Installation and Configuration Manual

ATM Controller

03.52.30

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Contents

The ATM controller is a Way4 NetServer software component.

The ATM controller is used to support interaction between an ATM network and a processing center. This interaction includes transmitting management commands to ATMs, receiving messages from ATMs and transmitting response codes, as well as other functions.

This document is intended for Way4 system administrators (banks or processing center employees) responsible for configuring the ATM network.

When working with this document, it is recommended to use the following resources from the OpenWay documentation series:

- DB Manager Manual
- Daily Procedures
- Acquiring Module
- Issuing Module
- ATM Monitoring
- Way4 Service Packages
- Configuration of Client Messages

The following notation is used in the document:

- Screen form field labels are shown in *italics*.
- Screen form button labels are shown in square brackets, such as [Approve].
- Sequences for selecting user menu items are shown using arrows as follows: "Issuing → Contracts Input & Update".
- Sequences for selecting system menu items are shown using arrows as follows: "Database => Change password".
- Key combinations in DB Manager are shown in angular brackets, for example <Ctrl>+<F3>.

Warnings about potentially hazardous situations or actions are marked with a special icon and highlighted.

Information about important features, additional options, or the best use of certain system functions is marked with a special icon and highlighted.

1 ATM controller dictionaries

Dictionaries are important sources of information used in Way4. Dictionaries are database tables containing one type of information; for example, dictionaries for ATM types, for ATM messages, etc.

Way4 uses two kinds of dictionaries:

- Custom – dictionaries whose content can be changed by users.
- Fixed – dictionaries whose content may only be changed by OpenWay representatives; in some cases dictionary data may be changed by bank or processing center specialists under the supervision of OpenWay representatives.

1.1 Customizing ATM controller dictionaries

1.1.1 ATM types dictionary

All types of ATMs interacting with Way4 must be registered in a special ATM types dictionary.

An ATM type is set during device configuration (see the section "Device Information" of the document "Acquiring Module").

The ATM type dictionary is accessed by selecting the following options in the user menu "Full → Configuration Setup → Merchant Device Setup → ATM Types".

ATM Types

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Code	Name	Brand	Model	Conf File	tgoing Cons	sette Account C	ash Account Cod	naining Account C	EMV Conf File	Transaction Attributes	Protocol Id
DEC4	DEC (4 Cassett	DEC		conf/atm/config/dec.cfg	Outgoing Cons	ATM Cassette	Cash Dispenser				Diebold 912
DIEBOLD106	Diebold 1064ix	DIEBOLD	1064ix	conf/atm/config/ibm_1.c	Outgoing Cons	ATM Cassette	Cash Dispenser				Diebold 912
DIEBOLD107	Diebold 1071ix	DIEBOLD	1071ix	conf/atm/config/ibm_1.c	Outgoing Cons	ATM Cassette	Cash Dispenser				Diebold 912
IBM4783	IBM 4783	IBM	4783	conf/atm/config/ibm_1.c	Outgoing Cons	ATM Cassette	Cash Dispenser				Diebold 912
IBM4785	IBM 4785	IBM	4785	conf/atm/config/ibm_1.c	Outgoing Cons	ATM Cassette	Cash Dispenser				Diebold 912
IBM4789	IBM 4789	IBM	4789	conf/atm/config/ibm_1.c	Outgoing Cons	ATM Cassette	Cash Dispenser				Diebold 912
NCR5070	NCR 5070	NCR3G	5070	conf/atm/ndc_conf/ndc	Outgoing Cons	ATM Cassette	Cash Dispenser				NDC+
NCR5070A	NCR 5070 Ange	NCR3G-AS	5070	conf/atm/ndc_conf/ndc	Outgoing Cons	ATM Cassette	Cash Dispenser				NDC+
NCR5084	NCR 5084	NCR3G	5084	conf/atm/ndc_conf/ndc	Outgoing Cons	ATM Cassette	Cash Dispenser			,ATM,TERM_TRACK,TERM_CC,	NDC+
NCR5084A	NCR 5084 Ange	NCR3G-AS	5084	conf/atm/ndc_conf/ndc	Outgoing Cons	ATM Cassette	Cash Dispenser				NDC+
NCR5305A	NCR 5305 Ange	NCR4G-AS	5305	conf/atm/ndc_conf/ndc	Outgoing Cons	ATM Cassette	Cash Dispenser				NDC+
NCR5670	NCR 5670	NCR	5670	conf/atm/ndc_conf/ndc	Outgoing Cons	ATM Cassette	Cash Dispenser				NDC+
NCR5674	NCR 5674	NCR	5674	conf/atm/ndc_conf/ndc	Outgoing Cons	ATM Cassette	Cash Dispenser				NDC+
NCR5684	NCR 5684	NCR	5684	conf/atm/ndc_conf/ndc	Outgoing Cons	ATM Cassette	Cash Dispenser				NDC+
NCR5840	NCR 5840 (Pers	NCR	5840	conf/atm/ndc_conf/ndc	Outgoing Cons	ATM Cassette	Cash Dispenser				NDC+

Ins | Del | Query | Dflt Oper | Dflt Hardware | Conditions | DevAttrs

Table containing ATM types registered in Way4

This table contains the following fields:

- *Code* – the code identifying the ATM type.
- *Name* – a description of the ATM type.
- *Brand* – brand name of the ATM manufacturer: "NCR", "BULL", "OLIVETTY", "NAUTILUS", ""WINCOR", "DIEBOLD".
- *Model* – the ATM model.
- *Conf File* – the name of the configuration file with its file path relative to the NetServer root directory.

- *Outgoing Console* – an ATM component that assists in ATM management.
- *Cassette Account Code*. *Cash Account Code*. *Remaining Account Code* – these fields define the names of account types from an ATM contract's Account Scheme that show the activity of funds when replenishing the ATM (see the section "Settlement scheme for ATM operations").
- *EMV Conf File* – device parameters; set in a "tag;value" list through semicolons; for example, using MPD and VPD tags, outgoing message attributes can be set (device type, card reading method, etc.) for processing in NetServer interface channels with Mastercard or Visa, respectively.
- *Transaction Attributes* – additional transaction parameters.
- *Protocol Id* – protocol name (see the section "ATM protocols dictionary").

To add a record to the grid form, click the [Ins] button; to delete a record, click [Del].

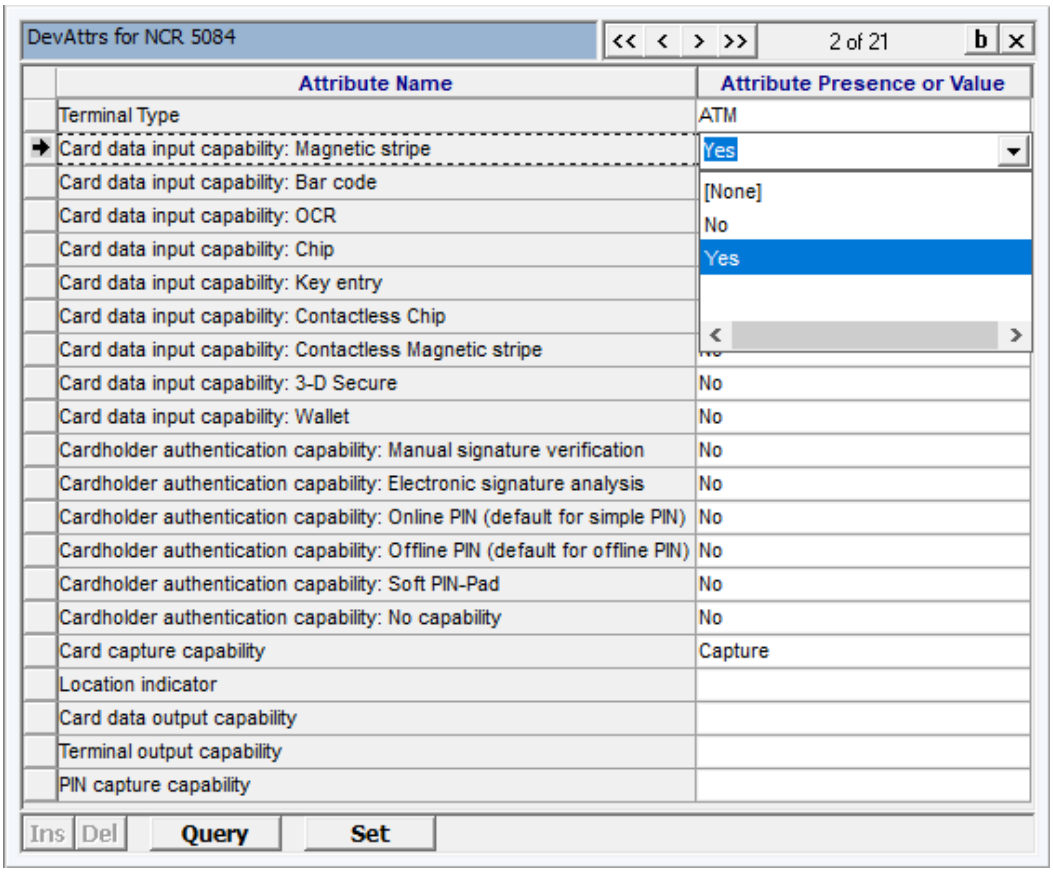
When deleting records from the "ATM Types" table that correspond to the type of ATM for which the contract device is registered in Way4 (see the section "Information about Device Contracts" of the document "Acquiring Module"), a warning will be displayed.

The [Dflt Oper] button makes it possible to set a list of default operations for the selected ATM type. The list is generated on the basis of the "ATM Operations" dictionary (see the section "ATM operations dictionary").

The [Dflt Hardware] button makes it possible to set a list of default components for the selected ATM type. Components from the "ATM Hardware Types" dictionary can be selected (see the section "ATM hardware types dictionary").

The [Conditions] button opens the "Conditions for <POS terminal name>" form. The form contains a list of conditions for specifying the allowed difference between the amounts of "Authorization Confirmation" and "Pre-Auth" transactions.

The [DevAttrs] button is used to specify a list of device attributes that will be recorded in transaction documents for this type of ATM (and can further be included in exported clearing information). The list is generated using the values selected in the "DevAttrs for <ATM type>" form:



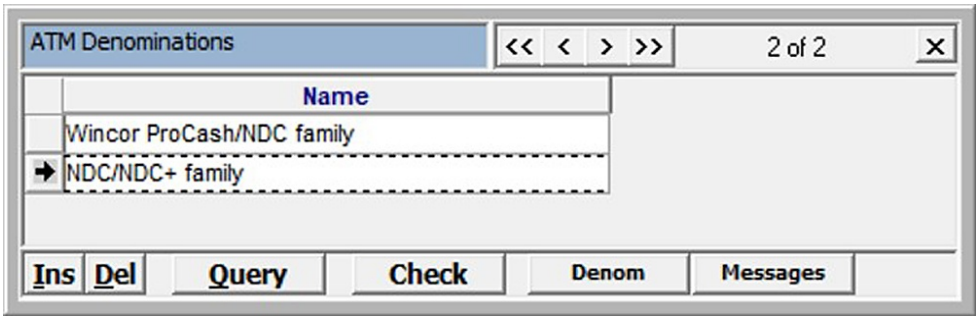
To approve the list of selected values, click [Set]. The list of codes for the corresponding attributes will be displayed in the *Transaction Attributes* field of the "ATM Types" form.

1.1.2 ATM denominations dictionary

Each ATM in Way4 is assigned a denomination type that defines the type of cassette that the ATM can use, the face value and currency of notes loaded into cassettes during replenishment, as well as some parameters for dispensing notes/coins.

The ATM denomination type can be set when configuring the device (see the section "Device Information" of the document "Acquiring Module").

The ATM denominations dictionary can be accessed by selecting the following: "Full → Configuration Setup → Merchant Device Setup → ATM Denominations".

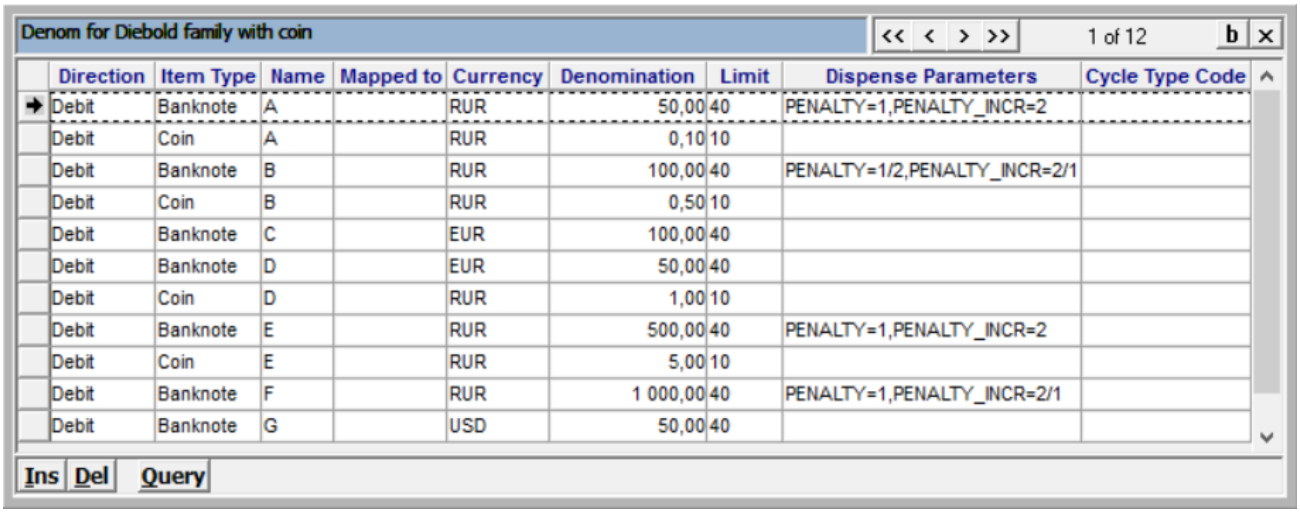


Denominations dictionary

To add a record to the grid form, click the [Ins] button; to delete a record, click [Del].

