amount at the ECR.

PT → ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
04	0D	xx	[06<TLV-container>]

Data block:

- 06<TLV-container>: Possible tags are 32.

Note:

- Input-Requests are only sent by the PT, if the ECR has added this command to the list of permitted ZVT-commands (tag 26) in Registration (06 00).

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	xx	06<TLV-container>

Data block:
- 06<TLV-container>: Possible tags are 32 (containing 1F3A).
  - The ECR returns the result of input in tag 1F3A in the response. If the timeout for the input has expired without any input, tag 1F3A or the TLV container is not added to response.

Alternative:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	00	xx	06<TLV-container>

Data block:
- 06<TLV-container>: Possible tags are 32 (containing 1F3A).
  - The ECR returns the result of input in tag 1F3A in the response. If the timeout for the input has expired without any input, tag 1F3A or the TLV container is not added to response.

Alternative:

ECR response:

ECR → PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	yy (any value, except-ing 00)	xx	xx

Note:
- The responses 80-00 and 84-00 are positive acknowledgements from the ECR.
- A response 84-yy with ‘yy’ not equal to ‘00’ implies that the **Input-Request was aborted or an error occurred** (See chapter Error-Messages).

3.16 Menu selection with graphic display (06 D0)

With this commend, a PT that supports Signature Capture via its touch display can send the screenshot to the ECR for verification.
In order to be able to support this command, the ECR must have sent Verify Signature command in Registration (06 00, 06<TLV Container>, tag 26)!

PT -> ECR			
APDU			
Control field		Length	Data block
CLASS	INSTR		
06	D0	XX	[70<image-id>] [72<image-mime>] [73<image-encoding>] F0<display-duration> F1<text line 1> [F9<beep-tones>] [FB<confirmation>] [E1<text2 line 1>] [71<image-size>] [74<chunk-count>] [75<chunk index>] 06<TLV Container>

Data block:

- F0<display-duration>: mandatory value in seconds, 1 byte (**not** BCD packed), '00' means infinite. default-value: '00'
- F1<text1 line 1>: mandatory headline
- F9<beep-tones>: optional number of beep-tones, 1 byte
- FB<confirmation>: optional confirmation of the input with <OK> required; '00' = no, otherwise yes, 1 byte; default: yes
- E1<text2 line 1>: optional further explanation text (shall be shown in parallel with F1)
- 70<image-id>: mandatory for image data that does not fit into a single APDU, not necessary for a single APDU image size or when no image transmitted
- 71<image-size>: mandatory for image data that does not fit into a single APDU.
- 72<image-mime>: mandatory for the starting request when image is transmitted
- 73<image-encoding>: mandatory for the starting request when image is transmitted
- 74<chunk-count>: mandatory for the starting request when image transmitted and data does not fit into a single APDU
- 75<chunk-index>: mandatory when image transmitted and data does not fit into a single APDU
- 06<TLV-container>: Possible tags are 2B (menu; exactly one time), and 1C (image; optional: 0 or 1 time)
  - Tag 2B describes the possible choices that can be made for actual situation
    - Subtag 14 (ISO character-set; optional)
    - Subtag 15 (language-code; optional)
    - Subtag 16 (menutype: '0x01')
    - Subtag 17 (context: '0x01', other menu)
    - Subtag 18 (target: '0x01', merchant display)
    - Subtag 2C (menu-item; several times)
      - Subtag 07 (display-text)
      - Subtag 19 (return-value; binary encoded)
      - Subtag 50 (background-color; 3 bytes RGB, optional)
  - Tag 1C carries the image data (if present).

ECR response

When transmission of the image is not finished (transmission so far successful, but still chunks to come):

ECR -> PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	00	

Alternative:

ECR response

When image was transmitted successful, and cashier has made his/her choice:

ECR -> PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
80	00	xx	06<TLV Container>

Data block:
06<TLV-container>: Possible tag is 19.

Alternative:

ECR response

On any error:

ECR -> PT			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	yy	xx	Xx

Note:
A response 84-yy implies that the Verify Signature-Request was aborted with an error, e.g. timeout (see chapter Error Messages).

3.17 Other Commands

The PT transmits no further commands to the ECR.

4 Synchronization between ECR and PT

4.1 Problem

PT and ECR have to be on the same page regarding the outcome of a transaction. Especially with TCP/IP connections there is a possibility of communication issues during a transaction.
The decition wheter a transaction was successful or not has to make the ECR.

Expamples for asynchronous situations:

- 04-0F message does not get to the ECR
  - Transaction not OK for ECR
  - Transaction OK for PT
  - PT does not know if transaction was OK for the ECR

- Confirmation 80-00 of the 04-0F command gets lost or PT recognioses timeout
  - Transaction OK for ECR
  - Transaction NOK for PT

4.2 Solution

Synchronization is only possible with the following transaction. If the PT and ECR have different results:

- Transaction OK for PT → transaction can be reversed afterwards
- Transaction NOK for ECR to be sure that goods are not gone in case of a wrong result

So, in case of communication problems, the PT shall not reverse the transaction because this can be done in the following transaction.

For synchronisation a unique identifier has to be used, the receipt number fulfills this requirement. The TLV tag 1F1F is used for this; the PT sends the receipt number within the 04-0F tag to the ECR. The ECR mirrors this value for the next transaction commands to the PT. **Only use this method for transactrion commands!** There are several possibilities now:

- Receipt number from ECR equal to last transaction known in the PT → ECR and PT are synchronized
- Receipt number from ECR =-1 compared to last known transaction in the PT → ECR and PT are not synchronized → PT will reuse the receipt number of the last transaction,a implicit reversal will be done. The type of reversal is similar to an auto reversal.
- Receipt number from ECR <-1 or >=1 compared to last known transaction in the PT → ECR and PT are not synchronized → The PT ignores the receipt number. This can happen in case of new installations. The ECR has to mirror the receipt number from this new transaction afterwards!
- The ECR has no receipt number from the PT e.g. cause of a new installation, the Tag 1F1F will be sent with the lenth of NULL. **Do not send a "0" cause this can reverse a transaction if the terminal's last successful receipt number was "1"!**

To use this feature an extra registration is not necessary. The ECR just has to send 1F1F, PT checks if the PT tag is present.

1F1F can be used with the following commands: Authorization (06 01), Account Balance Request (06 03), Activate Card (06 04), Book Tip (06 0C), Telephonic Authorisation (06 21), Pre-Authorisation / Reservation (06 22), Partial-Reversal of a Pre-Authorisation / Booking of a Reservation (06 23), Book Total (06 24), Pre-Authorisation Reversal (06 25), Reversal (06 30), Refund (06 31), End-of-Day (06 50).

5 Message Sequence IDs

This identifier is used to assign a response (confirmation) to a request and to identify duplicate or missing messages. By default the PT does not use the message sequence id only if the ECR sets up this configuration with the registration message (see chapter 5.1).

5.1 Registration with message sequence id (MsgSeqId)

The message sequence id can only be used if the ECR supports TLV-container. By default the PT does not use the message sequence id. If the ECR sends the new tag 1F73 with the value 000000 in the TLV-container of the registration message, PT and ECR will both use the message sequence id in each message starting from the next command after the registration command was completed.

Example registration with MsgSeqId (PT does not support it):

```
ECR -> PT: 06 00 14 00 00 00 9E 09 78 06 0C 26 04 0A 02 06 D3 1F 73 03 00 00 00
PT -> ECR: 80 00 00
PT -> ECR: 06 0F 12 19 00 29 65 00 00 28 49 09 78 06 06 26 04 0A 02 06 D3
ECR -> PT: 80 00 00
```

The ecr should not use a MsgSeqId in the next request because the terminal does not support it.

Example registration with MsgSeqId (terminal supports it):

```
ECR -> PT: 06 00 14 00 00 00 9E 09 78 06 0C 26 04 0A 02 06 D3 1F 73 03 00 00 00
PT -> ECR: 80 00 00
PT -> ECR: 06 0F 18 19 00 29 65 00 00 28 49 09 78 06 0C 26 04 0A 02 06 D3 1F 73
03 00 00 00
ECR -> PT: 80 00 00
```

The ecr should use a MsgSeqId in the next request, e. g. next command is authorization:

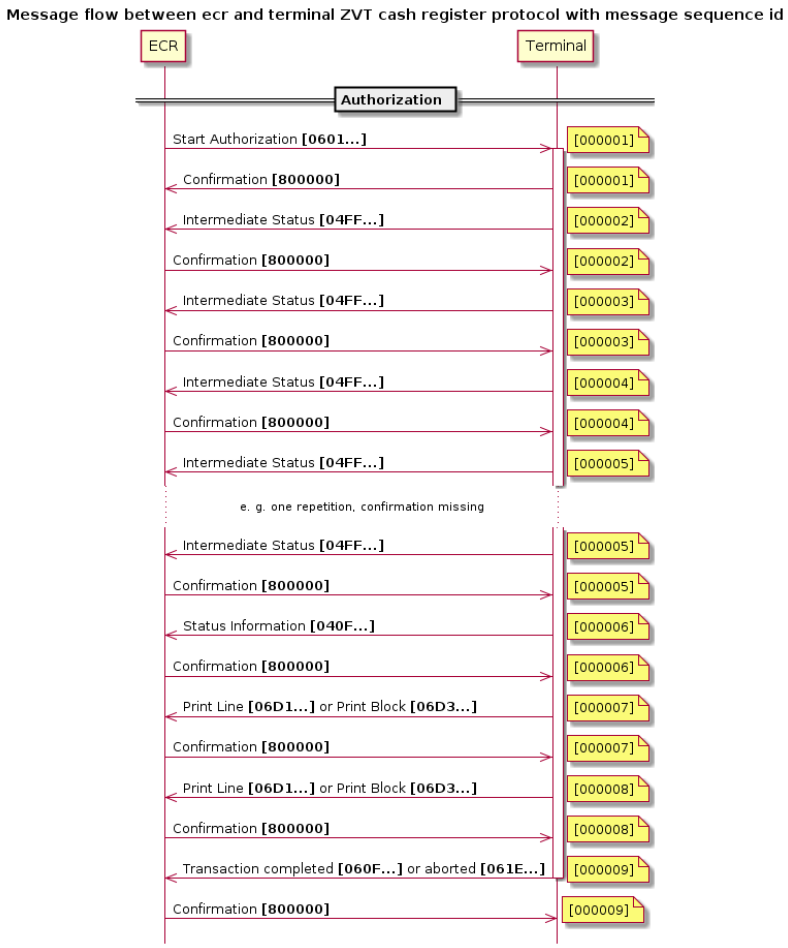
```
ECR -> PT: 06 01 0C 04 00 00 00 00 01 00 49 09 78 19 44 06 06 1F 73 03 00 00 01
ECR <- PT: 80 00 08 06 06 1F 73 03 00 00 01
ECR <- PT: 04 FF 09 17 06 06 1F 73 03 00 00 02
ECR <- PT: 80 00 08 06 06 1F 73 03 00 00 02
ECR <- PT: 04 FF 09 01 06 06 1F 73 03 00 00 03

ECR <- PT: 80 00 08 06 06 1F 73 03 00 00 03
....
ECR <- PT: 06 D3 FF 5D 03 06 82 03 59...1F 73 03 00 00 06
ECR <- PT: 80 00 08 06 06 1F 73 03 00 00 06
ECR <- PT: 06 D3 63 06 61...1F 73 03 00 00 07
ECR <- PT: 80 00 08 06 06 1F 73 03 00 00 07
ECR <- PT: 04 FF 19 17 03 06 15 24 0D 07 0B 30 30 20 41 70 70 72 6F 76 65 64 1F
73 03 00 00 08
ECR <- PT: 80 00 08 06 06 1F 73 03 00 00 08
ECR <- PT: 06 D3 FF 66 03 06 82 03 62...1F 73 03 00 00 09
ECR <- PT: 80 00 08 06 06 1F 73 03 00 00 09
```

```
ECR <- PT: 06 D3 37 06 35...1F 73 03 00 00 10
ECR <- PT: 80 00 08 06 06 1F 73 03 00 00 10
ECR <- PT: 06 0F 08 06 06 1F 73 03 00 00 11
ECR <- PT: 80 00 08 06 06 1F 73 03 00 00 11
```

5.2 Use of the message sequence id (MsgSeqId)

The message sequence id will be used in each message between ECR and PT, if the ECR sets up this configuration with the registration message (see chapter 5.1).
The MsgSeqId starts with “0000001” with the first command from ECR after the confirmation to the registration completion. The PT will echo it in the confirmation (80 00 00) and increment it for the next message to the ECR. After the value “999999” “000001” follows again.
If a message has to be repeated, the same MsgSeqId has to be used, until the partner answers to this message with the same id or a timeout occurs.
ECR and PT can check if the MsgSeqId of the answer corresponds to the MsgSeqId of the request.
The MsgSeqId has to be ascending.

Example:



6 Important Receipt Texts

6.1 Receipt layout Reccomendation

A non-mandatory recommendation for the receipt layout is provided by the VdTH and can be found on its website.

6.2 Transfer of Receipt-Information

If the ECR assumes printing of payment-data it can receive the important information for receipt-printout in two different ways:

1. Aquisition of the texts from the commands Print Line (06 D1) / Print Text-Block (06 D3) and their printing details without re-formatting.
2. Aquisition of the texts from the command Status-Information (04 0F) and their printing details with the preceding sorting and formatting.

The first method has the advantage that the programmer of the ECR does not need be concerned with the contents of the receipt; the important details are always present and the formatting is correctly set. Thus it is assured that the requirements of the ZKA or credit-card organisations or other partners are met. Additionally the ECR is not liable to the ZKA.

The following table gives an overview of the most important data which must be included on a receipt.

6.3 Receipt-Information – Common Information

The required common data for each payment are:

- name of the means-of-payment
- payment-type (payment, reversal, refund, aquisition, ...)
- amount from field 04 with currency code (recognisable from field 49; 0978 = ‘EUR’)
- terminal-ID from field 29
- date from field 0D and time from field 0C
- trace-number from field 0B
- receipt-number from field 87
- result-code from field A0 (if present)
- additional-text from field 3C (if present)
- expiry-date of the card from field 0E

6.4 Extended Receipt-Information dependent on Payment Type

payment-type	print-texts
ELV (Track 3)	• name of the means-of-payment: ec direct-debit • signature line for customer • permitted advice-text from operator for direct-debit entry • card-sequence number from BMP ‚17‘ • account-number and bank-code from the PAN from BMP ‚22‘

PoZ (obsolete)	• name of the means-of-payment: PoZ • signature line for customer • reference-number BMP ‚3B' (not available for reversal) • reference-parameter from BMP ‚BA' (not available for reversal) • permitted ZKA advice-text from operator for direct-debit entry • card-sequence number from BMP ‚17' • account-number and bank-code from the PAN from BMP ‚22'
Online-direct-debit (not ZKA)	• name of the means-of-payment obtained from network operator • signature line for customer • reference-number BMP ‚3B',so long as sent by network operator • reference-parameter from BMP ‚BA', so long as sent by network operator • permitted advice-text from operator for direct-debit entry • card-sequence number from BMP ‚17' • account-number and bank-code from the PAN from BMP ‚22'
ec-Cash (up to TA 6.0)	• name of the means-of-payment: electronic cash • authorisation-attribute from BMP ‚3B' • AID-parameter from BMP ‚BA' for online-TA or from BMP ‚92' for offline-TA • card-sequence number from BMP ‚17' • account-number and bank-code from the PAN from BMP ‚22'
GiroCard (TA7.0)	• the ECR has to check tag 45 to determine which receipts have to be printed • name of the means-of-payment from BMP 8B or tag 4A • receipt DOL from tags 46 or 47, if available • authorisation-attribute from BMP ‚3B' • card-sequence number from BMP ‚17' • account-number from the PAN in BMP ‚22'
Maestro (TA5.2)	• name of the means-of-payment: Maestro • authorisation-attribute BMP ‚3B' • AID-parameter BMP ‚BA' for online-TA or from BMP ‚92' for offline-TA • card-number from the PAN from BMP ‚22'
Geldkarte (Version 3.0)	receipt-printout is optional according to specification. If a receipt is printed, then following are required: • name of the means-of-payment: Geldkarte • Geldkarte-number from BMP ‚9A' • merchant card-number from BMP ‚9A' • purse booking account from BMP ‚9A' • certificate from BMP ‚9A' • sequence-number BSEQ from the Geldkarte from BMP ‚9A' • sequence-numbers SSEQ the merchant-card from BMP ‚9A' • sequence-numbers HSEQ the merchant-card from BMP ‚9A'
Credit-cards (non DC POS)	• authorisation-attribute from BMP ‚3B' • VU-Number from BMP ‚2A' • card-number from the PAN from BMP ‚22'
Credit-cards (DC POS 2.4)	• the ECR has to check tag 45 to determine which receipts have to be printed • name of the means-of-payment from BMP 8B or tag 4A • receipt DOL from tags 46 or 47, if available • authorisation-attribute from BMP ‚3B' • VU-Number from BMP ‚2A' • card-number from the PAN from BMP ‚22'
Customer-cards, Aquisition-cards, Fleetcards,	• to be agreed with network operator

other	

7 Event Sequence for PT in Locked Condition and for Execution of Time-Controlled Events on PT

7.1 Sequence for Locked Condition

There are locked-conditions during which the PT is temporarily out-of-order. These conditions are reflected by the terminal-status. In this condition the PT is basically able to receive and respond to all PT commands. However, all PT commands are responded to with the Abort command, with these exceptions:

- Status-Request
- Display Text
- Display Text (old Version)
- Display Text with Function-Key Input
- Display Text with Function-Key input (old Version)
- Display Text with numerical Input
- Display Text with numerical input (old Version)
- Activate Service-Mode
- Software-Update
- Registration
- Log-Off
- Read Card
- Abort

These commands will be processed normally.

