Installation and Configuration Manual

Importing and Exporting Card Production Tasks in XML Format

3.51.11

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Contents

This document is intended for Way4 users, bank and processing centre employees responsible for configuring the data preparation system for smart card personalisation.

Variables that differ for each local instance, such as directory and file names, as well as file paths are shown in angular brackets, as in <OWS_HOME>.
Warnings and information are marked as follows:

Warnings about potentially hazardous situations or actions.

Messages with information about important features, additional options, or the best use of certain system functions.

1 Processing tasks

Card production tasks can be generated:

- In Way4.
- In a third-party Core Banking System (automated banking system, CBS).

2 Processing tasks that were generated in WAY4

Way4 card production tasks in XML format are exported and imported in the following way (see Fig. 1):

- Card production tasks are exported from the issuing module using the pipe "com.openwaygroup.pipe.pm.file_export.jar" (PM File Export).
- Exported tasks are imported into the PIN Management module using the pipe "com.openwaygroup.pipe.pm.file_import.jar" (PM File Import).
- After the PIN Management module executes tasks, response files are exported using the pipe "com.openwaygroup.pipe.pm.file_response_export.jar" (PM File Response Export).
- Response files are imported into the issuing module using the pipe "com.openwaygroup.pipe.pm.file_response_import.jar" (PM File Response Import).

Fig. 1. Bankcard issuing scheme

Data for personalising bankcards is prepared by the following pipes (see Fig. 2):

- Cryptographic values are calculated and PIN mailers are printed in one of the following ways:
- By the single-thread pipe "com.openwaygroup.pipe.pm.security_calc_and_mailer_printing.jar" (PM Security Calc & Mailer Printing) using one HSM.

- Cryptographic values are calculated by the multithread pipe "com.openwaygroup.pipe.pm.security_calc_multithread.jar" (PM Security Calc Multithread) using one or several HSMs, and PIN mailers are printed on one HSM by the pipe "com.openwaygroup.pipe.pm.security_calc_and_mailer_printing.jar".
- A personalisation file (perso file) for magnetic and smart cards is generated by the pipe "com.openwaygroup.pipe.pm.personalization_file_export.jar" (PM Personalization File Export).

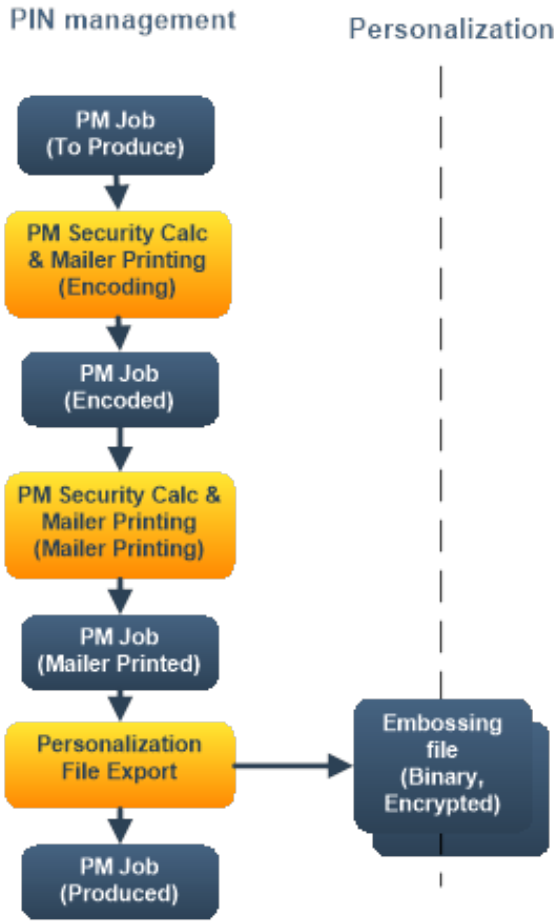

Fig. 2. Preparing data for personalising bankcards

By default, all files are located in subdirectories of the "<OW_WORK>/Data/Card_Prd/" directory according to the pipe purpose. Directories are specified using "output_directory" (outgoing file directory), "source_dir" (incoming file directory) and "processed_dir" (incoming imported files) pipe parameters in the corresponding menu items.

The "PM File Import" pipe imports jobs with the "Preloaded" status. Then, tasks are processed using stored procedures. If processing is successfully completed, jobs get the "Loaded" status. If processing finished with the status "Preloaded with Errors" (i.e. the job contains tasks that did not pass the correctness check), some errors can be fixed and the job can be reprocessed. If the "PM File Import" pipe imported a job with the "Error" status, this means an error occurred when executing tasks on the hardware security module (HSM). In this case, the job cannot be manually transferred to another status; this job should be deleted, errors analyzed, the job file fixed and imported again.

Pipes support the possibility to send PIN blocks encrypted under ZPK between the issuing module and the PIN Management module (PM). To do so, the global parameter "PM_PIN_TRANSLATE=Y" must be

added to the "Additional Global Parameters" form (Full → Configuration Setup → Main Tables → Additional Global Parameters), and an additional card production parameter "ISSUER_PIN_FORM=UNDER_ZPK" must be specified (Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters] → [Options]). Note that these parameters should be specified in both the issuing module and the PIN Management module, if the stand alone module PIN Management StandAlone is used.

Pipes support the possibility of translating PIN blocks to an online HSM device when sending PIN blocks encrypted under ZPK between the issuing module and the PIN Management module.

> The pipes (PM File Response Export, PM File Response Import) support work with the library for encrypting and decrypting data (Platform PipeEncryption). To get information about the Platform PipeEncryption library, contact "OpenWay".

The "RSA EMV Key Management" pipe is used to load issuer public keys, import issuer public key certificates and to import CA public keys.

When issuing cards with DDA authentication, a separate RSA key must be generated for each card. If a large number of private keys must be generated for a card, which may require significant loss of time, it is recommended to use the key pre-generation mode ("RSA ICC keys PRE-generation" pipe).

If PIN and PIN2 encrypted under LMK of the HSM are stored in WAY4, when changing LMK keys in the HSM, PIN and PIN2 must be re-encrypted under new LMKs. To do so, the pipes "PIN & PIN2 Migration to new LMK" (translate PIN and PIN2 values, and save these values in temporary tables in the database) and "Approve PIN & PIN2 Migration to new LMK" (copy PIN and PIN2 values encrypted under the new LMK to the location of the corresponding values encrypted under the old LMK) are used. In addition, these pipes are used to translate PIN blocks from under the LMK of one device under the LMK of another device (using a ZPK transitional key).

The "KM DES Key Management" pipe is used to translate encryption keys between two different HSMs (from under the LMK of one device under the LMK of another device).

3 Pipe Parameters

3.1 "PM File Export" Pipe Parameters

Parameter	Value	Parameter description
SOURCE_HINT	SELECT operator parameter	An optimizer (HINT), added to the SELECT operator of the base query. For example: /*+ALL_ROWS*/. This parameter is only used when working with the Oracle DBMS.
CARD_INFO_HINT	SELECT operator parameter	An optimizer (HINT), added to the SELECT operator of the card query. For example: /*+ALL_ROWS*/. This parameter is only used when working with the Oracle DBMS.
FILE_BREAK_BY		Rule for grouping records by files (can use field names of tables shown in Table 1). For example, "FI.Branch_Code||cs.SUBTYPE_CODE" – for grouping data according to contract subtypes within a financial institution. Also see the section "Example of Configuring Task Grouping in Files".
FILE_NAME_EXT	Field names united by the "||" character, a constant	The value is used to add information to the file name. For example, if "'_'||cs.SUBTYPE_CODE" is specified, the contract subtype code will be added to the file name when grouping records by contract subtypes.

Parameter	Value	Parameter description
FILTER	Conditional fragment	WHERE conditional fragment added to the SELECT operator for data filtering. Used for example to export the tasks of only one financial institution. When generating WHERE conditions, field names of tables shown in Table 1 can be used. ⚠ This parameter should not be specified for the menu item "Full → Issuing → Send/Receive Production Batches → Resend PIN Management File".
SORT_ORDER	ORDER BY conditional fragment	Specifies the order for sorting tasks for export. Fields names of tables shown in Table 1 can be used as values The default value is "ac.CONTRACT_NUMBER".
ADD_INFO_1, ADD_INFO_2, ADD_INFO_3, ADD_INFO_4	Conditional fragment, field names joined by "||"," " characters	Specify additional fields for export to the PIN Management module. The names of ACNT_CONTRACT table fields can be specified directly, and data from other tables (related to ACNT_CONTRACT) are specified using SELECT operator conditional fragments. These parameters allow the values of the "ADD1", "ADD2", "ADD3" and "ADD4" to be redefined, respectively (see the section "WAY4 Tags"). ⓘ There are no limits on the length of expressions in these fields, but when generating request conditions, it should be noted that the result returned must not exceed 255 characters.

Parameter	Value	Parameter description
FILE_NAMING_BY	BANK, BRANCH, HEAD_OFFICE	Rule for setting the sender code (element of the file FileHeader/Source) and file name: "BANK" – the BANK_CODE field of the F_I (financial institution) table "BRANCH" (default value) – the BRANCH_CODE field of the F_I table "HEAD_OFFICE" – the BRANCH_CODE field of the head financial office's F_I table.
MAX_FILE	Number	Specifies the maximum number of tasks in a file. The "0" value (default) means there are no limits to the number of tasks in the file.
SUB_DIRECTORIES	Y/N	When the value of this parameter is set to "Y", exported files will be grouped in the mail directory by subdirectories, according to the FILE_NAMING_BY parameter. In this case, the specified subdirectories must be created in advance. The default value of the parameter is "N".
CARD_ADDRESS_TYPE		Code of the address type used to deliver a card (the "CRDM" tag group of the ApplicationCommonData aggregate). A code from the ADDRESS_TYPE table must be specified as the value. If the parameter is set, the address is exported from the CLIENT_ADDRESS table. Otherwise, the address is exported from the CLIENT table (default).
PIN_ADDRESS_TYPE	<code>	Code of the address type used to deliver a PIN mailer ("PINM" tag group of the ApplicationDataPerCRN aggregate). Contains a code from the ADDRESS_TYPE table. The address is exported from the CLIENT_ADDRESS table. Otherwise, the address is exported from the CLIENT table (default).

Parameter	Value	Parameter description
CHECK_PROD_TYPE	Y/N	When the value of the parameter is set to "Y", the value of the task's *Production Type* field will be checked. Tasks with one of the following values in this field will be exported to the file: "0" – Reorder PIN "1" – Replace PIN "2" – Replace Plastic "3" – Replace All "9" – Replace CVV "A" – Replace Add Parms Tasks with the value "5" (Replace Chip Data) in the *Production Type* field will not be exported and an error message will be displayed on the screen. The default value is "N".
FILE_CODING	All allowable in XML	File encoding. By default - "UTF-8" (Unicode 3.0).
XLS_TAGS_GROUP	ADDI, ADTA, CRDM, PINM	The name of a tag group in an XML file (usually "ADTA"), where additional XLS data (extended loyalty system) will be placed from a smart card's card application. Possible values: "ADDI", "ADTA", "CRDM" or "PINM" (see "List of Functional Groups"). If this parameter is set, the "XLS_INFO" parameter must also be specified.
XLS_INFO	SQL query	Query for filtering additional XLS data (extended loyalty system) of a smart card's card application. The query must include one input parameter – the contract ID, and must return only two fields – a tag name and its value. For example, select 'CS'||code, data_value from card_info_p where card_info__oid in (select id from card_info where acnt_contract__oid = ? and status ='I'). If this parameter is set, the "XLS_TAGS_GROUP" parameter must also be specified.

Parameter	Value	Parameter description
STORAGE_FORM		Key storage method. The default value is "HH". Specified by the hardware security module (HSM). This parameter is used if the possibility to translate PIN blocks is enabled for the HSM.
SM_ID		The ID of the hardware security module (HSM), used to translate a PIN block. This parameter is used if the possibility to translate PIN blocks is enabled for the HSM. The parameter is ignored if the HSM is used online.
CLIENT_REG_NUMBER		Condition used to filter data for export to the 9F61 tag of the UICC group. If the parameter is not set, the REG_NUMBER field values of the CLIENT table will be exported to the tag. Used if "EXPORT_UICC_TAGS=Y".
CLIENT_REG_NUMBER_TYPE		Condition used to filter data for export to the 9F62 tag of the UICC group. If the parameter is not set, the REG_NUMBER_TYPE field values of the CLIENT table will be exported to the tag. Used if "EXPORT_UICC_TAGS=Y".

Parameter	Value	Parameter description
TEST_CARDS	PAN list	List of test cards for which memory dumps of security device commands can be logged. Contains a list of test card PANs delimited by commas or semicolons. Regular expressions cannot be used. Logging takes place if the value "99" is set in the *Debug Level field* (level of logging data about task execution on the HSM device) of the "Security Device" form (Full → Configuration Setup → Card Production Setup → Security Device). The log is stored in the "message.pkm" file, located in the standard temporary directory <OWS_TEMP>. The parameter is ignored if ONLINE_HSM = "Y".
DISABLE_SOURCE_COUNT	Y/N	When the value of the parameter is set to "N", the number of exported tasks will be counted. The parameter makes it possible to determine how many tasks were exported and how many remain to be exported. The default value of the parameter is "Y" (counting is disabled).
ONLINE_HSM	Y/N	When the value of the parameter is set to "Y", a PIN block will be translated on an online HSM device. The default value of the parameter is "N".
ONLINE_HSM_DELAY	Number	The delay (in seconds) after processing each task on an online HSM. The parameter is used to decrease the load on NetServer. The default value is "0".
INTRANET_NETSERVER_ADDRESS	Number	Three-digit NetServer Intranet ID. The parameter is used if ONLINE_HSM = "Y".
INTRANET_OVERALL_TIMEOUT	Number	Time (in milliseconds) for waiting for a response from NetServer. The default value is "50000". The parameter is used if ONLINE_HSM = "Y".

Parameter	Value	Parameter description
INTRANET_POLL_TIMEOUT	Number	The interval (in milliseconds) of a NetServer poll. The default value is "1000". This parameter is used if ONLINE_HSM = "Y".
CRDM_ADDR_LINE1_FMT, CRDM_ADDR_LINE2_FMT CRDM_ADDR_LINE3_FMT CRDM_ADDR_LINE4_FMT	Formula Message Converter	These parameters are used to redefine the values of card delivery addresses (respectively, the tags "PIN1", "PIN2", "PIN3" and "PIN4" in the "CRDM" tag group). Also see the section "WAY4 Tags". Variables whose list is provided in the section "List of Variables" of the document "Configuration of Client Messages" can be used in the formula. If these pipe parameters are not defined, client address data from the database will be used as values.
PINM_ADDR_LINE1_FMT, PINM_ADDR_LINE2_FMT PINM_ADDR_LINE3_FMT PINM_ADDR_LINE4_FMT	Formula Message Converter	These parameters are used to redefine the values of PIN mailer delivery addresses (respectively, the tags "PIN1", "PIN2", "PIN3" and "PIN4" in the "PINM" tag group). Variables whose list is provided in the section "List of Variables" of the document "Configuration of Client Messages" can be used in the formula. If these pipe parameters are not defined, client address data from the database will be used as values.

3.1.1 Tables used in Queries

Rules for grouping data and naming files, filters, as well as sorting rules can include fields from the following tables (see Table 1).

> It is mandatory to use aliases in parameters that affect the source of data in the pipe's basic queries (FILTER, etc.).