When attempting to delete a record from the "ATM Denominations" table that corresponds to the type of denomination used for the ATM registered in Way4 (see the section "Information about Device Contracts" of the document "Acquiring Module"), a warning will be displayed.

Each denomination type has certain parameters for loading note/coin cassettes and parameters for the cash dispensing algorithm. To access the table that contains the following parameters, select the desired denomination type in the "ATM Denominations" form and click the [Denom] button. The "Denom for <denomination type>" grid form will be displayed.



Denom for Diebold family with coin — << < > >> 1 of 12

Direction	Item Type	Name	Mapped to	Currency	Denomination	Limit	Dispense Parameters	Cycle Type Code
Debit	Banknote	A		RUR	50,00	40	PENALTY=1,PENALTY_INCR=2	
Debit	Coin	A		RUR	0,10	10		
Debit	Banknote	B		RUR	100,00	40	PENALTY=1/2,PENALTY_INCR=2/1	
Debit	Coin	B		RUR	0,50	10		
Debit	Banknote	C		EUR	100,00	40		
Debit	Banknote	D		EUR	50,00	40		
Debit	Coin	D		RUR	1,00	10		
Debit	Banknote	E		RUR	500,00	40	PENALTY=1,PENALTY_INCR=2	
Debit	Coin	E		RUR	5,00	10		
Debit	Banknote	F		RUR	1 000,00	40	PENALTY=1,PENALTY_INCR=2/1	
Debit	Banknote	G		USD	50,00	40		

Ins Del Query

Parameters for loading a cassette with notes

This table contains the following fields:

- *Direction* – cassette use according to the direction of funds ("Debit" – dispense, "Credit" – accept).
- *Item Type* – cassette type ("Banknote" or "Coin").
- *Name* – cassette name, depending on the ATM type, the numbers "1", "2", "3", "4", "5", "6", "7" are used for NDC/NDC+ protocols or upper-case letters of the Latin alphabet "A" – "H", "K" – "Z" (in alphabetical order) for Diebold protocols.
- *Mapped to* – link to the name of the cassette for cash acceptance (for example, rejected notes from the current cassette).
- *Currency* – drop-down list for selecting the name of the currency for notes loaded to the cassette.
- *Denomination* – denomination of notes/coins loaded in the cassette.
- *Limit* – maximum number of notes/coins (from 0 to 99) dispensed from a cassette during one operation.
- *Dispense Parameters* – rule for compiling a set of notes/coins for dispensing; set using the "PENALTY" and "PENALTY_INCR" tags (separated by a comma), for example:
  PENALTY=1/4/3,PENALTY_INCR=0/3/1
  where:
- PENALTY is the penalty for dispensing notes/coins from the cassette; 1/4/3 is the value of the penalty for the first, second and third algorithms, respectively, for compiling a set of notes/coins.

- PENALTY_INCR – increases the penalty for each subsequent note/coin dispensed from the cassette; 0/3/1 is the value for increasing the penalty for the first, second and third algorithms, respectively, for compiling a set of notes/coins.

  Integers from 0 to 99 (inclusively) can be specified as penalty values. For efficiency, it is recommended to use values in the range from 0 to 30.

> The algorithm for compiling notes/coins depending on the menu item selected at the ATM is determined in the controller configuration (see the section "Request processing configuration file") using the DispenseAlgorithm parameter, for example, as follows: <PARAMETER Name="DispenseAlgorithm" Value="1"/>.

Notes are selected from ATM cassettes when dispensing cash in such a way as to minimize the conditional penalty for dispensing a certain set of notes with consideration of limits.
The value of the conditional penalty *P* is calculated according to the following formula:

$$P = \sum_{i=1}^{N} (n_i \cdot CST\_FEE_i + \frac{n_i \cdot (n_i - 1)}{2} \cdot CST\_FEE\_INCREASE_i),$$

where:

- *N* is the number of cassettes from which notes are selected.
- n_i is the number of notes selected from the *i*-th cassette.
- CST_FEE_i is the penalty for dispensing notes from the *i*-th cassette (value of the PENALTY tag for the selected algorithm).
- $CST\_FEE\_INCREASE_i$ is the increase in the penalty for each subsequent note dispensed from the *i*-th cassette (value of the PENALTY_INCR tag for the selected algorithm).

To check whether the data is filled in correctly when adding or editing entries in the "Denom for <denomination type>" form, select the denomination type in the "ATM Denominations" form and click [Check]. Entries that meet the following conditions are considered valid:

- the *Name*, *Direction*, *Item Type*, *Currency*, and *Denomination* fields are not empty.
- the *Dispense Parameters* field does not contain the ";" character (semicolon).

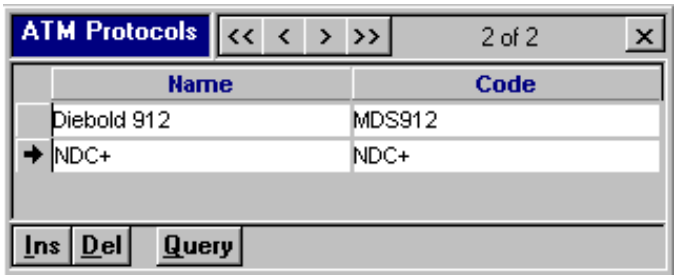
The check ends with the corresponding message. To get more information about the verification results, use the [Messages] button.

1.2 Fixed dictionaries

1.2.1 ATM protocols dictionary

ATM protocols regulate message format and rules for transmitting information between an ATM and a processing center.

The ATM protocols dictionary is contained in the "ATM Protocols" table.



Types of protocols for connecting ATMs to the processing center

This table contains the following fields:

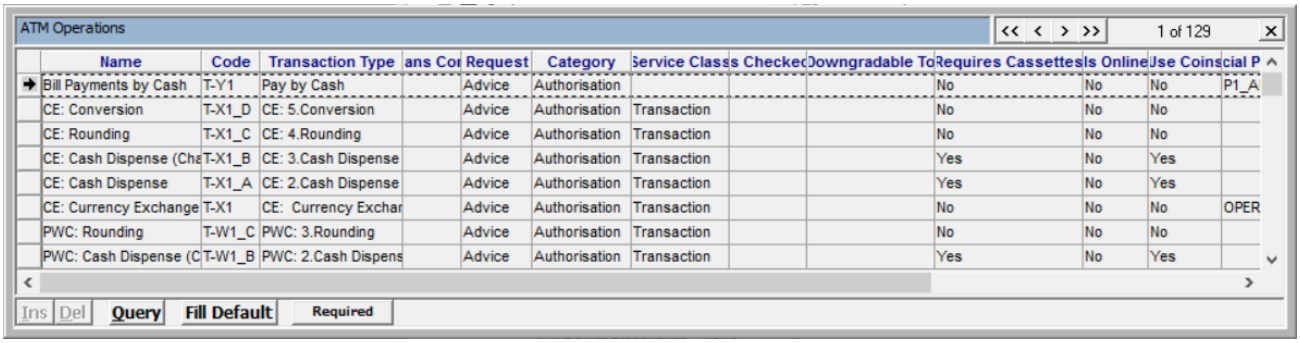
- *Name* – the name of the protocol
- *Code* – the protocol code indicated within the system

Currently, Way4 supports Diebold 912 ("MDS912") and NDC/NDC+ ("NDC+") protocols.

1.2.2 ATM operations dictionary

Every ATM contract in the system is registered in accordance with an aggregate of operations that can be accomplished by the given device, as well as a set of hardware components (see the section "ATM hardware types dictionary") necessary for those operations.

The ATM operations dictionary is contained in the "ATM Operations" table.



List of ATM operations

This table contains the following fields:

- *Name* – transaction name
- *Code* – transaction code
- *Transaction Type* – the type of transaction
- *Trans Cond* – transaction conditions
- *Request* – category of document generated for a message about an operation (request/ notification)
- *Category* – financial/authorization message category
- *Service Class* – the bank's transaction classification; the value of this parameter determines the way a document will be processed in Way4; if this field is empty, it means the default value *Service Class* = "Transaction" is used

- *Is Checked* – field with list of value options that indicate whether it is necessary to subject the service card to control actions (value "Yes") when fulfilling service operations (Replenishment, End of Day, ATM Service and others)
- *Downgradable To* – field indicating the name of the operation designated to be executed in the event that the given operation cannot be executed
- *Requires Cassettes* – flag indicating the use of cassettes when performing an operation
- I*s Online* – indicates if an operation is performed online (whether a request to the issuer is made when performing the operation)
- *Use Coins* – flag indicating whether coins can be used in performing the operation
- *Special Parameters* – additional parameters for an operation; set in a comma-delimited "tag=value" list

The list of ATM operations is contained in the section "ATM Operations" of the document "ATM Monitoring".

The [Required] button is used to call up the "Required for <name of operation>" grid form, which contains a list of ATM components (see the section "ATM hardware types dictionary") necessary for fulfilling a given operation.

When the [Fill Default] button is clicked, the "ATM Operations" table is filled with default values.

1.2.3 ATM hardware types dictionary

Every ATM contract in the system is registered in accordance with certain hardware components necessary for the ATM to fulfill its operations (see the section "ATM operations dictionary").

The ATM Hardware Types dictionary is contained in the "ATM Hardware Types" table.

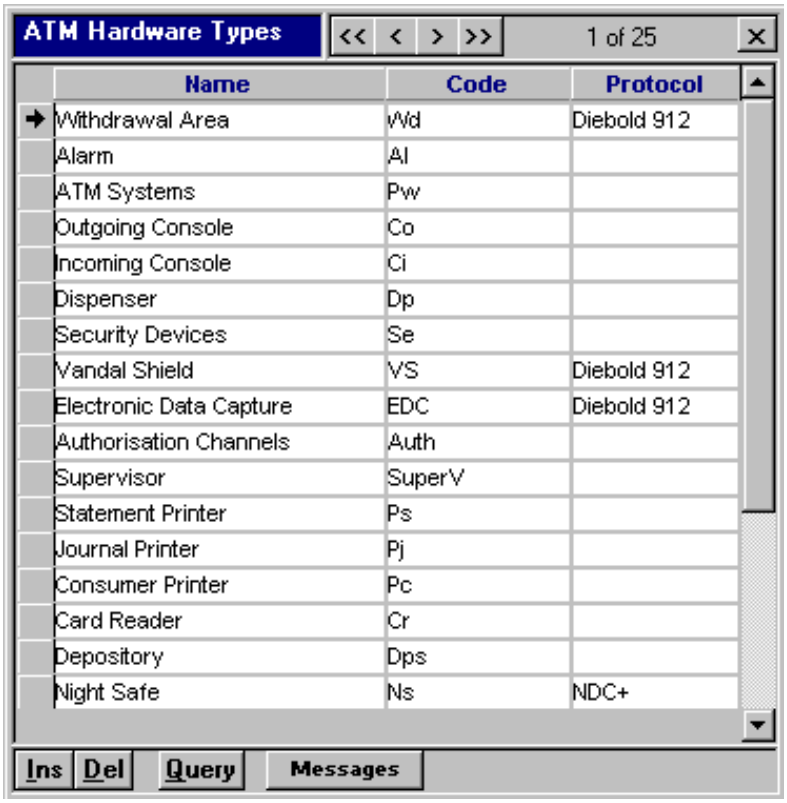


Table showing ATM hardware components

This table contains the following fields:

- *Name* – the name of the component
- *Code* – the code of the component in the system
- *Protocol* – the type of protocol allowing for the use of the given component (this field is left blank when using a component that is compatible with all registered protocol types)

The [Messages] button is used to pull up the "Messages for <name of component>" grid form, which contains a list of messages formed by the system when working with the given component (see the section "ATM message types dictionary").

The list of ATM components may be found in the paragraph "ATM Hardware" in the document "ATM Monitoring".

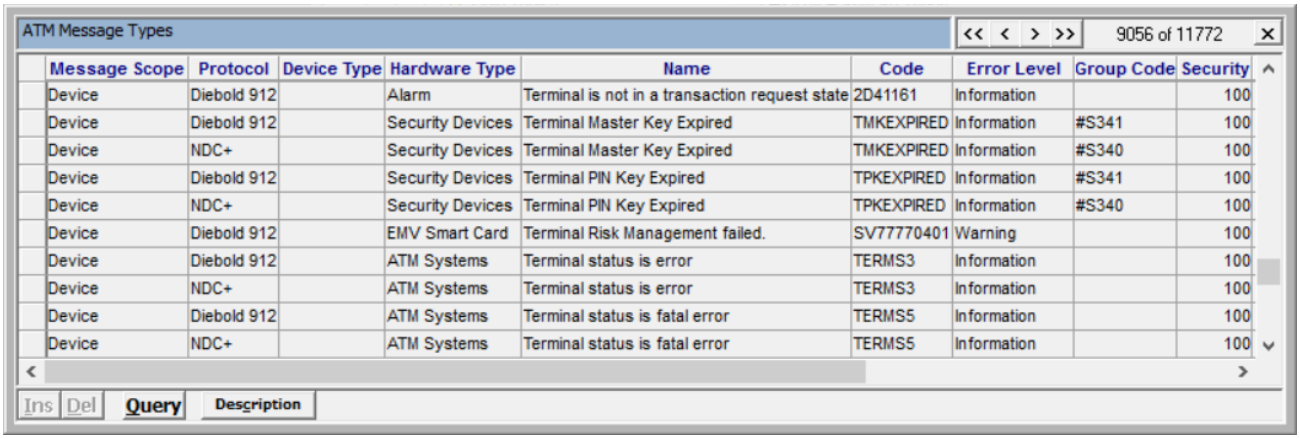
1.2.4 ATM message types dictionary

During the ATM's operation, certain status messages may be generated in Way4.