Additionally commands which can deactivate the locked condition, (state can be read via the PT-command „Status-Request“) are also processed.

7.2 Time-Controlled Events

The PT hat the possibility to execute time-controlled events independently. During this time the PT is temporarily out-of-order. In this case commands sent to the PT will not be responded to. After completion of the event, cammonads are processed normally by the PT again. It is left up to the vending-machines or ECR to decide how it reacts in this case. It is possible to discern when the PT is operational again by polling with the command Status-Request. It must be noted that time-controlled events may last a considerable time period (e.g. for software-update).

8 Additional Data

Depending on the software the ECR can send additional data commands Authorisation, Reversal etc.

8.1 Additional Data type 1 (for fleet-cards)

The field 3C<additional-data> is optional, length variable.

8.1.1 Structure

Length [byte]	Field
3	Length of flowing data within BMP 3C, LLLVAR encoded
2	Driver-code, BCD packed, if the field driver-code is not used, default ‚00 00‘
3	Mileage, BCD packed, if the field mileage is not used, default ‚00 00 00‘
2	Error- and status-code, binary
8	Goods-data information #1
	...
8	Goods-data information #n

8.1.2 Error- and Status-codes

byte 1: not used
byte 2:

bit	definition
0	PIN-input bypass
1	outdoor
2	RFU
3	card locked
4	card expired
5	transaction-data manually captured
6	rental car
7	reversal

8.1.3 Goods-Data Information

The maximum number of the goods-data information is variable and depends on the requirements of the host system. Each goods-data information comprises:

- Product code: 2 byte, BCD packed
- Partial amount: 3 byte, BCD packed, in hundreds of units, e.g. 000150 means 1,50 pieces or litre.
- Partial sum: 3 byte, BCD packed, in hundreds of units, e.g. 000150 means 1,50 €.
  Note: if a negative sum is given (e.g. for deposit), this can be noted via a ‘D’ in the MS-nibble of the partial-sum. In this case the maximum partial-sum is 999,99 €.

8.2 Additional Data type 2

RFU

8.3 Additional Data type 3 (for fleet-cards)

The field 3C<additional-data> is optional, length variable at most 213 byte.

8.3.1 Structure

Length [byte]	Field
3	Length of following data within BMP 3C, LLLVAR encoded
3	Mileage, BCD packed, if the field mileage is not used, default ‚00 00 00‘
2	Vehicle-number, BCD packed, if the field vehicle-number is not used, default ‚00 00‘
2	Driver-code, BCD packed, if the field driver-code is not used, default ‚00 00‘
3	Capture-type, binary encoded
20	Info, ASCII encoded
2	Filler, ASCII encoded
1	Number of the goods-data information, BCD packed, range 0 bis 15
12	Goods-data information #1
	...
12	Goods-data information #n

8.3.2 Capture-Type

The contents are dependent on the network operator.

8.3.3 Goods-Data Information

The number of the goods-data information is variable and limited to at most 15. Each goods-data information comprises:

- Product code: 3 byte, BCD packed
- Partial amount: 3 byte, (4 pre-decimal positions, 2 decimal positions), BCD packed.
- Partial sum: 5 byte, (7 pre-decimal positions, 3 decimal positions), BCD packed. The third decimal postion is always ‘0’.
- Prefix: 1 byte ASCII (“ “ for positive and “-“ for negative amounts).

9 TLV-Container

Using the TLV-container variable data-elements can be transferred between ECR and PT. In contrast to bitmaps the data-elements are transferred in a consistant format. Each element is pre-fixed with a tag (ID of the data-element) and a length. The concatenation of tag + length + data-element is known a a data-object.

9.1 Advantages of the TLV-container

1. The ECR-interface is increasingly extended through new functions. The number of the possible bitmaps is however limited to at most 256. Thus there is a resource-conflict. The flexible structure of the data-objects allows (theoretically) any desired number of different data-objects to be defined.
2. For bitmaps there are different formats: bitmaps with fixed length, LL-Var and LLL-Var encoded. Therefore the receiver must be able to identify each single bitmap to process it and to know where the next bitmap in the data-flow begins. Through their uniform structure data-objects may be skipped or igored if unknown to the receiver. This allows a certain downwards-compatibility for differing performance levels bewteen transmitter and receiver is possible.
3. The uniform structure and the flexibility facilitate the development of new functions and allow further development without creating unnecessarily long data-objects.

9.2 Transport of TLV-containers

The TLV-container is transmitted in a bitmap (= transport-container). The bitmap itself is TLV-encoded:

bitmap 06 (= pseudo-tag) + length-field (structure of the length-field according to chapter Length-Field, and NOT LLL-Var!) + data-element (= list of data-objects).

transport-container = BMP06 + length-field + liste of data-objects

Example:
- 06 + length + data-object
- 06 + length + data-object 1 + data-object 2 + ... + data-object n

data-object = tag + length + data-element (see chapter Structure)

9.2.1 Transmission of TLV-container from ECR to PT

The ECR can send the PT a TLV-container for any command. If the ECR only wants to signal the PT, that the PT may send a TLV-container, it can send BMP 06 with length 00 without data-element.

9.2.2 Transport of TLV-container from ECR to PT

The PT may only send a TLV-container to the ECR, if the ECR sent a TLV-container (BMP 06 with length 00 without data-element) during Registration or if the ECR sent a TLV-container to the PT in the corresponding request. For the following commands it is insignificant whether the ECR sent the BMP06 for the Authorisation or another command. The TLV-activation via the ECR is valid until Log-off.

9.3 Structure

Data-objects consist basically of 3 consecutive fields:

tag + length + data-element

For special-case length = 0 the data-element is omitted:

tag + length

9.3.1 Tag-field

The tag-field is the identification of the following data-element. With it the receiver can associate the contents.

In the tag is a class (bit 7 and 8), a type (bit 6) and a number (bit 1 bis 5) encode.

byte 1:

b8	***b7***	***b6***	***b5***	***b4***	***b3***	***b2***	***b1***	***Definition***
0	0							universal-class
0	1							application-class
1	0							context-specific class
1	1							private class
		0						primitive data-object
		1						constructed data-object
			0 0 0 0 0 bis 1 1 1 1 0					tag-number
			1	1	1	1	1	tag-number in next byte

byte 2 bis n (optional):

b8	***b7***	***b6***	***b5***	***b4***	***b3***	***b2***	***b1***	***Definition***
1								a further byte follows
0								last byte
	0 0 0 0 0 0 0 bis 1 1 1 1 1 1 1							(part of) tag-number

Primitive Data-Object:

tag	tength	data-element

Constructed Data-Object:

A constructed data-object contains, in contrast to primitive data-objects further sub-data-objects.These sub-data-objects can also contain primitive and constructed data-objects.
Example constructed data-object:

tag	length	constructed data-element

sub-object 1 (primitive or constructed data-object)					...	sub-object n (primitive data-object)		
tag	length	primitive or constructed data-object 1	...	primitive or constructed data-object n		tag	length	data-element

9.3.2 Length

byte 1:

b8	*b7*	*b6*	*b5*	*b4*	*b3*	*b2*	*b1*	*Definition*
0	value decimal 0 to 127							length (in bytes) of the following data-element
1	0	0	0	0	0	0	0	invalid value
1	0	0	0	0	0	0	1	one length-byte follows
1	0	0	0	0	0	1	0	two length-bytes follow: 2nd byte: high byte 3rd byte: low byte
1	value 3 to 127							RFU

If the length has value 0, the data-element is omitted. This is referred to as an empty data-object.

9.3.3 Data-Element

Format and contents of the data-elements are dependent on the particular tag.

9.4 Defined Data-Objects

The following data-objects are defined.

Note:
The given lengths are the typical values for each field. However, the length of each data-object must always be interpreted from the data-object since only this value is definitive.

9.4.1 Overview of tags used

9.4.1.1 ***Primitive***

Tag	Name	see
01	reversal-ID	section „Miscellaneous“
02	driver-number	section „Fleet-card“
03	auto-number	section „Fleet-card“
04	mileage	section „Fleet-card“
05	goods-group	section „Fleet-card“
06	restriction-code 1	section „Fleet-card“
07	text-lines	section „Miscellaneous“
08	receipt-number	section „Miscellaneous“
09	attribute	section „Miscellaneous“
0A	ZVT-command	section „Miscellaneous“
0B	info-field	section „Miscellaneous“
0C	info-field2	section „Miscellaneous“

Tag	Name	see
0D	restriction-code 2	section „Fleet-card“
0E	service-code	section „Fleet-card“
0F	assignment-number	section „Miscellaneous“
10	number of columns and number of lines merchant-display	section „Miscellaneous“
11	number of columns and number of lines customer-display	section „Miscellaneous“
12	number of characters per line of the printer	section „Miscellaneous“
13	extra result-code	section „Miscellaneous“
14	ISO character set	section „Miscellaneous“
15	language-code	section „Miscellaneous“
16	menu-type	section „Menu“
17	context	section „Menu“
18	destination	section „Menu“
19	return-code	section „Menu“
1A	maximum length of the APDU	section „Miscellaneous“
1B	diagnosis-type	section „Miscellaneous“
1C	file-block	section „Miscellaneous“
1D	file-ID	section „Miscellaneous“
1E	start-position	section „Miscellaneous“
40	EMV-config-parameter	section „EMV“
41	ZVT card-type-ID	section „EMV“
42	name of the application	section „EMV“
43	application-ID	section „EMV“
44	application preferred name	section „EMV“
45	receipt-parameter	section „EMV“
46	EMV-print-data (customer-receipt)	section „EMV“
47	EMV-print-data (merchant-receipt)	section „EMV“
48	priority	section „EMV“
49	network-operator card-type-ID	section „EMV“
4A	DC POS 2.4 product display	section „EMV“
4B	Issuer country code	section „EMV“
4C	UID	
4D	EF_ID GeldKarte / girogo	
50	Background-color	section „Menu“
80	prepaid-PIN	section „Prepaid“
81	telephone number	section „Prepaid“
82	top-up text	section „Prepaid“
83	prepaid type	section „Prepaid“
83	MinChargeAmount	section „Prepaid“
83	MaxChargeAmount	section „Prepaid“
C1	transaction-type	section „Bonus-points“
C2	number of bonus-points	section „Bonus-points“
C3	number of remaining bonus-points	section „Bonus-points“

Tag	Name	see
C4	transaction-number of ECR	section „Bonus-points“
C5		section „Bonus-points“
1F00	total length of file	section „Miscellaneous“
1F01	receipt-ID	section „Miscellaneous“
1F02	from_TA-number	section „Miscellaneous“
1F03	to_TA-number	section „Miscellaneous“
1F04	receipt-parameter	section „Miscellaneous“
1F05	transaction-parameter	section „Miscellaneous“
1F06	reservation-parameter	section „Miscellaneous“
1F07	receipt-type	section „Miscellaneous“
1F08	data track 1 of the magnet-stripe	section „Miscellaneous“
1F09	data track 2 of the magnet-stripe	section „Miscellaneous“
1F0A	data track 3 of the magnet-stripe	section „Miscellaneous“
1F0B	maximum pre-authorisation amount	section „Fleet-card“
1F0C	license plate number	section „Fleet-card“
1F0D	transparent data to host	section „Miscellaneous“
1F0E	date	section „Miscellaneous“
1F0F	time	section „Miscellaneous“
1F10	cardholder authentication	section „Miscellaneous“
1F11	online flag	section „Miscellaneous“
1F12	card-technology	section „Miscellaneous“
1F13	ECR function request	section „Miscellaneous“
1F14	card identification item	section „Miscellaneous“
1F15	card reading control	section „Miscellaneous“
1F16	extended error code	section „Miscellaneous“
1F17	extended error text	section „Miscellaneous“
1F18	card notification control	section „Miscellaneous“
1F19	card acceptance, binary	section „Miscellaneous“
1F1A	PAN for card acceptance matching	section „Miscellaneous“
1F1B	markup in % with 2 decimals	section „DCC“
1F1C	card name	section „DCC“
1F1D	currency information Type	section „Miscellaneous“
1F1E	number of decimals	section „Miscellaneous“
1F1F	Unique transaction identifier	section „Miscellaneous“
1F20	amount	section „Miscellaneous“
1F21	ISO currency code	section „Miscellaneous“
1F22	Inverted rate display unit	section „DCC“
1F23	Retrieval ID	section „DCC“
1F24	Reference Number	section „DCC“
1F25	Cashback Amount	section „Miscellaneous“
1F26	End of Day mode	section „Miscellaneous“
1F27	Extended product name (EuroELV DF8118)	section „Miscellaneous“
1F28	Emergency mode (EuroELV)	section „Miscellaneous“
1F29	Limit overridden (EuroELV)	section „Miscellaneous“
1F2A	Additional card holder information (EuroELV DF8117)	section „Miscellaneous“
1F2B	Trace number (long format)	section „Miscellaneous“
1F2C	Profilename	section „Miscellaneous“
1F2D	Card data input type	section „Miscellaneous“