Table 1. Using tables in queries

Table	Query alias
ACNT_CONTRACT	ac

Table	Query alias
CARD_INFO	ci
F_I	fi
CONTR_SUBTYPE	cs
CONTR_TYPE	ct
COUNTRY	cn
CLIENT	cl

3.1.2 Example of Configuring Task Grouping in Files

The most frequently used example of task grouping in files is grouping according to plastic type, as well as according to the location of plastic and PIN mailer delivery (bank branch, post office).

To do so, the following settings must be made:

- When marking cards, a custom procedure may be executed in which it is necessary to specify the rule for filling in the ORDER_N field of the CARD_INFO table. This field may contain the value of the *Branch Code* field (bank branch ID) as well as any other similar information. Note that the ORDER_N field must contain Latin letters in ASCII encoding.
- In the issuing module, configure task grouping by plastic type. To do so, the following "PM File Export" pipe parameters must be set:
- "FILE_BREAK_BY=cs.subtype_code";
- "SORT_ORDER=cs.subtype_code||CONTRACT_NUMBER".
- Therefore, when importing tasks from the issuing module to the Pin Management module, only one type of card will be in each job. The ORDER_REFERENCE field of the PM_TASK table will contain the value of the CARD_INFO table's ORDER_N field.
- Configure task sorting by the values of the PM_TASK table's ORDER_REFERENCE field when generating personalisation files. To do so, in the "PM Personalization File Export" pipe, set the parameter "SORT_ORDER=JOB_ID,ORDER_REFERENCE,PM_TASK_ID".
  Note that including the PM_TASK_ID field in the SORT_ORDER parameter ensures that sorting within ORDER_REFERENCE is the same as sorting in the issuing mode, i.e. in our example – by the value of the CONTRACT_NUMBER field.

3.2 "PM File Import" Parameters

Parameter	Value	Parameter description
MULTI_SOURCE	Y/N	When this flag is set ("Y" value), the sender code is added to task numbers in the PM_JOB table. The flag must be set if files generated by a third party system are imported. The default value of the parameter is "N".
FILE_CODING	All allowed in XML	File encoding. By default – "UTF-8" (Unicode 3.0).

3.3 "PM File Response Export" Pipe Parameters

Parameter	Value	Parameter description
PAN_MASK	<mask>	Mask for the number of the card in the file being exported. The parameter is set in "<N><X><M>" format, where: <N> – the number of visible digits at the beginning of the number <X> – filler symbol for the hidden part of the number <M> – number of visible digits at the end of the number. For example, when the mask "1*4" is set, all digits will be masked by the "*" symbol except the first digit and four last digits.

Parameter	Value	Parameter description
EXPORT_TRACK	Y/N	The parameter ("Y" value) is used to export the following: ·magnetic tracks ·cryptographic values ·EMV tags containing data used to generate "chip" tracks (magnetic track images). The parameter's default value is "N". To export this data, Bank Production Parameters must be specified correctly. In particular, formulas for specifying magnetic track data must be present in the form for setting additional card parameters "Options for <...>" (Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters] → [Options]). These formulas (by default) appear after executing the command [Manage] →[Check] in the "Options for <...>" form for each card product. After doing so, formulas can be manually modified, if required.
FILTER	Conditional fragment	WHERE conditional fragment added to the SELECT operator for additional filtering of tasks to be exported. The following aliases may be used to specify the table to which a field belongs: j – for the PM_JOB table t – for the PM_TASK table b – for the PM_BANK table p – for the PM_PARMS table.
FILE_CODING	All allowed in XML	File encoding. By default – "UTF-8" (Unicode 3.0).
STORAGE_FORM		Key storage method. The default value is "HH". Specified by the type of hardware security module (HSM). This parameter is used if PIN block translation is enabled for the HSM.
PIN_FORMAT	UNDER_ZPK	When this parameter is set, the PIN block and PIN2 block will be re-encrypted from under LMK under ZPK. If the parameter is absent, these values will be encrypted using LMK of the hardware security module (HSM).

Parameter	Value	Parameter description
DEFAULT_TAGS_VALUE	All allowable in XML, including an empty string	If the parameter is not set, tags (production parameters) containing NULL or an empty value (including only spaces), will not be exported to a file. If the parameter is set (even with an empty value), tags (production parameters) containing NULL or an empty value (including only spaces) will be exported to a file with the value that was specified in the parameter.
PBID		ID of the external personalisation bureau for which the file is being exported Also in the form for setting additional bank production parameters (Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters] → [Options]) the corresponding ID of the external personalisation bureau (PBID parameter) must be specified for the PEK, KEK and ZPK keys
SM_ID		ID of the hardware security module (HSM) used for PIN block translation. This parameter is used if PIN block translation is enabled for the HSM. The parameter is ignored if the HSM is used online.
DISABLE_SOURCE_COUNT	Y/N	When the parameter value is set to "N", the number of exported tasks will be counted. The parameter makes it possible to determine how many tasks were exported and how many tasks remain to be exported. The default value is "Y" (count disabled).
ONLINE_HSM	Y/N	When the parameter value is set to "Y", PIN blocks will be translated on an online HSM. The default value is "N".
ONLINE_HSM_DELAY	number	Delay (in seconds) after processing each task online on the HSM. The parameter is used to decrease the load on NetServer. The default value is "0".
INTRANET_NETSERVER_ADDRESS	number	Three-digit NetServer Intranet ID. The parameter is used if ONLINE_HSM = "Y".

Parameter	Value	Parameter description
INTRANET_OVERALL_TIMEOUT	number	Time (in milliseconds) for waiting for a response from NetServer. The default value is "50000". The parameter is used if ONLINE_HSM = "Y".
INTRANET_POLL_TIMEOUT	number	NetServer poll interval (in milliseconds). The default value is "1000". The parameter is used if ONLINE_HSM = "Y".

3.4 "PM File Response Import" Pipe Parameters

Parameter	Value	Parameter Description
PROD_DATE_FROM_PM	Y/N	When the parameter value is set to "N" (default value) the date will be imported into the CARD_INFO table from the "AEDT" tag (the date the task was exported to production). When the value of this parameter is set to "Y", the date will be imported into the CARD_INFO table from the "PEDT" tag (the date the task was exported from the PIN Management module).
FILE_CODING	All allowed in XML	File encoding. By default – "UTF-8" (Unicode 3.0).
SOURCE_DIR		Incoming file directory. Default value – "@CARD_PROD_DIR@/OUT".
PROCESSED_DIR		Incoming imported file directory. Default value – "@CARD_PROD_DIR@/ARCH".
ERROR_DIR		Directory of incoming files in which errors in XML format were found during import. If other errors occur when processing a file, the error text is saved in the process log and the file remains in the SOURCE_DIR directory. Default value – "@CARD_PROD_DIR@/ERR". To ensure uniform processing of errors in files, it is recommended to set a parameter value corresponding with the value of the SOURCE_DIR parameter.

Parameter	Value	Parameter Description
STORAGE_FORM		Key storage method. The default value is "HH". Determined by the type of hardware security module (HSM). This parameter is used if PIN block translation is enabled for the HSM.
SM_ID		ID of the hardware security module (HSM) used to translate PIN blocks. This parameter is used if PIN block translation is enabled for the HSM. The parameter is ignored if HSM is used online.
TEST_CARDS	PAN list	List of test cards for which logging of security device command memory dumping is possible. Contains a list of test card PANs delimited by commas or semicolons. Regular expressions cannot be used. Logging takes place if the value "99" is set in the *Debug Level* field (level of logging information about the execution of tasks on the HSM device) of the "Security Device" form (Full → Configuration Setup → Card Production Setup → Security Device). The log is stored in the "message.pkm" file, located in the standard temporary file directory <OWS_TEMP>. The parameter is ignored if ONLINE_HSM = "Y".
ONLINE_HSM	Y/N	When the parameter value is set to "Y", PIN blocks will be translated by an online HSM. The default value of the parameter is "N".
ONLINE_HSM_DELAY	number	Delay (in seconds) after processing each task online on the HSM. The parameter is used to decrease the load on NetServer. The default value is "0".
INTRANET_NETSERVER_ADDRESS	number	Three-digit NetServer Intranet ID. The parameter is used if ONLINE_HSM = "Y".
INTRANET_OVERALL_TIMEOUT	number	Time (in milliseconds) for waiting for a response from NetServer. The default value is "50000". The parameter is used if ONLINE_HSM = "Y".

Parameter	Value	Parameter Description
INTRANET_POLL_TIMEOUT	number	NetServer polling interval (in milliseconds). The default value is "1000". The parameter is used if ONLINE_HSM = "Y".

3.5 "PM Security Calc & Mailer Printing" Pipe Parameters

Parameter	Value	Parameter description
STAGE	‘1’ or ’2’	Stage of pipe operation: ‘1’ – calculation of cryptographic values ‘2’ – print PIN mailers.
FILTER	Conditional fragment	WHERE conditional fragment added to the SELECT operator for additional filtering of tasks being imported. The following aliases are permitted for determining to which tables the fields belong: j – for the PM_JOB table t – for the PM_TASK table b – for the PM_BANK table p – for the PM_PARMS table.
STORAGE_FORM		Key storage method. The default value is "HH". Determined by the type of hardware security module (HSM). This parameter is used if PIN block translation is enabled for the HSM.
SHOW_STATISTICS	Y/N	When this flag is set ("Y" value) when the pipe finishes operating, a dialog window will be shown with the number of processed tasks. The default value is "N".

Parameter	Value	Parameter description
ADD_PRN_FIELD1 ADD_PRN_FIELD2 ADD_PRN_FIELD3 ADD_PRN_FIELD4	Field in the SELECT operator	The parameters specify the values of additional fields for printing PIN mailers. To use the values of these parameters, in the template for printing a PIN mailer specify, respectively, the tags "ADD_FLD1", "ADD_FLD2", "ADD_FLD3" and "ADD_FLD4". The following aliases are permitted for determining to which tables the fields belong: j – for the PM_JOB table t – for the PM_TASK table b – for the PM_BANK table p – for the PM_PARMS table. The parameter should only be used for PIN mailer printing mode (STAGE='2').
PBID		ID of the external personalisation bureau for which cryptographic values are calculated. In addition, in the form for setting additional bank production (Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters] → [Options]), the corresponding personalisation bureau ID (PBID parameter) must be specified for PEK, KEK and ZPK keys.
SM_ID		ID of the hardware security module (HSM) used for PIN block translation. This parameter is used if PIN block translation is enabled for the HSM. The parameter is ignored if the HSM is used online.
SORT_ORDER	ORDER BY conditional fragment	Specifies the order for sorting PIN mailer printing tasks. The default value of the parameter is "JOB_ID,PM_TASK_ID". When specifying the parameter at the stage of preparing tasks for export from the issuing module, it is recommended to specify the parameter value "JOB_ID,ORDER_REFERENCE,PM_TASK_ID"that corresponds with the recommended value of the sorting order when exporting jobs to the electric personalisation module (see "Example of Configuring Task Grouping in Files").

Parameter	Value	Parameter description
DISABLE_SOURCE_COUNT	Y/N	When the parameter value is set to "N", the number of exported tasks will be counted. This parameter makes it possible to determine how many tasks were exported and how many remain to be exported. The default value of the parameter is "Y" (counting disabled).
ONLINE_HSM	Y/N	When the value of the parameter is set to "Y", PIN blocks will be translated on the HSM online. The default value of the parameter is "N".
ONLINE_HSM_DELAY	number	Delay (in seconds) after processing each task online on the HSM. The parameter is used to decrease the load on NetServer. The default value is "0".
INTRANET_NETSERVER_ADDRESS	number	Three-digit NetServer Intranet ID. The parameter is used if ONLINE_HSM = "Y".
INTRANET_OVERALL_TIMEOUT	number	Time (in milliseconds) for waiting for a response from NetServer. The default value is "50000". The parameter is used if ONLINE_HSM = "Y".
INTRANET_POLL_TIMEOUT	number	NetServer polling interval (in milliseconds). The default value is "1000". The parameter is used if ONLINE_HSM = "Y".

3.6 "PM Security Calc Multithread" Pipe Parameters

The "PM Security Calc Multithread" pipe is used to prepare data simultaneously on hardware security modules (HSM), or using one HSM supporting multithread mode.

Parameter	Value	Parameter description
SM_ID	List of device IDs	List of hardware security module (HSM) IDs. IDs in the list are separated by commas (‘,’) or semicolons (‘;’). Multiple use of one HSM in the list of devices is allowed if calculation must take place simultaneously using one device (multithread mode). The following format can be used: "SM_ID=<ID>*N", where N is the number of simultaneous connections with the HSM, <ID> is the device ID. The number of simultaneous connections may not exceed 64. The optimal value for performance is from 6 to 8 connections. Each device used must be active at the time the pipe is started. Devices must be of the same type and initialized by the same LMK.
FILTER	Conditional fragment	WHERE conditional fragment added to the SELECT operator for additional filtering of tasks being imported. The following aliases are permitted for determining to which tables the fields belong: j – for the PM_JOB table t – for the PM_TASK table b – for the PM_BANK table p – for the PM_PARMS table
STORAGE_FORM		Key storage method. The default value is "HH". Specified by the hardware security module (HSM).

3.7 "PM Personalization File Export" Pipe Parameters

Parameter	Value	Parameter description
CHIP	Y/N	When the value of this parameter is set to "Y", a personalisation file in smart card format will be generated (the mode can also be used for magnetic cards). The file format is described in the section "Smart Card Personalisation File Format". When the parameter value is "N", a personalization file will be generated in magnetic card format (the mode is used only for magnetic cards). The file format is described in the section "Magnetic Card Personalisation File Format". The default value is "N".
FILE_CODING	All allowed in XML	Personalisation file encoding. By default – "windows-1251". This parameter can only be used to change the encoding of the unencrypted part of a file. The use of multi-byte encoding (Unicode and others) is not recommended as in this case the length of data changes, and the length of file fields is fixed or has size restrictions.
MULTITHREAD	Y/N	When the parameter value is "Y", the pipe will operate in multithread mode. In this case, the "SM_ID" parameter must also be defined. The default value is "N".

Parameter	Value	Parameter description
SM_ID	List of device IDs	This parameter is not mandatory for "MULTITHREAD=N". If "MULTITHREAD=Y", this parameter defines the list of hardware security modules (HSM). Commas (",") or semicolons (";") are used as delimiters. It is possible for one HSM to be used in the list multiple times if calculation must be made in parallel using one device (multithread mode). The following format can be used: "SM_ID=<ID>*N" where N is the number of simultaneous connections with the HSM, <ID> is the device identifier. The number of connections simultaneously in use may not exceed 64. The optimal value for performance is from 6 to 8 connections. Each device used must be active at the time the pipe is started. Devices must be of the same type and initialised with the same LMK value.
SOURCE_FETCH_SIZE	Number	Number of tasks read from the database to RAM for multithread processing by the pipe. The default value is "30".
USE_SMIFCEJ	Y/N	When the parameter value is "Y", java implementation of the pipe is used ("smlfce" library); otherwise, C implementation is used. The default value is "Y".
PIN_FORMAT	UNDER_ZPK	When this parameter is set, the PIN block and PIN2 block will be re-encrypted from under LMK under ZPK. If this parameter is absent, these values will be encrypted with the hardware security module LMK.
EXTENDED_EMBS_FORMAT	Y/N	When this parameter has the "Y" value, additional data specified by the pipe parameters ADD_INFO_1, ADD_INFO_2, ADD_INFO_3, ADD_INFO_4 will be added to the personalisation file for magnetic stripe card mode. The size of exported additional data is limited to 100 bytes. The default value is "N".