The Way4 host may send management messages (commands) to the controller, ATM or ATM group. For example, through the management console (see the section "ATM Status" of the document "ATM Monitoring") it is possible to install an ATM configuration or load controller configuration files.

ATMs, in turn, send messages about the results of executing host commands, and messages with information about the state of their devices. As a result, several messages for the corresponding ATM are recorded in the Way4 database; each message belonging to a certain ATM component.

The dictionary of possible ATM message types is contained in the "ATM Message Types" table.


ATM Message Types

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Message Scope	Protocol	Device Type	Hardware Type	Name	Code	Error Level	Group Code	Security
Device	Diebold 912		Alarm	Terminal is not in a transaction request state	2D41161	Information		100
Device	Diebold 912		Security Devices	Terminal Master Key Expired	TMKEXPIRED	Information	#S341	100
Device	NDC+		Security Devices	Terminal Master Key Expired	TMKEXPIRED	Information	#S340	100
Device	Diebold 912		Security Devices	Terminal PIN Key Expired	TPKEXPIRED	Information	#S341	100
Device	NDC+		Security Devices	Terminal PIN Key Expired	TPKEXPIRED	Information	#S340	100
Device	Diebold 912		EMV Smart Card	Terminal Risk Management failed.	SV77770401	Warning		100
Device	Diebold 912		ATM Systems	Terminal status is error	TERMS3	Information		100
Device	NDC+		ATM Systems	Terminal status is error	TERMS3	Information		100
Device	Diebold 912		ATM Systems	Terminal status is fatal error	TERMS5	Information		100
Device	NDC+		ATM Systems	Terminal status is fatal error	TERMS5	Information		100

Ins Del Query Description

Messages generated during ATM operation

This table contains the following fields:

- *Message Scope* – message recipient/source:
- "Device" – ATM
- "Device Group" – ATM group
- "Physical Channel" – controller
- *Protocol* – protocol name (see the section "ATM protocols dictionary")
- *Device Type* – ATM types registered in Way4, this field is used to provide message details according to the device type; for example, a message with various values in the field *Error Level* may appear for different kinds of ATMs when fulfilling the same operation (with the same value in the *Code* field).
- *Hardware Type* – the name of the ATM hardware component (see the section "ATM hardware types dictionary") that was running when the message was generated; only specified for *Message Scope* = "Device".
- *Name* – a description of the message
- *Code* – message code
- *Error Level* – the error level to which the ATM hardware component is relegated upon receiving the given message; depending on the error level, the current status of the component and ATM may change as follows:

- "OK" (code "0") – hardware component status is "OK"; ATM status is "OK" if there no errors on other hardware and there haven't been any; ATM status is "Information" if there are no errors on other hardware , but there was an error on this hardware; ATM status is "Information", "Warning" or "Error" depending on the status of other hardware.
- "Information" (code "1") – hardware status and ATM status does not change.
- "Warning" (code "2") – hardware status is "Warning"; ATM status is "Information".
- "Error" (code "3") – hardware status is "Error"; ATM status is "Warning".
- "Not Configured" (code "4") – hardware status is "Not Configured"; ATM status is "Information".
- "Unavailable" (code "6") – hardware status is "Unavailable"; ATM status is "Information".
- "Fatal Error" (code "5") – hardware status is "Fatal Error"; ATM status is "Error".
- *Group Code* – field used to enter instructions to the ATM that are executed when the given message is received (instruction format: #<operation code> or a simplified name); for example:
- DI01=1113 – set cassette status, where DI01 is the dispenser code according to the "ATM Hardware Types" dictionary, 1, 1, 1, 3 are cassette status codes (see the codes in the description of the Error Level field).
- #S340 – send keys to the ATM (where S340 is the code of the corresponding operation in the "ATM Operations" dictionary).
- STARTUP – execute a sequence of commands; take out of service, request configuration and counter information, put into service.
- *Security* – the access level granted to the processing center's operator for administrative control of the ATM controller. The access level for user groups can be queried through the *Security Level* field in the form "Constants for <name of group>", which can be invoked by clicking on the [Constants] button in the "User Groups and Users – View" grid form (Full → DB Administrator Utilities → Users & Grants → User Groups and Users – View).

The [Description] button invokes the form "Description for <message description>", which contains further details on the message.

2 Description and configuration of a new ATM

2.1 Setting up an ATM contract and its device

A description of ATM contract may be found in the section "Information about Device Contracts" of the document "Acquiring Module".

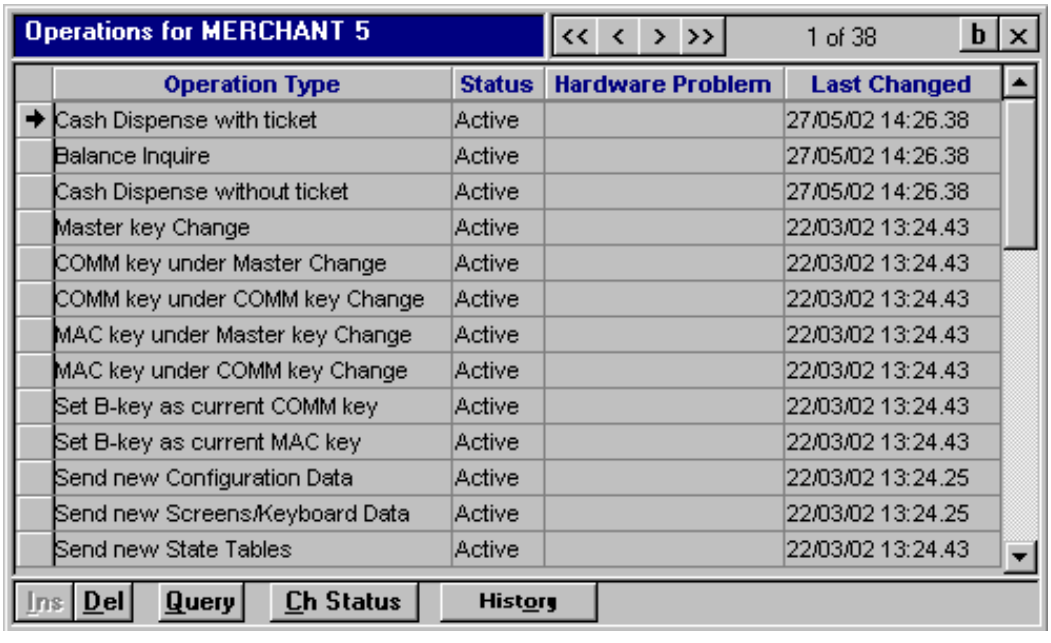
Parameters of devices for ATM contracts are described in the section "Device Information" of the document "Acquiring Module".

2.1.1 Setting up the executable range of ATM operations

The executable range of ATM operations is set up through the grid form "Operations for <name of ATM>".

The form can be invoked on the screen in two ways:

- After selecting from the user menu "Acquiring → ATM Controller → ATM Device Management", select the desired ATM and click on the [Operations] button in the form "ATM Device Management".
- After selecting from the user menu "Acquiring → Acquiring Contracts", select the desired account contact and click the [Devices] button in the account contract form, then select the desired ATM. Then, click on the [ATM] button in the device contract and click [Operations] in the device configuration form.



List of executable ATM operations

An operation can be deleted from the list by selecting the desired row in the table and clicking on the [Del] button.

The execution of any given operation can be suppressed by changing its status after clicking on the [Ch Status] button. Clicking on this button will change the status of executable operations from the value "Active" to value "Closed".

The *Last Changed* field contains the date and time of the last change to the operation's status.

To restore the list of allowed operations (according to the "ATM Operations" dictionary) after rows have been deleted from the table, click the [Setup] button and choose the [Check and Fill] context menu item in the "ATM Device Management" form or the "ATM for <device identifier>" device configuration form.

2.1.2 Configuring ATM hardware components

ATM components can be configured through the grid form "Hardware for <name of ATM>".

The form can be invoked on the screen in two ways:

- After selecting from the user menu "Acquiring → ATM Controller → ATM Device Management", select the desired ATM and click on the [Hardware] button in the form "ATM Device Management".
- After selecting from the user menu "Acquiring → Acquiring Contracts", select the desired account contact and click the [Devices] button in the account contract form, then select the desired ATM. Then, click on the [ATM] button in the device contract and click [Hardware] in the device configuration form.

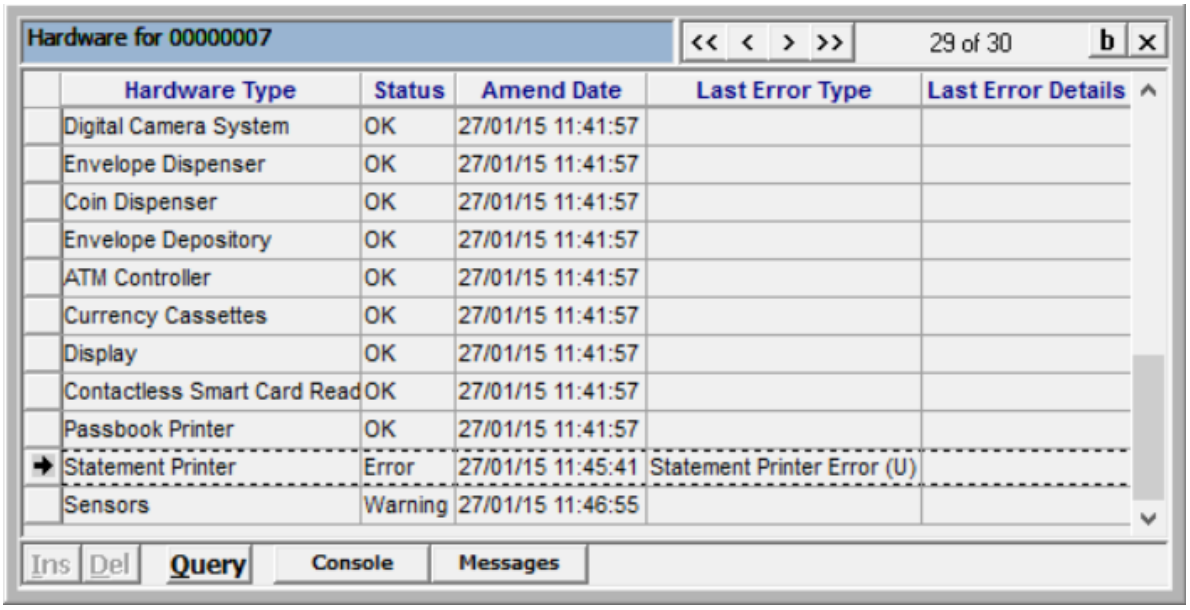


Table for configuration of ATM components

The list of ATM components available for configuration is generated as follows:

- Based on the list of default components for this ATM type (see the section "ATM types dictionary").

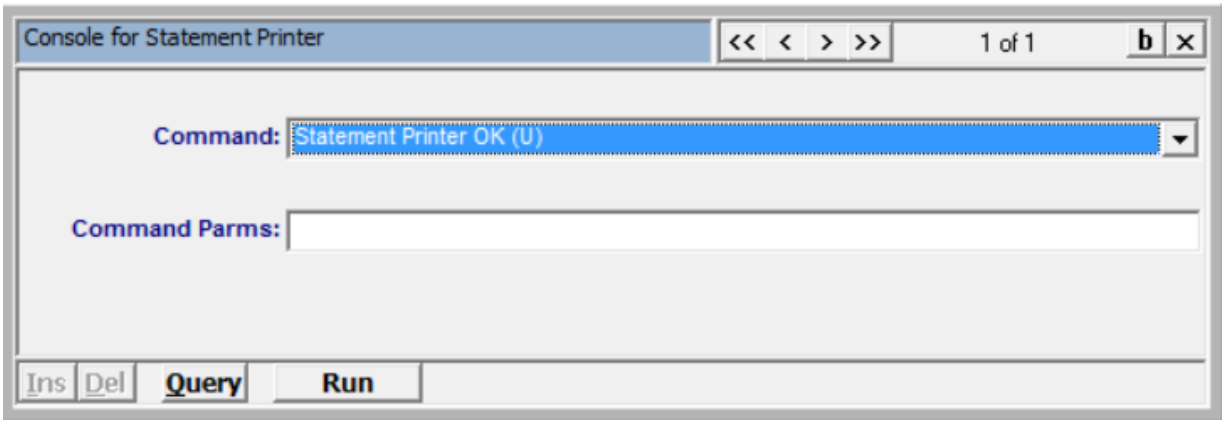
- If default components are not specified for this ATM type, the list is generated on the basis of the entire "ATM Hardware Types" dictionary (see the section "ATM hardware types dictionary").
  In this case components that are missing in the ATM must be disabled by setting their status to "Not Configured" (the procedure for changing components status is described below).

This list is filled in with records relevant for the current configuration by selecting the [Check and Fill] context menu item of the [Setup] button in the "ATM Device Management" form or the "ATM for <device ID>" form.

The *Amend Date* field of the "Hardware for <ATM name>" grid form contains the date and time the component's status was last changed. In the event of an error, the *Last Error Type* and *Last Error Details* fields contain the error type and text, respectively.

The ATM component is ready to function properly if the status of the component is set to "OK". A component can also function in the "Warning" status, but this state indicates that problems in its operation are possible.

To change the status of a component, select the desired row in the table and click on the [Console] button. By this command the screen will display the form "Console for <name of component>". Select in the *Command* field of the form the desired control command, for example, "<name of component> OK", and click on the [Run] button.