Tag	Name	see
1F2E	Barcode type	section "Barcode data"
1F2F	Product code	section "Barcode data"
1F30	EPurse top up amount	section „Miscellaneous“
1F31	Encrypted PIN	section „Miscellaneous“
1F32	SMID value	section „Miscellaneous“
1F33	Message data	section „Miscellaneous“
1F34	MAC value	section „Miscellaneous“
1F35	ECR Identification	section „Miscellaneous“
1F36	TIP Amount	section "EMV"
1F37	Receipt information	section „Miscellaneous“
1F38	Input mode	section „Input“
1F39	Timeout	section „Input“
1F3A	Input result	section „Input“
1F3B	Transaction information	section „Miscellaneous“
1F3C	Input	section „Input“
1F3D	Alphanumeric data	section „Input“
1F3E	Encrypted cardholder information	section „Miscellaneous“
1F3F	Remaining balance	
1F40	Device name	
1F41	Software version	
1F42	Serial number	
1F43	Device state	
1F44	Terminal identifier	
1F45	ATS	
1F46	Command APDUs	
1F47	Card read error code	
1F48	reserved	
1F49	reserved	
1F4A	reserved	
1F4B	reserved	
1F4C	Card type	
1F4D	Card subtype	
1F4E	reserved	
1F4F	reserved	
1F50	reserved	
1F51	Debit mandate identifier	Section SEPA Direct Debit
1F52	Debit creditor identifier	Section SEPA Direct Debit
1F53	Debit pre-notification	Section SEPA Direct Debit
1F54	Key generation number (GN)	
1F55	Terminal locks	
1F56	4eye Customer identifier (CID)	
1F57	Merchant SAM number	
1F58	Merchant SAM expiry date	
1F59	Payment application	
1F5A	reserved	
1F5B	Card poll timeout	
1F5C	Encrypted key	
1F5D	Plaintext key	
1F5E	IBAN	Section SEPA Direct Debit

Tag	Name	see
1F5F	BIC	Section SEPA Direct Debit
1F60	Allowed card technologies	
1F61	Customer Index	section „Miscellaneous“
1F62	BMP 60 identifier for the individual reference number	section „Miscellaneous“
1F63	Individual reference number	section „Miscellaneous“
1F64	*** free ***	
1F65	Processing selection	Section “Value added services”
1F66	Wallet data	Section “Value added services”
1F67	Retailer identifier	Section “Value added services”
1F68	Loyalty identifier	Section “Value added services”
1F69	Voucher identifier	Section “Value added services”
1F6A	Remaining Amount	section „Miscellaneous“
1F6B	Age verification control	section „Miscellaneous“
1F6C	Age verification result	section „Miscellaneous“
1F70	Indicator for partial approval capability	Section “Miscellaneous”
1F71	TLV tags recognized by the PT	Section “Miscellaneous”
1F72	Extended CTLS card detection in status poll	Section “Miscellaneous”
1F73	Message sequence id (MsgSeqId)	Section “Miscellaneous”
1F74	Password large version	Section “Miscellaneous”
1F75	DUKPT encrypted input	
1F76	Send tag 1F32, SMID of the DUKPT key used in commands 06 E7 and 06 E5 in Status Enquiry (05 01	
1F77	Index of DUKPT engine	
1F78	Request to send the 24 hour reboot information	Section “Miscellaneous”
1F79	Request to start an action	Section “Miscellaneous”
1F80	Filename optional including path information	Section “Miscellaneous”
1F81	MIME type of the file	Section “Miscellaneous”
1F82	Transaction reference number	
1F83	Acquirer identifier	
FF01	Coupon data	Section “Value added services”
FF02	Loyalty data	Section “Value added services”
FF03	Parking ticket	Section “Value added services”
FF04	Voucher data	Section “Value added services”

9.4.1.2 Constructed

Tag	Name	see
20	fleet-card container	section „Fleet-card“
21	list of permitted goods-groups	section „Fleet-card“
22	list of prohibited goods-groups	section „Fleet-card“
23	list of open pre-authorisations	section „Miscellaneous“
24	display-texts	section „Miscellaneous“
25	print-texts	section „Miscellaneous“
26	list of permitted ZVT-Commands	section „Miscellaneous“
27	list of supported character-sets	section „Miscellaneous“
28	list of supported languages	section „Miscellaneous“
29	list of menus	section „Menu“
2A	list of menus	section „Menu“
2B	menu	section „Menu“

Tag	Name	see
2C	menu-point	section „Menu“
2D	file	section „Miscellaneous“
2E	time-stamp	section „Miscellaneous“
2F	payment-type	section „Miscellaneous“
30	card acceptance matching, container	section „Miscellaneous“
31	amount information	section „Miscellaneous“
32	input container	section „Input“
33	DUKPT key container	
34	Terminal date time	section „Miscellaneous“
35	24 hour reboot date time	section „Miscellaneous“
60	application	section „EMV“
61	list of applications on magnet-stripe	section „EMV“
62	list of applications on chip	section „EMV“
63	prepaid-container	section „Prepaid“
64	receipt header	section „EMV“
65	receipt advertising text	section „EMV“
66	receipt customer copy	section „EMV“
67	receipt merchant copy	section „EMV“
68	receipt transaction outcome	section „EMV“
69	reference transaction	section „EMV“
6A	invalid application	section „EMV“
E1	bonus-points container	section „Bonus-points“
E2	DCC container	section „DCC“
E3	Barcode Container	section "Barcode data"
E4	Device information container	
E5	Key Container	
E6	Card type container	
E7	Merchant SAM information container	
E8	Value added services container	Secion “Value added services”
E9	Reference number container	

9.4.2 Miscellaneous

9.4.2.1 ***Primitive data objects***

Tag	Data-element
01	reversal -ID for EC-Cash chip offline, 8 byte, binary encoded. The PT sends the reversal-ID in the status-information.
07	text-lines, length variable, encoded according to the current character set (not null-terminated). See tag 14, 24, 25, and 2C.
08	receipt-number, BCD-packed, 2 byte with leading zeros. See tag 23.
09	attribute; length 1 byte. Structure see chapter Print Lines (06 D1). 0xFF indicates on linefeed, no combination with a count possible as described in command 06 D1. See also tag 25.
0A	ZVT-command (CLASS and INSTR, see specification Application Protocol); 2 byte. This tag is used in connection with tag 26.

Tag	Data-element
0B	info-field; ASCII-encoded (not null-terminated), max. 20 byte. The PT sends the info-field in the status-information.
0C	info-field 2; ASCII-encoded (not null-terminated), max. 10 byte. The PT sends the info-field 2 in the status-information.
0F	assignment-number; ASCII-encoded (not null-terminated), max. 20 byte; can be used for sequence-control for service-calls (see command „Software-Update“)
10	number of columns and number of lines of the merchant-display (of the ECR or of the PT); 2 bytes BCD-packed; format SSZZ (SS= number of columns; ZZ= number of lines); tag 10 can be sent by the ECR to the PT during registration, if the ECR has a merchant-display and/or from the PT in the Completion command of the Registration on the ECR. If the tag is empty (i.e. length = 0 or no data-element available), then no merchant-display is available.
11	number of columns and number of lines of the customer-display (of the ECR or of the PT); 2 bytes BCD-packed; format SSZZ (SS= number of columns; ZZ= number of lines); can be sent by the ECR to the PT during registration, if the ECR has a customer-display and/or from the PT in the Completion command of the Registration on the ECR
12	number of characters per line of the printer; format 1 byte BCD-packed. With command “Registration” the ECR sends the width ECR printer. In Completion the PT sends optionally the used width of the terminal printer.
13	extra result-code; variable length; ASCII encoded (not null-terminated) e.g. for EMV: Z1-Z3, Y1-Y3 The error-codes are application-specific. The definition must be taken from the relevant specification. The PT sends the extra result-code in the Status-Information to the ECR. The PT should however still send the BMP27.
14	ISO-character-set; length variable 0x00 – ASCII 7 bit common character-set (does not correspond to ZVT-character-set!) 0x01 – ISO 8859-1 (Latin 1) 0x02 – ISO 8859-2 … – and so on til 0x10 – ISO 8859-16 with the exception for ISO 8859-12 which is not in the standard. 0xFE – UTF8 Encoder for unicode 0xFF – 8 bit ZVT-character-set CP437 (default; must be supported) The PT sends this tag within the tags 27, 2B, 32 and in the status-information and within tag 27 in completion command for registration.
15	language-code; length 2 bytes; ASCII encoded (not null-terminated) language-code according to ISO 639-1; e.g. DE = German; FR = French; EN = English; IT = Italian; There is no difference between capital and small letters. The PT sends this tag within the Tags 28 and 2B, in authorisation commands as optional language preselection and in the status-information.
1A	max. length the APDU; length variable; binary encoded (hi-byte sent before lo-byte) During the Registration the ECR defines in tag 1A the maximum size of the APDU that the ECR can process. The PT can send it owns max. size of APDU to be received in tag 1A in the Completion of the Registration. Note: During the implementation it must be observed that the data of the transport-protocols can be notably longer than the APDU (overhead of the transport-protocol: DLE, STX, DLE, ETX, CRC, CRC and duplication of the ‘0x10’; see also PA00P016).

<table>
<tr><th>Tag</th><th>Data-element</th></tr>
<tr><td></td><td>Each transmitter must observe that the APDU does not exceed the receive-buffer capacity of the receiver.</td></tr>
<tr><td>1B</td><td>diagnosis-type; length variable, binary encoded

<table><tr><td>0x01</td><td>line diagnosis</td></tr><tr><td>0x02</td><td>extended-diagnosis (default-value)</td></tr><tr><td>0x03</td><td>configuration diagnosis</td></tr><tr><td>0x04</td><td>EMV configuration diagnosis</td></tr><tr><td>0x05</td><td>EP2 configuration</td></tr></table></td></tr>
<tr><td>1C</td><td>file-block; length variable; contains the transmitted raw-data; the contents are implementation-dependent</td></tr>
<tr><td>1D</td><td>file-ID; length variable; with this tag the ECR can select which it wants to read or write. The PT signals with this tag which file will be sent or which file shall be transferred by the ECR.

<table><tr><td>0x01</td><td>merchant-journal</td></tr><tr><td>0x02</td><td>log-file the application</td></tr><tr><td>0x03</td><td>log-file of the ECR-protocol</td></tr><tr><td>0x04</td><td>log-file of the communication-module</td></tr><tr><td>0x05</td><td>log-file of the PIN-pad</td></tr><tr><td>0x06</td><td>reconciliation data (content is implementation dependent)</td></tr></table></td></tr>
<tr><td>1E</td><td>start-position; length variable; network byte order; this tag has two functions:

1.) for the request from the ECR: offset from which should be read/written
2.) for file-transfer: position within the file.</td></tr>
<tr><td>1F00</td><td>total-length of file network byte order. Should the file be so large that it cannot be transmitted in a single tag, then this tag serves to inform the receiver, that further status-information may follow. From the start-position (tag ‚1E‘) the receiver knows in which order the status-information belong</td></tr>
<tr><td>1F01</td><td>receipt-ID; length variable; binary encoded; this tag is used together with command „Repeat Receipt“:

<table><tr><td>0x01</td><td>last receipt</td></tr><tr><td>0x02</td><td>payment-receipt merchant (see also tag ‚1F02‘ and tag ‚1F03‘)</td></tr><tr><td>0x03</td><td>payment-receipt customer (see also tag ‚1F02‘ and tag ‚1F03‘)</td></tr><tr><td>0x04</td><td>end-of-day receipt</td></tr><tr><td>0x05</td><td>journal (see also tag ‚1F02‘ and tag ‚1F03‘)</td></tr><tr><td>0x06</td><td>reconciliation</td></tr></table></td></tr>
<tr><td>1F02</td><td>from_TA-number; length variable; binary encoded; used with tag ‚1F01‘.

If from_TA-Number is given in command Repeat Receipt the terminal prints all receipts stored in the terminal starting at TA-number from_TA-number.
from_TA-Number can be linked with to_TA-Number.
If from_TA-Number and to_TA-Number are identical only one receipt will be printed for this TA-number. For from_TA-Number= 0 and missing to_TA-Number all receipts are printed.</td></tr>
<tr><td>1F03</td><td>to_TA-number; length variable; binary encoded; used with tag ‚1F01‘ and tag ‚1F02‘.</td></tr>
<tr><td>1F04</td><td>receipt-parameter; length variable; bit-field; sent for the Registration or for a transaction:
Byte 0:
1xxx xxxx
positive customer-receipt required (0xxx xxxx = no customer-receipt); only relevant if the PT should send print-lines or receipt-blocks and the transaction was success fully completed

x1xx xxxx</td></tr>
</table>

Tag	Data-element
	negative customer-receipt required (x0xx xxxx = no customer-receipt); only relevant if the PT should send print-lines or receipt-blocks and the transaction was not successfully completed xx1x xxxx positive merchant-receipt required (xx0x xxxx = no merchant-receipt); only relevant if the PT should send print-lines or receipt-blocks and the transaction was successfully completed xxx1 xxxx negative merchant-receipt required (xxx0 xxxx = nomerchant-receipt); only relevant if the PT should send print-lines or receipt-blocks and the transaction was not successfully completed xxxx 1xxx customer-receipt should be sent before the merchant-receipt (xxxx 0xxx = merchant-receipt should be sent before the customer-receipt) ; only relevant if the PT should send print-lines or receipt-blocks xxxx x1xx print short receipt (payment-data excluded; no header/footer/advertising-text) (xxxx x0xx = print normal receipt) xxxx xx1x do not print product-data (from BMP3C) on the receipt (xxxx xx0x = print normal receipt) xxxx xxx1 use ECR as printer (commands 06 D1/ 06 D3) instead of internal printer or if no printer available. This enables printing of receipts with print commands only for the command the tag is issued with, despite the print commands being disabled in general in the registration with MSB of the config byte equal to 0. It does not influence the effect of the bits xxxx x11x in the config byte of the registration. Byte 1: 1xxx xxxx enable sending of TLV-Tag E3 in command print text-block (06D3) within TLV-Tag 25 Further functions may be added in future, the bit-field can be extended from the right. The ECR should set all unused bits to ‚0'. These parameters are only valid for optional receipts, i.e. via the payment-type used the PT can override these guidelines (e.g. customer-receipt for ec-cash or error-receipt for prepaid top-up). If tag 1F04 is not sent, the order of the receipts is dependent on the implementation in the PT. See also tag 1F07.
1F05	transaction-parameter; length variable; bit-field; sent for the Registration or for a transaction: 1xxx xxxx The PT should send the card-data read during the Authorisation to the ECR if these cannot be processed by the terminal, i.e card unknown/locked. (0xxx xxxx = Terminal aborts in this case with an error). See also tag 1F08, 1F09, 1F0A. x1xx xxxx Activate swipe-reader (x0xx xxxx = deactivate swipe-reader) Further functions may be added in future, the bit-field can be extended from the right. The ECR should set all unused bits to ‚0'.
1F06	reservation-parameter; length variable; sent for pre-authorisation or book total: 0x01 Pre-authorisation (deprecated, use 0x02 instead)

Tag	Data-element
	0x02 Reservation (default for the primary reservation) 0x03 Extension of reservation (default for a reservation extension) 0x04 Book total (deprecated) 0x05 Booking of reservation (deprecated) 0x06 Telephonic reservation 0x07 Telephonic extension of reservation
1F07	receipt-type; length variable; sent by receipt-printout: 0x01 transaction-receipt (merchant-receipt) 0x02 transaction-receipt (customer-receipt) 0x03 administration-receipt See also tag 1F04 and 1F37.
1F08	magnet-stripe data, track 1; length variable; optional; unpacked The PT can send the track-data in the Status-Information to the ECR. See also tag 1F05. Note: if the track has an even length no padding (e.g. „1F“ or „F0“) may be used.
1F09	magnet-stripe data, track 2 of the magnet-stripe; length variable; optional; BCD packed including special characters (A-F). The PT can send the track-data in the Status-Information to the ECR, if the PT cannot process the card-data itself (e.g. card unknown, card not permitted in PT). See also tag 1F05. Note: if the track has an even length no padding (e.g. „1F“ or „F0“) may be used.
1F0A	magnet-stripe data, track 3 of the magnet-stripe; length variable; optional; BCD packed including special characters (A-F). The PT can send the track-data in the Status-Information to the ECR, if the PT cannot process the acrd-data itself (e.g. card unknown, card not permitted in PT). See also tag 1F05. Note: if the track has an even length no padding (e.g. „1F“ or „F0“) may be used.
1F0D	ECR data transported transparently from and to host
1F0E	date. 4 byte, BCD-Format: YYYYMMDD
1F0F	time. 3 byte, BCD-Format: HHMMSS
1F10	cardholder authentication: 0x00 no cardholder authentication 0x01 signature 0x02 online PIN 0x03 offline encrypted PIN 0x04 offline plaintext PIN 0x05 offline encrypted PIN + signature 0x06 offline plaintext PIN + signature 0x07 online PIN + signature 0xFF unknown cardholder verification
1F11	online flag: 0 offline 1 online
1F12	card-technology:

Tag	Data-element
	0x00 magnetic stripe 0x01 chip 0x02 NFC (near field communication, contactless)
1F13	The PT requests a ZVT function from the ECR to avoid loosing information in an automatic execution after e. g. a host return code. 0x00 extended diagnosis 0x01 reconciliation with closure 0x02 configuration diagnosis 0x03 OPT pre initialisation 0x04 EMV configuration diagnosis 0x05 Tax free transaction
1F14	card identification item. Variable in length, binary. Contains a unique identification of a card. Algorithm not specified here. This tag is only sent if requested by tag 1F15 due to possible impact on execution time of the card reading process. The data doesn't contain any plain text data as track data and can be stored by the ECR for reference purpose e.g. receipt printing in gas vending machines.
1F15	card reading control. Variable length, bitfield, extension. 1xxx xx00 The PT should calculate with default algorithm and send the tag 1F14 in the status information (04 0F) of the command Read Card and card payment commands. 1xxx xx01 online algorithm 1xxx xx10 offline hash algorithm (SHA-256) x1xx xxxx Contactless cards: The PT should read the unique ID (UID) from the card, pad it with leading '00' bytes to a length of 10 bytes, and return it in tag 4C in the status information. xx1x xxxx GeldKarte / girogo: The PT should read the remaining balance and return it in tag 1F3F. Further functions may be added in future, the bit-field can be extended to the right. The ECR should set all unused bits to ‚0'.
1F16	extended error code. Variable length, binary. Contains PT manufacturer specific error code. Can be used if no reasonable mapping to ZVT error codes is possible. Can be sent within status information (04 0F) or abort frames (06 1E). This tag mainly serves logging or debug purposes.
1F17	extended error text. Variable length, encoded in ZVT 8-bit character set. Contains the PT manufacturer specific plain text related to the error code specified in tag 1F16. Can be used for the merchant receipt in case no reasonable mapping to ZVT error codes is possible. In other cases the tag may serve logging or debug purposes
1F18	card notification control Controls behaviour of ZVT command Display Text with Function-Key Input 06 E1: 00 or missing: only function keys are recognized 01 card insertion terminates the command too
1F19	card acceptance, binary 0x00 accept 0x01 deny
1F1A	PAN for card acceptance matching, BCD-packed, according to BMP 22 encoding

Tag	Data-element
1F1D	currency information; binary: 0x01 Base currency 0x02 Exchange rate 0x03 Foreign currency 0x04 Commission 0x05 Balance
1F1E	number of decimals, binary
1F1F	Unique transaction identifier, binary, length variable For synchronisation a unique identifier has to be used, the receipt number fulfills this requirement. The PT sends the receipt number within the 04-0F tag to the ECR. The ECR mirrors this value for the next transaction commands to the PT. To use this feature an extra registration is not necessary. The ECR just has to send 1F1F, PT checks if the PT tag is present. 1F1F can be used with the following commands: Authorization (06 01), Account Balance Request (06 03), Activate Card (06 04), Book Tip (06 0C), Telephonic Authorisation (06 21), Pre-Authorisation / Reservation (06 22), Partial-Reversal of a Pre-Authorisation / Booking of a Reservation (06 23), Book Total (06 24), Pre-Authorisation Reversal (06 25), Reversal (06 30), Refund (06 31), End-of-Day (06 50).
1F20	amount; BCD-packed encoded
1F21	ISO-currency code; packed BCD encoded; e.g. 0978 for EUR (€)
1F25	Cash back amount; BCD-packed encoded The tag contains the cashback amount for transactions with cashback. The tag can be used as follows: 1. In ECR command to the PT (e.g. 06 01 Authorization): The ECR may send this tag in the command to the PT to specify the amount for the customer cashback. Please note: • BMP 04 (amount) must contain the sum of both, the payment amount and the cashback amount. • The support of cashback depends on the card that is used for transaction and the configuration/implementation of the PT. For this reason it is recommended for the ECR to use command 04 0D (Input-Request) for amount inputs instead of usage of 1F25. If the ECR sends 1F25 and cashback isn't supported by PT or card, the PT may reject the ECR command or ignore the tag. In second case the PT performes normal payment without cashback, but uses the complete amount! 2. In command 04 0F (Status-Information) from PT to the ECR: The PT sends this tag in command 04 0F (Status-Information) to ECR, if a transaction with cashback was processed. Please note: For transactions with cashback BMP 04 (amount) contains the sum of both, the payment amount and the cashback amount.
1F26	End of Day mode 0x00 Normal End of Day 0x01 Forced End of Day

Tag	Data-element
	0x02 Automatic End of Day
1F27	Extended product name (EuroELV tag DF8118), 1 to 24 bytes, to be printed in a separate line before the product name (bitmap 8B).
1F28	Emergency mode (EuroELV), 1 byte, 0 or 1, if 1 print "Notbetrieb" on merchant's receipt only
1F29	Limit overridden (EuroELV), 1 byte, 0 or 1, if 1 print "Limit übersteuert" on merchant's receipt only
1F2A	Additional card holder information (EuroELV tag DF8117), 1 to 24 bytes, ASCII encoded, can occur up to two times, the element consists of to parts separated by the "/" character (e.g. "BLZ/1234567" or "Kto/12345"). It's recommended to print the first part left adjusted and the second part right adjusted on the receipt.
1F2B	Trace number, BCD-packed encoded, variable length. Note: This tag is only used for trace numbers with more than 6 digits. In this case bitmap 0B is set to 000000. Bitmap 0B is still used for trace numbers up to 6 digits to keep compatibility to old implementations. For commands sent to PT, it is also required by ECR to set bitmap 0B to 000000 before using long trace number in TLV tag 1F2B.
1F2C	Profile name (name of a card profile) ASCII encoded (not null-terminated)
1F2D	Card data input type (binary, 1 byte). If the ECR sends card data (a PAN for a manual payment in BMP 22 or track data in BMP 2D, 23 or 24), this tag contains additional information about how the card was mechanically read by ECR (e.g. if the PAN was read from a barcode and not manually entered via keyboard). 0x00 read from magnet stripe 0x01 read from chip 0x02 read from barcode
1F30	EPurse top up amount (e.g. German GeldKarte), 6 bytes, BCD: This TLV tag is sent by the terminal in status information command 040F during EPurse payments, if the payment amount has exceeded the credit of the EPurse card and an implicit EPurse top up transaction was processed during payment to increase the credit.
1F31	Encrypted PIN block, BCD-packed encoded PIN-Verification for Customer-Card (06 E3)
1F32	SMID value (10bytes length)
1F33	Message data, binary Contains a hash value (SHA-256, SHA-1) of the message or the message itself. For this data the MAC will be calculated using the key specified by SMID (see 1F32.). The data shall be padded according to EMV rules.
1F33	Message data, binary Contains a hash value (SHA-256, SHA-1) of the message or the message itself. For this data the MAC will be calculated using the key specified by SMID (see 1F32.). The data shall be padded according to EMV rules.
1F34	MAC value, binary Specifies the calculated MAC.
1F35	ECR Identification, 4 bytes BCD encoded number to identify the ECR at PT with an 8 digit workstation ID
1F36	Tip amount, BCD-packed encoded The tag contains the tip amount for transactions with tip. The tag can be used as follows: 1. In ECR command to the PT (e.g. 0601 Authorization): The ECR may send this tag in the command to the PT to specify the tip amount. Please note: • BMP 04 (amount) must contain the sum of both, the payment amount and the tip amount.

<table>
<tr><th>Tag</th><th>Data-element</th></tr>
<tr><td></td><td>
The support of tip depends on the card that is used for transaction and the configuration/implementation of the PT. For this reason it is recommended for the ECR to use command 04 0D (Input-Request) for amount inputs instead of usage of 1F36. If the ECR sends 1F36 and tip isn't supported by PT or card, the PT may reject the ECR command or ignore the tag. In second case the PT performes normal payment without tip, but uses the complete amount!
2. In command 04 0F (Status-Information) from PT to the ECR:
The PT sends this tag in command 04 0F (Status-Information) to ECR, if a transaction with tip was processed.
Please note:
For transactions with tip BMP 04 (amount) contains the sum of both, the payment amount and the tip amount.
</td></tr>
<tr><td>1F37</td><td>
Receipt information (binary, variable length)
When printing with command 06D3 (Print Text-Block) the PT sends this optional tag with additional information about the receipt. The tag may prevent the ECR to parse or analyse the text lines in tag 25 to get the information that is provided by following bit mask:

Byte 0:
<table>
<tr><th>Value</th><th>Description</th></tr>
<tr><td>0x01</td><td>Positive receipt for an authorised transaction
(0x04 used for negative receipts)</td></tr>
<tr><td>0x02</td><td>If a positive receipt is printed (bit combined with 0x01), this receipt contains a signature field.</td></tr>
<tr><td>0x04</td><td>Negative receipt for an aborted or rejected transaction
(0x01 used for positive receipts)</td></tr>
<tr><td>0x80</td><td>Printing of the receipt is mandatory and must not be aborted by customer/retailer.</td></tr>
</table>
Further functions may be added in future, the bit-field can be extended and additional bytes can be added. The ECR should set all unused bits to '0'.

See also tag 1F07 containing information about the receipt type.
</td></tr>
<tr><td>1F3B</td><td>
Transaction information (binary, variable length)

The PT sends this optional tag in command 040F (Status-Information) to the ECR to provide additional information about the transaction with following bit mask:

Byte 0:
0x01: tippable transaction, the ECR is allowed to send command 060C (Book tip) for this transaction

Further functions may be added in future, the bit-field can be extended and additional bytes can be added. The ECR should set all unused bits to '0'.
</td></tr>
<tr><td>1F3E</td><td>Encrypted cardholder information, binary, variable length
General data field comprising encrypted data for transaction journal purposes. Since decryption information (algorithm, keys) is not available on ECR side the content is fully transparent and can only be used for post-processing by the host provider or within another secure environment.</td></tr>
<tr><td>1F3F</td><td>Remaining balance</td></tr>
<tr><td>1F45</td><td>ATS, length variable, binary</td></tr>
</table>

<table>
<tr><th>Tag</th><th>Data-element</th></tr>
<tr><td>1F46</td><td>Command and response APDU, length variable, binary</td></tr>
<tr><td>1F47</td><td>Card read error code, 1 byte
There is one error code for each command APDU.

<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x01</td><td>Contactless level 1 transmission error</td></tr><tr><td>0x02</td><td>Contactless level 1 protocol error</td></tr><tr><td>0x03</td><td>Contactless level 1 timeout</td></tr><tr><td>0x04</td><td>Contactless collision detected</td></tr><tr><td>0x05</td><td>Command not allowed due to whitelist check</td></tr><tr><td>0xFF</td><td>Unknown card reader error, details are specified as extended errors in tags 1F16 and 1F17</td></tr></table></td></tr>
<tr><td>1F4C</td><td>Card type, big-endian integer

<table><tr><th>Value</th><th>Card type</th></tr><tr><td>0x00</td><td>ISO 7816-4</td></tr><tr><td>0x01</td><td>MIFARE</td></tr><tr><td>0x02</td><td>FeliCa</td></tr></table></td></tr>
<tr><td>1F4D</td><td>Card subtype, big-endian integer

Specifies the card subtype according PC/SC3 Sup1. Values that are not covered by the PC/SC specification will be added from 0x01 00 00 on (behind the 2-byte identifier specified in the PC/SC specification).

<table><tr><th>Value</th><th>Card type</th><th>Remark</th></tr><tr><td>0x010344</td><td>MIFARE DESFire</td><td>http://www.nxp.com/documents/application_note/AN10833.pdf, page 9, table 5 => ATQA Coding of NXP Contactless Card ICs</td></tr></table></td></tr>
<tr><td>1F5B</td><td>Card poll timeout, big-endian integer, timeout in seconds
The maximum time the PT waits for a card to be inserted. 0 means infinite. If it is omitted the default-value of the PT is used.</td></tr>
<tr><td>1F5C</td><td>Encrypted key, binary
The encrypted key. This tag and 1F5C are mutually exclusive. The actual format is out of scope of this document.</td></tr>
<tr><td>1F5D</td><td>Plaintext key
The plaintext key. This tag and 1F5D are mutually exclusive. The actual format is out of scope of this document.</td></tr>
<tr><td>1F60</td><td>Allowed card technologies, bit field, 1 byte
Specifies the card technologies the PT should accept for this command.

<table><tr><td>xxxx xxx1</td><td>Magnetic stripe card</td></tr><tr><td>xxxx xx1x</td><td>Chip card</td></tr><tr><td>xxxx x1xx</td><td>Contactless card</td></tr></table></td></tr>
<tr><td>1F61</td><td>Customer index, binary. Used to select customer specific elements in the PT, e.g. salt for tokens.</td></tr>
<tr><td>1F62</td><td>Identifier for the individual reference number, two letters
This identifier is used in BMP60 when transmitting the individual reference number (specified by 1F63) to the host.</td></tr>
<tr><td>1F63</td><td>Individual reference number for each transaction, alphanumeric</td></tr>
<tr><td>1F6A</td><td>Remaining amount e.g. for purse systems, bonus systems; BCD-packed encoded, in terminal currency.</td></tr>
</table>

Tag	Data-element
	If a negative sum is given, this can be noted via a ‚D' in the MS-nibble of the amount
1F6B	Age verification control Format: BCD Used for age verification in command "card read". If present, value is interpreted as minimum age in years. Reference is the local time of the payment terminal. If age can be determined, the terminal will send 1F6C in the 04-0F response
1F6C	Age verification result Format: 1 byte binary: 0x00: minimum age not reached 0x01: minimum age reached 0x02: customer card does not support age verification 0x03: terminal does not support verification
1F6D	Mode control for command 06-E6 Format: 1 byte binary: 0x00: If amount is set to 0, do not allow a payment transaction, perform only card poll. All other values: allow payment transactions for all possible amounts If this tag is not present for 06-E6, the behavior for amount 0 is to perform only the card poll.
1F70	Indicator for partial approval capability of ECR systems. Used by ECR in request to inform the PT whether the ECR can process transactions for which only a partial amount is approved by the payment terminal or authorization system. Format: 1 Byte, binary; 0x00: partial approval cannot be handled. This is the default assumed by the PT if 1F70 is not present. All other values: partial approval is supported by the ECR
1F71	Indicates the TLV tags that are evaluated by the payment terminal. Sent in the 06-00 login response. Format: binary, variable length. Content: contains a list if TLV tag numbers Example: 1F71 04 15 20 1F6D: the payment terminal recognizes tags 15, 20 and 1F6D.
1F72	Enables or disables extended contactless card detection during Status-Enquiry (05 01). Format: 1 byte binary 0x00 — no extended card detection 0x01 — Enables extended card detection. The payment terminal shall include tags 60, 43 and 1F60 in the Status-Enquiry (05 01) response if available. These tags shall be included even if the service byte of Status-Enquiry (05 01) asks for no TLV tags in the response.
1F73	Message sequence id (MsgSeqId); BCD-packed encoded, 3 byte with leading zeros. • Registration: MsgSeqId = 000000 Sent in the registration message with zero to indicate that the ECR supports MsgSeqId. If the

Tag	Data-element
	PT supports the MsgSeqId, it echos the tag in the completion of the registration. Otherwise this tag is missing in the completion message and the ECR shall not use it. • All other messages: The tag is sent in all messages between ECR and PT. This is unique per pair of messages. For the detailed description, see chapter Message Sequence IDs.
1F74	Password field with variable length; alphanumeric with special characters, ASCII encoded (not null-terminated)
1F75	DUKPT encrypted input Contains either PIN format ISO 9564-0 or ISO 9564-1.
1F76	Enable or disable extended DUKPT information during Status-Enquiry (05 01). Format: 1 byte binary 0x00 — no extended DUKPT information 0x01 — SMID will be sent in tag 1F32 in the Status-Enquiry (05 01) response
1F77	Index of DUKPT engine
1F78	Request to send the 24 hour reboot information
1F79	Request to Request to start an action format 1 byte **Value** — **Description** 0x01 — Reboot was performed. Performing the Logon Process
1F80	Manufacturer-dependent file name (including optional path information)

1F81	MIME type of the file, string of variable length.
	