Parameter	Value	Parameter description
SUB_DIRECTORIES	Y/N	When this parameter has the "Y" value, the pipe puts exported personalisation files in separate subdirectories with names corresponding to the bank branch ID (*Branch Code* field of the financial institution). The default value is "N".
BREAK_BY_JOB	Y/N	When this parameter has the "Y" value, each job will be put in a separate personalisation file. The default value is "N".
ADD_INFO_1, ADD_INFO_2, ADD_INFO_3, ADD_INFO_4		Specification of additional fields for export in a personalisation file. A constant can be used (in single quotes) as well as the following aliases for determining to which tables the fields belong: j – for the PM_JOB table t – for the PM_TASK table b – for the PM_BANK table p – for the PM_PARMS table Data from other tables is extracted with subqueries. Default values – "ADD_INFO_1=t.ADD_INFO_01", "ADD_INFO_2=t.ADD_INFO_02", "ADD_INFO_3=t.ADD_INFO_03", "ADD_INFO_4=t.ADD_INFO_04".

Parameter	Value	Parameter description
APPL_ADD_INFO_1, APPL_ADD_INFO_2, APPL_ADD_INFO_3, APPL_ADD_INFO_4		Specification of additional fields containing information for smart card card applications (Applet). A constant can be used (in single quotes) as well as the following aliases for determining to which tables the fields belong: t – for the PM_TASK table p – for the PM_PARMS table Data from other tables is extracted with subqueries. The values of these parameters will be placed, respectively in the "ACX1", "ACX2", "ACX3", "ACX4" tags (see the section "WAY4 Tags"). Default values – "ADD_INFO_1=t.ADD_INFO_01", "ADD_INFO_2=t.ADD_INFO_02", "ADD_INFO_3=t.ADD_INFO_03", "ADD_INFO_4=t.ADD_INFO_04".
ADD_INFO_LEN_1, ADD_INFO_LEN_2, ADD_INFO_LEN_3, ADD_INFO_LEN_4	Numbers	The maximum length of a data field (in symbols), specified, respectively, by the parameters "ADD_INFO_1", "ADD_INFO_2", "ADD_INFO_3", "ADD_INFO_4". The default value is "0". If these parameters are not specified or have a null value, the corresponding tags "CSD1", "CSD2", "CSD3", "CSD4" will not be created in the personalisation file.

Parameter	Value	Parameter description
LINE_LENGTH	Number	The parameter specifies the length of a line (in characters) in a personalisation file to which file lines will be justified. Using this parameter, lines in a personalisation file are justified; to get data of the required length, a special tag "PADD" will be automatically added to the file. If the length of a line is less than that specified by this parameter, but by no more than 8 characters, this line is not justified. Personalisation file lines that are longer than that specified remain unchanged. A warning is shown in the Process Log and on the screen that the length of card data exceeds the required value and loss of data during embossing is possible.
DCPREFIX	Y/N	When the value of this parameter is "Y", a record of the binary prefix of service data will be added to the file (after magnetic stripe data) for the file to be used together with embosser software ("Data Card SCPM" or "DataCard Affina Personalization Manager") and the WAY4 electronic personalisation module.
DCFIR		Specifies the content of "Data Card File Information Record (FIR)". In a personalisation file, "FIR" is placed in the first string and after it 2 symbols for separating strings "<CR><LF>" are automatically added. This parameter can, for example, be used to specify the path to the configuration file containing settings for personalisation of a particular card type.
FILTER	Conditional fragment	WHERE conditional fragment added to the SELECT operator for additional filtering of exported tasks. The following aliases are permitted for determining to which tables the fields belong: j – for the PM_JOB table t – for the PM_TASK table b – for the PM_BANK table p – for the PM_PARMS table

Parameter	Value	Parameter description
STORAGE_FORM	String	Key storage method. The default value is "HH". Determined by the type of hardware security module (HSM). This parameter is used if PIN block translation is enabled for the HSM. When the PEK key is selected from the database, the value of the STORAGE_FORM parameter is not considered, the first key found with the appropriate type is used.
SORT_ORDER	ORDER BY conditional fragment	Specifies the order for sorting personalisation tasks. The default value is "JOB_ID,PM_TASK_ID" (first, sorting by the ID field values of the PM_JOB table and then by the values of the PM_TASK table's ID field). When this parameter is specified at the stage of preparing tasks for export from the issuing mode to the ORDER_N field of the CARD_INFO table (tag), it is recommended to specify the parameter value "JOB_ID,ORDER_REFERENCE,PM_TASK_ID"
SM_ID	String	ID of the hardware security module (HSM) used to translate PIN blocks. This parameter is used if PIN block translation is enabled for the HSM. The parameter is ignored when the HSM is used online.
DISABLE_SOURCE_COUNT	Y/N	When the value of the parameter is set to "N", the number of exported tasks will be counted. The parameter makes it possible to determine how many tasks were exported and how many remain to be exported. The default value of the parameter is "Y" (counting is disabled).

Parameter	Value	Parameter description
PM_PF_FILL_ADTA	N/Y	The parameter makes it possible to group data in a personalisation file for co-badge cards (for example, MIR). Parameter values: "N" (default value) – the values of tags used for personalisation are put into the main functional group (CHED) and then into the block for the card's first applet, and into blocks for subsequent applets. "Y" – the values of tags are common for all a card's applets (Cardholder Name, PAN, PIN, etc.) are put into the main functional group (CHED). Tags whose values are not common for all a card's applets are put into individual blocks for each applet. For more information about personalisation file structure, see the section "Smart Card Personalisation File Format".

3.8 "RSA EMV Key Management" Pipe Parameters

Parameter	Value	Parameter description
KEY_ID		Identifier of the key record in the database. It is not recommended to change the default value – "@DOC@", used to set the identifier corresponding to the identifier of the current record in the form from which the pipe is called.
COMMAND_TEXT		Pipe operation mode: "G" – generate an issuer RSA key ("Generate Key Pair" context menu item). "I" – import a CA public key ("Import CA Public Key" menu item). "L" – load an issuer public key certificate ("Load Issuer PK Certificate" context menu item). "M" – verify MAC for a CA public key ("Verify Public Key MAC" context menu item).

Parameter	Value	Parameter description
BIN_LEN		BIN length (from 3 to 8 digits) considered by the pipe when generating an issuer public key. The default value is "6".
DEFAULT_PATH		Path to the working directory for file exchange with the CA. If this parameter is set but the "SOURCE_DIR" parameter is not defined, the directory specified with the "DEFAULT_PATH" parameter will be used to search for files. Any file satisfying the mask and located in the directory (subdirectories are not searched) will be selected. If the "SOURCE_DIR" parameter is set, this parameter's value will be used to search for files. If neither "DEFAULT_PATH" nor "SOURCE_DIR" are specified, an error message will be shown.
SOURCE_DIR		Path to the working directory for file exchange with the CA. This parameter's priority is higher than that of the "DEFAULT_PATH" parameter: if a "SOURCE_DIR" parameter value is specified, the value of the "DEFAULT_PATH" parameter is not considered, and key files will be searched for in the "SOURCE_DIR" directory (including subdirectories). Search results satisfying the mask will be shown on the screen in the corresponding window, after which the required key file must be selected. If the "SOURCE_DIR" parameter is not set, the directory specified with the "DEFAULT_PATH" parameter will be used. If neither "DEFAULT_PATH" nor "SOURCE_DIR" are specified, an error message will be shown. It is recommended to set the "SOURCE_DIR" parameter since the "DEFAULT_PATH" parameter is used for backward compatibility.
SM_ID		Identifier of the hardware security module (HSM) used for the pipe.

3.9 "RSA ICC keys PRE-generation" Pipe Parameters

Parameter	Value	Parameter description
SHOW_ERROR_MESSAGES	Y/N	When this flag is set ("Y" value), information about errors is not only saved in the process log, it is displayed on the screen in a window with the corresponding message. The default value is "N".
COPY_ICCK_OPTIONS	Y/N	When the parameter value is "Y", additional ICC key parameters (PM Key Options) will be copied from the template during key generation.
RSA_KEY_TEST	Y/N	When this flag is set ("Y" value) key generation parameters and their compliance with payment system requirements will be checked. The default value is "N".
SM_ID	String	ID of the hardware security module (HSM) used to translate PIN blocks. This parameter is used if PIN block translation is enabled for the HSM. The parameter is ignored when the HSM is used online.
FILTER	Conditional fragment	WHERE conditional fragment added to the SELECT operator for additional filtering of tasks being exported. Fields from the PM_KEYS, PM_KEYS_OPT, PM_PARMS, PM_PARMS_OPT and PM_BANK tables can be used..

3.10 "PIN & PIN2 Migration to new LMK" Pipe Parameters

Parameter	Value	Parameter description
MODE	String	Pipe operation mode: "PIN" – mode for translating PIN from under the old LMK of a device under the new LMK of the same device. "PIN2" – mode for translating PIN2 from under the old LMK of a device under the new LMK of the same device. "PIN_ZPK" – translation of PIN from under the LMK of one device under the LMK of another device (using a ZPK interim key). First, the PIN is translated under ZPK on the first device, and then on the second device, this PIN is translated from under ZPK to under LMK of the second device. "PIN_ZPK_TO_LMK" – translation of a PIN block stored in the database from under ZPK under LMK of a device. By default, the pipe operates in "PIN" mode.
SM_ID	String	Hardware security module (HSM) ID. For "MODE=PIN_ZPK" – the ID of the first HSM under whose keys PIN blocks are encrypted.
FILTER	Conditional fragment	WHERE conditional fragment added to the SELECT operator for additional filtering of tasks being exported. Fields of the following tables can be used: – ACNT_CONTRACT; – TD_AUTH_VAL (only in PIN2 translation mode) – TD_AUTH_SCH (only in PIN2 translation mode) – CARD_INFO (only in PIN translation mode).
SM_ID_DEST	String	For "MODE=PIN_ZPK" – the ID of the second HSM under whose LMK PIN blocks will be translated. For "MODE=PIN_ZPK_TO_LMK" – the ID of the HSM under whose LMK PIN blocks will be translated. The same value must be specified for "SM_ID".

Parameter	Value	Parameter description
ZPK_SM	String	ZPK (Zone Pin Key) encrypted under the LMK of the first HSM.
ZPK_SM_DEST	String	For "MODE=PIN_ZPK" – ZPK (Zone Pin Key) encrypted under the LMK of the second HSM. The ZPK is the same for both devices. For "MODE=PIN_ZPK_TO_LMK" – ZPK (Zone Pin Key) encrypted under the LMK of the HSM.
PIN_LENGTH	Number	Unencrypted PIN length. The parameter is only used for "MODE=PIN_ZPK_TO_LMK".

3.11 Approve PIN & PIN2 Migration to new LMK Pipe Parameters

Parameter	Value	Parameter description
MODE	String	Pipe operation mode: "PIN" – PIN block translation mode "PIN2" – PIN2 block translation mode. By default, the pipe operates in "PIN2" mode.
FILTER	Conditional fragment	WHERE conditional fragment added to the SELECT operator for additional filtering of tasks being exported. Fields of the CARD_INFO_P table can be used.

3.12 "KM DES Key Management" Pipe Parameters

Parameter	Value	Parameter Description
MODE	String	Pipe operation mode. It is not recommended to change the default value – "TRANSLATE_CARD_RANGE_KEYS" (mode for translating card production parameter 3DES keys).

Parameter	Value	Parameter Description
PM_PARMS_ID	String	Identifier of card production parameters corresponding to one card range. It is not recommended to change the default value – "@DOC@".
SRC_SM_ID	String	Identifier of the first hardware security module (HSM), from under the LMK of which 3-DES keys will be translated.
SRC_ZMK	String	ZMK (Zone Master Key), encrypted under the LMK of the first HSM.
SRC_STORAGE_FORM	String	Method for storing the key encrypted under the LMK of the first device. The default value is "HH". Determined by the HSM type: "HH" –Thales, "WH" – SafeNet OWSem.
DEST_SM_ID	String	Identifier of the second hardware security module under the HSM of which 3DES keys will be translated.
DEST_ZMK	String	ZMK (Zone Master Key), encrypted under the LMK of the second HSM.
DEST_STORAGE_FORM	String	Method for storing the key encrypted under the LMK of the second device. The default value is "HH". Determined by the HSM type: "HH" –Thales, "WH" – SafeNet OWSem. For key translation it is not recommended to use devices of the same type; i.e. the value of the parameters "SRC_STORAGE_FORM" and "DEST_STORAGE_FORM" must differ.
TRANSLATE_SINGLE_CVK_PVK	Y/N	The "Y" value of the parameter enables translation of two single-length keys ("CVK A" and "CVK B", as well as "PVK 1" and "PVK 2"); as a result, one double-length key will be obtained ("CVK" or "PVK"). The default value is "Y".
TRANSLATE_SINGLE_IBMK	Y/N	The "Y" value of the parameter enables translation of a single-length "IBMK" DES key. The default value is "N".

4 Global Parameters

The WAY4 additional global parameters shown in Table 2 affect the operation of all pipes.

Additional global parameters are edited (setting parameters, changing their values) in the "Additional Global Parameters" form (Full → Configuration Setup → Main Tables → Additional Global Parameters).

Table 2. Additional global parameters

Parameter	Value	Parameter description
PM_PIN_TRANSLATE	Y/N	When the value of this parameter is "Y", during import/export pipes will re-encrypt the PIN block from under ZPK under LMK (PIN translation mode) according to the value of the additional bank production parameter "ISSUER_PIN_FORM" (Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters] → [Options]).
PM_PIN_LENGTH	Number	The length of a PIN in the list of "weak" PINs, used when specifying the global parameter "PM_WEAK_PIN_TABLE". Used in the process of importing the list of "weak" PINS into the hardware security module (HSM).
PM_WEAK_PIN_TABLE	List of "weak" PINs	Specifies the list of "weak" PINs (for example, "0000", "1111"). The list may contain from 1 to 99 "weak" PINs in open form, which should not be generated by the hardware security module (HSM) when new PINs are generated. PINs in the list are shown in open form and are not separated by spaces or commas; the length of each PIN is specified by the global parameter PM_PIN_LENGTH. This list must be imported into the HSM using the "Load Weak PIN Table" pipe so that "weak" PINs aren't generated by the HSM device.

5 Bank Production Parameters Affecting Pipe Operation

This section contains a description of bank production parameters that affect pipe operation.

Bank production parameters are specified for each card type in the "Options for <...>" form, opened by clicking the [Options] button in the "Parameters for <...>" form (Full →Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters]).

This section gives the codes of additional bank parameters.

5.1 "PM File Export" Pipe Additional Parameters

Parameter	Value	Parameter description
ISSUER_PIN_FORM	UNDER_ZPK	This parameter means that the PIN block in the file is sent encrypted under ZPK. Respectively, in export, a PIN block will be re-encrypted from under LMK under ZPK, and in import, from under ZPK under LMK.

5.2 "PM File Response Export" Pipe Additional Parameters

Parameter	Value	Parameter description
TRACK1_DDF		Formula for compiling the first track of a magnetic stripe (Track1). See the section "Formulas for Compiling Magnetic Stripe Tracks (TRACK1 and TRACK2)". These formulas (by default) appear after the command [Manage] → [Check] is executed in the "Options for <...>" form for every card product. The formulas can then be manually changed, if necessary.

Parameter	Value	Parameter description
TRACK2_DDF		Formula for compiling the second track of a magnetic stripe (Track2). See the section "Formulas for Compiling Magnetic Stripe Tracks (TRACK1 and TRACK2)". These formulas (by default) appear after the command [Manage] → [Check] is executed in the "Options for <... >" form for every card product. The formulas can then be manually changed, if necessary.

5.2.1 Formulas for Compiling Magnetic Stripe Tracks (TRACK1 and TRACK2)

In the formulas for compiling tracks, the concatenation sign (+), a constant in double quotes (") and the following variables may be used. The name of the tag in the XML file to which the value of the corresponding variable will be exported is specified in the *Tag* field of this table.