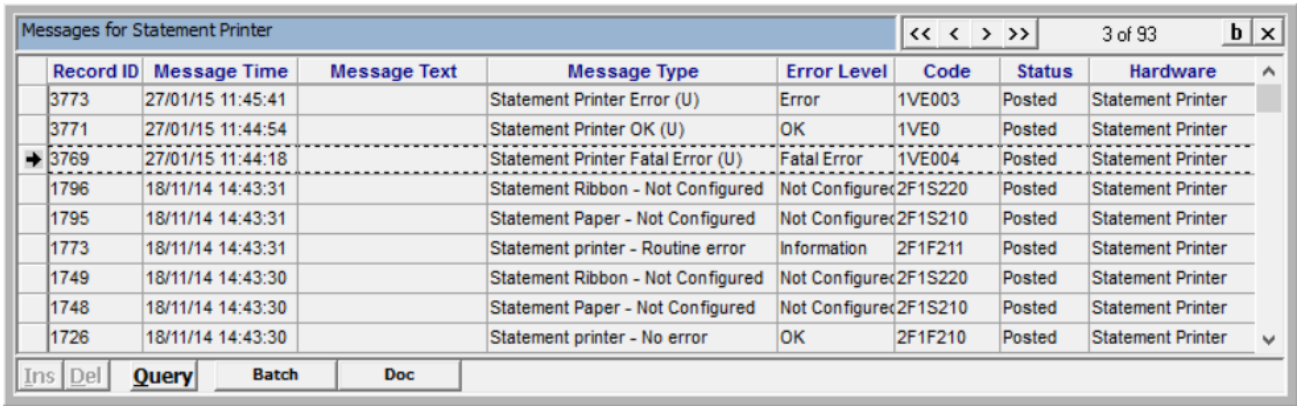


Form for entering ATM component management commands

The "OK" status can be set for all components at once by selecting the [Set to OK] context menu item of the [Setup] button in the "ATM Device Management" form or the "ATM for <device ID>" form.

To deactivate a component selected in the "Hardware for <ATM name>" form, select the management command "<component name> Not Configured" in the *Command* field of the "Console for <component name>" form and click the [Run] button. For more information about ATM management commands, see the section "ATM management commands" of the document "ATM Monitoring".

Information on the history of messages related to this component can be found in the grid form "Messages for <name of component>". The form is invoked from the table "Hardware for <name of ATM>" after choosing the desired row and clicking on the [Messages] button.



Grid form containing system messages generated during changes in ATM component status

2.1.3 Managing ATM state

To show information about an ATM's current state, click on the [State] button in the "ATM Device Management" form or in the "ATM for <device ID>" device configuration form. The following information will be shown:

- *Status* – current status of the ATM ("OK", "Information", "Warning", "Error", "Not Configured", and "Fatal Error").
- *Online* – indicates if an ATM is available online ("Yes"/"No").
- *Online Service* – communication service code identifying the connection between the controller and the ATM.

To switch an ATM to an operational state ("OK" status), select the [Set to OK] context menu item of the [Setup] button in the "ATM Device Management" form or in the "ATM for <device ID>" device configuration form. All components of this device will be switched to the "OK" status.

To temporarily suspend operation of the ATM, when Way4 ignores all requests and messages received from a device, select the [Set to Repair] context menu item of the [Setup] button. The ATM status will be changed to "Not Configured". Operation of the ATM will be resumed when the status is changed to "OK" (as described above).

2.1.4 Specifying encryption keys

Encryption keys are created by a security officer with the help of encryption equipment and include a fixed number of digits.

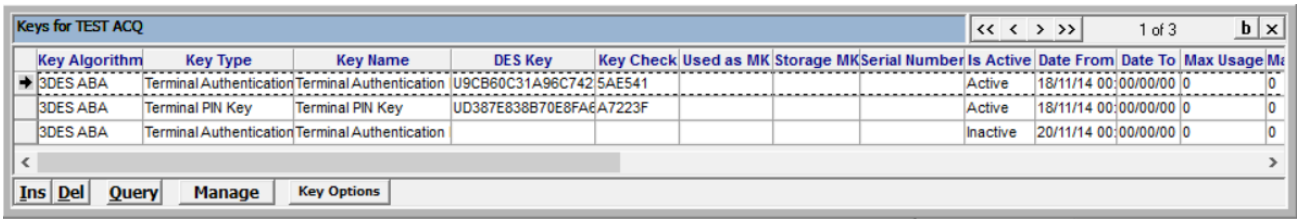
Encryption keys are only stored in the system and in the ATM in a state where each key is encrypted by other encryption keys. A check value is used for controlling the key's accuracy. This value is defined only by the value of the key and does not depend on how it is encrypted.

Specification of encryption keys is accomplished through the form "Keys for <name of ATM>".

The form can be invoked on the screen in two ways:

- After selecting from the user menu "Acquiring → ATM Controller → ATM Device Management", select the desired ATM and click on the [Keys] button in the form "ATM Device Management".

- After selecting from the user menu "Acquiring → Acquiring Contracts", select the desired account contact and click the [Devices] button in the account contract form, then select the desired ATM. Then, click on the [Keys] button in the device contract.



Form for the specification of ATM encryption keys

This form contains the following fields:

- *Key Algorithm* – a selection from a list in order to indicate an encryption algorithm the key will be used for.
- *Key Type* – the type of encryption key indicated through selecting from a list formed on the basis of the "PM Key Types" system dictionary.
- *Key Name* – the name of an encryption key.
- *DES Key* – the field for entering the value of an encryption key encrypted with the Local Master Key of the HSM (Host Security Module).
- *Key Check* – the check value of an encryption key.
- *Used as MK* – this field determines whether the key will be used as the master key.
- *Storage MK* – drop-down list to select the master key used to encrypt this key when transmitting it to the terminal; the list consists of keys with the "Yes" value in the *Used as MK* field.
- *Serial Number* – the ID of a key determining its value among other keys of the same type.
- *Is Active* – this field indicates an encryption key's availability; possible values:
- "Active" – active key (used in encryption).
- "Inactive" – inactive key (not used in encryption).
- "Locked" – key that has been locked because the number of attempts to use it incorrectly was exceeded (not used in encryption).
- "BackUp" – backup key (for RKL Diebold keys).
- *Date From* – the field for entering the initial date of the period of time, within which the key in question remains available for use.
- *Date To* – the field for entering the final date of the period of time, within which the key in question remains available for use.
- *Max Usage* – the field for entering a number determining how many times the encryption key in question may be used.
- *Max Wrong Attempts* – number of attempts to incorrectly use the key after which the key is locked.
- *Wrong Attempts Threshold* – number of wrong attempts to incorrectly use the key after which an alarm goes off.
- *Current Usage* – the field containing the current value of the use counter of an encryption key.
- *Wrong Attempts* – counter of attempts to incorrectly use the key.
- *Storage Form* – form for storing the key in the database.
- *Key Code* – Key Type value shown in the form specified in the Storage Form field.

- *Parent Key* – parent key.
- *Add Data* – additional data.

The [Manage] button of the "Keys for <ATM name>" form opens the "DES Management Mode" form used for generating keys.

The [Key Options] button in the "Keys for <ATM name>" form opens the "Key Options for Terminal PIN Key" form, used to manage additional key parameters.

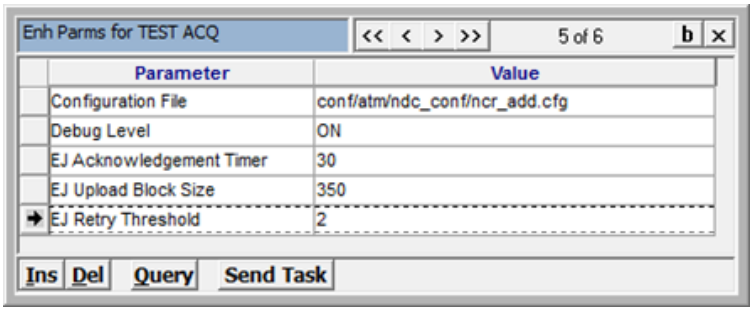
To add a record to this table, click the [Ins] button; to delete a record, click [Delete]

2.1.5 Enabling MAC signature mode

To enable MAC (Message Authentication Code) mode, set the value "Mandatory" in the field *Mac Status* in the ""ATM Device Management" form or "ATM for <ATM name>" form. If the value in this field is set to "None", this mode is not enabled.

2.1.6 Additional device parameters

The list of device configuration parameters can be expanded by specifying additional parameters in the "Enh Parms for <ATM name>" grid form. This form is opened by clicking the [Enh Parms] button in the "ATM for <ATM name>" form or "ATM Device Management" form.



Additional device parameters

The form contains the following fields:

- *Parameter* – name of an available parameter.
- *Value* – parameter value.

For example, in the figure above, the "Configuration File" parameter is specified. This parameter determines the path to the configuration file (relative to the NetServer root directory) that will be loaded to the ATM in addition to the file set for this ATM type.

The [Send Task] button is not used for ATM parameters.

2.2 Configuring the ATM connection with the Way4 host

An ATM interacts with the Way4 host via TCP connections transmitting messages in both directions. Each TCP connection is unique and is uniquely identified by a pair of sockets (a set of four elements defining the two end points of the connection: local IP address of the terminal, local TCP port, remote IP address of the host and remote TCP port) in a network.

To ensure the TCP connection is unique, the ATM must use dynamically allocated ports; that is, ports with a short lifecycle.

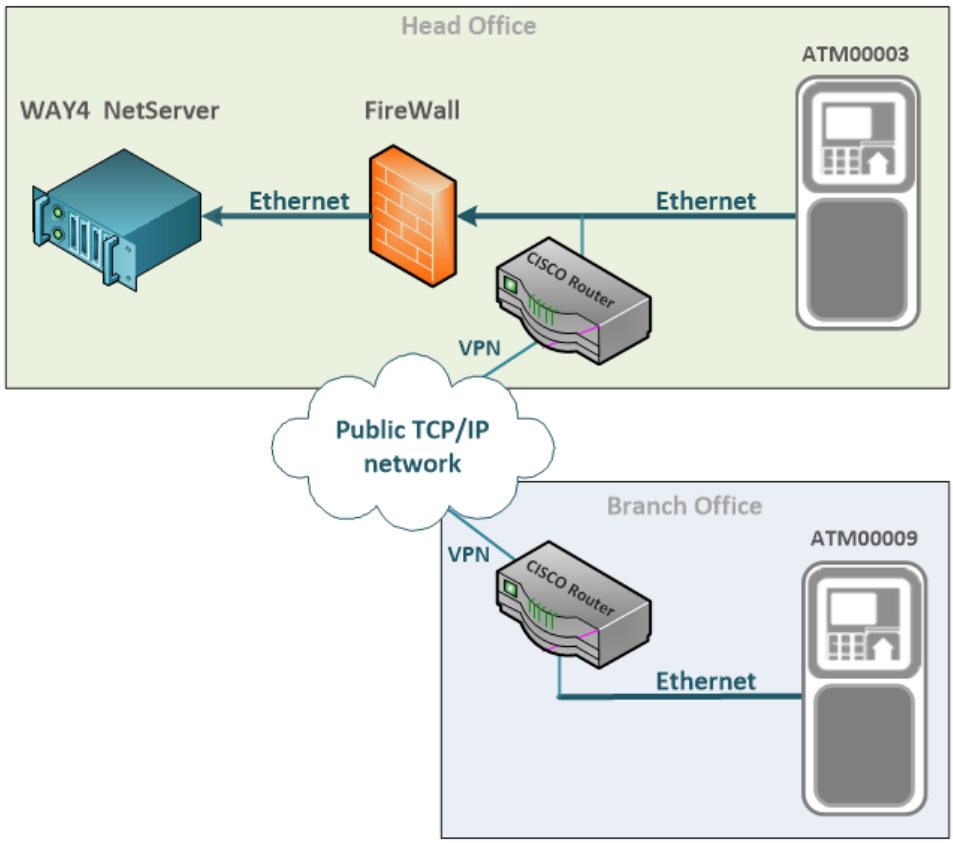
To get up-to-date information about the state of a connection, a keep-alive timer must be set up.

When establishing a connection with NetServer, the ATM connects to a channel whose IP address and port are defined in the device's software settings. When a connection is established, the controller checks the Way4 database for a device with an IP address corresponding to this ATM (see the section "Device Information" of the document "Acquiring Module").

To work with the ATM, the controller generates a special communication service code consisting of the NetServer code and the name of the channel on which the connection is established. After connecting, this code is saved in the Way4 database and is shown in the *Online Service* field of the form with the device's state ("Acquiring → ATM Controller → ATM Device Management", [State] button).

If connection problems occur, the ATM can dynamically switch between controllers (for example, between main and backup). In this case, a new communication service code is set for the ATM and recorded in the Way4 database for the corresponding device.

The figure shows the scheme for connecting ATMs to NetServer over leased lines using the TCP/IP protocol.



ATMs connected to NetServer on dedicated lines using the TCP/IP protocol

2.3 Preparing and loading ATM configurations

2.3.1 Preparing configuration files

ATM configuration files may contain the following information:

- States – components of the configuration file that define the sequence of operations executed by the ATM depending on user actions, in the event of equipment or service failure or other events.
- Screens – components of the configuration file that define the external appearance of the ATM screen in each possible step of an operation being executed (the screen menu, messages to the user, and others).
- FIT form – components of the configuration file that are used to determine the affiliation of the bank card to a certain payment system.
- Configuration parameters, various additional utilities, the ATM's logical number, the values of different time intervals and delays.
- Extended configuration parameters, various additional utilities, the ATM's logical number, the values of different time intervals and delays (for ATMs running on NDC/NDC+ protocol series).
- Templates for entering data to the ATM screen (for ATMs running on Diebold series protocols).
- Configuration data for reserve screen templates, used during operations (for ATMs running on NDC/NDC+ series protocols).
- Configuration data for smart card operations.