	Specifies the media type of the file according RFC 2046 (as used in HTTP header attribute “content-type”).
	Examples:
	`text/plain`
	`video/mpeg`
	`image/png`
	`application/tar`

1F82	Transaction reference number BCD packed encoded n11
1F83	Acquirer identifier BCD packed encoded n11

*9.4.2.2 **Constructed data objects***

Tag	Data-element
23	List of open pre-authorisations; container with an arbitrary list of receipt-numbers (tag '08') The PT sends the tag 23 in command „Enquire if Pre-Authorisations exist“
24	display-texts; container with an arbitrary list of text lines (tag '07') Note: each text line is formed in its own line, i.e. no line-return necessary The PT sends the tag 24 in Intermediate Status-Information.
25	print-texts; container with an arbitrary list of attributes and text lines (tag '09' and '07'). The PT sends the tag 25 in command „Print Text-Block“. Note: - the attribute (tag '09') has to be sent as last item in the last text block of a receipt with the contents 1xxx xxxx (not equal to 80) to indicate the end of a receipt for the ECR. In all other text block the tag is optional.

Tag	Data-element
	- the attribute (tag '09') relates to all following text lines until a further attribute follows - a further attribute replaces the previous attribute for the following text lines - each text line is formed in its own line, i.e. no line-return necessary - for barcode support additional tags 'E3' may be inserted between attributes (tag '09') and text lines (tag '07'), see also description of tag 1F04 for activation - the attribute (tag '09') doesn't affect format of barcode in (tag 'E3')
26	List of permitted ZVT-commands; container with an arbitrary list of ZVT-commands (tag '0A'). **Function:** With this list the ECR informs the PT during the Registration which ZVT-commands it can process (e.g. is the dial-up for network operation over ECR possible or must another communication-module be used; should the receipt via command "Print Lines" or "Print Text-Block" be sent to the ECR etc.) Not listed commands should not be sent by the PT to the ECR. **Exceptions:** - The commands "Status-Information", "Completion" and "Abort" may always be sent by the PT - independent of whether in the list of allowed commands not. - For ZVT-command "Intermediate-Status", the config-byte of the Registration must be evaluated. If the Intermediate-Status is allowed by the config-byte the Registration the PT may send Intermediate-Status - independent of whether the command is in the list of allowed commands or not. - If via the config-byte of the Registration the receipt-printout over the ECR is demanded, the PT should either send 06D1 or 06D3 to the ECR (not valid if the ECR builds the receipt itself from the status-information!). Which of the two commands (06D1 or 06D3) should be sent from PT to the ECR is defined by the ECR in this list. Should information from the ECR be missing then the PT uses 06D1 for downwards-compatibility, i.e. the ECR must explicitly request 06D3. - All other commands should not be used by the PT if the ECR sends bitmap 06 in the Registration.
27	List of supported character-sets; length variable The ECR sends the list of supported character sets in command “Registration” to the PT. The PT responds in the Completion command of the Registration with the list of commonly (ECR + PT) supported character sets. Alternatively the tag can be used to configure a specific character set to the PT. The ECR sends a single character-set (tag 14) in command “Registration” to the PT. If the PT supports the character set, it is echoed in tag 27 in the Completion command. If the transmitted character set is not supported by the PT or more than one tag 14 was sent in the Registration, then no tag 27 is sent in the Completion and the default character set CP437 is used by the PT. If a character set is accepted by the PT it is then used for all print (06 D1, 06 D3) and display commands (customer and merchant texts). See also tag 14.
28	List of supported languages; length variable The ECR sends the list of supported languages in command „Registration“ to the PT. The PT responds in the Completion command of the Registration with the list of commonly (ECR + PT) supported languages. The ECR can then use command „Select Language“ to choose a suitable language. See also tag 15.
2D	file; length variable; consists of file -block (tag ‚1C`), file-ID (tag ‚1D`), start-position (tag ‚1E`) and total length of the file (tag ‚1F00`), (tag ‚1F80`) filename and (tag ‚1F81`) MIME type of the file Used together with command „Read File" and „Write File".

Tag	Data-element
2E	time-stamp, container with tags „date“ (1F0E) and „time“ (1F0F) in arbitrary order.
2F	payment-type, container with tags „cardholder authentication“ (1F10), „online flag“ (1F11) and "card-technology" (1F12) in arbitrary order.
30	card acceptance matching, container consists of ZVT card-type-ID(tag, 41), card acceptance (tag, 1F19) and optionally PAN for card acceptance matching (tag, 1F1A) With this container the ECR sends a black- and or whitelist of card-type-IDs in payment and refund commands. The PT checks if the ZVT card-type-ID of the used card matches. Depending on the content of the card acceptance tag the card is accepted ot denied. If a whitelist is sent, all other cards are denied, if a blacklist is sent, all other cards are accepted. If a card can be accepted due to the card acceptance matching, the final acceptance is the terminal's decision. If both, black- and whitelist are sent, the whitelist has priority over the blacklist. For each card in the black- or whitelist the ECR has to send a tag 30 with tags 41 or 1F1A and 1F19. If the PAN for card acceptance matching is provided, it will also be used for the matching. Only the unmasked digits are compared.
31	Amount information, container, consists of • Currency information type (tag 1F1D) • Number of decimal digits (tag 1F1E) • Amount (tag 1F20) • ISO-currency code (tag 1F21) This container bundles information related with a transaction amount.
33	DUKPT key container, consists of • index of DUKPT engine (tag **Fehler! Verweisquelle konnte nicht gefunden werden.**) • SMID value (tag 1F32)
34	Terminal date time container with tags „date“ (1F0E) and „time“ (1F0F) in arbitrary order.
35	24 hour reboot date time container with tags „date“ (1F0E) and „time“ (1F0F) in arbitrary order.
4C	UID
4D	EF_ID GeldKarte / girogo
E5	Key Container
E6	Card type container
E7	Merchant SAM information container
E9	Reference number container, consists of • Identifier to be used in BMP 60 in the request to the host (tag 1F62) • Actual reference number (tag 1F63)
EA	Container for ExpressPay Membership data

9.4.3 Bonus-points/ Card credit

9.4.3.1 Primitive data objects

Tag	Data-element
C1	transaction-type; value: '47 4C' for card top-up (credit amount BMP4) '4D 45' for collect bonus-points '4D 53' for redeem bonus-points '4D 55' for enquire bonus-points '4D 57' for credit bonus-points See tag E1.
C2	number of bonus-points, BCD-packed, 8 byte with leading zeros

	See tag E1.
C3	number of remaining bonus-points, BCD-packed, 8 byte with leading zeros See tag E1.
C4	transaction-number of the ECR, BCD-packed, 4 byte with leading zeros **Caution:** this is an ECR-internal number and not the trace-number of the PT! See tag E1.
C5	Bonus points equivalent amount, BCD-packed encoded, in terminal currency Value of the remaining bonus points converted into an amount. See tag E1.

9.4.3.2 Constructed data objects

Tag	Data-element
E1	bonus-points container The ECR sends the bonus-points container in command “Authorisation“, “Pre-Authorisation“, “Reversal“, “Refund“, or “Telephonic Authorisation“. The PT sends the bonus-points container in the Status-Information to the ECR.

9.4.4 Fleet-cards

9.4.4.1 Primitive data objects

Tag	Data-element
02	driver-number, BCD-packed, 2 byte, with leading zeros. See tag 20
03	auto-number, BCD-packed, 2 byte, with leading zeros. See tag 20
04	mileage, BCD-packed, 3 byte, with leading zeros. See tag 20
05	goods-group, BCD-packed, 3 byte, with leading zeros. See tag 20
06	restriction-code 1, BCD-packed, 1 byte, with leading zeros. See tag 20
0D	restriction-code 2, BCD-packed, 1 byte, with leading zeros. See tag 20
0E	service-code, BCD-packed, 2 byte, with leading zeros. See tag 20
1F0B	maximum pre-authorisation amount, with leading zeros in Cent, BCD-packed, max. 6 byte
1F0C	license plate number, ASCII encoded, **not** null-terminated.

9.4.4.2 Constructed data objects

Tag	Data-element
20	fleet-card container contents: arbitrary data-objects for fleet-cards (see primitive data-objects) Function: transfer of additional information that the ECR requires for the journal or the receipt-printout. The PT sends the tag 20 in the Status-Information.
21	list of permitted goods-groups contents: arbitrary list of tag 05 Function: transfer of permitted goods-groups belonging to sequence "Read Card" to inform the ECR which goods-groups (e.g. for a pump-selection) are possible. With this the ECR can execute the pump-selection immediately after reading the card and can recognize early whether the actual transaction should be started at all. Avoiding unnecessary PIN-input, communication-costs etc. Alternatively this tag can be sent with the status-information of a pre-authorisation command to return the list of permitted goods eventually sent by the host.
22	list of prohibited (blocked) goods-groups contents: arbitrary list of tag 05

	Function: transfer of prohibited goods-groups in the Status-Information during the sequences "Authorisation" in case the PT recognizes that at least one goods-group is not permitted. Herewith the ECR can recognize which goods-group is not permitted for this card.

9.4.5 EMV (debit/credit and DC POS)

*9.4.5.1 **Primitive data objects***

Tag	Data-element
40	EMV-configuration-parameter; sent by the ECR in command „Registration“ to the PT; length variable; bit-field: Byte 1 1xxx xxxx the PT should send „Application Label“ (tag 42) in the Status-Information (for Read Card and (Pre-)Authorisation) x1xx xxxx the PT should send „Application Preferred Name“ (tag 44) in the Status-Information (for Read Card and (Pre-)Authorisation) xx1x xxxx the PT should send tag 46 in the Status-Information xxx1 xxxx the PT should send tag 47 in the Status-Information xxxx 1xxx the PT should send tag 64 in the Status-Information xxxx x1xx the PT should send tag 65 in the Status-Information xxxx xx1x the PT should send tag 66 in the Status-Information xxxx xxx1 the PT should send tag 67 in the Status-Information Byte 2 1xxx xxxx the PT should send „DC POS 2.4 product display“ (tag 4A) in the Status-Information If tags 66 and 67 are requested by the ECR, the PT may send tags 46 and 47 within tags 66 and 67, even if tags 46 and 47 were not specifically requested. The PT should ignore the configuration bits for tag 46 and 47 in this case. Affects tag 60 in the Status-Information for Read Card and (Pre-)Authorisation and not the BMP 8B. See also tag 60.
41	ZVT card-type-ID of the application on magnet-stripe; length variable; binary encoded; correlates to the ZVT card-type-ID; see chapter „list of ZVT-card-type-IDs“ Sent by the PT in the Status-Information of command „Read Card“ to the ECR see also tag 60. Additionally the ECR can also pre-define the card-type-ID (tag 41) for command „Authorisation“ (e.g. after the application-selection on second customer-display). If the ZVT card-type-ID is larger than decimal 255 then BMP 8A should be set to ‘FF’ and tag 41 used, providing the ZVT card-type-ID should be sent to the ECR. Alternatively tag 8A can be omitted. The sending of the ZVT card-type-ID to the ECR is optional.
42	name of the application (= Application Label); length variable; ASCII encoded (not null-terminated); see also tag 60.
43	application-ID (RID+PIX). length variable; binary encoded See also tag 44. Additionally the ECR can also pre-define the application -ID (tag 43) for command „Authorisation“ (e.g. after the application-selection on second customer-display).

Tag	Data-element
44	application preferred name; length variable; ASCII encoded (not null-terminated); see also tag 60.
45	receipt-parameter, 4 byte BCD encoded The PT sends the tag 45 in the Status-Information of a transaction. **Pos. Value Definition** 1 pre-definition of merchant-receipt '0' no merchant-receipt '1' merchant-receipt for authorised transactions '2' merchant-receipt for authorised, rejected and aborted transactions 2 pre-definition of customer-receipt '0' no customer-receipt '1' customer-receipt for authorised transactions, printing of customer-receipt may be aborted '2' customer-receipt s for authorised, rejected and aborted transactions 4 - 8 '0' RFU the nibble position 1 is the ms-nibble (left) of byte 1 and nibble position 8 is the ls-nibble(right) of byte 4.
46	EMV-print-data (customer-receipt), length variable, ASCII-encoded (not null-terminated) = evaluated directly printable receipt-DOL for customer-receipt. The PT sends the tag 46 in the Status-Information if configured in tag 40. The ECR should print the receipt-DOL unchanged. For new implementations only tag 66 should be evaluated.
47	EMV-print-data (merchant-receipt), length variable, ASCII-encoded (not null-terminated) = evaluated directly printable receipt-DOL for merchant-receipt The PT sends the tag 47 in the Status-Information if configured in tag 40. The ECR should print the receipt-DOL unchanged For new implementations only tag 67 should be evaluated.
48	priority; length variable; hex-encoded. Priority is sen in tag 60 to deliver the priority of the different applications (chip- and/or magnet-strip applications) for the application-selection.
49	network-provider card-type ID; length variable; binary coding; represents BMP 8C of the status information. If the network-provider card-type-ID is larger than decimal 255 then BMP 8C should be set to 'FF' and tag 41 used, providing the network-provider card-type-ID should be sent to the ECR. Alternatively BMP 8C can be omitted. The sending of the network-provider card-type-ID to the ECR is optional.
4A	DC POS 2.4 product display; length variable; ASCII encoded (not null-terminated); contains the product name to be displayed according to the rules of DC POS 2.4.
4B	Issuer country code (EMV Tag ,5F28'), 2 byte BCD encoded with leading 0

*9.4.5.2 **Constructed data objects***

Tag	Data-element
60	application consists of the tags 41 or 43 and additionally (depending on configuration following command „Registration" see tag 40) the tags 42 and/or 44 and 48 (priority), 4A product display and 4B issuer country code see also tag 61 and tag 62
61	list of applications on magnet-stripe. The list consists of one or several tag 60, which the PT sends in the Status-Information of command „Read Card" to the ECR.