Table 3. Variables used when compiling magnetic stripe tracks

Variable	Tag	Comments
PVKI	PVKI	PVKI value from the PVKI field of the PM_PARMS table.
PVV	PVVC	PVV value from the PVV field of the PM_TASK table.
OFFSET_DATA	IBMO	IBM3624 Offset value from the OFFSET_DATA field of the PM_TASK table.
CVC1	CVC1	CVC1 value from the CVC1 field of the PM_TASK table (for magnetic stripe tracks) or the ICVV value for VCDC cards with iCVV support (for compiling tracks stored in EMV tags).
E_DATE	5F25 or PM_TASK.DATE_FROM	Effective Date value from the "5F25" tag (PM_ADD_PARMS table) or the value of the DATE_FROM field of the PM_TASK table, if the "5F25" tag is not specified.
CSC5D	AMEX_5DCSC	For "AMEX" cards – the value of the "AMEX_5DCSC" tag from the PM_ADD_PARMS table.

5.3 "PM Personalization File Export" Pipe Additional Parameters

Parameter	Value	Parameter description
TRACK1_DDF		Formula for compiling the first track of a magnetic stripe (Track1). See the section "Formulas for Compiling Magnetic Stripe Tracks (TRACK1 and TRACK2)". These formulas (by default) appear after the command [Manage] →[Check] is executed in the "Options for <... >" form for every card product. The formulas can then be manually changed, if necessary.
TRACK2_DDF		Formula for compiling the second track of a magnetic stripe (Track2). See the section "Formulas for Compiling Magnetic Stripe Tracks (TRACK1 and TRACK2)". These formulas (by default) appear after the command [Manage] →[Check] is executed in the "Options for <... >" form for every card product. The formulas can then be manually changed, if necessary.

5.4 "RSA ICC keys PRE-generation" Pipe Additional Parameters

Parameter	Value	Parameter description
ICCF		Card key generation format ("PQ", "CRTM", "CRTF", "CRTFNL", "03", "04", "13").

6 Format of XML Files for Sending Tasks

This section describes the format of PIN Management module XML files. XML files are used to send card production tasks

, and to receive response files from the PIN Management module.

Files contain information on tasks to issue cards and parameters for printing PIN mailers.

The ApplicationCommonData aggregate contains general card production parameters. The ApplicationDataPerCRN aggregate contains additional parameters for card production and for each card application (Applet). Production parameters from the ApplicationDataPerCRN aggregate can redefine common card production parameters from the ApplicationCommonData aggregate.

Card production parameters in a task file are grouped according to functional groups (see the section "List of Functional Groups"). Each of these groups is placed in a separate aggregate ApplicationCommonData/ApplicationData/ICCData/DataSet (common card production parameters) or ApplicationDataPerCRN/ApplicationData/ICCData/DataSet (additional parameters of card production and each card application). The Name field of the corresponding DataSet aggregate contains the group name.

A parameter's data is stored in the DataSet/Data aggregate. The parameter name is entered in the DataElement field of the Data aggregate, and the value – in the Value field.

6.1 Field Types

Field formats:

Fields may not contain leading and ending spaces.

- **n** – numeric field, contains only digits and a period as a decimal symbol for fractional numbers.
- **an** – symbol field, may contain any printable symbols.
- **YJJJ** – date, where Y is the last digit of the year (0 ... 9), and JJJ is the sequence number of the day in the year (001 ... 366).
- **YYMM** – date, where YY are the last two digits of the year (00 ... 99), and MM is the sequence number of the month in the year (01 ... 12).
- **YYYYMMDD** – date, where YYYY is the year (0000 ... 9999), MM is the sequence number of the month in the year (01 ... 12), and DD is the sequence number of the day in the month (01 ... 31).
- **YYYY-MM-DD** – date, where YYYY is the year (0000 ... 9999), MM is the sequence number of the month in the year (01 ... 12), and DD is the sequence number of the day in the month (01 ... 31).
- **HHMISS** – time, where HH is hours (00 ... 23), MI is minutes (00 ... 59), SS is seconds (00 ... 59).
- **HH:MI:SS** – time, where HH is hours (00 ... 23), MI is minutes (00 ... 59), SS is seconds (00 ... 59).

The obligation to fill in fields with data (the "Mand." field in tables):

- **M** – the field must be filled in.
- **O** – the field does not have to be filled in.

- **C** – depends on how other fields are filled in.
- **n/a** – the field is not used.

Field types:

- "A" (Aggregate) – aggregate (contains fields or other aggregates, does not have values).
- "F" (Field) – simple field (contains a value; does not contain child objects).

"Frequency" (the "Freq." field in tables) – the number of times this field or aggregate is used. When the "n" value is specified, the field or aggregate can be used an unlimited number of times.

6.2 File Name Structure

File name structure:

№	Field	Pos	Lgth	Mand.	Format	Comments
1.	File Name Prefix	1	7	M	an	"PM_REQ_" – card production task file "PM_RSP_" – response file.
2.	File Sender	8	5	M	an	Sender code for job files. Original file sender code for response files. For a response file and file for external personalisation bureau – the original file's sender code. If the length of the code is less than five symbols, it is added to on the right with underline ("_") symbols.
3.	Delimiter	13	1	M	an	"_" (underline symbol).
4.	File Creation Date	14	8	M	YYYYMMDD	For a card production task file – the file creation date. For a response file – the creation date of the original file.
5.	Delimiter	22	1	M	an	"_" (underline symbol).

№	Field	Pos	Lgth	Mand.	Format	Comments
6.	File Number	23	6	M	n	For a card production task file – the sequence number of the file for a day. For a response file and file for external personalisation bureau – the sequence number of the original file for a day. Right-justified, added to on the left with zeros up to the required length.
7.	Delimiter	29	1	M	an	Delimiter symbol "."
8.	File Name Extension	30	3	M	an	"XML"

6.3 File Structure

This section gives the structure of xml files for sending tasks. All aggregates and simple fields are XML elements. File structure:

Field	Type	Format	Freq.	Mand.	Comments
<?xml version="1.0" encoding="UTF-8" ?>				M	Standard xml file header. Encoding may change depending on the FILE_CODING pipe parameter.
PinManagementFile	A	-	1	M	Information on card production tasks and PIN mailer printing.

6.3.1 PinManagementFile

Field	Type	Format	Freq.	Mand.	Comments
FileHeader	A	-	1	M	File header.
PMJobs	A	-	1	M	Card production jobs.

6.3.2 FileHeader

Field	Type	Format	Freq.	Mand.	Comments
FileType	F	an	1	M	"REQUEST" – card production task file "RESPONSE" – response file
Version	F	n	1	M	File format version number – "3.0".
Source	F	an	1	M	For a card production task file – the sender code (see the parameter FILE_NAMING_BY in the section ""PM File Export" Pipe Parameters").
Destination	F	an	1	M	Data recipient code.
FileDate	F	YYYY-MM-DD	1	M	File creation date.
FileTime	F	HH:MI:SS	1	M	File creation time.
FileNumber	F	n	1	M	Sequence number of the file for a day.
AddInfo	F	an	0...1	O	Additional information.

6.3.3 PMJobs

Field	Type	Format	Freq.	Mand.	Comments
GPMessage	A	-	1	M	Card production job.

6.3.4 GPMessage

Field	Type	Format	Freq.	Mand.	Comments
xmlns	F	an	1	M	Constant "http://namespaces.globalplatform.org/systems-messaging/1.0.0".
GPHeader	A	-	1	M	Message header.
GPBody	A	-	1	M	Message body.

6.3.5 GPHeader

Field	Type	Format	Freq.	Mand.	Comments
TransactionID	F	n	1	M	PIN management task ID (value of the BATCH_ID field of the PM_JOB table).
Source	F	an	1	M	File sender code. Codes are set in the *Member ID* field of the BIN table ("Full → Configuration Setup → Routing → BIN Groups → [BIN Table]").
Destination	F	an	1	M	File recipient code. Codes are set in the *Member ID* field of the BIN table ("Full → Configuration Setup → Routing → BIN Groups → [BIN Table]").
Type	F	an	1	M	Message type – "MIXED" constant.
ErrataVersion	F	n	0...1	O	Format version – "1" constant.
xmlns	F	an	1	M	Constant "http://namespaces.globalplatform.org/systems-messaging/1.0.0"

6.3.6 GPBody

Field	Type	Format	Freq.	Mand.	Comments
ApplicationDataNotification	A	-	0...n	O	Card production task.

6.3.7 ApplicationDataNotification

Field	Type	Format	Freq.	Mand.	Comments
BatchID	F	n	1	M	PIN management job (PM Job) ID.
ApplicationCommonData	A	-	1	M	General information on the card production task. This information is regarding the main card application (payment application) This information is inherited by sub applications.
ApplicationDataPerCRN	A	-	1...n	M	Information on the parameters of card production or the card application (for smart cards). Production parameters from this aggregate can redefine common parameters of card production from the ApplicationCommonData aggregate.

6.3.8 ApplicationCommonData

Field	Type	Format	Freq.	Mand.	Comments
ApplicationData	A	-	1	M	Information on card production task.

6.3.9 ApplicationDataPerCRN

Field	Type	Format	Freq.	Mand.	Comments
CRN	A	-	1	M	Unique identifier of a task. Contains the card number (PAN) and the plastic's sequence number in WAY4 (card sequence number). Pursuant to PCI-DSS standards, the card number (PAN) can be masked in the file. Cards are masked using the PAN_MASK parameter (see the section ""PM File Response Export").

Field	Type	Format	Freq.	Mand.	Comments
ApplicationData	A	-	1	M	Information about the card production task.

6.3.10 CRN

Field	Type	Format	Freq.	Mand.	Comments
Number	F	n	1	M	Unique identifier of a task. Consists of the card number (PAN) and the sequence number of the plastic in WAY4 (card sequence number).

Field	Type	Format	Freq.	Mand.	Comments
Number	F	n	1	M	Unique identifier of a task. Consists of the card number (PAN) and the sequence number of the plastic (card sequence number).

6.3.11 ApplicationData

Field	Type	Format	Freq.	Mand.	Comments
AID	A	-	1	M	Dataset ID.
ICCData	A	-	1	M	Information about the card production task.

6.3.12 AID

Field	Type	Format	Freq.	Mand.	Comments
AID	F	an	1	M	ID. Not filled in.
Order	F	n	1	M	Sequence number. Contains the constant "1".

6.3.13 ICCData

Field	Type	Format	Freq.	Mand.	Comments
DataSet	A	-	1...n	M	Information about the card production task, grouped according to functional groups.

6.3.14 DataSet

Field	Type	Format	Freq.	Mand.	Comments
Name	F	an	1	M	Name of the functional group.
Data	A	-	1...n	M	Contents of the functional group.

6.3.15 Data

Field	Type	Format	Freq.	Mand.	Comments
DataElement	F	an	1	M	Production parameter name (tag).
Value	F	an	1	M	Production parameter value (tag).

6.4 Example of File Structure

In this file example, only those fields are filled in that are constants.

```
<?xml version="1.0" encoding=""?>
<PinManagementFile>
  <FileHeader>
    <FileType></FileType>
    <Version>3.0</Version>
    <Source></Source>
    <Destination></Destination>
    <FileDate></FileDate>
    <FileTime></FileTime>
    <FileNumber></FileNumber>
    <AddInfo></AddInfo>
  </FileHeader>
  <PMJobs>
    <GPMessage xmlns="http://namespaces.globalplatform.org/systems-messaging/1.0.0">
      <GPHeader Destination="" ErrataVersion="1" source="" TransactionID=""
Type="MIXED" xmlns="http://namespaces.globalplatform.org/systems-messaging/1.0.0"/>
      <GPBody>
        <ApplicationDataNotification BatchID="" xmlns="http://
namespaces.globalplatform.org/systems-messaging/1.0.0">
          <ApplicationCommonData>
            <ApplicationData>
              <AID AID="" Order="1"/>
              <ICCData>
                <DataSet name="">
                  <Data DataElement="" value=""/>
                  <Data DataElement="" value=""/>
                  ...
                </DataSet>
                <DataSet name="">
                  <Data DataElement="" value=""/>
                  <Data DataElement="" value=""/>
                  ...
                </DataSet>
                ...
```

```
      </ICCData>
    </ApplicationData>
  </ApplicationCommonData>
  <ApplicationDataPerCRN>
    <CRN Number=""/>
    <ApplicationData>
      <AID AID="" Order="1"/>
      <ICCData>
        <DataSet name="">
          <Data DataElement="" value=""/>
          <Data DataElement="" value=""/>
          ...
        </DataSet>
        <DataSet name="">
          <Data DataElement="" value=""/>
          <Data DataElement="" value=""/>
          ...
        </DataSet>
        ...
      </ICCData>
    </ApplicationData>
  </ApplicationDataPerCRN>
  <ApplicationDataPerCRN>
    <CRN Number=""/>
    <ApplicationData>
      <AID AID="" Order="1"/>
      <ICCData>
        <DataSet name="">
          <Data DataElement="" value=""/>
          <Data DataElement="" value=""/>
          ...
        </DataSet>
        <DataSet name="">
          <Data DataElement="" value=""/>
          <Data DataElement="" value=""/>
```

```
                ...
              </DataSet>
              ...
            </ICCData>
          </ApplicationData>
        </ApplicationDataPerCRN>
        ...
      </ApplicationDataNotification>
      <ApplicationDataNotification BatchID="" xmlns="http://
namespaces.globalplatform.org/systems-messaging/1.0.0">
        <ApplicationCommonData>
          <ApplicationData>
            <AID AID="" Order="1"/>
            <ICCData>
              <DataSet name="">
                <Data DataElement="" value=""/>
                <Data DataElement="" value=""/>
                ...
              </DataSet>
              <DataSet name="">
                <Data DataElement="" value=""/>
                <Data DataElement="" value=""/>
                ...
              </DataSet>
              ...
            </ICCData>
          </ApplicationData>
        </ApplicationCommonData>
        <ApplicationDataPerCRN>
          <CRN Number=""/>
          <ApplicationData>
            <AID AID="" Order="1"/>
            <ICCData>
              <DataSet name="">
                <Data DataElement="" value=""/>
```

```
            <Data DataElement="" value=""/>
            ...
          </DataSet>
          <DataSet name="">
            <Data DataElement="" value=""/>
            <Data DataElement="" value=""/>
            ...
          </DataSet>
          ...
        </ICCData>
      </ApplicationData>
    </ApplicationDataPerCRN>
    <ApplicationDataPerCRN>
      <CRN Number=""/>
      <ApplicationData>
        <AID AID="" Order="1"/>
        <ICCData>
          <DataSet name="">
            <Data DataElement="" value=""/>
            <Data DataElement="" value=""/>
            ...
          </DataSet>
          <DataSet name="">
            <Data DataElement="" value=""/>
            <Data DataElement="" value=""/>
            ...
          </DataSet>
          ...
        </ICCData>
      </ApplicationData>
    </ApplicationDataPerCRN>
    ...
  </ApplicationDataNotification>
  ...
</GPBody>
```

```
      </GPMessage>
    </PMJobs>
</PinManagementFile>
```

7 Contents of XML Files for Sending Tasks

7.1 List of Functional Groups

Table 4. XML file functional groups

№	Group name	Name of aggregate, where used	Comments
1.	ENCD	ApplicationCommonData	Encoding parameters
2.	EMBD	ApplicationCommonData	Embossing parameters
3.	PINM	ApplicationDataPerCRN	Address for sending PIN mailer
4.	CRDM	ApplicationCommonData	Address for sending cards
5.	ADTA	ApplicationCommonData ApplicationDataPerCRN	Card application parameters
6.	ADDI	ApplicationDataPerCRN	Card application additional parameters.
7.	SMEM	ApplicationDataPerCRN	Smart card production parameters
8.	EMVT	ApplicationCommonData ApplicationDataPerCRN	EMV tags
9.	EMVC	ApplicationCommonData ApplicationDataPerCRN	EMV tags for Contactless cards

Table 5. Set of functional groups depending on the pipe operation mode

	OUTSIDE_PRODUCTION=N	OUTSIDE_PRODUCTION=Y	
		FROM_MAILER=N	FROM_MAILER=Y
ENCD	+	+	+
EMBD	+	+	+

	OUTSIDE_PRODUCTION=N	OUTSIDE_PRODUCTION=Y	
		FROM_MAILER=N	FROM_MAILER=Y
PINM	+	+	-
CRDM	-	+	+
ADTA	+	+	+
ADDI	+	+	+
SMEM	-	-	-
EMVT	-	+	+
EMVC	-	+	+

7.2 Card Parameters

7.2.1 ADDI Group

ADD1 Tag – Additional information specified by the user, line 1. By default, contains the value of the F_I (financial institution) table's BANK_CODE field.This value can be redefined with the ADD_INFO_1 parameter of the "PM File Export" pipe. The maximum length is 255 characters.