- Script commands to the ATM controller:
- #S331 – change the ATM's master key, the new key is sent to the ATM encrypted under the current master key
- #S332 – change the ATM's PIN-key, the new key is sent to the ATM encrypted under the current master key
- #S333 – change the ATM's PIN-key, the new key is sent to the ATM encrypted under the current PIN-key
- #S335 – change the ATM's MAC-key, the new key is sent to the ATM encrypted under the current master key
- #S336 – change the ATM's MAC-key, the new key is sent to the ATM encrypted under the current PIN-key
- #S340 – change the ATM's MAC-key and PIN-key, the new keys are sent to the ATM encrypted under the current master key
- #S341 – change the ATM's MAC-key and PIN-key and sets up the current value of the Configuration ID, the new keys are sent to the ATM encrypted under the current master key
- #S334 – setting up the ATM's PIN-key from the cell containing a key, directly placed in the ATM by security officers
- #S337 – setting up the ATM's MAC-key from the cell containing a key, directly placed in the ATM by security officers
- #S322 – operation for setting the time and date in the ATM

The configuration file may contain several variants of ATM configuration, which are distinguished from one another by their configuration ID.

The NetServer directory containing configuration files for each type of ATM as well as the file names themselves must correspond to the values in the *Configuration File* field in the ATM Types dictionary (see the section "ATM types dictionary").

An ATM configuration file has the following format:

Position	Value	Parameter
1	1	ATM screen template
	2	ATM basic state
	3	Configuration parameters, timing delay values
	5	Financial institution tables
	A	Additional configuration parameters (for "NDC/NDC+" protocols)
	B	Parameter (for "NDC/NDC+" protocols) determining the message fields for which Message Authentication Code (MAC) will be used

Position	Value	Parameter
	G	Parameter (for "NDC/NDC+" protocols) determining rewriting of system templates for ATM screens
	*	Instructions to the ATM controller
2	1/0	Flag indicating use of a Message Authentication Code (MAC) for the corresponding line in the configuration file; "1" – MAC is used, "0" – MAC is not used
3-6	Number from 0000 to 9999	Configuration ID
7-...	Characters according to the device specification	Data on basic states, screen templates, financial institutions, etc.

Presented below is a fragment of the configuration file:

```
100002001   cfJGTEMPORARILY OFF-LINE
210000205   J055000055055000000000000
300000      0000000003203000116000_000_006075070020807509072
510000000   000103098004255255000000132000000000003113800
@10000001   C04ZZZZ5ZZ9699
A00000      000_006075070020807509072
B10000      000000000000000000000000
G00000D0010 034
*00000#S332
```

2.3.2 Sending a configuration to an ATM

An ATM configuration is updated through the management console by executing the "Send New Configuration to ATM" management command in the ATM controller (see the section "Commands for loading configuration data" of the document "ATM Monitoring").

2.3.3 Sending a configuration to all ATMs

The configuration of all ATMs registered in Way4 can be updated through the ATM group management console using the command "Send new Configuration to GROUP" (see the section "Commands for loading configuration data" of the document "ATM Monitoring"). The configuration of a specific ATM will be loaded according to the Configuration ID value specified in the *Configuration* field for the corresponding ATM (see the section "Device Information" of the document "Acquiring Module").

3 Cash dispensation

3.1 Cash dispensation: ATM setup

In order to dispense cash, the ATM must support the following options:

- PIN entry by the cardholder.
- Selection of the language in which the ATM screen will present information; this can be done automatically by the ATM, for example, depending on the card number.
- Filtering by financial institution.
- Selection of operations.
- Selection of currency for the operation (for multi-currency ATMs).
- Selection of account type by the cardholder (for holders of cards issued by other banks).
- Entry of operation amount.
- Request to print a receipt.
- Reaction to response from the processing center (for example, that the given operation is not authorized for the cardholder).

Upon executing the operation, the ATM transmits the following information to the processing center:

- Bank card number
- Account type selected by the cardholder (for holders of cards issued by other banks)
- Amount of the operation
- Currency of the operation
- Language in which the receipt from the executed operation is printed

3.2 Cash dispensation: Configuring the receipt

The receipt indicating the result of the executed operation can contain fields that correspond to the data received from the processing center:

- Bank name and address
- ATM number
- Date and time of operation
- Abbreviated bank card number
- Unique identification number for the operation
- Authorization code
- Amount and currency of the operation
- Amount and currency of the acquiring fee (if such is determined)
- Card account balance (when there is one)

These fields should be configured in the receipt template (see the section "ATM receipt and screen format description language").

4 ATM cash acceptance

Way4 facilitates cash acceptance operations through ATM cash acceptor devices, such as the Bunch Note Acceptor and the Cash Acceptor. This functionality is provided as a separate Way4 module and is made available through special permissions from OpenWay. While executing this operation, the cash acceptor device checks the authenticity of notes as well as note currency and denomination.

During this operation, the cardholder indicates the currency of the deposit. The cash acceptor device checks the authenticity of the notes, as well as their currency and denomination. The ATM sends an authorization request to the processing center while indicating the type of operation and the sum and currency of the deposit (or information that allows those parameters to be determined on the NetServer). The system implements the standard procedure for bank card verification, and checks whether the given operation is authorized for the cardholder. If one of these conditions is not met, the system will return an operation refusal to the ATM. If the necessary parameters are successfully met, the amount, registered by the cash acceptor device upon processing by an authorization document, will be added to the amount of available funds in the card account. The actual account replenishment, or in other words, transfer of monetary funds, is accomplished through processing the financial document of that operation.

4.1 ATM cash acceptance: ATM setup

To replenish accounts, the ATM configuration should support the following:

- PIN entry by the cardholder.
- Selection of the language in which the ATM screen will present information; this can be done automatically by the ATM, for example, depending on the card number.
- Filtering by financial institution.
- Selection of operations.
- Selection of cardholder account.
- Selection of currency for the operation (for multi-currency ATMs).
- Request to print a receipt.
- Reaction to response from the processing center (for example, that the given operation is not authorized for the cardholder).

Upon executing the operation, the ATM transmits the following information to the processing center:

- Bank card number
- Account type selected by the cardholder
- Amount and currency of the operation or information that allows those parameters to be determined on the NetServer
- Language in which the receipt from the executed operation is printed

4.2 ATM cash acceptance: Configuring the receipt

The receipt indicating the result of the executed operation can contain fields that correspond to the data received from the processing center:

- Bank name and address
- ATM number
- Date and time of operation
- Abbreviated bank card number
- Unique identification number for the operation
- Authorization code
- Amount and currency of the operation
- Amount and currency of the acquiring fee (if such is determined)
- Amount of accepted notes presented by denomination with breaks in between (this information can be printed in a receipt by configuring the receipt template, when the necessary information is available)

These fields should be configured in the receipt template (see the section "ATM receipt and screen format description language").

5 Standing orders for public utilities and other services

Way4 allows cardholders to pay bills through the ATM for standard public utilities, such as telephone, gas, and electricity, through fund transfer from the cardholder's account.

For the ATM this does not count as a financial transaction and does not change its internal accounts. The ATM only initializes the execution of a standing order, registered to the contract of the cardholder or to the Account Scheme (see the section "Standing payment orders" of the document "Issuing Module").

When making a payment on public utilities, the cardholder indicates the type and the amount of payment, and can also indicate additional conditions of payment. The ATM sends an authorization request to the processing center indicating the type of payment and other payment conditions. The system initiates the standard verification procedure for bank cards (presence of funds in the system, PIN verification, sufficient funds), as well as verifying the availability of on-line payment for public utilities. If one of these conditions is not met the system will return an operation refusal to the ATM. If all of the required parameters are met, the amount indicated by the cardholder is blocked in his or her account and the ATM is sent an authorization code.

After receiving the reply, the ATM prints out a receipt with the date of payment, the payment's digital code and/or the text describing payment type, the authorization code, and the payment amount. This receipt may serve as official confirmation of payment on the public utility.

A document with "Waiting" status is formed in the database, which is subjected to the standard document procedure according to contract accounts (see the document "Daily Procedures"), after which the funds are debited from the cardholder account and credited to the account of the recipient.

5.1 Standing orders for public utilities: Configuring the ATM and receipts

5.1.1 Standing orders for public utilities: ATM setup

To make payments on public utilities, the ATM must be configured to support the following:

- PIN entry by the cardholder.
- Selection of the language in which the ATM screen will present information; this can be done automatically by the ATM, for example, depending on the card number.
- Filtering by financial institution.
- Selection of operations.
- Selection of cardholder account.
- Selection of additional conditions of payment.
- Selection of operation currency.
- Entry of operation amount.

- Request to print a receipt.
- Reaction to response from the processing center (for example, that the given operation is not authorized for the cardholder).

When online payment is accomplished, the ATM transmits the following information to the processing center:

- Payment code
- Bank card number
- Payment amount
- Payment currency
- Language in which the receipt for the given operation will be printed
- Additional conditions of payment

5.1.2 Standing orders for public utilities: Configuring the receipt

The receipt indicating the results of the online payment can contain fields that correspond to the data received from the processing center:

- Bank name and address
- ATM number
- Date and time of operation
- Payment name
- Abbreviated bank card number
- Unique identification number for the operation
- Authorization code
- Payment amount
- Card account balance (when there is one)

These fields should be configured in the receipt template (see the section "ATM receipt and screen format description language").

5.2 Describing public utilities in Way4

5.2.1 Creating a new public utility type

To register a new type of public utility payment, choose from the user menu "Full → Configuration Setup → Transaction Types → Payment on Account Types".

Doing so will invoke the grid form "Payment on Account Types".

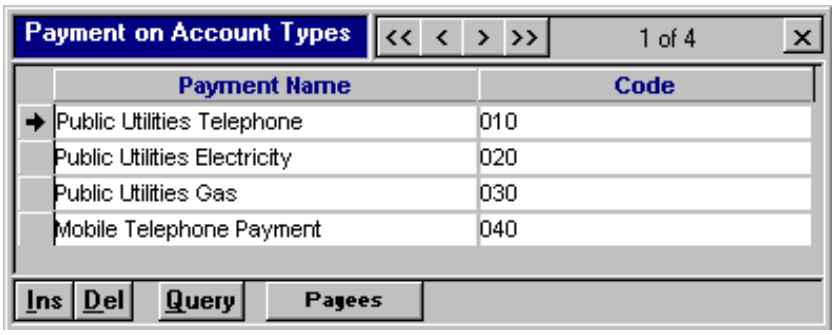


Table of public utilities

This table contains the following fields:

- *Payment Name* – the name of the kind of payment.
- *Code* – payment code unique within the table

The payment code may be used in the ATM's configuration file (if the code can be entered through pressing a certain button on the ATM) or may be entered manually by the cardholder.

To add a record to the grid form, click the [Ins] button; to delete a record, click [Del].

A warning will appear when attempting to delete a record from the "Payment on Account Type" table that corresponds to a payment type used for registering a standard order in the system (see the section "Creating a standing order for utility payments").

To enter recipient requisites, select the desired payment type in the "Payment on Account Types" table and click the [Payee] button. The "Payees for <name of payment>" grid form will open.

Table of payment recipients

- *Name* – name of the payment recipient.
- *Member ID* – identification value of the client's bank, coinciding with the bank's identification contained in the *Bank ID Code* table "RBS Bank Identification Codes" (see the section "BIC Table" of the document "Acquiring Module").
- *Contract Number* – the number registered in the system of the transit accounting contract, to which funds on the client's credit card will be transferred.
- *Code* – payment code from the "Payment on Account Types" table.
- *Payee Details 1*, *Payee Details 2* – fields for entering additional information on the payment recipient.

To add a record to the grid form, click the [Ins] button; to delete a record, click [Del].

A warning will appear when attempting to delete a record from the "Payees for <name of payment>" table that corresponds to a name of payment used for registering a standard order in the system (see the section "Creating a standing order for utility payments").

5.2.2 Creating a standing order for utility payments

The creation of a standing order for utility payments is described in the section "Standing payment orders" of the document "Issuing Module".

5.3 Utility payments made by the cardholder

To make utility payments through an ATM, the cardholder should:

- Insert the card in the ATM’s card reader, and upon being prompted by the ATM, enter the PIN.
- Select the type of public utilities operation.
- Select from the offered list the desired type of payment or enter the payment code on the keypad.
- Indicate the payment amount.
- Receive the card.
- Receive the receipt.

6 Support of additional online services

Way4 allows acquirers to support additional online services through an ATM. These operations include, among others, payments to mobile service providers, purchasing Internet cards, etc.

6.1 Additional online services: Configuring the ATM and receipts

To enable additional online services, for example, for making payments for mobile services, the ATM should be configured to support the following:

- PIN entry by the cardholder.
- Selection of display language, the selection can take place automatically depending, for example, on the card number.
- Filtering by financial institution.
- Selection of operation – for example, "payment for mobile services".
- Selection of service providers.
- Selection of cardholder account.
- Entry of additional payment requisites: client ID (for example, mobile phone number).
- Selection of operation currency.
- Entry of operation amount.
- Reaction to processing center response; for example, a message should be displayed if there are insufficient funds in the cardholder's account, if the client ID is not correctly entered, if services at that time are unavailable, or other conditions are detected.

After input, the ATM sends the following data to the processing center:

- Bank card number
- Payment amount
- Payment currency
- Unique service provider ID (by this the processing center can determine, for example, the mobile service operator)
- Cardholder account type, from which the payment will be made
- Language in which the receipt for the given operation will be printed
- Additional payment requisites: client ID (for example, the mobile phone number).