Tag	Data-element
	Additionally the ECR can also pre-define card-type-ID (tag 41) for command „Authorisation“ (e.g. after the application-selection on second customer-display).
62	list of applications on chip. The list consists of one or several tag 60, which the PT sends in the Status-Information of command „Read Card“ to the ECR. Additionally the ECR can also pre-define application-ID (tag 43) for command „Authorisation“ (e.g. after the application-selection on second customer-display).
64	receipt header. container with attributes and text-lines, order arbitrary (tag ‚09' and ‚07'). Note: - attribute (tag ‚09') is optional - attribute (tag ‚09') relates to all following text-lines until the next attribute. - a further attribute replaces the previous one for following text-lines. - each text-line is represented in its own line, i.e. no carriage return must be sent. The PT sends tag 64 in the Status Information if configured in tag 40. The ECR should print the receipt unchanged.
65	receipt advertising text. container with attributes and text-lines, order arbitrary (tag ‚09' and ‚07'). Note: - attribute (tag ‚09') is optional - attribute (tag ‚09') relates to all following text-lines until the next attribute. - a further attribute replaces the previous one for following text-lines. - each text-line is represented in its own line, i.e. no carriage return must be sent. The PT sends tag 65 in the Status Information if configured in tag 40. The ECR should print the receipt unchanged.
66	customer receipt data. container with arbitrary order of tags: - “EMV print data (customer receipt)” (46) - “print text transaction outcome” (68) The PT sends tag 66 in the Status Information if configured in tag 40. The ECR should print the receipt unchanged.
67	merchant receipt data. container with arbitrary order of tags: - “EMV print data (merchant receipt)” (47) - “print text transaction outcome” (68) The PT sends tag 67 in the Status Information if configured in tag 40. The ECR should print the receipt unchanged.
68	receipt text transaction outcome. container with attributes and text-lines, order arbitrary (tag ‚09' and ‚07'). Note: - attribute (tag ‚09') is optional - attribute (tag ‚09') relates to all following text-lines until the next attribute. - a further attribute replaces the previous one for following text-lines. - each text-line is represented in its own line, i.e. no carriage return must be sent.
69	reference transaction container (e.g. timestamp of the orginal transaction for reversal, tag 2E).
6A	invalid application consists of the tags 41 or 43 and additionally (depending on configuration following command „Registration“ see tag 40) the tags 42 and/or 44 and 48 (priority) and 4A product display see also tag 61 and tag 62

9.4.6 Menus

9.4.6.1 ***Primitive data objects***

Tag	Data-element
16	Menu-type: length variable The tag menu-type is used in tag 2B. 0x01 request 1 from n further values RFU
17	context: length variable The tag context is used in tag 2B. 0x01 other menu 0x02 application-selection 0x03 language-selection further values RFU tag 17 is used to control the appearance of the menus. In connection with tag 18 the target-display can also be controlled. It must be ensured during the implementation that the ECR always displays the application-selection on the customer-display. see tag 18 and 2B
18	target; length variable The tag target is used in tag 2B. 0x01 merchant-display 0x02 customer-display further values RFU see tag 17 and 2B
19	return-value; length variable; binary encoded. The tag return-value is used in tag 2C.
50	background-color; length variable; binary encoded. The tag background-color can be used in tag 2C. 0xFF0000 red 0xFFFF00 yellow 0x00FF00 green examples of possible colors

9.4.6.2 ***Constructed data objects***

Tag	Data-element
29	list of menus which should be displayed over the ECR or on a second customer-display. The ECR sends this information for the Registration to the PT. see also tag 16, 17.
2A	list of menus which the ECR will not display and therefore must be displayed on the PT. The ECR sends this information for the Registration to the PT. see also tag 16, 17.

2B	menu; contains the tags 14 (ISO character-set; optional), 15 (language-code; optional), 16 (menutype), 17 (context) and 18 (target) and several tag 2C. The PT sends this tag for command „Menu-Request“.
2C	menu-item; contains a display-text (tag 07) and a related return-value (tag 19). The PT sends the tag 2C in tag 2B.

All menus which are not listed in tag 29 nor in tag 2A, handles the PT according to the default-settings in the PT, i.e. in the PT it must be configured (or programmed) whether the PT sends the command „Menu-Request“ for these menus.

Menus can only be sent if the ECR had signaled in the Registration in tag 26 (= permitted ZVT-Commands) that the ECR supports menus.

9.4.7 Prepaid

*9.4.7.1 **Primitive data objects***

Tag	Data-element
80	prepaid-PIN; optional; length variable; ASCII encoded; see tag 63
81	telefon number; optional; length variable; ASCII encoded; see tag 63
82	top-up text; optional; length variable; ASCII encoded; see tag 63
83	prepaid type, optional, length variable, ASCII encoded; see tag 63 P = PIN printing; E = E-loading
84	MinChargeAmount; optional; 6 byte BCD, amount in minor currency units. See tag 63.
85	MaxChargeAmount; optional; 6 byte BCD, amount in minor currency units. See tag 63.

*9.4.7.2 **Constructed data objects***

Tag	Data-element
63	prepaid container; container for Prepaid tags; sent in the Status-Information after the Prepaid Top-Up (see also tag 80, 81, 82, 83, 84, 85)

9.4.8 DCC

*9.4.8.1 **Primitive data objects***

Tag	Data-element
1F1B	markup in % with 2 dezimals;BCD-packed encoded; 2 bytes
1F1C	card name; e.g. VISA; ASCII encoded; up to 32 bytes
1F22	inverted rate display unit; exponent of the base currency to be printed (e.g. ‘1’ or ‘100‘; 1 USD or 100 JPY); BCD-packed encoded; 1 byte
1F23	retrieval ID; ASCII encoded; up to 18 bytes
1F24	reference Number; ASCII encoded; up to 14 bytes

*9.4.8.2 **Constructed data objects***

Tag	Data-element
E2	DCC container; container for DCC tags; sent in the Status-Information of a DCC transaction to enable receipt printing based on the Status-Information It contains multiple Tags 31, each identified by the contents of Tag 1F1D (currency information type) (see also tag 1F1B, 1F1C, 31, 1F22, 1F23, 1F24)

9.4.9 Barcode data

9.4.9.1 ***Primitive data objects***

Tag	Data-element
1F2E	Barcode type, binary, 1 byte: **Value** / **Barcode type** 0x00 UPC-A 0x01 UPC-E 0x02 EAN 13 0x03 EAN 8 0x04 Code 39 0x05 Interleaved 2/5 (ITF) 0x06 Codabar 0x07 Code 128 0x08 EAN 128 0x09 QR-Code ISO/IEC 18004:2015, error correction level L (Low) 0x0A QR-Code ISO/IEC 18004:2015, error correction level M (Medium) 0x0B QR-Code ISO/IEC 18004:2015, error correction level Q (Quartile) 0x0C QR-Code ISO/IEC 18004:2015, error correction level H (High)
1F2F	Product code, variable length. The value depends on the barcode type. If the barcode type is Code 128 or EAN 128 it consists of the Code 128 values otherwise it consists of BCD values. In the latter case it is padded with one nibble 0xf if the length of the product code is odd. If QR-Code is used, the value is a string in the configured character set

9.4.9.2 ***Constructed data objects***

Tag	Data-element
E3	Container for barcode data that is sent in command print text-block (06D3) within TLV-Tag 25. It contains data for the ECR for printing a barcodes on the receipt, see tags 1F2E (barcode type) and 1F2F (product code). Please note that the tag must be enabled in Tag 1F04 with registration command, before the PT will send it.

9.4.10 Input

9.4.10.1 ***Primitive data objects***

Tag	Data-element
1F38	Input mode (1 byte, binary): 0 – input a string (all characters allowed, default if tag 1F38 is missing) 1 – input a number (only characters '0'-'9' are allowed) 2 – input an amount (same as input number, additional currency may be found in TLV tag 1F21) see tag 32
1F39	Timeout (2 bytes, big endian, binary): An optional timeout may specify the maximal time for the input in seconds. If the tag is missing, the time for input is not limited. see tag 32
1F3A	Input result (variable length, ASCII):

	The tag contains the result of the input and returned in the response 8000 for the input request. For amount input (tag 1F38) the amount is returned as a numeric character string in smallest unit of the used currency (tag 1F21). The ECR also has to consider the number of decimal places (tag 1F1E) for the result. Example: "100" for 1 Euro with 2 decimal places. If the timeout (tag 1F39) for the input expires, result tag 1F3A (or complete TLV container) is not sent in the response message. see tag 32
1F3C	Input
1F3D	Alphanumeric data

*9.4.10.2 **Constructed data objects***

Tag	Data-element
32	Input container Container for TLV tags used for command 040D (Input-Request). For the request and the response the tag contains the following tags: 1. Request: • 24 (mandatory): Prompt text for user input, arbitrary list of text lines (tag '07') • 1F38 (optional): Input mode • 1F39 (optional): Timeout • 14 (optional): ISO-character-set specifying encoding of prompt text (tag 24) and input result text to be returned in tag 1F3A. If the tag is missing, the terminal uses encoding that was configured with tag 27 in command 0600 (Registration). • 1F21 (optional): ISO-currency code, for amount input only. If the tag is missing, 0x0978 for EUR (€) is the default. • 1F1E (optional): Number of decimals, for number and amount input only. If the tag is missing, 2 decimal places for amount input or 0 decimal places for input a number is the default. • 1F3A (optional): initial value for the input dialog. If omitted an empty input dialog is used. 2. Response: • 1F3A (optional): Input result. If the tag is missing, the timeout for the input has expired.

Input-Requests are only sent by the PT, if the ECR has added 040D to the list of permitted ZVT-commands (tag 26) in command 0600 (Registration).

9.4.11 Value added services

9.4.11.1 Primitive data objects

Tag	Data-element
1F65	Processing selection (1 byte binary, bit-filed): 0000 0001 = read data 0000 0010 = write data 0000 0100 = redeem data 0000 1000 = delete data
1F66	Wallet data (binary, variable length) This specific data can only interpreted by the coupon issuer and the wallet.

1F67	Retailer identifier (binary, variable length) This identifier is used by the wallet to decide which coupon data have to be sent to the terminal. Other uses cases are possible.
1F68	Loyalty identifier (binary, variable length) This identifier is used by the wallet to decide which loyalty data have to be sent to the terminal. More than one loyalty identifier is possible.
1F69	Voucher identifier (binary, variable length) This identifier is used by the wallet to decide which voucher data have to be sent to the terminal. More than one voucher identifier is possible.

9.4.11.2 Constructed data objects

Tag	Data-element
E8	The ECR can send the VAS container in command Read Card (06 C0), Authorization (06 01), Pre-Authorisation / Reservation (06 22), Reversal (06 30), Reversal of external transaction (Reservation) (06 26), Refund (06 31), Telephonic Authorisation (06 21) The terminal can send the VAS container in the status and completion message.
FF01	Coupon data. In combination with tag 1F65 the following use cases are possible: 1F65 01 01 = read list of activated coupons from wallet 1F65 01 02 = write list of new coupons to wallet (in combination with tag 1F66) 1F65 01 04 = redeem list of coupons in the wallet 1F65 01 08 = delete list of invalid coupons in the wallet
FF02	Loyalty data. In combination with tag 1F65 the following use cases are possible: 1F65 01 01 = read loyalty data from 1F68 xx yy = optional
FF03	Parking ticket. In combination with tag 1F65 the following use cases are possible: 1F65 01 01 = read parking data from wallet
FF04	Voucher data. In combination with tag 1F65 the following use cases are possible: 1F65 01 01 = read list of activated voucher from wallet 1F65 01 02 = write list of new voucher to wallet (in combination with tag 1F66) 1F65 01 04 = redeem list of voucher in the wallet 1F69 xx yy = optional

9.4.12 Configuration

9.4.12.1 Primitive data objects

Tag	Data-element
1F40	Device name, ASCII
1F41	Software version, ASCII
1F42	Serial number, BCD
1F43	Device state, 1 byte **State** / **Description** 0x00 Ready 0x01 Initialization needed 0x02 No keys loaded 0x03 Fraud
1F44	Terminal identifier, 4 byte BCD

<table>
<tr><td>1F54</td><td>Key generation number (GN), big-endian integer</td></tr>
<tr><td>1F55</td><td>Terminal locks, 2 byte bit-field

<table>
<tr><th>Bit</th><th>Description</th></tr>
<tr><td></td><td>1. Byte</td></tr>
<tr><td>b7</td><td>Lock of reconciliation with closure</td></tr>
<tr><td>b6</td><td>Initialization lock</td></tr>
<tr><td>b5</td><td>Diagnosis lock</td></tr>
<tr><td>b4</td><td>Service lock</td></tr>
<tr><td>b3</td><td>Out of order</td></tr>
<tr><td>b2</td><td>Printer lock</td></tr>
<tr><td>b1</td><td>Terminal start up needed</td></tr>
<tr><td>b0</td><td>Secure module changed</td></tr>
<tr><td></td><td>2. Byte</td></tr>
<tr><td>b7</td><td>Transaction log defective</td></tr>
<tr><td>b6</td><td>Card reader not found</td></tr>
<tr><td>b5</td><td>Card still inserted</td></tr>
<tr><td>b4</td><td>Secure link not ready</td></tr>
<tr><td>b3</td><td>Activation needed</td></tr>
<tr><td>b2</td><td>Low battery power</td></tr>
<tr><td>b1</td><td>Contactless reader not initialized</td></tr>
<tr><td>b0</td><td>MDB not ready</td></tr>
</table></td></tr>
<tr><td>1F56</td><td>4eye Customer identifier (CID)</td></tr>
<tr><td>1F57</td><td>Merchant SAM number, BCD</td></tr>
<tr><td>1F58</td><td>Merchant SAM expiry date, BCD, format YYMM</td></tr>
<tr><td>1F59</td><td>Payment applications, ASCII
This field is repeated and contains the payment applications that are configured in the terminal by the EMV diagnosis.</td></tr>
</table>

9.4.12.2 Constructed data objects

Tag	Data-element
E4	Device information container: May contain 1F40, 1F41, 1F42, 1F43.
E7	Merchant SAM information container: May contain 1F57, 1F58.

9.4.13 SEPA Direct Debit

9.4.13.1 Primitive data objects

Tag	Data-element
1F51	Debit mandate identifier, alphanumeric with special characters
1F52	Debit creditor identifier, alphanumeric with special characters
1F53	Debit pre-notification text, alphanumeric with special characters As taken from the EMV configuration tag DF57 (i.e. without applying any formatting or replacing any placeholders like #CRLF#).
1F5E	IBAN, alphanumeric
1F5F	BIC, alphanumeric

9.4.14 Container for ExpressPay Membership data

9.4.14.1 Primitive data objects

Tag	Data-element
9F5A	Membership Product Identifier
9F5B	Product Membership Number

9.4.14.2 Constructed data objects

Tag	Data-element
EA	Container for ExpressPay Membership data May contain 9F5A and 9F5B

10 Error-Messages

Following error messages are possible:

Error-ID (hexa-deci-mal)	Error-ID (decimal)	Definition
00	00	no error
01-63	01 – 99	errorcodes from network-operator system/authorisation-system
64	100	card not readable (LRC-/parity-error)
65	101	card-data not present (neither track-data nor chip found)
66	102	processing-error (also for problems with card-reader mechanism)
67	103	function not permitted for ec- and Maestro-cards
68	104	function not permitted for credit- and tank-cards
6A	106	turnover-file full
6B	107	function deactivated (PT not registered)
6C	108	abort via timeout or abort-key
6E	110	card in blocked-list (response to command 06 E4)
6F	111	wrong currency
71	113	credit not sufficient (chip-card)
72	114	chip error
73	115	card-data incorrect (e.g. country-key check, checksum-error)
74	116	DUKPT engine exhausted
75	117	text not authentic
76	118	PAN not in white list
77	119	end-of-day batch not possible
78	120	card expired
79	121	card not yet valid
7A	122	card unknown
7B	123	fallback to magnetic stripe for girocard not possible
7C	124	fallback to magnetic stripe not possible (used for non girocard cards)
7D	125	communication error (communication module does not answer or is not present)
7E	126	fallback to magnetic stripe not possible, debit advice possible (used only for giro-card)
83	131	function not possible
85	133	key missing
89	137	PIN-pad defective
9A	154	ZVT protocol error. e. g. parsing error, mandatory message element missing
9B	155	error from dial-up/communication fault
9C	156	please wait
A0	160	receiver not ready
A1	161	remote station does not respond
A3	163	no connection
A4	164	submission of Geldkarte not possible
A5	165	function not allowed due to PCI-DSS/P2PE rules
B1	177	memory full
B2	178	merchant-journal full
B4	180	already reversed
B5	181	reversal not possible
B7	183	pre-authorisation incorrect (amount too high) or amount wrong

Error-ID (hexa-deci-mal)	Error-ID (decimal)	Definition
B8	184	error pre-authorisation
BF	191	voltage supply to low (external power supply)
C0	192	card locking mechanism defective
C1	193	merchant-card locked
C2	194	diagnosis required
C3	195	maximum amount exceeded
C4	196	card-profile invalid. New card-profiles must be loaded.
C5	197	payment method not supported
C6	198	currency not applicable
C8	200	amount too small
C9	201	max. transaction-amount too small
CB	203	function only allowed in EURO
CC	204	printer not ready
CD	205	Cashback not possible
D2	210	function not permitted for service-cards/bank-customer-cards
DC	220	card inserted
DD	221	error during card-eject (for motor-insertion reader)
DE	222	error during card-insertion (for motor-insertion reader)
E0	224	remote-maintenance activated
E2	226	card-reader does not answer / card-reader defective
E3	227	shutter closed
E4	228	Terminal activation required
E7	231	min. one goods-group not found
E8	232	no goods-groups-table loaded
E9	233	restriction-code not permitted
EA	234	card-code not permitted (e.g. card not activated via Diagnosis)
EB	235	function not executable (PIN-algorithm unknown)
EC	236	PIN-processing not possible
ED	237	PIN-pad defective
F0	240	open end-of-day batch present
F1	241	ec-cash/Maestro offline error
F5	245	OPT-error
F6	246	OPT-data not available (= OPT personalisation required)
FA	250	error transmitting offline-transactions (clearing error)
FB	251	turnover data-set defective
FC	252	necessary device not present or defective
FD	253	baudrate not supported
FE	254	register unknown
FF	255	system error (= other/unknown error), See TLV tags 1F16 and 1F17

The host return-codes the ‘A0’ – ‘AF’ are returned to the ECR as error-code ‘00’.