ADD2 Tag – Additional information specified by the user, line 2. By default, contains the value of the F_I (financial institution) table's BRANCH_CODE field.This value can be redefined with the ADD_INFO_2 parameter of the "PM File Export" pipe. The maximum length is 255 characters

ADD3 Tag – Additional information specified by the user, line 3. By default, contains the value of the F_I (financial institution) table's NAME field.

This value can be redefined with the ADD_INFO_3 parameter of the "PM File Export" pipe.

The maximum length is 255 characters

ADD4 Tag – Additional information specified by the user, string 4. By default, contains the value of the CLIENT table's ZIP_CODE field. This value can be redefined with the ADD_INFO_4 parameter of the "PM File Export" pipe. The maximum length is 255 characters.

7.2.2 ADTA Group

AEDT – Card effective date. The default value is the date the production task was exported.

CSNB – Sequence number of the plastic issued with this PAN.

CVER – Cryptogram version number.

DCDN – Check value of the dynamic number generation derived key.

DCEN – Check value of the data encryption derived key.

DCMA – Check value of the MAC generation derived key.

DCTC – Check value of the transaction cryptogram generation derived key.

DKDN – Dynamic number generation card key.

DKEN – Data encryption card key.

DKMA – MAC generation card key.

DKTC – Derived key for generating the transaction cryptogram.

ESDD – Extended SDA DOL.

FCTR – The value of the "Risk Factor" parameter. Consists of 7 digits without delimiters, the last three digits are the fractional portion of the number.

ICCF – ICC Key Format. See "ICC RSA Key Format"

ICCK – ICC Private Key - part1.

ICCM – ICC Key Modulus. See "ICC RSA Key Format"

KEKA – KEK algorithm.

KEKI – KEK index.

MKDI – Derivation master key index.

NMBR – Number of the main card application (PAN). This parameter is used to produce smart card PANs.

PAND – Card number (the number of the smart card contract or card application number).

PEDT – Card effective date; corresponds with the date the task was exported from the PIN Management module.

PEKA – PEK algorithm.

PEKI – PEK Index.

PIND – Encrypted PIN. The encryption type is specified by the value of the "PINF" tag.

PINF – PIN format (PIN encryption type):

- "01" – ANSI X9.8 (ZPK);
- "H" – HSM LMK.

PLSC – Plastic type.

PMTI – PM Task Identification. Task identifier; makes it possible to get information about execution of a task in an emvperso.log file.

PN2D – Encrypted PIN2. The encryption type is specified by the value of the "PINF" tag.

PPSC – PayPass Service Code. If the tag is set, its value redefines the card's service code and is used to calculate a for PayPass CVC value.

PRTP – Card production type:

- "0" – issue a new PIN for existing plastic; the new PIN will be printed in a new PIN mailer.
- "1" – reprint a PIN for existing plastic (this functionality is only available when a special agreement has been made with the WAY4 vendor).
- "2" – issue new plastic replacing the old one; new plastic will be issued with new CVV1/CVV2 and PVV, which will be calculated for the old PIN.
- "3" – issue new plastic with new CVV1/CVV2 and a new PIN.
- "5" – reissue smart card data; the old CVV1/CVV2, PVV and PIN are used (a PIN mailer is not printed).
- "9" – issue new plastic with new CVV1/CVV2; a new PIN is not created, the PVV is not recalculated.
- "A" – produce additional card parameters (contents of the "PRDP" tag).

PTLM – Value of the maximum permissible number of attempts to enter a PIN.

PWLE – Encrypted list of passwords. Used for cards with the "PL" value (Password List, OTP list) in the Encoding Method field of production parameters.

PWLL – Length of one password. Used for cards with the "PL" value (Password List, OTP list) in the Encoding Method field of production parameters.

PWLN – Number of passwords in the list. Used for cards with the "PL" value (Password List, OTP list) in the Encoding Method field of production parameters.

RLTN – Type of relation between contracts (Related Cards). The parameter contains the value of the ACNT_CONTRACT table's BASE_RELATION field; only filled in for additional card applications (applet) and is not filled in for the main card application (Application).

QAIP – Application Interchange Profile (AIP) for qVSDC. Exported for VISA PayWave cards.

QICC – Integrated Circuit Card (ICC) Public Key Certificate for qVSDC. Exported for VISA PayWave cards.

SCR1 – Personalization preprocessing Script Name.

SCR2 – Personalization Script Name.

PMCD – Data preparation system internal identifier

NSPK – Indicator that a card belongs to the MIR payment system.

QCVM – Contactless CVM List.

QESD – Contactless extended SDA DOL

QCD1 – Contactless CDOL1

QAUC – Contactless Application Usage Control

QVCV – Contactless cryptogram version number

QVPD – Contactless Processing Options Data Object List (PDOL)

AIPM – Application Interchange Profile for MSD (PayWave) and for Express Pay Magstripe

TRNB – Data preparation system internal identifier.

7.2.3 CRDM Group

CITY – City

CNTR – Country

DLVT – PIN mailer or card delivery type

FRSN – Cardholder name

LSTN – Cardholder last name

PIN1 – Address, line 1

PIN2 – Address, line 2

PIN3 – Address, line 3

PIN4 – Address, line 4

ZIPC – ZIP (postal) code

7.2.4 EMBD Group

CMPN – Company name for embossing

CRDN – Cardholder name for embossing

7.2.5 ENCD Group

CVC1 – Card Verification Code 1/Card Verification Value 1

CVC2 – Card Verification Code 2/Card Verification Value 2

IBMO – IBM 3624 Offset

ICVV – Chip ICVV value

MST1 – Contents of the first track of a magnetic stripe (Track 1)

MST2 – Contents of the second track of a magnetic stripe (Track 2)

EXDT – Card expiry date in "YYMM" format

PRST – Status of card production task:

- "2" – "Encoded" (card data has been processed, but a PIN mailer has not been printed)
- "3" – "Mailer Printed" (card data has been processed and a PIN mailer has been printed)

PVKI – PIN Verification Key Index

PVVC – PIN Verification Value

SVCD – Card Service Code

TRC1 – Cardholder name in the format of the first track of a magnetic stripe card, according to ISO-7813

7.2.6 PINM Group

CITY – City

CNTR – Country

DLVT – PIN mailer or card delivery type

FRSN – Cardholder name

LSTN – Cardholder last name

PIN1 – Address, line 1

PIN2 – Address, line 2

PIN3 – Address, line 3

PIN4 – Address, line 4

ZIPC – ZIP (postal) code

7.2.7 EMVT Group

4F – Application identifier (AID)

50 – Application label

57 – Track 2 Equivalent Data

5A – Application Primary Account Number (PAN)

5F20 – Cardholder name

5F24 – Application Expiration Date

5F25 – Application Effective Date

5F28 – Issuer Country Code

5F2D – Language Preference

5F30 – Service Code

5F34 – PAN Sequence number

82 – Application Interchange Profile (AIP)

84 – Dedicated File Name

87 – Application Priority Indicator

8C – Card Risk Management Data Object List1 (CDOL1)

8D – Card Risk Management Data Object List2 (CDOL2)

8E – Cardholder Verification Method (CVM) List

8F – Certification Authority Public Key Index

90 – Issuer Public Key Certificate

92 – Issuer Public Key Remainder

93 – Signed Static Application Data

9F05 – Application Discretionary Data

9F07 – Application Usage Control

9F08 – Application Version Number

9F0D – Issuer Action Code Default

9F0E – Issuer Action Code Denial

9F0F – Issuer Action Code Online

9F14 – Lower consecutive offline limit

9F1F – Track 1 Discretionary Data

9F23 – Upper consecutive offline limit

9F32 – Issuer Public Key Exponent

9F38 – Processing Options Data Object List (PDOL)

9F42 – Application currency code

9F46 – Integrated Circuit Card (ICC) Public Key Certificate

9F47 – Integrated Circuit Card (ICC) Public Key Exponent

9F48 – Integrated Circuit Card (ICC) Public Key Remainder

9F49 – Dynamic Data Authentication Data Object List (DDOL)

9F4A – Static Data Authentication (SDA) Tag List

9F51 – Application Currency Code [VSDC]. MChip4-Log Format [MChip/4]

9F52 – Application Default Action [VSDC]

9F53 – Consecutive Transaction Limit (International) [VSDC]

9F54 – Cumulative Total Transaction Amount Limit [VSDC]

9F56 – Issuer Authentication Indicator [VSDC]

9F58 – Lower Consecutive Offline Limit [VSDC]

9F59 – Upper Consecutive Offline Limit [VSDC]

9F5C – Cumulative Total Transaction Amount Upper Limit [VSDC]

9F5E – VSDC Consecutive Upper Limit International [VSDC]

9F72 – Consecutive Transaction Limit (International Country) [VSDC]

9F73 – Currency Conversion Factor [VSDC]

9F75 – Cumulative Total Transaction Amount Limit (Dual Currency) [VSDC]

9F76 – Secondary Application Currency [VSDC]

BFxx – Tags that are specific to MIR payment system cards. Tag values are generated according to MIR payment system regulations

C3 – Card Issuer Action Code - Denial [MChip/4 and [MChip/2]

C4 – Card Issuer Action Code - Default [MChip/4 and MChip/2]

C5 – Card Issuer Action Code - Online [MChip/4 and MChip/2]

C6 – Counters. MasterCard proprietary data element [MChip/4]. MCHIP2 Card TVR Action Code [MChip/2]

C8 – CRM Country Code (MChip4) [MChip/4]

C9 – CRM Currency Code (MChip4) [MChip/4]

CA – MCHIP Lower Cumulative Transaction Amount Limit [MChip/2 and MChip/4]

CB – MCHIP Upper Cumulative Transaction Amount Limit [MChip/2 and MChip/4]

CE – Card Issuer Action Code (PayPass) - Online [PayPass]. Non Domestic Control Factor Exponent [MChip/2]

D1 – Currency Conversion Table (MChip4) [MChip/4]

D3 - Additional Check Table [MChip/4]

D5 - Application Control [MChip/4 and MChip/2]

D6 - Default ARPC Response Code [MChip/4]

7.2.8 EMVC Group

The group can have the same list of tags as EMVT.
The set of of Risk Scheme parameters for each card category determines whether the tags are present in the group.

8 Card Production Parameters [Importing and Exporting Card Production Tasks in XML Format]

8.1 Specifying Card Production Parameters

The designations shown in Table 11 will be used when specifying card production parameters in WAY4.

Table 11. Setting card production parameters

Code	Name	Menu item
PMP	PM Parameters	Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters]
EMV	PM Parameters/ EMV section	Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters] → [EMV]
MC	PM Parameters / MChip Parameters	Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters] → [EMV] → [MC Parms]
VIS	PM Parameters / VISA Parameters	Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters] → [EMV] → [VISA Parms]
OPT	PM Parameters Options	Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters] → [Options]
CHP	Chip Scheme	EMV Smart Cards → Configuration → Chip Schemes → [Edit] → [Parms]
PEA	Production Event Additional Parameters	Full → Configuration Setup → Transaction Types → Production Events; *Add Prod Parms* field

8.2 EMV Tags

Table 12 shows card production parameters specified in the EMV standard (EMV tags). The smart card type for which this parameter is specified is shown in square brackets. If the card type is not specified, the parameter can be set for any smart card type.

If there is no value determining where the parameter is specified, this is a concatenation parameter, since its value is either calculated automatically or generated by the concatenation of the values of other parameters.

Table 12. EMV tags

Tag	Value	Where specified
4F	Application identifier (AID).	EMV
50	Application label.	EMV
56	Track 1 Data [PayPass].	
57	Track 2 Equivalent Data.	
5A	Application Primary Account Number (PAN).	
5F20	Cardholder name.	
5F24	Application Expiration Date.	
5F25	Application Effective Date.	
5F28	Issuer Country Code.	CHP
5F2D	Language Preference.	CHP
5F30	Service Code.	
5F34	PAN Sequence number.	
82	Application Interchange Profile (AIP).	EMV
84	Dedicated File Name.	EMV
87	Application Priority Indicator.	
8C	Card Risk Management Data Object List1 (CDOL1).	EMV
8D	Card Risk Management Data Object List2 (CDOL2).	EMV
8E	Cardholder Verification Method (CVM) List.	EMV
8F	Certification Authority Public Key Index.	
90	Issuer Public Key Certificate.	