6.1.1 Additional online services: Configuring the receipt

The receipt received after an online payment can contain fields corresponding to the data received from the processing center:

- Bank name and address
- ATM number

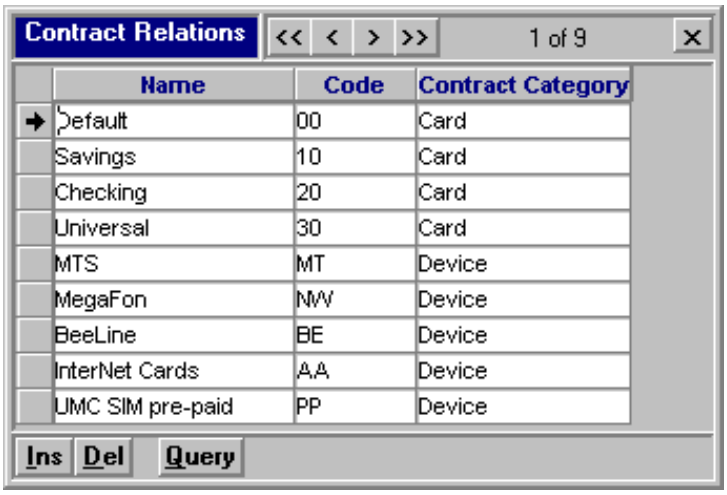
- Operation date and time
- Abbreviated bank card number
- Unique identification number for the operation
- Authorization code
- Payment name
- Additional payment requisites: client ID (for example, the mobile phone number)
- Payment amount and currency
- Card account balance (when there is one)

These fields should be configured in the receipt template (see the section "ATM receipt and screen format description language").

6.2 Configuring Way4 to support additional online services

Way4 should be configured in the following way to work with payment acceptance systems, for example, for mobile connection services.

Step 1. Add a new relations type to the ATM contract. Select the DB Manager user menu item "Full → Configuration Setup → Accounting Setup → Contract Relations". The "Contract Relations" grid form will open.

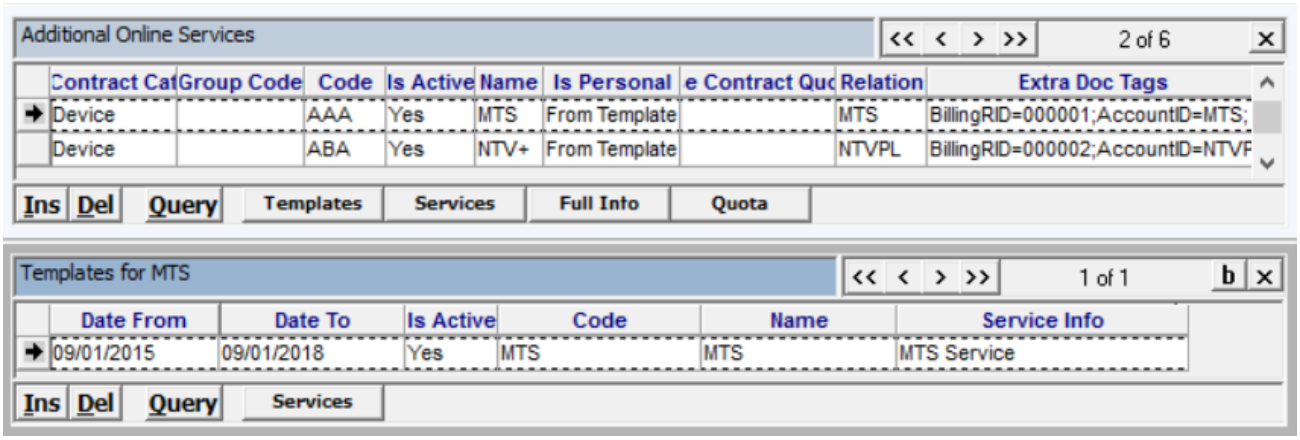


Creating new contract relations

Fill in the following fields in the form:

- *Name* – relation type name.
- *Code* – unique code selected from a code dictionary, containing no more than two characters.
- *Contract Category* – contract category; this field should contain "Device", selected from the drop-down list.

Step 2. Add a new type to the Additional Online Services Dictionary. Select the DB Manager user menu item "Full → Configuration Setup → Merchant Device Setup → Additional Online Services". The "Additional Online Services" grid form will open.



Configuring additional online services

Fill in the following fields in the form:

- *Contract Cat* – category of the contract for which this type of online service is used.
- *Code* – service code; this value should correspond to the SERVICE_ID attribute value of the PARAMETERS element or to the SERVICE_ID adjustable parameter value of the operation key buffer file (see the section "Configuration files for controller interaction with the ATM"). Prepaid cards should be indicated in the following format: service provider code + ":" + service code. For example, "MEGAFON:LITE05";. In the example shown in figure, the service code is set according to controller settings determining that this service will be selected when specific keys are pressed on the ATM (see the section "Configuring the controller to support additional online services").
- *Is active* – indicates whether this type of service is active ("Y" – active, "N" – not active).
- *Name* – service name, for example, "MTS" for a mobile service payment or "Lite 05" for a prepaid card purchase.
- *Is Personal* – drop-down list to select one of the following values:
  - "From Template" – for online services with a payment acceptance system.
  - "Individual" – for prepaid cards (vouchers). When this value is selected, the system behavior is as follows: If the voucher was successfully purchased, the status of the sold voucher changes to "Posted". If there are no available vouchers in the system (no records with the "Waiting" status), the system returns the "96".
  - "Card Service" – for prepaid cards (vouchers) that can be sold an unlimited number of times.
- *Extra Doc Tags* – additional parameters for an operation; set in a "tag=value" list, delimited by semi- colons; the example in figure shows payment parameters: BillingRID is the identifier for routing the request through the channel for interaction with the payment system, AccountID is the code identifying the type of account to which funds are being transferred.
- *Relations* – this field should indicate a selection from a drop-down list from the contract relation types registered in the "Contract Relations" table (see figure) in step 1. This value is used to indicate the "ATM Retail" relation with the contract ATM in step 3.

To specify the cost of a service, click the [Full Info] button and set the appropriate values in the *Service Curr* and *Amount* fields of the "Full Info For <service name>" form.

After filling in the fields in the "Additional Online Services" grid form, click the [Templates] button to finish configuring the new additional online service type. This will open the "Templates for <service name>" grid form (see figure). Add a record in this form, and fill in the following fields:

- *Date From* and *Date To* – specifies the start and expiry date for this service template.
- *Is active* – indicates whether this template is active ("Y" – active; "N" – not active").
- *Code* – service code
- *Name* – name of additional online service.
- *Service Info* – additional information, for example, the service telephone number that will be printed in the receipt.

In configuring additional online services for prepaid cards, for example, for replenishing card units for mobile phone services, data is loaded from special files created by the service provider. To view information that has been loaded about prepaid services, click the [Services] button to open the "Services for <service name>" grid form.

It is forbidden for users to edit the data in files received on prepaid services.

After data is loaded into the table, a number of rows will be added corresponding to the number of prepaid services, for example, the number of prepaid mobile phone services cards that can be activated. In this case, the grid form contains the following field values:

- *Name* – field containing a pointer to the encryption key and control factor for hidden data. If hidden data is presented in the *Code* field without encryption, then the *Name* field is not filled.
- *Code* – private data for prepaid cards, for example, the activation code for prepaid mobile phone services cards.
- *Status* – after files are loaded, the field will automatically show value "Waiting"; after the service has been activated, the field will show "Posted".
- *Date From* and *Date To* – fields indicating the start and end dates for the prepaid service.
- *Service Info* – additional public information on the prepaid service.

Step 3. The last step in configuring Way4 to support additional online services is creating a related contract, "ATM Retail" (see the section "ATM Retail Contracts" of the document "Acquiring Module").

To indicate the relations type between the "ATM Retail" contract and the ATM contract, use the value registered in the "Contract Relations" table (see figure) in step 1.

6.3 Configuring the controller to support additional online services

For additional online services to be possible, rules for determining the code of the service specified in the "Additional Online Services" grid form must be set in the request processing configuration file (see the section "Request processing configuration file"), for example according to keys pressed on the ATM.

To set these rules, before calling the "Start Operation" process (determined by the PROCESS element of the configuration file), define the SERVICE_ID parameter, for example, as follows:

```
<PARAMETER Name="SERVICE_ID"
 Value="replace_char(substr(OPERATION_KEY, '5', '3'),' ','~')"/>
```

where:

- The function substr(OPERATION_KEY, '5', '3') determines the values of three positions in Operation Key Buffer, starting from the fifth.
- The function replace char(str,' ','~') replaces possible spaces with the "~" symbol.

The value obtained in this way will be used to search "Additional Online Services" for a service with the corresponding code.

The following options are also possible for determining SERVICE_ID:

- Concatenation of values from different Operation Key Buffer positions (in the example below, SERVICE_ID consists of values from the 5th and 7th positions):

```
<PARAMETER Name="SERVICE_ID"
Value="replace_char(concat(substr(OPERATION_KEY, '5', '1' ),
                           substr(OPERATION_KEY, '7', '1' )),' ','~')"/>
```

- Concatenation of strings and values from Operation Key Buffer (in the example below, SERVICE_ID contains the "TELCOM" prefix):

```
<PARAMETER Name="SERVICE_ID"
Value="concat( 'TELCOM_',replace_char(substr(OPERATION_KEY, '5', '3' ),' ','~'))"/>
```

After executing the "Start Operation" procedure, the values of parameters can be determined that are set for the corresponding service in the *Extra Doc Tags* field of the "Additional Online Services" form. In the example shown in figure, these are the BillingRID and ACCOUNT_ID_2 parameters:

```
<PARAMETER Name="BillingRID"
    Value="GetDataFromTxtBuffer(TextTAGs,'BillingRID' )"/>
<PA RAMETERName="ACCOUNT_ID_2"
    Value="GetDataFromTxtBuffer(TextTAGs,'AccountID' )"/>
```

Other parameters set in the *Extra Doc Tags* field for the corresponding service can be determined in the same way.

A fragment of an operation key buffer file is shown below:

```
<Condition OPERATION_KEY="D">
   <PARAMETERS OPERATION="RETAIL"/>
   <Condition OPERATION_KEY="*A">
      <PARAMETERS REQUEST_CURRENCY="'810'"/>
   </Condition>
   <Condition OPERATION_KEY="**F">
      <PARAMETERS OPERATION="CASH_PAYMENT"/>
   </Condition>
   <Condition OPERATION_KEY="***B">
      <PARAMETERS FROM_ACCOUNT="DEFAULT"/>
   </Condition>
   <Condition OPERATION_KEY="***C">
      <PARAMETERS FROM_ACCOUNT="CREDIT"/>
   </Condition>
   <Condition OPERATION_KEY="***D">
      <PARAMETERS FROM_ACCOUNT="SAVINGS"/>
   </Condition>
   <Condition OPERATION_KEY="***F">
      <PARAMETERS FROM_ACCOUNT="UNIVERSAL"/>
   </Condition>
   <Condition OPERATION_KEY="*******B">
      <PARAMETERS LANGUAGE="Rus"/>
   </Condition>
   <Condition OPERATION_KEY="*******C">
      <PARAMETERS LANGUAGE="Eng"/>
   </Condition>
    ...
   <PARAMETERS TRN_DESC="???..."/>
    ...
   <PARAMETER Name="SERVICE_ID" Value="replace_char(substr(OPERATION_KEY,
'5', '3' ),' ','~')"/
   <!--PARAMETER Name="SERVICE_ID"
Value="replace_char(concat(substr(OPERATION_KEY, '5', '1'
),substr(OPERATION_KEY, '7', '1' )),' ','~')"/-->

   <!--PARAMETER Name="SERVICE_ID"
Value="concat('TELCOM_',replace_char(substr(OPERATION_KEY, '5', '3' ),' ','~'))"/-->
   <PARAMETER Name="TextTAGs" Value="SetDataToTxtBuffer(
TextTAGs,'F104', TRN_DESC )"/>
   <Process Name="Start Operation"/>
   <PARAMETER Name="BillingRID" Value="GetDataFromTxtBuffer(
TextTAGs,'BillingRID' )"/>
   <PARAMETER Name="ACCOUNT_ID_2"
Value="GetDataFromTxtBuffer( TextTAGs,'AccountID' )"/>
   <PARAMETER Name="ProviderName"
Value="GetDataFromTxtBuffer( TextTAGs,'ProviderName'
)"/>
   <Condition RC="00">
      <Process Name="Check Retail Request" Timeout="20s"/>
      <Condition RC="00">
         <PARAMETER Name="STEP" Value="'Confirm'"/>
         <Process Name="Request Customer"  Timeout="600s"/>
         <Condition LAST_Process_RC="ERROR">
            <exit/>
         </Condition>
```

```
<PARAMETER Name="FunctionKey" Value="substring(BUFFER_B, '-1', '1' )"/>
         <Condition FunctionKey="'B'">
            <PARAMETERS RC="17"/>
            <abort/>
         </Condition>
         <Condition FunctionKey="'T'">
            <PARAMETERS RC="17"/>
            <abort/>
         </Condition>
      </Condition>
   </Condition>
   <exit/>
</Condition>
```

6.4 Configuring request routing through a payment acceptance system communication channel

For the ATM controller to communicate with a payment acceptance system on the NetServer platform, the corresponding channel must be configured (for example CHANNEL NAME="BILLING").

To enable routing by BillingRID value (see the section "Configuring the controller to support additional online services"), set the following parameter in the ATM controller configuration:

```
<PARAMETER NAME="RID_ROUTING" VALUE="ON"/>
```

To define routing rules, add the following string to the routing table (the path to the corresponding file is specified in the ROUTING section of the controller configuration file):

```
<RID_Route MIN_RID="000001" MAX_RID="000005" ToChannel="BILLING" Service="BILLING"
 COMMENT="BILLING">
```

The aforementioned settings support the following functionality:

- The ATM controller receives a request to make an online payment acceptance operation; according to ATM controller settings (see the section "Configuring the controller to support additional online services"), a certain sequence of keys pressed on the ATM is interpreted as the service code (SERVICE_ID).
- A search is made for the record corresponding to this service code in the "Additional Online Services" table (see the section "Configuring Way4 to support additional online services"); the value of BillingRID and other parameters is determined from the *Extra Doc Tags* field of the record found.
- If the BillingRID value is in the range (MIN_RID="000001", MAX_RID="000005") set in the routing table, the request is sent to the appropriate channel for processing (ToChannel="BILLING").