11 Terminal Status Codes

Following status codes are defined:

Error-ID (hexa-decimal)	Status-Code (decimal)	Definition
00	00	PT ready
51	81	Initialisation required
62	98	Date/time incorrect
9C	156	Please wait (e.g. software-update still running)
9D	157	Partial issue of goods
B1	177	Memory full
B2	178	Merchant-journal full
BF	191	Voltage supply too low (external power supply)
C0	192	Card locking mechanism defect
C1	193	Merchant card locked
C2	194	Diagnosis required
C4	196	Card-profile invalid. New card-profiles must be loaded
CC	204	Printer not ready
DC	220	Card inserted
DF	223	Out-of-order
E0	224	Remote-maintenance activated
E1	225	Card not completely removed
E2	226	Card-reader does not answer / card-reader defective
E3	227	Shutter closed
E4	228	Terminal activation required
F0	240	Reconciliation required
F6	246	OPT-data not available (= OPT-Personalisation required)

11.1 Recovery-Actions:

The following table describes which actions are necessary to resolve the status from the PT.

Status-Code (decimal)	Recovery-Action (ZVT-Command)
00	PT ready → no action required
81	„Initialisation“
98	„Set Date and Time in PT“ (time from vending machine) or „Diagnosis“ (time from host)
100	repeat card insertion
101	„Start OPT-Action“
156	PT needs further time → no action required
177	„End-of-Day“ or service-technician fix
178	„Read File“ and/or „Delete File“
191	service-technician fix
192	service-technician fix
193	„Set Date and Time in PT“(time from vending machine) or „Diagnosis“ (time from host). Depending on PT merchant-card re-register and re-attempt, otherwise service-technician fix
194	„Diagnosis“

196	„Software-Update“ (new card profiles can be loaded from the service-computer) or service-technician fix
204	service-technician fix
220	PT ready. Card can be processed or via „Abort“ ejected.
223	service-technician fix
224	service-technician fix
225	PT ready. Card must be fully extracted.
226	service-technician fix
228	Service-technician fix

12 List of ZVT-card-type IDs

Card	ZVT card type ID	IIN/AID
DouglasCard	1	604655
ec-card (national, international, bank-customer card) - obsolete	2	
Miles&More	3	
(RFU)	4	
girocard	5	
Mastercard	6	
EAPS	7	
American Express	8	
Debit advice based on track 2 or EMV chip (e.g. EuroELV)	9	
Visa	10	
VISA electron	11	
Diners	12	
V PAY	13	
JCB	14	
REKA Card	15	
Esso fleet-card	16	
Happiness Cards	17	
DKV/SVG	18	
Transact Geschenkkarte	19	
Shell fleet-card	20	
Payeasy	21	
DEA	22	
boncard POINTS	23	
Leaseplan	24	
boncard PAY	25	
OK	26	
Klarmobil	27	
UTA	28	
Mobile World	29	
Geldkarte (formerly also: ec-cash with Chip)	30	
Ukash	31	
Hessol	32	
Wallie	33	
Lomo	34	
MyOne	35	
Woehrl	36	
Gutscheinkarte DOUGLAS Gruppe	37	691000 639402 636663 604655
Breuninger	38	
ABO Card	39	A000000157444A
BSW	40	
BonusCard	41	A000000157010B
Comfort Card	42	
CCC Commit Card	43	A0000001574457
YESSS	44	

Card	ZVT card type ID	IIN/AID
DataStandards (DAS)	45	A0000001574461
Maestro (formerly: edc)	46	
GiftCard	47	A0000001574451
Easycard	48	
Jelmoli Card	49	A0000001570103
CitiShopping	50	
J-Geschenkkarte	51	A000000157444E
EuroReal (TeleCash)	52	
Jubin	53	A000000157445F
Hertie	54	
ManorCard	55	A0000001570104
Goertz	56	
Power Card	57	A000000157010D 9756163001
Lafayette	58	
Supercard plus	59	A0000001574444
Heinemann	60	
SwissBonus Card	61	A0000001574449
Harley Davidson	62	
SwissCadeau	63	A000000157445A
Shopping Plus	64	
Tetora	65	A0000001579999
Family Dent Card	66	
WIRcard	67	A000000157010C
Karstadt Club	68	
Postcard (Postfinance Card)	69	A0000001110101 A0000001570050 A0000001570051
Hagebau Partner Card	70	
Lebara	71	
Lycamobile	72	
GT Mobile	73	
HP	74	
epay Gutscheinkarte	75	
IKEA Family Plus	76	
Karstadt Bonus Card	77	34
Koch Card Plus	78	
Yapital	79	
XTRA Card	80	
Pay-At-Match	81	-
Optimus	82	
Lunch-Check Card	83	A000000157447D
VW Club	84	
Tankstellen-Netz-Deutschland	85	927600
Scandlines	86	
Bancontact-MisterCash	87	6703
Cast Customer-Card, Payment-function	88	
PAYBACK PAY	89	308342
Cast Customer-Card, Bonus-capture	90	
ValueMaster	91	9120032060009

Card	ZVT card type ID	IIN/AID
ECMcard	92	
Orlen Flottenkarte	93	789664
Solitair Card	94	
Orlen Star-Card	95	789665
Blauworld	96	
ALIPAY	97	
REA Gutschein- und Bonuskarte	98	62776412
Roth	99	708386
Roth TP	100	70009727681
EuroWAG	101	789663
Porsche-card	102	53965990
ARBÖ-card	103	526687
ÖAMTC-card	104	308194
Netto-App	105	-
GroupCard	106	60045207
ALIPAY @POS-Model 2	107	-
Cheque Dejeuner / UP Slovensko	108	A000000180000703010001
Callio Gastro	109	A000000028310102000201
DOXX	110	A000000028310102000203
Instant Payment	111	
AVIA PrePaid Karte	112	7013710010
AirPlus	127	
Hornbach Profi	137	
Hornbach Projektwelt	138	
Weat fleet-card	142	
GDB fleet-card	144	
DKV blue fleet-card	146	
Conoco/Jet fleet-card	148	
Gulf card	149	
Eurotrafic fleet-card	150	
Westfalen fleet-card	152	
Elf fleet-card	154	
Präsentcard	155	
Agip fleet-card	156	
Hornbach Gutscheinkarte	157	
Total fleet-card	158	
AVIA	160	
BFT fleet-card	162	
Routex fleet-card	164	
PAN-Diesel fleet-card	166	
BayWa	176	
GAZ-card/Roadrunner-Card	177	
Go-Card	178	
XNet-Card	179	
PaysafeCard Blue	180	
PaysafeCard Red	181	
Tele 2	182	
Sunrise	183	
Sorena ZED	184	
Quam now-card	185	

Card	ZVT card type ID	IIN/AID
Mox Universal	186	
Mox Calling Card	187	
Loop Card	188	
Go Bananas	189	
Free & Easy card	190	
Callya-Card	191	
VCS-DAFA	192	
Caravaning-Card	193	
AirPlus Cargo	194	
HEM-card	195	
Dankort	196	
VISA/Dankort	197	
CUP-card	198	
Mango-card	199	
Payback payment-card	200	
Lunch Card	201	
Payback (without payment function)	202	
Micromoney	203	
T-Card	204	
Blau	205	
BILDMobil	206	
Congstar	207	
C3 Bestminutes	208	
C3 Bestcard	209	
C3 Callingcard	210	
EDEKAMOBIL	211	
XTRA-PIN	212	
Klimacard	213	
ICP-International-Fleet-Card	214	
ICP-Gutscheinkarte	215	
ICP-Bonuskarte	216	
Austria Card	217	
ConCardis Geschenkkarte	218	
TeleCash Gutscheinkarte	219	
Shell private label credit card	220	
ADAC	221	
Shell Clubsmart	222	
Shell Pre-Paid-Card	223	
Shell Master-Card	224	
bauMax Zahlkarte	225	
Fiat-Lancia-Alfa Servicecard	226	
Nissan-Karte	227	
ÖBB Vorteilskarte	228	
Österreich Ticket	229	
Shopin-Karte	230	
Tlapa-Karte	231	
Discover Card	232	
f+f-Karte (frei & flott - Karte)	233	700164 700165
Syrcon	234	

Card	ZVT card type ID	IIN/AID
Citybike Card	235	
	236	
	237	
IKEA FAMILY Bezahlkarte	238	
Ikano Shopping Card	239	
Intercard Gutscheinkarte	240	
Intercard Kundenkarte	241	
M&M-Gutscheinkarte	242	636347
Montrada card	243	
CP Customer Card	244	
AmexMembershipReward	245	
FONIC	246	
OTELO DE	247	
SIMYO	248	
Schlecker Smobil	249	
Schlecker Zusatzprodukte	250	
CHRIST Gutscheinkarte	251	691000
IQ-Card	252	
AVS Gutscheinkarte (Pontos)	253	
Novofleet Card	254	708551
Indication for ZVT-card-type ID in TLV tag 41	255	
MiFare NFC cards	256	
myCard4u	257	
Ratenkauf	258	
AVIA Prepaid	259	
BlueCode	260	

13 Summary of utilised BMPs

BMP	Format	Definition
01	1 byte binary	Timeout
02	1 byte binary	Maximal number of status informations
03	1 byte binary	Service byte, bit-field. Meaning of bits depends on command this field is used in.
04	6 byte BCD	Amount in minor currency units
05	1 byte binary	Pump number, range 00 - FF
06	TLV-encoded	TLV-container; length according to TLV-encoding (not LLL-Var !)
0B	3 byte BCD	Trace number
0C	3 byte BCD	Time, format HHMMSS
0D	2 byte BCD	Date, format MMDD (see also AA)
0E	2 byte BCD	Expiry-date, format YYMM
17	2 byte BCD	Card sequence-number
19	1 byte binary	• Status-byte as defined in Registration (06 00) • Payment-type as defined in Authorization (06 01) • Card-type as defined in Read Card (06 C0)
22	LL-Var BCD	PAN / EF_ID, 'E' used to indicate a masked numeric digit[1]. If the card-number contains an odd number of digits, it is padded with an 'F'.
23	LL-Var	Track 2 data, without start and end markers; 'E' used to indicate a masked numeric digit
24	LLL-Var	Track 3 data, without start and end markers; 'E' used to indicate a masked numeric digit
27	1 byte binary	Result-Code as defined in chapter Error-Messages
29	4 byte BCD	Terminal identifier
2A	15 byte ASCII	VU-number
2D	LL-Var	Track 1 data, without start and end markers
2E	LLL-Var	Synchronous chip data
37	3 byte BCD	Trace-number of the original transaction for reversal
3A	2 byte BCD	CVV/CVC value, right padded with 'F' if less than 4 digits
3B	8 byte	AID authorisation-attribute
3C	LLL-Var	Additional-data/additional-text
3D	3 byte BCD	Password
49	2 byte BCD	Currency code
60	LLL-Var	Individual totals
70	4 byte integer, big endian	Uniquely identifies Display Image request. In case image data is transmitted by more than one Display Image message (image data is chunked) then each of them has to have the same request-id set.
71	4 byte integer, big endian	Total size of the image that will be displayed. Image-size is 4 bytes long. This field is used when image data is chunked and pays control role to ensure receiver that sum of all received image data chunks is correct.
72	1 byte integer	MIME type of the image. **Value** | **Description**

[1] To meet the PCI-DSS requirements, the bitmap 22 through 24 can be omitted instead of using masking.

<table>
<tr><th>BMP</th><th>Format</th><th>Definition</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td>0</td><td>undefined/unknown - MIME is not known/set. In this case, the behavior of the receiver of an image is undefined and depends on presentation layer that can examine image content regarding its type. If receiver doesn't accept unknown type or is not able to properly process the image without this information then it shall return 102 error code.</td></tr>
<tr><td>1</td><td>image/gif
• information https://en.wikipedia.org/wiki/GIF
• defined https://tools.ietf.org/html/rfc2045
• defined https://tools.ietf.org/html/rfc2046</td></tr>
<tr><td>2</td><td>image/jpeg
• information https://en.wikipedia.org/wiki/JPEG
• defined https://tools.ietf.org/html/rfc2045
• defined https://tools.ietf.org/html/rfc2046</td></tr>
<tr><td>3</td><td>image/png
• information https://en.wikipedia.org/wiki/Portable_Network_Graphics
• registered http://www.iana.org/assignments/media-types/image/png</td></tr>
<tr><td>4</td><td>image/tiff
• information https://en.wikipedia.org/wiki/Tagged_Image_File_Format
• defined https://tools.ietf.org/html/rfc3302</td></tr>
<tr><td>5</td><td>image/x-icon
• information https://en.wikipedia.org/wiki/ICO_%28file_format%29
• registered http://www.iana.org/assignments/media-types/image/vnd.microsoft.icon</td></tr>
<tr><td>6</td><td>image/webp
• information https://en.wikipedia.org/wiki/WebP</td></tr>
<tr><td>7</td><td>application/pdf
• information https://en.wikipedia.org/wiki/Portable_Document_Format
• defined https://tools.ietf.org/html/rfc8118</td></tr>
</table>
</td></tr>
<tr><td>73</td><td>1 byte integer</td><td>image encoding type.
<table>
<tr><th>Value</th><th>Definition</th></tr>
<tr><td>0</td><td>undefined/unknown</td></tr>
<tr><td>1</td><td>none - no special encoding has been applied.</td></tr>
<tr><td>2</td><td>base64
• information https://en.wikipedia.org/wiki/Base64</td></tr>
</table>
</td></tr>
<tr><td>74</td><td>1 byte integer</td><td>Total number of chunks of the image to display.</td></tr>
<tr><td>75</td><td>1 byte integer</td><td>Index of the chunk of the image data.</td></tr>
<tr><td>87</td><td>2 byte BCD</td><td>Receipt-number</td></tr>
<tr><td>88</td><td>3 byte BCD</td><td>Turnover record number</td></tr>
<tr><td>8A</td><td>1 byte binary</td><td>Card-type (card-number according to ZVT-protocol; see also 8C)</td></tr>
<tr><td>8B</td><td>LL-Var</td><td>Card-name</td></tr>
<tr><td>8C</td><td>1 byte binary</td><td>Card-type-ID of the network operator (see also 8A)</td></tr>
<tr><td>9A</td><td>LLL-Var</td><td>GeldKarte payments-/ failed-payment record/total record Geldkarte</td></tr>
</table>

<table>
<tr><th>BMP</th><th>Format</th><th>Definition</th></tr>
<tr><td>A0</td><td>1 byte binary</td><td>Result-code-AS</td></tr>
<tr><td>A7</td><td>LL-Var</td><td>Chip-data, EF_ID</td></tr>
<tr><td>AA</td><td>3 byte BCD</td><td>Date, format YYMMDD (see also 0D)</td></tr>
<tr><td>AF</td><td>LLL-Var</td><td>EF_Info</td></tr>
<tr><td>BA</td><td>5 byte binary</td><td>AID-parameter</td></tr>
<tr><td>D0</td><td>1 byte binary</td><td>Algorithm key</td></tr>
<tr><td>D1</td><td>LL-Var</td><td>Card offset/PIN-data</td></tr>
<tr><td>D2</td><td>1 byte binary</td><td>Card output direction. Determines the direction of card output for a motor-reader, default = ‘00’.