Tag	Value	Where specified
92	Issuer Public Key Remainder.	
93	Signed Static Application Data.	
9F05	Application Discretionary Data.	
9F07	Application Usage Control.	EMV
9F08	Application Version Number.	EMV
9F0D	Issuer Action Code Default.	EMV
9F0E	Issuer Action Code Denial.	EMV
9F0F	Issuer Action Code Online.	EMV
9F14	Lower consecutive offline limit.	CHP
9F17	PIN Try Counter.	
9F1F	Track 1 Discretionary Data.	
9F23	Upper consecutive offline limit.	CHP
9F32	Issuer Public Key Exponent.	
9F38	Processing Options Data Object List (PDOL).	EMV
9F42	Application currency code.	CHP
9F44	Application Currency Exponent (used for CVM).	CHP
9F46	Integrated Circuit Card (ICC) Public Key Certificate.	
9F47	Integrated Circuit Card (ICC) Public Key Exponent.	
9F48	Integrated Circuit Card (ICC) Public Key Remainder.	
9F49	Dynamic Data Authentication Data Object List (DDOL).	EMV
9F4A	Static Data Authentication (SDA) Tag List.	EMV
9F4D	Log Entry.	OPT
9F51	Application Currency Code [VSDC].	CHP

Tag	Value	Where specified
9F51	MChip4-Log Format [MChip/4].	
9F52	Application Default Action [VSDC].	VIS; CHP
9F53	Consecutive Transaction Limit (International) [VSDC].	CHP
9F54	Cumulative Total Transaction Amount Limit [VSDC].	CHP
9F55	Geographic Indicator [VSDC].	CHP
9F56	Issuer Authentication Indicator [VSDC].	VIS; CHP
9F57	Issuer Country Code [VSDC].	CHP
9F58	Lower Consecutive Offline Limit [VSDC].	CHP
9F59	Upper Consecutive Offline Limit [VSDC].	CHP
9F5C	Cumulative Total Transaction Amount Upper Limit [VSDC].	CHP
9F5E	VSDC Consecutive Upper Limit International [VSDC].	CHP
9F62	PayPass PCVC3 - Track 1 [PayPass].	OPT
9F63	PayPass PUNATC - Track 1 [PayPass].	OPT
9F64	PayPass NATC - Track 1 [PayPass].	OPT
9F65	PayPass PCVC3 - Track 2 [PayPass].	OPT
9F66	PayPass PUNATC - Track 2 [PayPass].	OPT
9F67	PayPass NATC - Track 2 [PayPass].	OPT
9F68	PayPass Mag Stripe CVM List [PayPass].	OPT
9F69	PayPass UDOL [PayPass].	OPT
9F6B	Track 2 Data [PayPass].	
9F6C	Mag Stripe Application Version Number (Card) [PayPass].	OPT
9F72	Consecutive Transaction Limit (International Country) [VSDC].	CHP
9F73	Currency Conversion Factor [VSDC].	CHP

Tag	Value	Where specified
9F75	Cumulative Total Transaction Amount Limit (Dual Currency) [VSDC].	CHP
9F76	Secondary Application Currency [VSDC].	CHP
BF0C	File Control Information (FCI) Issuer Discretionary Data.	OPT
C1	CPA Application Control.	CHP
C3	Card Issuer Action Code - Denial [MChip/4]. Card Issuer Action Code - Denial [MChip/2].	MC; CHP
C4	Card Issuer Action Code - Default [MChip/4]. Card Issuer Action Code - Default [MChip/2].	MC; CHP
C5	Card Issuer Action Code - Online [MChip/4]. Card Issuer Action Code - Online [MChip/2].	MC; CHP
C6	Counters. MasterCard proprietary data element [MChip/4]. MCHIP2 Card TVR Action Code [MChip/2].	MC
C7	CDOL1-Related Data Length [MChip/2 and MChip/4].	CHP
C8	CRM Country Code (MChip4) [MChip/4].	CHP
C9	CRM Currency Code (MChip4) [MChip/4].	CHP
CA	MCHIP Lower Cumulative Transaction Amount Limit [MChip/2 and MChip/4].	CHP
CB	MCHIP Upper Cumulative Transaction Amount Limit [MChip/2 and MChip/4].	CHP
CD	Card Issuer Action Code (PayPass) - Offline [PayPass].	
CE	Card Issuer Action Code (PayPass) - Online [PayPass].	
CE	Non Domestic Control Factor Exponent [MChip/2].	CHP
CF	Card Issuer Action Code (PayPass) - Decline [PayPass].	
D1	Currency Conversion Table (MChip4) [MChip/4].	CHP
D3	Additional Check Table [MChip/4].	CHP

Tag	Value	Where specified
D5	Application Control [MChip/4]. Application Control [MChip/2].	MC; CHP
D6	Default ARPC Response Code [MChip/4].	CHP
D7	Application Control (PayPass) [PayPass].	
D8	Application Interchange Profile (PayPass) [PayPass].	

8.3 WAY4 Tags

Table 13 shows card production parameters (WAY4 tags).

If there is no value determining where the parameter is specified, this is a concatenation parameter, since its value is either calculated automatically or generated by the concatenation of the values of other parameters.

Note that by default, card production parameters (WAY4 tags) containing "NULL" or an empty value are not exported to a file.

Table 13. WAY4 tags

Tag	Value	Where specified
ACX1	The first line of additional information of a card application (Applet) for processing in the electric personalisation module. The parameter is used to send encrypted application data.	
ACX2	The second line additional information of a card application (Applet) for processing in the electric personalization module. The parameter is used to send encrypted application data.	
ACX3	The third line of additional information of a card application (Applet) for processing in the electric personalization module. The parameter is used to send encrypted application data.	
ACX4	The fourth line of additional information of a card application (Applet) for processing in the electric personalization module. The parameter is used to send encrypted application data.	

Tag	Value	Where specified
ADD1	Additional information, line 1. By default, contains the value of the F_I (financial institution) BANK_CODE field. This value can be redefined using the ADD_INFO_1 parameter of the "PM File Export" pipe.	
ADD2	Additional information, line 2. By default, contains the value of the F_I (financial institution) BRANCH_CODE field. This value can be redefined using the ADD_INFO_2 parameter of the "PM File Export" pipe.	
ADD3	Additional information, line 3. By default, contains the value of the F_I (financial institution) NAME field. This value can be redefined using the ADD_INFO_3 parameter of the "PM File Export" pipe.	
ADD4	Additional information, line 4. By default, contains the value of the CLIENT table's ZIP_CODE field. This value can be redefined using the ADD_INFO_4 parameter of the "PM File Export" pipe.	
AEDT	Card effective date. The default value is the date the task was exported to production.	
CITY	City.	
CMPN	Company name for embossing.	
CNTR	Country.	
CRDN	Cardholder name for embossing.	
CSD1	First line of user data for processing in the personalisation module. Contains data for the personalisation file header (for all card applications). By default, contains data from the "ADD1" tag. The value can be redefined using the "ADD_INFO_1" parameter of the "PM Personalization File Export" pipe. The maximum length of the tag's data is specified by the "ADD_INFO_LEN_1" pipe parameter. If the parameter is not set or has the "0" value, the tag is not placed in the personalisation file. If the "CSD1" tag is set in [OPT], the tag value is placed in application data and encrypted.	OPT

Tag	Value	Where specified
CSD2	Second line of user data for processing in the personalisation module. Contains data for the personalisation file header (for all card applications). By default, contains data from the "ADD2" tag. The value can be redefined using the "ADD_INFO_2" parameter of the "PM Personalization File Export" pipe. The maximum length of the tag's data is specified by the "ADD_INFO_LEN_2" pipe parameter. If the parameter is not set or has the "0" value, the tag is not placed in the personalisation file. If the "CSD2" tag is set in [OPT], the tag value is placed in application data and encrypted.	OPT
CSD3	Third line of user data for processing in the personalisation module. Contains data for the personalisation file header (for all card applications). By default, contains data from the "ADD3" tag. The value can be redefined using the "ADD_INFO_3" parameter of the "PM Personalization File Export" pipe. The maximum length of the tag's data is specified by the "ADD_INFO_LEN_3" pipe parameter. If the parameter is not set or has the "0" value, the tag is not placed in the personalisation file. If the "CSD3" tag is set in [OPT], the tag value is placed in application data and encrypted.	OPT
CSD4	Fourth line of user data for processing in the personalisation module. Contains data for the personalisation file header (for all card applications). By default, contains data from the "ADD4" tag. The value can be redefined using the "ADD_INFO_4" parameter of the "PM Personalization File Export" pipe. The maximum length of the tag's data is specified by the "ADD_INFO_LEN_4" pipe parameter. If the parameter is not set or has the "0" value, the tag is not placed in the personalization file. If the "CSD4" tag is set in [OPT], the tag value is placed in application data and encrypted.	OPT
DCDN	Check value of the dynamic number generation derived key.	

Tag	Value	Where specified
DCEN	Check value of the data encryption derived key.	
DCMA	Check value of the MAC generation derived key.	
DCTC	Check value of the transaction cryptogram generation derived key.	
DKDC	Dynamic CVC (dCVC)/CVC3 derived key.	
DKDN	Dynamic number generation card key.	
DKEN	Data encryption card key.	
DKMA	MAC generation card key.	
DKTC	Derived key for generating the transaction cryptogram.	
DLVT	PIN mailer or card delivery type.	
EPSF	Encrypted PIN selection form.	
ERRC	Card production result code. Used for the response file: "0" – successful task execution, otherwise – an error message.	
ERRT	Card production error message. Present if the ERRC tag has a value differing from "0".	
ESDD	Extended SDA DOL.	EMV
EXDT	Card expiry date in "YYMM" format.	
FCTR	The value of the "Risk Factor" parameter. Includes 7 digits without delimiters, the last three digits are the fractional portion of the number.	
FRSN	Cardholder name	
IBMO	IBM 3624 Offset.	
IC31	PayPass IVCVC3 for Track 1.	
IC32	PayPass IVCVC3 for Track 2.	
ICC2	ICC Private Key - part3. See "ICC RSA Key Format".	
ICCC	ICC Private Key - part2. See "ICC RSA Key Format".	

Tag	Value	Where specified
ICCF	ICC Key Format. See "ICC RSA Key Format".	OPT
ICCK	ICC Private Key - part1. See "ICC RSA Key Format".	
ICCM	ICC Key Modulus. See "ICC RSA Key Format".	
ICVV	Chip ICVV value.	
IIPB	MasterCard CAP IIPB.	OPT; CHP*
KEKA	KEK algorithm.	
KEKI	KEK index.	
LSTN	Cardholder last name.	
MKDI	Derivation master key index.	EMV
MNGC	Code of card production parameters set	
MST1	Contents of the first track of a magnetic stripe (Track 1).	
MST2	Contents of the second track of a magnetic stripe (Track 2).	
NMBR	Number of the main card application (PAN). This parameter is used when issuing smart card card applications.	
PAND	Card number (number of the smart card contract or card application).	
PEDT	Card effective date, corresponds to the date the task was exported from the PIN Management module.	
PEKA	PEK algorithm.	
PEKI	PEK Index.	
PIN1	Address, line 1.	
PIN2	Address, line 2.	
PIN3	Address, line 3.	
PIN4	Address, line 4.	

Tag	Value	Where specified
PIND	Encrypted PIN. The type of encryption depends on the value of the "PINF" tag value.	
PINF	PIN format (PIN encoding type): "01" – ANSI X9.8 (ZPK) "H" – HSM LMK.	
PLSC	Plastic type.	
PN2D	Encrypted PIN2. The type of encryption depends on the value of the "PINF" tag value.	
PRCD	Card production code (value of Production Code field in the PM_TASK table).	
PRDP	List of tags. Each tag defines an issued attribute. For example, "PTPIN2=Y;" – issue PIN2. Tags must consist of 6 characters and have the prefix "PT".	
PPSC	PayPass Service Code. If the tag is set, its value redefines the card's service code and is used to calculate values for PayPass CVC.	OPT
PRST	Status of card production task: "2" – "Encoded" (card data is processed, but no PIN mailer has been printed). "3" – "Mailer Printed" (card data is processed and a PIN mailer has been printed).	

Tag	Value	Where specified
PRTP	Card production type: "0" – issue a new PIN for existing plastic; the new PIN will be printed in a new PIN mailer. "1" – reprint a PIN for existing plastic (this functionality is only available when a special agreement has been made with the WAY4 vendor). "2" – issue new plastic replacing the old one; new plastic will be issued with new CVV1/CVV2 and PVV, which will be calculated for the old PIN. "3" – issue new plastic with new CVV1/CVV2 and a new PIN. "5" – reissue smart card data; the old CVV1/CVV2, PVV and PIN are used (a PIN mailer is not printed). "9" – issue new plastic with new CVV1/CVV2; a new PIN is not created, the PVV is not recalculated. "A" – produce additional card parameters (contents of the "PRDP" tag).	The value is determined when approving a contract, as well as using the menu items "Full → Issuing → Mark/Unmark Card To Production → Mark/Unmark Single Card" and "Full → Issuing → Mark/Unmark Card To Production → Mark/Unmark Single Card for Plastic Replacement".
PTLM	Maximum number of PIN attempts.	
PVKI	PIN Verification Key Index.	PMP
PVVC	PIN Verification Value.	
PWLC	Unencrypted list of passwords. Used for cards with the "PL" (Password List, OTP list) value in the *Encoding Method* field of production parameters.	
PWLE	Encrypted list of passwords. Used for cards with the "PL" (Password List, OTP list) value in the *Encoding Method* field of production parameters.	
PWLL	Length of one password. Used for cards with the "PL" (Password List, OTP list) value in the *Encoding Method* field of production parameters.	OPT
PWLN	Number of passwords in the list. Used for cards with the "PL" (Password List, OTP list) value in the *Encoding Method* field of production parameters.	OPT
QAIP	Application Interchange Profile (AIP) for qVSDC. Used for VISA PayWave cards. The value "2000" should be specified (recommended by Visa).	OPT

Tag	Value	Where specified
QICC	Integrated Circuit Card (ICC) Public Key Certificate for qVSDC. Calculated for VISA PayWave cards.	
RLTN	Type of relation between contracts (Related Cards). The parameter contains the value of the ACNT_CONTRACT table's BASE_RELATION field; only filled in for additional card applications (applet) and not filled in for the main card application (Application).	
SVCD	Card service code.	
TRC1	Cardholder name in the format of the first track of a card's magnetic stripe according to ISO-7813.	
XKRC:ICC_KEY	ICC Public Key MAC.	
XKRL:ICC_KEY	ICC RSA Key Length.	
XKRM:ICC_KEY	ICC RSA key modulus.	
XKRP:ICC_KEY	ICC RSA Key Public Exponent.	
ZIPC	ZIP (postal) code.	
CS*	Custom tags beginning with the prefix "CS". Note that the tag "CSNB" is reserved in WAY4.	

8.3.1 ICCK, ICCC and ICC2 Tag Format

If data is exported for the WAY4 electric personalisation module, the ICCK, ICCC and ICC2 tags placed in the personalisation file will be presented in the following format:

```
<tag name(4 letters)><Tag length (2 bytes)><Component 1><Component 2>...
```

For example:

```
ICCK012EPC4891AB...BAQC480F94...4EEU0103
```

If the ICCF tag (ICC RSA key format) has the value "03", all CRT components of the key are placed sequentially in the ICCK tag without component codes and length prefixes. The components will be placed in the following order (component name): "P", "Q", "X", "Y", "Z".

If the ICCF tag has the values "04", "13", "PQ", "CRTFNL" or "CRTM", key components in tags will be presented in the following format:

```
<Component code(2 letters)><Component length (1 byte)><Component value>
```

8.3.2 CRT Components of a Key

CRT components of an ICC RSA key for personalisation files are shown in Table 14 It is assumed that the key length is k bits. The codes of encrypted components are shown for two encryption modes – "CBC" and "ECB".

Table 14. CRT components of an ICC RSA key

Component name	Vlaue	Length (unencrypted)	Codes of encrypted components	Tag
P	Simple number p	$k/2$	"PC" – CBC "PE" – ECB.	ICCK
Q	Simple number q	$k/2$	"QC" – CBC "QE" – ECB.	ICCK
X	$d \bmod (p-1)$	$k/2$	"XC" – CBC "XE" – ECB.	ICCC, ICCK without a code
Y	$d \bmod (q-1)$	$k/2$	"YC" – CBC "YE" – ECB.	ICCC, ICCK without a code
Z	$q^{-1} \bmod p$	$k/2$	"ZC" – CBC "ZE" – ECB.	ICC2, ICCK without a code

Component name	Vlaue	Length (unencrypted)	Codes of encrypted components	Tag
E	e, public exponent	1 or 3 bytes (2 or 17 bits)	"EU" – unencrypted	ICCC, ICCK
D	d, private exponent $d = e^{-1} mod\ (p-1)(q-1)$	k	"DE" – ECB.	ICCK, ICC3
M	Modulus $m = pq$	k	"ME" – "ECB"	ICCK, ICCM unencrypted, ICC4

Key components in tags can be presented unencrypted or encrypted under KEK (in CCB or ECB encryption modes) depending on key format (the value of the ICCF tag).

If ICCF="04", only key components will be encrypted (information on component length and characters used for padding will be missing).

For ICC key format ICCF=CRTF only EMV padding added to encrypted component, there is no length prefix.

If the ICCF tag has the value "03", "13", "PQ" or "CRTM", before encryption, to the left of the component value information will be added about the length (1 byte), and to the right – byte "80" and zeros for padding components (EMV padding), i.e., components will have the following format:

```
<Component length(1 byte)><Component value>80(1 byte)00(1 byte)00(1 byte)...
```

Note that in EMV padding, the number of bytes containing zeros will be selected in such a way that the length of the entire message will be a multiple of 8 bytes. Therefore, an encrypted component will contain information about the length of a component, the component value itself and characters used for padding.

8.3.3 Key Components in Tags

Rules for generating ICCK, ICCC and ICC2 tags depending on the ICC RSA key format (the ICCF tag) are given in the following table. Key components will be presented according to the format (see "ICCK, ICCC and ICC2 Tag Format"). For example, for the format ICCF="PQ", the "P" component will be presented in the ICCK tag as "PC<component length><component value>", and for the format ICCF="03" – as "<component value>".

Table 15. Presentation of key components in tags

Component	Tag	ICCF=PQ (Default)	ICCF=CRTM	ICCF=04	ICCF=13	ICCF=03	ICCF=CRTF (CRT Full)	ICCF=CRTFNL (CRT Full no Length)
Key format in the hardware security module (HSM)	-	03	03	04	13 (only for OWSem)	03	05 (only for HSM 9000 & Contactless & EMV issuing)	05 (only for HSM 9000 & Contactless & EMV issuing)
Encryption mode	-	CBC	CBC	ECB	ECB	CBC	CBC	CBC
Length prefix (size)	-	1 byte	1 byte	-	1 byte	1 byte	1 byte	-
Padding algorithm	-	EMV	EMV	-	EMV	EMV	EMV	EMV
P	ICCK	PC	PC		PE	First component	PC	PC
Q	ICCK	QC	QC		QE	Second component	QC	QC
X	ICCC	XC	XC		XE		XC	XC
X	ICCK					Third component		
Y	ICCC	YC	YC		YE		YC	YC
Y	ICCK					Fourth component		
Z	ICC2	ZC	ZC		ZE		ZC	ZC
Z	ICCK					Fifth component		
E	ICCK	EU	EU		EU		EU	EU
E	ICCC			EU				
D	ICCK			DE				
D	ICC2						DC	DC

Component	Tag	ICCF=PQ (Default)	ICCF=CRTM	ICCF=04	ICCF=13	ICCF=03	ICCF=CRTF (CRT Full)	ICCF=CRTFNL (CRT Full no Length)
M	ICCK			ME				
M	ICC2						MC	MC
M	ICCM clear		ICCM		ICCM		ICCM	ICCM

8.3.4 Loading a Key's CRT Components to a Card (Personalisation)

This section describes loading a key's CRT components if the value of the ICCF tag is "PQ", "CRTF", "CRTM", or "03".

Pursuant to "EMV Personalization Specification" (EMV_CPS_v1.1) and "MChip Advance Card Application Specification Payment and Data Storage", for smart card personalisation, "qmp" format is applied, meaning the value $Z = q^{-1} \, mod \, p$ is used as the CRT coefficient. WAY4 generates a key using this format.

For personalising DDA/CDA cards according to "qmp" format (the format used depends on the card type and is determined in the smart card specification) components of the ICC RSA key will be written to the card to the DGI (Data Grouping Identifiers) elements shown in Table 16. For the contents of CRT components, see the section "CRT Components of a Key".

Table 16. Loading components to a card in "qmp" format

CRT Component name	DGI	DGI meaning (EMV_CPS)
Z	8201	CRT constant $q^{-1} \, mod \, p$
Y	8202	CRT constant $d \, mod \, (q-1)$
X	8203	CRT constant $d \, mod \, (p-1)$
Q	8204	CRT constant prime factor q
P	8205	CRT constant prime factor p

In "pmq" format (the CRT coefficient is the value $p^{-1} \, mod \, q$), components of the ICC RSA key will be written to the card to DGI elements shown in Table 17.

Table 17. Loading components to a card in "pmq" format

CRT Component name	DGI	DGI meaning (EMV_CPS)
Z	8201	CRT constant $q^{-1} \bmod p$
X	8202	CRT constant $d \bmod (q-1)$
Y	8203	CRT constant $d \bmod (p-1)$
P	8204	CRT constant prime factor q
Q	8205	CRT constant prime factor p

8.3.5 Loading a Key's Modulus and Private Exponent to a Card (Personalisation)

This section describes loading a key's modulus and private exponent if the tag ICCF="04". See the section "CRT Components of a Key" for the format of a key's modulus and private exponent. These values will be written to a card to DGI elements (Data Grouping Identifiers), shown in Table 18.

Table 18. Loading the modulus and private exponent to a card

CRT Component name	DGI	DGI meaning (EMV_CPS)
D	8101	ICC Private Key Exponent
M	8103	ICC Modulus

8.4 Card Production Configuration Parameters

Some WAY4 tags are card production configuration parameters affecting the generation of other production parameters, as well as pipe operation mode. The values of configuration parameter values given in this section are not copied to task parameters imported into the PIN Management module and are not exported to personalisation files.

Parameter	Value	Where determined
CHCVV	When this flag is set ("Y", "y", "1" values) a CVV will be generated for a smart card. Setting this flag affects the "ICVV" parameter.	OPT

Parameter	Value	Where determined
CVV2_YYMM	When this flag is set ("Y", "y", "1" values) the date in "YYMM" format will be used to calculate the CVV2 (for VISA). When a different value is specified for this parameter (including an empty value) the date in "MMYY" format will be used.	OPT
DCPASS	Mode for generating passwords for "Distribution Cards". Any non-empty value enables this mode. In the *Production Type* field of the "Production Events" form (Full → Configuration Setup → Transaction Types → Production Events) it is recommended to specify the value "Replace Add Parms" (code "A") for "Distribution Cards".	PEA
DCVV_SH	Scheme for calculating Dynamic CVC/CVV (DCVV). Used for MasterCard PayPass and VISA PayWave cards. Mandatory parameter for processing MagStripe profile of transactions for these card types. Possible values: "M" – MasterCard PayPass; "V" – Visa PayWave.	OPT
DCVV_V	Version of the scheme for calculating Dynamic CVC/CVV (DCVV). Used for MasterCard PayPass and VISA PayWave cards. Mandatory parameter for processing MagStripe profile of transactions for these card types. For the parameter "DCVV_SH=M", the value "2" must be specified (MasterCard PayPass – PAN provided in input and IVCVC3 calculated from provided magnetic stripe data); for the parameter "DCVV_SH=V" – the "0" value (VISA dCVV). The remaining values are reserved for future use.	OPT
DST_CODEPAGE	The code of the encoding into which characters sent from the database must be transformed. Transformation is applied for PIN mailer fields, text representation of the PIN, etc. The default value is "Windows-1251".	OPT
FORCE_ICC_KEY	When this flag is set (the "Y", "y", "1" values) an ICC RSA key will be generated regardless of whether the card supports DDA/CDA authentication.	OPT
IIPB_MAC	MasterCard IIPB MAC. Only specified for Thales HSM.	OPT; CHP*

Parameter	Value	Where determined
INHERIT_TAGS	Comma-delimited list of tags whose values must be copied by the child application (Applet) from the main card application (Application).	OPT
ISSUER_PIN_FORM	Format for PIN block encryption. The value "UNDER_ZPK" enables PIN block translation when executing operations between the issuing module and PIN Management. In this case, the PIN block in the file is sent encrypted under ZPK. Correspondingly, when exporting data from the issuing mode, the PIN block will be re-encrypted from under LMK under ZPK, and when importing – from under ZPK under LMK.	OPT
NUM_OF_KEYS	The number of ICC RSA keys that will be generated in the mode for preliminary generation of keys for a certain card range. The parameter is set as a decimal number.	OPT
PIN2_MAILER_FORMAT	String with parameters for printing a PIN2 mailer (the format is the same as that for printing a PIN mailer). The parameter is used when the "PTPIN2" flag is set for generating a "PIN2" value.	OPT
PIN_TXT	String for printing a PIN in text format. Contains comma (";") delimited words equivalent to digits. The first value corresponds to the number "0", the last – to the number "9". The maximum length of each word in the string for printing a PIN is 16 characters.	OPT
PRINT_PIN_S_FORM	When this flag is set ("Y", "y", "1" values), the mode will be enabled for printing a "PIN Selection Form" on the HSM.	PEA
CLEAR_PIN_LEN	Redefines the PIN length set in the *PIN Len* field of the "Parameters for <...>" form (Full → Configuration Setup → Card Production Setup → Bank Production Parameters → [Parameters]). It is recommended to use this parameter together with the "Encrypted PIN length" parameter specified for the hardware security module (HSM).	PEA

Parameter	Value	Where determined
PRIORITY	The priority for exporting applications during personalisation. The value is one decimal number from "0" to "9" ("0" is the highest priority and "9" is the lowest). This parameter influences the order for personalisation of additional card applications: applications with the lowest priority are personalised first and with the highest – last. Considered when exporting applications for external and internal personaliÑ‹ation modules	OPT
PTPIN2	When this flag is set ("Y", "y", "1" values) the mode for generating a PIN2 value will be enabled. The format for printing a PIN2 mailer is specified by the parameter "PIN2_MAILER_FORMAT".	PEA
PTPWL_CARD	Mode for generating an OTP list. If this mode is enabled (the "Y", "y" or "1" value is set) and the "PWLN" tag contains a non-empty positive value, tags with a list of passwords ("PWLC" and "PWLE") will automatically be created.	PEA
VOID_PIN	When this flag is set (any value) the mode for generating an invalid PIN will be enabled. This PIN is invalid (i.e. it is not possible to make a transaction using this value), and is used for technical purposes. The parameter is used if a "valid" PIN is set online for a card (for example, using Issuer Scripts).	PEA

9 List of Predefined Tags

This chapter presents predefined tags whose values are only specified by card parameters. Predefined tags are always included in exported and imported PIN Management files. The values of these tags are copied from database fields (in the *Source* field, the value is shown as "<TABLE>.<table field>"). Some tag values can be redefined with the parameters of the corresponding pipes.

9.1 "PM File Export" Pipe

Group	Tag	Source
ENCD	PAND	ACNT_CONTRACT.contract_number
	EXDT	CARD_INFO.card_expire
	SVCD	CONTR_SUBTYPE.service_code
	TRC1	CARD_INFO.card_track_1
	PVKI	PM_PARMS.PVKI
	PVVC	CARD_INFO.pvv
	IBMO	CARD_INFO.offset_data
	CVC1	CARD_INFO.cvc
	CVC2	CARD_INFO.cvc2
	ICVV	CARD_INFO.icvv
EMBD	CRDN	CARD_INFO.card_name
	CMPN	CARD_INFO.company_name
CRDM/PINM	The values of this group's tags are specified in one of the following ways: 1)Default value 2)The value of the tag if the address type code is set using "CARD_ADDRESS_TYPE" and "PIN_ADDRESS_TYPE" pipe parameters, respectively3)Values specified by the corresponding pipe parameters (have the highest priority).	

Group	Tag	Source
	PIN1	1)CLIENT.address_line_1 2)CLIENT_ADDRESS.address_line_1 3)Specified by the "CRDM_ADDR_LINE1_FMT" and "PINM_ADDR_LINE1_FMT" parameters, respectively.
	PIN2	1)CLIENT.address_line_2 2)CLIENT_ADDRESS.address_line_2 3)Specified by the "CRDM_ADDR_LINE2_FMT" and "PINM_ADDR_LINE2_FMT" parameters, respectively.
	PIN3	1)CLIENT.address_line_3 2)CLIENT_ADDRESS.address_line_3 3)Specified by the "CRDM_ADDR_LINE3_FMT" and "PINM_ADDR_LINE3_FMT" parameters, respectively.
	PIN4	1)CLIENT.address_line_4 2)CLIENT_ADDRESS.address_line_4 3)Specified by the "CRDM_ADDR_LINE4_FMT" and "PINM_ADDR_LINE4_FMT" parameters, respectively.
	ZIPC	1)CLIENT.address_zip 2)CLIENT_ADDRESS.address_zip.
	DLVT	1)DELIVERY_TYPE.code for CLIENT 2)DELIVERY_TYPE.code for CLIENT_ADDRESS
	CNTR	1)CLIENT.country 2)CLIENT_ADDRESS.country
	CITY	1)CLIENT.city 2)CLIENT_ADDRESS.city
	LSTN	1)CLIENT.last_nam 2)CLIENT_ADDRESS.last_nam
	FRSN	1)CLIENT.first_nam 2)CLIENT_ADDRESS.first_nam
TCH	TRNB	CARD_INFO.order_n
	PMCD	CARD_INFO.pm_code

Group	Tag	Source
ADDI	The values of this group's tags are specified in one of the following ways: 1)Default value 2)Values specified by the corresponding pipe parameter (have the highest priority).	
	ADD1	1)F_I.bank_code 2)ADD_INFO_1.
	ADD2	1)F_I.branch_code 2)ADD_INFO_2.
	ADD3	1)F_I.name 2)ADD_INFO_3.
	ADD4	1)CLIENT.zip_code 2)ADD_INFO_4
ADTA	NMBR	ACNT_CONTRACT.contract_number of the main card application (not the additional card application).
	AEDT	CARD_INFO.date_from (by default, the system date).
	PAND	ACNT_CONTRACT.contract_number.
	CSNB	CARD_INFO.seqv_number.
	RLTN	ACNT_CONTRACT.base_relation.
	PRTP	CARD_INFO.production_type.
	PRDP	PROD_EVENT.add_prod_parms, selected with consideration of the condition PROD_EVENT.code = CARD_INFO.production_event.
	PLSC	CONTR_SUBTYPE.subtype_code.
	PINF	CARD_INFO.pin_format.
	PIND	CARD_INFO.pin.
	FCTR	ACNT_CONTRACT.risk_factor.
	TRNB	CARD_INFO.order_n.

Group	Tag	Source
	PMCD	CARD_INFO.pm_code.
SMEM	Tags specified in the smart card Risk Control Scheme (Chip Scheme).	
	5F2D	List of languages used, taken from the CARD_INFO_P table for the condition SCRIPT_TYPE = "CARD_PROD". The card marking procedure (MRK.MARK_CARD_INT) that copies all language codes from the following tables is responsible for the creation of the parameter with the list of languages in the CARD_INFO_P table: – RISK_PARM_CMND (Risk Control Scheme); – From the LANGUAGE field of the CLIENT table (the language code is taken from LANG.code_2 according to the condition LANG.CODE=CLIENT.LANGUAGE); – Additional language codes that can be defined in the ADD_INFO_1,2,3 fields of the APPL_INFO table (the language code is taken from LANG.code_2 according to the conditions LANG.CODE= APPL_INFO.ADD_INFO_1/2/3).
		Other tags from the CARD_INFO_P table.

9.2 "PM File Import" Pipe

This section describes parameters created by the "PM File Import" pipe as well as by the process for PIN Management module pre-processing of card issuing tasks.

Group	Tag	Source
ADTA	ESDD	PM_PARMS.sda_dol.
	CVER	PM_PARMS.cryptogram_version.
	MKDI	PM_PARMS.data_encr_mk_ind.
	PEKA	PM_KEYS.key_algorithm (if PM_KEYS.key_type = "PEK").
	PEKI	PM_KEYS.serial_number (if PM_KEYS.key_type = "PEK"). Default value – "00" (applied if PEK is not set).
	KEKA	PM_KEYS.key_algorithm (if PM_KEYS.key_type = "KEK").