<table><tr><th>Value</th><th>Definition</th></tr><tr><td>00</td><td>card output outwards (direction customer)</td></tr><tr><td>01</td><td>card output inwards</td></tr><tr><td>02</td><td>park card (not supported by all motor-readers)</td></tr></table></td></tr>
<tr><td>D3</td><td>1 byte binary</td><td>DUKPT key identifier

<table><tr><th>Value</th><th>Definition</th></tr><tr><td>0x00</td><td>Swiss server</td></tr><tr><td>0x01</td><td>OASE</td></tr><tr><td>0x02</td><td>Oil company</td></tr><tr><td>0x03</td><td>Ratio</td></tr><tr><td>0x04</td><td>Reservered for further use</td></tr><tr><td>0x05</td><td>Reservered for further use</td></tr><tr><td>0x06</td><td>Reservered for further use</td></tr><tr><td>0x07</td><td>Reservered for further use</td></tr><tr><td>0x08</td><td>Reservered for further use</td></tr><tr><td>0x09</td><td>Reservered for further use</td></tr></table></td></tr>
<tr><td>E0</td><td>1 byte binary</td><td>Minimal length of the input</td></tr>
<tr><td>E1</td><td>LL-Var</td><td>Text2 line 1</td></tr>
<tr><td>E2</td><td>LL-Var</td><td>Text2 line 2</td></tr>
<tr><td>E3</td><td>LL-Var</td><td>Text2 line 3</td></tr>
<tr><td>E4</td><td>LL-Var</td><td>Text2 line 4</td></tr>
<tr><td>E5</td><td>LL-Var</td><td>Text2 line 5</td></tr>
<tr><td>E6</td><td>LL-Var</td><td>Text2 line 6</td></tr>
<tr><td>E7</td><td>LL-Var</td><td>Text2 line 7</td></tr>
<tr><td>E8</td><td>LL-Var</td><td>Text2 line 8</td></tr>
<tr><td>E9</td><td>1 byte binary</td><td>Maximal length of the input</td></tr>
<tr><td>EA</td><td>1 byte binary</td><td>Echo the input</td></tr>
<tr><td>EB</td><td>8 byte binary</td><td>MAC over text 1 and text 2</td></tr>
<tr><td>F0</td><td>1 byte binary</td><td>Display-duration in seconds. ‘00’ means infinite. Default-value = ‘00’.</td></tr>
<tr><td>F1</td><td>LL-Var</td><td>Text1 line 1</td></tr>
<tr><td>F2</td><td>LL-Var</td><td>Text1 line 2</td></tr>
<tr><td>F3</td><td>LL-Var</td><td>Text1 line 3</td></tr>
<tr><td>F4</td><td>LL-Var</td><td>Text1 line 4</td></tr>
<tr><td>F5</td><td>LL-Var</td><td>Text1 line 5</td></tr>
<tr><td>F6</td><td>LL-Var</td><td>Text1 line 6</td></tr>
<tr><td>F7</td><td>LL-Var</td><td>Text1 line 7</td></tr>
<tr><td>F8</td><td>LL-Var</td><td>Text1 line 8</td></tr>
<tr><td>F9</td><td>1 byte binary</td><td>Number of beep-tones, default-value = ‘00’</td></tr>
</table>

BMP	Format	Definition
FA	1 byte binary	Card reader activation. Defines whether the card-reader should be activated or de-activated. Only an activated card-reader will draw-in the card or release the shutter. **Value** / **Definition** 00 – Activate card reader FF – Deactivate card reader
FB	1 byte binary	Confirmation the input with <OK> required
FC	1 byte binary	Dialog-control
FD	1 byte binary	Display device on which text should be shown. The default display-device type is the terminal display. **Value** / **Definition** 00 – Show text on all available displays (default) 01 – External display 02 – Internal display

The PT needn't support all bitmaps listed above; however the PT must react correctly. The PT should ignore known, but not supported bitmaps and respond to unknown bitmaps with an error:

PT response:

PT → ECR			
APDU			
Control field		Length	Data block
CCRC	APRC		
84	83	00	

14 Summary of Commands

0F XX RFU for proprietary applications, the utilisation for particular cases should be clarified between manufacturers
01 01 RFU

04 01 Set Date and Time in ECR
04 0D Input-Request
04 0E Menu-Request
04 0F Status-Information
04 FF Intermediate-Statusinformation

05 01 Status-Enquiry
05 FF RFU

06 00 Registration
06 01 Authorisation
06 02 Log-Off
06 03 Account Balance Request
06 04 Activate Card
06 05 Procurement
06 09 Prepaid Top-Up
06 0A Tax Free
06 0B RFU
06 0C Tip
06 0D Menu selection with graphic display
06 0F Completion
06 10 Send Turnover Totals
06 11 RFU
06 12 Print Turnover Receipts
06 18 Reset Terminal
06 1A Print System Configuration
06 1B Set/Reset Terminal-ID
06 1E Abort
06 20 Repeat Receipt
06 21 Telephonic Authorisation
06 22 Pre-Authorisation/Reservation
06 23 Partial-Reversal of a Pre-Authorisation/Booking of a Reservation
06 24 Book Total
06 25 Pre-Authorisation Reversal
06 26 Reversal of external transaction
06 30 Reversal
06 31 Refund
06 50 End-of-Day
06 51 Send offline Transactions
06 70 Diagnosis
06 79 Selftest
06 82 RFU
06 85 Display Text (only included for downwards-compatibility, for new implementations use 06 E0)
06 86 Display Text with Numerical Input (only included for downwards-compatibility, for new implementations use 06 E2)
06 87 PIN-Verification for Customer-Card (only included for downwards-compatibility, for new implementations use 06 E3)

06 88 Display Text with Function-Key Input (only included for downwards-compatibility, for new implementations use 06 E1)
06 90 RFU
06 91 Set Date and Time in PT
06 93 Initialisation
06 95 Change Password
06 B0 Abort
06 C0 Read Card
06 C1 reserved
06 C2 reserved
06 C3 reserved
06 C4 reserved
06 C5 Close Card Session
06 C6 Send APDUs
06 CE RFU
06 D1 Print Line
06 D3 Print Text-Block
06 D4 RFU
06 D8 Dial-Up
06 D9 Transmit Data via Dial-Up
06 DA Receive Data via Dial-Up
06 DB Hang-Up
06 DD Transparent-Mode
06 E0 Display Text
06 E1 Display Text with Function-Key Input
06 E2 Display Text with Numerical Input
06 E3 PIN-Verification for Customer-Card
06 E4 Blocked-List Query to ECR
06 E5 MAC calculation
06 E6 Card poll with authorization
06 E8 reference number in BMP 60
06 E9 reference number in BMP 58
06 F0 Display Image

08 01 Activate Service-Mode
08 02 Switch Protocol
08 10 Software-Update
08 11 Read File
08 12 Delete File
08 13 Change Configuration
08 14 Write File
08 20 Start OPT Action
08 21 Set OPT Point-in-Time
08 22 OPT-Pre-Initialisation
08 23 Output OPT-Data
08 24 OPT Out-of-Order
08 30 Select Language
08 40 Change Baudrate
08 50 Activate Card-Reader

0F xx reserved for proprietary extensions
0F CA ChipActivator

80 00 Positive Acknowledgement
84 00 Positive Acknowledgement
84 xx Negative Acknowledgement
84 9C Repeat Statusinfo

15 ZVT-Charactersets

15.1 7-bit ASCII ZVT-Characterset

0x20		0x30	**0**	0x40	@	0x50	**P**	0x60	`	0x70	**p**
0x21	**!**	0x31	**1**	0x41	**A**	0x51	**Q**	0x61	**a**	0x71	**q**
0x22	**"**	0x32	**2**	0x42	**B**	0x52	**R**	0x62	**b**	0x72	**r**
0x23	#	0x33	**3**	0x43	**C**	0x53	**S**	0x63	**c**	0x73	**s**
0x24	**$**	0x34	**4**	0x44	**D**	0x54	**T**	0x64	**d**	0x74	**t**
0x25	**%**	0x35	**5**	0x45	**E**	0x55	**U**	0x65	**e**	0x75	**u**
0x26	**&**	0x36	**6**	0x46	**F**	0x56	**V**	0x66	**f**	0x76	**v**
0x27	**'**	0x37	**7**	0x47	**G**	0x57	**W**	0x67	**g**	0x77	**w**
0x28	**(**	0x38	**8**	0x48	**H**	0x58	**X**	0x68	**h**	0x78	**x**
0x29	**)**	0x39	**9**	0x49	**I**	0x59	**Y**	0x69	**i**	0x79	**y**
0x2a	*****	0x3a	**:**	0x4a	**J**	0x5a	**Z**	0x6a	**j**	0x7a	**z**
0x2b	**+**	0x3b	**;**	0x4b	**K**	0x5b	**Ä**	0x6b	**k**	0x7b	**ä**
0x2c	**,**	0x3c	**<**	0x4c	**L**	0x5c	**Ö**	0x6c	**l**	0x7c	**ö**
0x2d	**-**	0x3d	**=**	0x4d	**M**	0x5d	**Ü**	0x6d	**m**	0x7d	**ü**
0x2e	**.**	0x3e	**>**	0x4e	**N**	0x5e	**^**	0x6e	**n**	0x7e	**ß**
0x2f	**/**	0x3f	**?**	0x4f	**O**	0x5f	_	0x6f	**o**	0x7f	**Δ**

15.2 8-bit ZVT-Characterset (CP437, OEM-US)

	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9	.A	.B	.C	.D	.E	.F
0.	NUL 0	☺ 263A	☻ 263B	♥ 2665	♦ 2666	♣ 2663	♠ 2660	• 2022	◘ 25D8	○ 25CB	◙ 25D9	♂ 2642	♀ 2640	♪ 266A	♫ 266B	☼ 263C
1.	► 25BA	◄ 25C4	↕ 2195	‼ 203C	¶ B6	§ A7	▬ 25AC	↨ 21A8	↑ 2191	↓ 2193	→ 2192	← 2190	∟ 221F	↔ 2194	▲ 25B2	▼ 25BC
2.	 20	**!** 21	**"** 22	**#** 23	**$** 24	**%** 25	**&** 26	**'** 27	**(** 28	**)** 29	*** 2A	**+** 2B	**,** 2C	**-** 2D	**.** 2E	**/** 2F
3.	**0** 30	**1** 31	**2** 32	**3** 33	**4** 34	**5** 35	**6** 36	**7** 37	**8** 38	**9** 39	**:** 3A	**;** 3B	**<** 3C	**=** 3D	**>** 3E	**?** 3F
4.	**@** 40	**A** 41	**B** 42	**C** 43	**D** 44	**E** 45	**F** 46	**G** 47	**H** 48	**I** 49	**J** 4A	**K** 4B	**L** 4C	**M** 4D	**N** 4E	**O** 4F
5.	**P** 50	**Q** 51	**R** 52	**S** 53	**T** 54	**U** 55	**V** 56	**W** 57	**X** 58	**Y** 59	**Z** 5A	**[** 5B	**** 5C	**]** 5D	**^** 5E	**_** 5F
6.	**`** 60	**a** 61	**b** 62	**c** 63	**d** 64	**e** 65	**f** 66	**g** 67	**h** 68	**i** 69	**j** 6A	**k** 6B	**l** 6C	**m** 6D	**n** 6E	**o** 6F
7.	**p** 70	**q** 71	**r** 72	**s** 73	**t** 74	**u** 75	**v** 76	**w** 77	**x** 78	**y** 79	**z** 7A	**{** 7B	**|** 7C	**}** 7D	**~** 7E	⌂ 2302
8.	**Ç** C7	**ü** FC	**é** E9	**â** E2	**ä** E4	**à** E0	**å** E5	**ç** E7	**ê** EA	**ë** EB	**è** E8	**ï** EF	**î** EE	**ì** EC	**Ä** C4	**Å** C5
9.	**É** C9	**æ** E6	**Æ** C6	**ô** F4	**ö** F6	**ò** F2	**û** FB	**ù** F9	**ÿ** FF	**Ö** D6	**Ü** DC	**¢** A2	**£** A3	**¥** A5	**₧** 20A7	**ƒ** 192
A.	**á** E1	**í** ED	**ó** F3	**ú** FA	**ñ** F1	**Ñ** D1	**ª** AA	**º** BA	**¿** BF	**⌐** 2310	**¬** AC	**½** BD	**¼** BC	**¡** A1	**«** AB	**»** BB
B.	░ 2591	▒ 2592	▓ 2593	**|** 2502	**┤** 2524	**╡** 2561	**╢** 2562	**╖** 2556	**╕** 2555	**╣** 2563	**||** 2551	**╗** 2557	**╝** 255D	**╜** 255C	**╛** 255B	**┐** 2510
C.	**└** 2514	**┴** 2534	**┬** 252C	**├** 251C	**─** 2500	**┼** 253C	**╞** 255E	**╟** 255F	**╚** 255A	**╔** 2554	**╩** 2569	**╦** 2566	**╠** 2560	**═** 2550	**╬** 256C	**╧** 2567
D.	**╨** 2568	**╤** 2564	**╥** 2565	**╙** 2559	**╘** 2558	**╒** 2552	**╓** 2553	**╫** 256B	**╪** 256A	**┘** 2518	**┌** 250C	**█** 2588	**▄** 2584	**▌** 258C	**▐** 2590	**▀** 2580
E.	**α** 3B1	**ß** DF	**Γ** 393	**π** 3C0	**Σ** 3A3	**σ** 3C3	**µ** B5	**τ** 3C4	**Φ** 3A6	**Θ** 398	**Ω** 3A9	**δ** 3B4	∞ 221E	**φ** 3C6	**ε** 3B5	∩ 2229
F.	≡ 2261	± B1	≥ 2265	≤ 2264	⌠ 2320	⌡ 2321	÷ F7	≈ 2248	° B0	∙ 2219	· B7	√ 221A	ⁿ 207F	² B2	■ 25A0	 A0

The hexadecimal number below the symbol denotes the unicode number.
This charset is valid for incoming commands with text displays.

16 References

PA00P016 ECR-Interface ZVT-Protocol – Transport-Protocol and Application-Protocol
PA00P017 Implications of TA7.0 / DC POS2.4 on the ECR-Interface Protocol
DCPOS25 Schnittstellenspezifikation für chipbasierte EMV-Debit/Credit-Anwendungen POS-Terminals Version 2.5 07.04.2011
ISO 4217 http://www.iso.org/iso/home/standards/currency_codes.htm
PC/SC3 Sup1 http://www.pcscworkgroup.com/specifications/html/pcsc3_v2.01.09_sup/

17 Change-Control

The change-control for this documentation is assigned to CCV Deutschland GmbH. The current versions are announced on http://www.terminalhersteller.de.