Group	Tag	Source
	KEKI	PM_KEYS.serial_number (if PM_KEYS.key_type = "KEK"). Default value – "00" (applied if KEK is not set).
	PINF	PINF tag from the PM_PARMS_OPT table.
	ICCK	PM_KEYS.rsa_priv_exp (if PM_KEYS.key_type = "ICC_KEY"). This tag, as well as the tags "XKRP:ICC_KEY", "XKRM:ICC_KEY", "XKRC:ICC_KEY" and "XKRL:ICC_KEY" are only created for pre-generated ICC RSA keys using the "RSA ICC keys PRE-generation" pipe.
	XKRP:ICC_KEY	PM_KEYS.rsa_public_exp (if PM_KEYS.key_type = "ICC_KEY").
	XKRM:ICC_KEY	PM_KEYS.rsa_modulus (if PM_KEYS.key_type = "ICC_KEY").
	XKRC:ICC_KEY	PM_KEY_CERT.certificate_body (if PM_KEYS.key_type = "ICC_KEY").
	XKRL:ICC_KEY	PM_KEYS.rsa_modulus_len (if PM_KEYS.key_type = "ICC_KEY").
EMVT	4F	PM_PARMS.reg_appl_id.
	50	PM_PARMS.appl_label.
	5A	Copied from the imported task file (PAND tag of the ADTA group) or from the "CRN Number" field of the application (if the PAND tag is not set). The "0xF" symbol is added to the value if the length of the source HEX value is odd.
	5F24	If the tag of the same name is missing in the imported task file, the tag will be generated and the last day of the month of the card's expiry date specified in the EXDT tag will be the tag value.
	5F25	The first day of the month of the card's effective date, specified in the AEDT tag of the ADTA group.
	5F30	The value of the SVCD (Service Code) tag of the ENCD group, padded on the left with a zero.
	5F34	The value of the CSNB tag of the ADTA group; if necessary, a zero is added to this value on the left. Default value – "00".
	82	PM_PARMS.appl_xf_profile.
	84	PM_PARMS.dedicated_file.

Group	Tag	Source
	8C	PM_PARMS.cdol1.
	8D	PM_PARMS.cdol2.
	8E	PM_PARMS.cvm_list.
	8F	PM_KEYS.key_idt_in_scheme.
	90	PM_KEY_CERT.certificate_body.
	92	PM_KEY_CERT.certificate_remain.
	9F05	Copied from the NBMR tag of the imported task file's ADTA group. The "0xF" symbol is added to this value if the length of the source HEX value is odd.
	9F07	PM_PARMS.appl_usage_control.
	9F08	PM_PARMS.appl_version.
	9F0D	PM_PARMS.iac_default.
	9F0E	PM_PARMS.iac_denial.
	9F0F	PM_PARMS.iac_online.
	9F32	PM_KEYS.rsa_public_exp (masterkey).
	9F38	PM_PARMS.pdol.
	9F47	PM_KEYS.rsa_public_exp (keyself). (This tag is only created for pre-generated ICC RSA keys using the "RSA ICC keys PRE-generation" pipe.)
	9F49	PM_PARMS.dda_dol.
	9F52	PM_PARMS.appl_def_action.
	9F56	PM_PARMS.iss_authentication.
	C3	PM_PARMS.ciac_denial.
	C4	PM_PARMS.ciac_offline.
	C5	PM_PARMS.ciac_online.
	C6	PM_PARMS.card_tvr_act_code.

Group	Tag	Source
	D5	PM_PARMS.appl_control.

9.3 "PM File Response Export" Pipe

Group	Tag	Source
ADTA	PAND	PM_TASK.pan.
	RLTN	PM_TASK.applet_idt.
	NMBR	PM_TASK.old_pan.
	AEDT	PM_TASK.date_from.
	PEDT	System date.
	CSNB	PM_TASK.seqv_number.
	PRTP	PM_TASK.production_type.
	PLSC	PM_TASK.plastic_code.
	PINF	"01" – if PIN is transferred as ANSI PIN block under ZPK/PEK; "H" – if PIN is not translated and is under LMK.
	PIND	PM_TASK.pin, if PIN export is not disabled using the "EXPORT_PIN" pipe parameter.
	PN2D	PM_ADD_PARMS, if PIN export is not disabled using the "EXPORT_PIN" pipe parameter.
	ERRC	The card production result code: "0" – successful execution of the task, otherwise, an error code.
	ERRT	PM_TASK.LOG_MESSAGE.
ADDI	ADD1	PM_TASK.add_info_01.
	ADD2	PM_TASK.add_info_02.
	ADD3	PM_TASK.add_info_03.

Group	Tag	Source
	ADD4	PM_TASK.add_info_04.
ENCD	EXDT	PM_TASK.card_expire.
	SVCD	PM_TASK.service_code.
	TRC1	PM_TASK.card_track_1.
	PVKI	PM_PARMS.pvki or, if not set, is imported from additional parameters, the PM_ADD_PARMS table (PVKI parameter). This tag is exported if the "EXPORT_TRACK" pipe parameter is set.
	PVVC	PM_TASK.pvv. This tag is exported if the "EXPORT_TRACK" pipe parameter is set.
	IBMO	PM_TASK.offset_data. This tag is exported if the "EXPORT_TRACK" pipe parameter is set.
	CVC1	PM_TASK.cvc1. This tag is exported if the "EXPORT_TRACK" pipe parameter is set.
	CVC2	PM_TASK.cvc2. This tag is exported if the "EXPORT_TRACK" pipe parameter is set
	ICVV	PM_ADD_PARMS (ICVV parameter). This tag is exported if the "EXPORT_TRACK" pipe parameter is set.
	MST1	TRACK1__DDF. This tag is exported if the "EXPORT_TRACK" pipe parameter is set.
	MST2	TRACK2__DDF. This tag is exported if the "EXPORT_TRACK" pipe parameter is set
	PRST	PM_JOB.production_status.
EMBD	CRDN	PM_TASK.card_name.
	CMPN	PM_TASK.company_name.
PINM	Tags are filled in according to the condition PM_ADDRESS.address_code="PINM".	
	PIN1	PM_ADDRESS.address_line_1.
	PIN2	PM_ ADDRESS.address_line_2.

Group	Tag	Source
	PIN3	PM_ ADDRESS.address_line_3.
	PIN4	PM_ ADDRESS.address_line_4.
	ZIPC	PM_ADDRESS.address_zip.
	CNTR	PM_ADDRESS.country.
	CITY	PM_ADDRESS.city.
	LSTN	PM_ADDRESS.last_nam.
	FRSN	PM_ADDRESS.first_nam.
	DLVT	DELIVERY_TYPE.CODE. The DELIVERY_TYPE table is searched by the type ID specified in the PM_ADDRESS.DELIVERY_TYPE field.
CRDM		Tags are filled in the same way as for the PINM tag group according to the condition PM_ADDRESS.address_code="CRDM".

9.4 "PM File Response Import" Pipe

This section describes the mechanism for sending tag values from a response file from the PIN Management module to issuing module database table fields.

Group	Tag	Parameters of the "cinf.CPI_LOAD_CARD_DATA" procedure (according to the declared order)
ADTA	PAND	PMPAN.
ADTA	RLTN	Relation.
ADTA	AEDT/ PEDT	DateFrom (depending on the parameter PROD_DATE_FROM_PM).
ENCD	EXDT	CardExpire.
ADTA	CSNB	SeqvNumber (by default – "0").
EMBD	CRDN	CardName.
EMBD	CMPN	CompanyName.

Group	Tag	Parameters of the "cinf.CPI_LOAD_CARD_DATA" procedure (according to the declared order)
ENCD	TRC1	CardTrack1.
ENCD	PVVC	PMPVV.
ENCD	IBMO	OffsetData.
ENCD	CVC1	PMCVC1.
ENCD	CVC2	PMCVC2.
ENCD	ICVV	PMICVV.
ADTA	PIND	PMPIN.
ADTA	PRTP	ProductionType.
ADTA	ERRC	ProductionCode.
ADTA	PLSC	PlasticCode.
ENCD	SVCD	ServiceCode.
PINM	PIN1	Address1Line1.
PINM	PIN2	Address1Line2.
PINM	PIN3	Address1Line3.
PINM	PIN4	Address1Line4.
ADDI	ADD1	AddInfo01.
ADDI	ADD2	AddInfo02.
ADDI	ADD3	AddInfo03.
ADDI	ADD4	AddInfo04.
ADTA	ERRT	ErrMsgIn.

Group	Tag	Parameters of the "cinf.CPI_LOAD_CARD_DATA" procedure (according to the declared order)
ADTA	PN2D PWLE PWLL PWLN	AddData.

10 WAY4 Electric Personalisation Module Personalisation File Formats

Personalisation files are text files, ASCII encoding is used. The combination of symbols <CR><LF> is used as line delimiters.

Field formats:

- **n** – numeric field, contains digits only. Right justified, padded on the left with zeros up to the specified length.
- **ns** – numeric field, contains only digits and a symbol separating the fractional portion. A "." (period) is used as the delimiter. The number of positions in the fractional portion is fixed and specified in the field description. Right justified, padded on the left with spaces up to the specified length.
- **an** – symbol field that can contain any printable symbols, left justified, padded on the right with spaces up to the specified length
- **YYMM** – date where YY is the last two digits of the year (00 ... 99), MM is the sequence number of the month in the year (01 ... 12).
- **YYYYMMDD** – date where YYYY is the year (0000 ... 9999), MM is the sequence number of the month in the year (01 ... 12), DD is the sequence number of the day in the month (01 ... 31).
- **hex** – hexadecimal number.
- **Ðµncrypted** – encrypted field value.
- **b** – binary field, used only for line delimiter symbols.

Obligation to fill in fields with data:

- **M** – field must be filled in with data.
- **O** – field does not have to be filled in with data.
- **C** – obligation to fill in the field depends on certain conditions.
- **n/a** – field is not used.
- **n/e** – field is absent.

10.1 Magnetic Card Personalisation File Format

Magnetic card personalisation files consist of homogeneous strings. Each string contains data for personalising one card.

Personalisation string structure:

№	Field	Pos.	Length	Mand.	Format	Value
1.	Pan	1	19	M	n	First 16 digits are used for standard setup.

№	Field	Pos.	Length	Mand.	Format	Value
2.	Card Name	20	30	M	an	Card name for embossing on the card face.
3.	Track 1 Name	50	26	M	an	Card name for encoding on Track 1.
4.	Company Name	76	35	C	an	Company name for encoding on BUSINESS cards.
5.	Plastic Code	111	5	C	an	Unique plastic name (if embosser can use).
6.	Expiry date	116	4	M	YYMM	Expiration Date in ANSI format.
7.	Service Code	120	3	M	n	Card Service Code for encoding.
8.	Card Sequence Number	123	1	M	n	Card Sequence Number.
9.	PVV	124	4	C	n	ESM PVV for MasterCard or VISA PVV for VISA card.
10.	Key Index	128	1	C	n	PVKI.
11.	Offset	129	4	C	n	IBM 3624 Pin Offset Value.
12.	CVC 1	133	3	C	n	CVC1 for MasterCard or VISA CVV for VISACARD.
13.	CVC 2	136	3	C	n	CVC2 for indent printing on card.
14.	ICA Number	139	4	C	n	Bank ICA for MasterCard products.
15.	Production date	143	6	M	YYMMDD	Date in ANSI format for cards with "FROM – TO".
16.	CVC 3	149	3	C	n	CVC3 for MasterCard PayPass.
17.	Service Code 2	152	3	C	n	Card service code for encoding for MasterCard PayPass.
18.	Filler	155	2	M	an	Spaces.
19.	Add Info 1	157	100	O	an	Additional information issued by ADD_INFO_1 pipe parameter. Exported if pipe parameter EXTENDED_EMBS_FORMAT=Y.

№	Field	Pos.	Length	Mand.	Format	Value
20.	Add Info 2	257	100	O	an	Additional information issued by ADD_INFO_2 pipe parameter. Exported if pipe parameter EXTENDED_EMBS_FORMAT=Y.
21.	Add Info 3	357	100	O	an	Additional information issued by ADD_INFO_3 pipe parameter. Exported if pipe parameter EXTENDED_EMBS_FORMAT=Y.
22.	Add Info 4	457	100	O	an	Additional information issued by ADD_INFO_4 pipe parameter. Exported if pipe parameter EXTENDED_EMBS_FORMAT=Y.
23.	Delimiter	557	2	M	b	0x0D, 0x0A (CRLF).

10.2 Smart Card Personalisation File Format [WAY4 Electric Personalisation Module]

Smart Card personalisation files consist of homogeneous strings. Each string contains data for personalising one card (including all card applications).

Personalisation string structure:

№	Field	Pos.	Length	Mand.	Format	Value
1	Section 1 Code	1	4	M	an	"EMBD" value. Section 1 contains fields 1-10.
2	Section 1 Length	5	4	M	hex	"007A" value.
3	Pan	9	24	M	n	First 16 digits are used for standard setup.
4	Expiry date	33	6	M	YYMMDD	Expiration Date.
5	Effective date	39	6	M	YYMMDD	Effective Date.
6	CVC 2	45	4	M	n	CVC2 for indent printing on card.

№	Field	Pos.	Length	Mand.	Format	Value
7	Card Name	49	34	M	an	Card name for embossing on the card face.
8	Company Name	83	39	C	an	Company name for encoding on BUSINESS cards.
9	Plastic Code	122	5	C	an	Unique plastic name (if embosser can use).
10	ICA Number	127	4	C	n	Bank ICA for MasterCard products.
11	Section 2 Code	131	4	M	an	"ENCD" value. Section 2 contains fields 11-14.
12	Section 2 Length	135	4	M	hex	"0079" value.
13	Track 2 Data	139	42	M	an	Track 2 Data.
14	Track 1 Data	181	79	M	an	Track 1 Data.
15	Custom data 0	260		O	an	Passwords List for encoding method "PL".
16	Custom data 1	260		O	an	Additional information issued by ADD_INFO_1 pipe parameter. Exported if pipe parameter ADD_INFO_LEN_1 specified. Field format: <tag><tag N><length in hex, 4 symbols><data, ADD_INFO_LEN_1 symbols>.
17	Custom data 2			O	an	Additional information issued by ADD_INFO_2 pipe parameter. Exported if pipe parameter ADD_INFO_LEN_2 specified. Field format: <tag><tag N><length in hex, 4 symbols><data, ADD_INFO_LEN_2 symbols>.
18	Custom data 3			O	an	Additional information issued by ADD_INFO_3 pipe parameter. Exported if pipe parameter ADD_INFO_LEN_3 specified. Field format: <tag><tag N><length in hex, 4 symbols><data, ADD_INFO_LEN_3 symbols>.

№	Field	Pos.	Length	Mand.	Format	Value
19	Custom data 4			O	an	Additional information issued by ADD_INFO_4 pipe parameter. Exported if pipe parameter ADD_INFO_LEN_4 specified. Field format: <tag><tag N><length in hex, 4 symbols><data, ADD_INFO_LEN_4 symbols>.
20	Section 3 Code		4	M	an	"CHED" value. Section 3 contains fields 19-23
21	Section 3 Length		4	M	hex	Length of Section 3.
22	Subsection 3-1 Code		4	M	an	"EDTA" value. Subsection 3-1 contains fields 21-23.
23	Subsection 3-1 Length		4	M	hex	Subsection 3-1 Length.
24	Head Data for Chip Card			M	encrypted	Keys, EMV-tags, etc.
25	Const		8	M	an	"ADTA0000" value.
26	Section 4...n Code		4	M	an	"ADTA" value. Subsection 4...n contains fields 25-29. Repeated for each applet.
27	Section 4...n Length		4	M	hex	Length of Section 4...n.
28	Subsection 4...n-1 Code		4	M	an	"EDTA" value. Subsection 4...n-1 contains fields 27-29.
29	Subsection 4...n-1 Length		4	M	hex	Subsection 4...n-1 Length.
30	Applet Data for Chip Card			M	encrypted	EMV tags.
31	Delimiter		2	M	b	"0x0D", "0x0A" (CRLF).