7 Receiving balances and mini-statements

7.1 Configuring card account balance inquiries

7.1.1 Configuring balance inquiries

The rules for giving out balances according to card accounts are set up when working with the Way4 issuing module, and are also regulated by the ATM receipt format template.

Restrictions on the number of free balance inquiries of card accounts, as well as the fee factor for exceeding that number, may be specified by configuring the Service Package of the card account (see the document "Way4 Service Packages").

The ATM receipt template file (see the section "ATM receipt and screen format description language") may be configured to block balance inquiries on card accounts with card numbers within a certain range or those issued by a bank with a certain bank identification number.

Balance inquiries, including balances on card accounts, can be blocked with changing the status of the corresponding operation or the ATM component (see the sections "ATM operations" and "ATM hardware" of the document "ATM Monitoring").

7.1.2 Configuring the receipt format for card account balance inquiries

The receipt for balance inquiries on card accounts can contain fields that correspond to the data received from the processing center:

- Bank name and address
- ATM number
- Date and time of operation
- Abbreviated bank card number
- Amount available
- Credit limit

These fields should be configured in the receipt template (see the section "ATM receipt and screen format description language").

7.2 Configuring card account mini-statement requirements

7.2.1 Configuring mini-statement requirements

The rules for giving out mini-statements according to card accounts are similar to the rules governing balances and are set up when working with the Way4 issuing module and regulated by the ATM receipt format template.

Restrictions on the number of free mini-statements on card accounts, as well as the fee factor for exceeding that number, may be queried by configuring the Service Package of the card contract (see the document "Way4 Service Packages").

The ATM receipt template file (see the section "ATM receipt and screen format description language") may be configured to block requests for mini-statements on card accounts with card numbers within a certain range or those issued by a bank with a certain bank identification number.

Balance inquiries, including mini-statements on card accounts, can be blocked with changing the status of the corresponding operation or the ATM component (see the sections "ATM operations" and "ATM hardware" of the document "ATM Monitoring").

7.2.2 Configuring the receipt format for mini-statement requirements

The mini-statement on card accounts can contain fields that correspond to the data received from the processing center:

- Bank name and address
- ATM number
- Date and time of operation
- Bank card number
- Amount available

These fields should be configured in the receipt template (see the section "ATM receipt and screen format description language").

7.3 Configuring display of information

The cardholder can be presented with a choice of where the balance request results should be displayed: printed in a receipt, or displayed on the ATM screen.

To do this, the corresponding screen template should be configured along with the response code configuration file (see the section "Response message configuration file"). Add this text:

```
        <Condition RECEIPT="NO">
           <PARAMETERS Printer1="None"/>
           <PARAMETERS ScrTemplate1="SCREENS_TEMPLATE"/>
        </Condition>
```

8 PIN change

Way4 allows cardholders to change their card PIN at ATMs. This functionality is not part of the standard setup for Way4 and is provided through special agreement with OpenWay representatives.

8.1 PIN change: ATM setup

To change the PIN, the ATM should support the following:

- Selection of the language in which the ATM screen will present information; this can be done automatically by the ATM, for example, depending on the card number.
- Entering of the old PIN by the cardholder.
- Filtering by financial institution.
- Selection of operations.
- Entering of the new PIN by the cardholder.
- Confirming of the new PIN by the cardholder by entering it twice.
- Reaction to response from the processing center (for example, that the given operation is not authorized for the cardholder).

When the PIN change operation is completed, the ATM transmits the following data to the processing center:

- Bank card number
- Language in which the receipt for the given operation will be printed
- Old PIN-block, encrypted under the ATM's PIN-key
- New PIN-block, encrypted under the ATM's PIN-key

8.2 ATM controller setup

The ability to change PINs is provided by adding PIN_CHANGE sections to the key.xml and rc.xml configuration files, and if necessary, to receipt and screen templates.

Example of settings in the key.xml file:

```
...
<Condition OPERATION_KEY="?">
<PARAMETERS OPERATION="PIN_CHANGE"/>
      <Condition PROTOCOL="MDS912" BRAND="DIEBOLD">
      <PARAMETER Name="CSP_Data" Value="PINBlock"/> <!–new PIN-->
      <PARAMETER Name="PINBlock" Value="BUFFER_B"/> <!--old PIN-->
      </Condition>
<Condition PROTOCOL="MDS912" BRAND="WINCOR">
<PARAMETER Name="CSP_Data" Value="BUFFER_C"/>
      </Condition>
      ...
      <PARAMETER Name="ALLOW_REVERSAL" Value="'Y'"/>
      <Process Name="Start Enhanced Operation"/>
</Condition>
...
```

To support the operation using the NDC protocol, no special settings in the PIN_CHANGE section of the key.xml file are required.

Example of settings in the rc.xml file:

```
...
<Condition RC="00">
...
<Condition OPERATION="PIN_CHANGE">
<PARAMETERS RC_DESCRIPTION="Pin_change Approved"/>
 <PARAMETERS NextStateID="300"/>
<!--close state-->
<PARAMETERS Screen1="070"/>
 <PARAMETERS Printer1="Journal" PrnTemplate1="JOURNAL_RECEIPT"/>
 <Condition RECEIPT="YES">
 <PARAMETERS Screen1="072"/>
<PARAMETERS Printer2="Consumer PrnTemplate2="CONSUMER_RECEIPT"/>
</Condition>
</Condition>
...
</Condition>
...
```

The receipt issued to the client with the results of the PIN change can contain fields that correspond to the following data received from the processing center, for example:

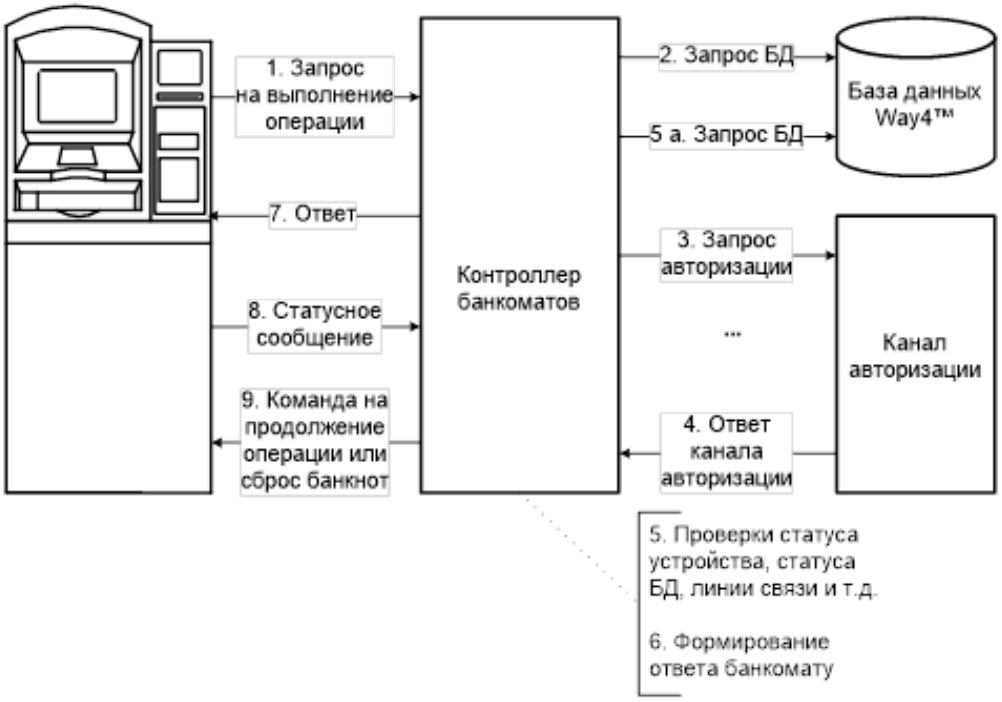
- Bank name and address
- ATM number
- Date and time of operation
- Abbreviated bank card number
- Operation’s unique identification number

Sample fragment of a receipt template (see the section "ATM receipt and screen format description language"):

```
...
<PIN_CHANGE
CARD Nr.          ATM Nr.
%CARDNUM%         %LUNO%
Auth.Code: %AUTHCODE:6%
RRN: %RRN%
YOUR PIN WAS CHANGED!
>
...
```

9 Automatic reversal message creation

The following figure shows the exchange of messages when an operation is executed.



Message exchange while executing ATM operations

The ATM controller automatically creates and transmits through the authorization channel reversal messages in the following four situations:

In stage 4 of the operation: if there is no response from the authorization channel within a specified time (50 sec).

In stage 5 of the operation if one of the of the following conditions is found:

- Connection to the ATM was lost.
- Device status has changed.
- DB status has changed.
- A command is received to immediately remove the device from service.
- Another request for another operation is received from the ATM.

In stage 6 of the operation: if data is insufficient, absent, or corrupted in field #39 of standard ISO message 8583, also if it is not possible to create a MAC message, for example, because of no connection with the hardware security module (HSM).

In stage 8 of the operation: if a corresponding status message is received, for example, that the amount selected has not been dispensed to the cardholder.

10 Administrative operations and replenishment

Replenishment is a set of operations to re-supply the ATM with the cash funds intended for dispense, to collect funds deposited by clients to replenish their accounts, to reconcile the information stored in the ATM and held in the processing center on the results of ATM operations, and to fulfill other functions.

The replenishment procedure contains the following steps:

- Printing of receipts for the cash replenishment officer according to the processing center and the state of the ATM's counters.
- Removal of the cassette from the ATM for its contents to be inventoried at the bank.
- Loading new cassettes into the ATM.
- Removal of retracted and retained cards.
- Closing of the financial cycle in the database (see the section "Closing financial cycles" of the document "ATM Monitoring").

During the replenishment process, the cash replenishment officer may enter data on the quantity of loaded and unloaded notes.

ATM replenishment is accomplished through the use of a replenishment officer service card (see the chapter "Issuing Service Cards" of the document "Acquiring Module").

10.1 Financial cycles

Financial cycles are intervals of time between the ATM's replenishment. The system allows for observing the balance (*Balance*) for the current financial cycle and past financial cycles, as the difference between the quantity of notes loaded into and dispensed from the ATM (see the section "Financial cycles" of the document "ATM Monitoring").

Closing the current financial cycle in the database and opening the next one is done automatically after the ATM is replenished and the replenishment officer enters the completed operation in the processing center by a special transaction or manually.

10.2 Configuring the ATM replenishment receipt format

The replenishment officer's receipt can contain fields corresponding to data received from the processing center:

- Bank name and address
- ATM number
- Date and time of operation

- Replenishment officer's service card number
- Unique identification number for the operation
- Amount of dispensed funds from each cassette
- Amount of dispensed funds according to currency (for multi-currency ATMs)
- Amount of notes loaded, dispensed, dispensed but ignored by the cardholder and retracted by the ATM, and diverted by ATM during dispense
- Financial cycle number

These fields should be configured in the receipt template (see the section "ATM receipt and screen format description language").

10.3 Configuring the replenishment officer's receipt for collecting client-deposited funds

The replenishment officer's receipt can contain fields corresponding to data received from the processing center:

- Bank name and address
- ATM number
- Date and time of operation
- Replenishment officer's service card number
- Unique identification number for the operation
- Amount of deposited funds in each currency
- Amount of deposited notes in each denomination
- Financial cycle number

These fields should be configured in the receipt template (see the section "ATM receipt and screen format description language").

11 Settlement scheme for ATM operations

During ATM operation (cash dispense/acceptance, collection operations) accounting entries are generated in Way4 that reflect cash flows.

An ATM contract's Account Scheme determines the types of accounts between which entries are made. The acquiring module contains the standard Account Scheme "001-Default ATM Scheme" (see acquiring Product Account Schemes: "Full → Configuration Setup → Products → Acquiring Products → Acquiring Account Schemes") which establishes the relation between the following types of account:

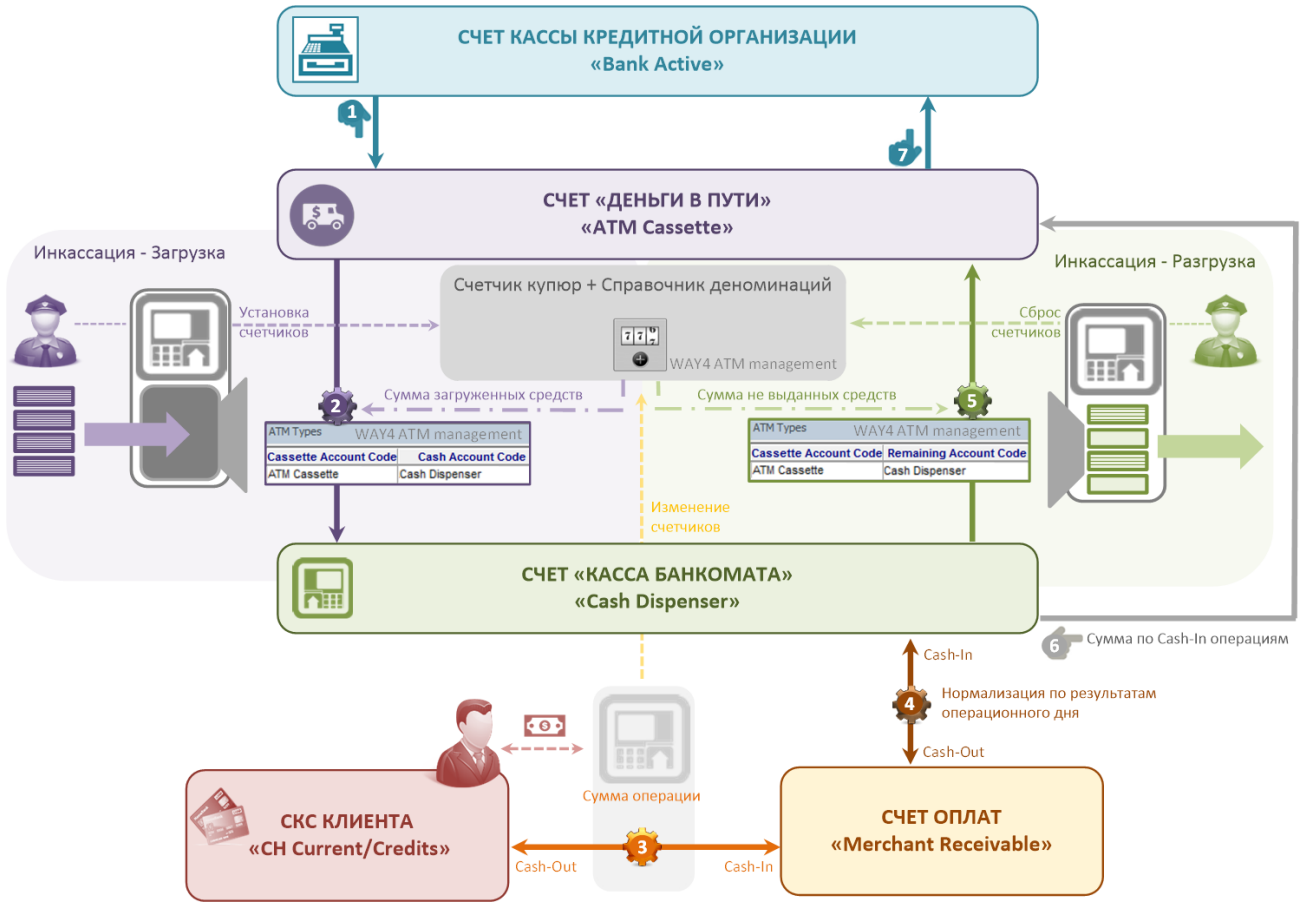
- "ATM Cassette" – type of account that shows fund activity:
- In cassettes issued to replenishment officers from the bank till for loading into the ATM.
- In cassettes taken from the ATM by replenishment officers, to be given to the bank till.
- "Cash Dispenser" – type of account that shows fund activity in the ATM in the period between loading and unloading.
  If ATM cash acceptance and dispensing operations are supported, two separate types of account must be used in the Account Scheme; for example, "Cash Dispenser In" and "Cash Dispenser Out" to show funds that have been accepted and funds that are available for dispensing, respectively.
- "Merchant Receivable" – type of account that shows the amount of funds for operations made by clients at the ATM during the business day.
  If ATM cash acceptance and dispensing operations are supported, two separate types of account must be used in the Account Scheme; for example, "Merchant Receivable In" and "Merchant Receivable Out" to show funds that have been accepted from and dispensed to clients during the business day.

Due normalization between "Cash Dispenser" and "Merchant Receivable" account types is set up that determines whether the accumulated amount of dispensed/accepted funds must be shown in the "Cash Dispenser" account when opening a new business day.

Entries showing the movement of funds between accounts in the process of ATM operation and service are generated in two ways:

- Manually – when posting financial documents created by the operator (for example, through the "Doc – General" form for working with documents).
- Automatically – when posting financial documents created as a result of:
- Due normalization set up in the ATM contract's Account Scheme.
- Replenishment (loading/unloading the ATM).

The settlement scheme for ATM operations is shown below. This scheme is based on acquiring module standard settings and includes the following entries:



Settlement scheme for ATM operations

Step 1. The operator manually creates a document for an "ATM cash replenishment" transaction (see the transaction type dictionary in the menu item "Full → Configuration Setup → Transaction Types → Transactions – All"). When this document is posted, an entry is created between the following types of account:

- Dt "ATM Cassette" Ct "Bank Active"

  For the amount of funds issued to replenishment officers to be loaded into the ATM.

> Here and further – the document posting process can be run several times a day and is not linked to the process for opening the banking day.

Step 2. After loading cassettes into the ATM, the replenishment officer uses a service card and performs the ATM_SERVICE operation. Information about the number of notes loaded in each cassette is entered in the ATM menu. This data is used to set cassette note counters in Way4.

For each cassette, a separate document is generated whose amount is determined based on the specified number of notes and the denominations dictionary (see the section "ATM denominations dictionary"). When posting these documents, entries between accounts are generated. Account types are set in the *Cassette Account Code* and *Cash Account Code* fields for the corresponding ATM type (see the section "ATM types dictionary"):

- Dt "Cash Dispenser" Ct "ATM Cassette"

Step 3. If a debit/credit operation is successful, a financial document is created in the Way4 database whose posting results in the following entries:

- Dt "CH Current/Credits" Ct "Merchant Receivable" – for cash dispensing settlement schemes.
- Dt "Merchant Receivable" Ct "CH Current/Credits" – for cash acceptance settlement schemes.

> The account type "CH Current/Credits used for settlements with the bank's "own" clients was chosen as an example.

Step 4. The procedure for opening a new banking day performs due normalization for the amount of operations made during the previous business day.

- Dt "Merchant Receivable" Ct "Cash Dispenser" – for cash dispensing settlement schemes.
- Dt "Cash Dispenser" Ct "Merchant Receivable" – for cash acceptance settlement schemes.

> The "ENTRY_GROUPING" tag can be used to show cash dispensing and cash acceptance turnover in a "Merchant Receivable" account for a financial cycle. For this, in the appropriate Account Scheme (menu item "Full → Configuration Setup → Products → Acquiring Products → Acquiring Account Schemes") specify the value "ENTRY_GROUPING=BY_BATCH;" in the *Template Details* field for the "Merchant Receivable" account.

Step 5. After removing cassettes from the ATM, the replenishment officer uses a service card and performs the REPLENISHMENT operation. As a result of this operation, for each cassette a separate document is generated in Way4 for the amount of funds not dispensed (determined on the basis of current values for note counters and the denominations dictionary in the Way4 database). When posting these documents, entries between accounts are generated. Account types are set in the *Cassette Account Code* and *Remaining Account Code* fields for the corresponding ATM type (see the section "ATM types dictionary"):

- Dt "ATM Cassette" Ct "Cash Dispenser"

Step 6. For cash acceptance settlement schemes, the operator "manually" creates financial documents for cassettes that replenishment officers removed with accepted notes. When posting these documents, entries between accounts are created:

- Dt "ATM Cassette" Ct "Cash Dispenser"

Step 7. When funds removed by replenishment officers in unloading the ATM are received, the operator "manually" creates a document for an "ATM residual cash collection" transaction (see the dictionary of transaction types in the menu item "Full → Configuration Setup → Products → Acquiring Products → Acquiring Account Schemes"). When this document is posted, an entry is created between the following types of account:

- Dt "Bank Active" Ct "ATM Cassette"

If discrepancies are found, adjustments (for the excess/insufficient amount) are manually generated by the operator.

12 ATM controller configuration files

The following configuration files are used to set up the ATM controller:

- ATM controller configuration file
- Request processing rule configuration file
- Response processing rule configuration file
- Files with ATM receipt and screen form templates

12.1 Controller configuration file

The ATM controller configuration file is located in the directory, indicated in the NetServer configuration file.

This file contains ATM controller parameters, changed in the following conditions:

- Exceeding current limits on the quantity of ATMs serviced.
- Changes in the states template or in the receipt template.
- Installing and configuring a new protocol for transferring information between the ATM and the processing center.

> ⚠ The configuration file should only be changed under the supervision of OpenWay representatives.

Configuration File Parameters

Parameter	Description
ANALYSE	Configurations of the subsystem supporting message conversion from Diebold/NDC protocol format to ISO format
FORMAT	Configurations of the subsystem supporting message conversion from ISO format to Diebold/NDC protocol format
NETWORK	Parameters of the ATM Controller module that supports receiving messages from the ATMs
DRIVER	Names of protocols supported by the ATM Controller

Parameter	Description
OPERATION_KEY_FILE	Determines the name and location of the file describing the operation key buffer and its interpretation
FORMATFILE	Determines the name and location of the file describing the format of messages sent to a terminal. This file cannot be edited.
DATA_MAPPING_TABLE	Determines the name and location of the file describing the rules of data conversion. This file cannot be edited.
MAP_TABLE	Determines the name and location of the file describing the rules of the conversion of Unicode symbols into those of the code tables of ATMs.
RC_TABLE	The name of the configuration file for response codes (see the sections "Configuration files for controller interaction with the ATM" and "Response message configuration file").
CONSUMER_RECEIPT	Name of template file for printing on the consumer printer
JOURNAL_RECEIPT	Name of template file for printing on the journal printer
STATEMENT_RECEIPT	Name of template file for printing on the statement printer.
ADMIN_RECEIPT	Name of the template file for output of data on administrative operations to the printer.
SCREENS_TEMPLATE	Name of template file for updated screens.
RC_MALFUNCTION_ERROR	Name of response code for errors not described in the controller configuration file for interactions with the ATM (see the section "Response message configuration file").
MAX_START_PAN_PRN	Specifies the quantity of the first digits (percentage of PAN length) of the bank card number printed in the receipt.
MAX_END_PAN_PRN	Specifies the quantity of the last digits (percentage of PAN length) of the bank card number printed in the receipt.
RESOURCE_LIMIT	Maximum number of ATMs that can be logged into the ATM controller.

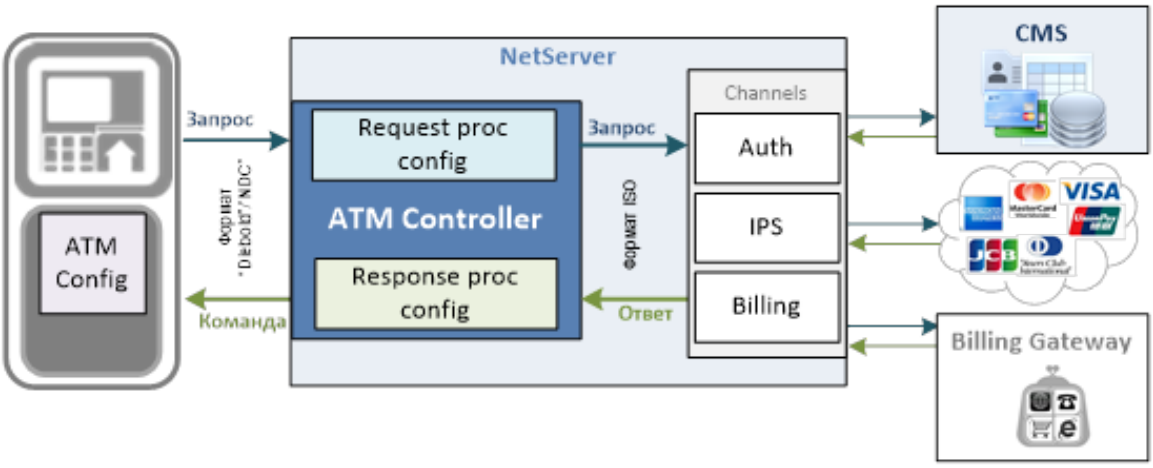
Parameter	Description
REPEAT_COUNTER	Quantity of time-outs in waiting for the ATM's response; values: 1, 2,....
ATM_TIMER_03	Controller time-out delay for the ATM's ready signal after a completed transaction; value in seconds: 10, 11, ...
CMD_TIMER	Controller time-out delay for a queried status or for the ATM's ready signal after fulfilling a command.
MAXIMUM_NOTES	The sum quantity of notes of all denominations loaded into the dispenser.
TRACE_FILE	File name for message tracing.
TRACE_SIZE	Size of message tracing file, given in Mb in whole numbers from 1 to 10.
BACK_NUM	Quantity of message tracing files held in archive, specified in the form <file name>.XXX, where XXX=1,2...999.
CONVERT_TPK_ZPK	Defines the way a PIN-block is transmitted: "ON" – PIN-block is transmitted in a form encrypted by the Zone Pin Key (ZPK). "OFF" – PIN-block is transmitted in a form encrypted by the Terminal Pin Key (TPK).
DBACCESS	Section containing module parameters that support controller interaction with the database.
RECEIVETYPE, TRANSMITTYPE	Section containing module parameters to describe the transport level of controller interactions with the ATM.

12.2 Configuration files for controller interaction with the ATM

Setup of controller interaction with ATMs includes:

- Defining rules for processing requests from ATMs, for their further conversion to ISO messages and transmission to NetServer interface channels (with bank, payment system or payment acceptance system) (see the section "Request processing configuration file").

- Defining rules for processing responses received in ISO messages from interface channels to generate the corresponding commands to the ATM (see the section "Response message configuration file").



ATM interaction with the controller

The names and location of the corresponding files are specified as controller configuration file parameter values (see the section "Controller configuration file").

12.2.1 Functions used in files for setup of interaction between controllers and ATMs

The following functions determining operations with arguments, that may be variables, constants or the results of function calculations, may be used in configuration files. The constants must be placed within single quotation marks.

- sum(argument1,argument2,...,argumentN) or plus(argument1,argument2,...,argumentN) – the adding up of argument values
- minus(argument1,argument2,...,argumentN) – the detracting of argument values
- mul(argument1,argument2,...,argumentN) – the multiplication of argument values
- div(argument1,argument2,...,argumentN) – the division of argument values
- concat(argument1,argument2,...,argumentN) – the concatenation of strings. For instance, the concat('TEST=', BUFFER_C,';') function returns the "TEST=<variable value BUFFER_C>;" value.
- substr(argument1,argument2,argument3) or substring(argument1,argument2,argument3) – the function returning a sub-string; argument1 is the initial string, argument2 is the sequential number of a symbol in the initial string that is the first symbol of the sub-string, argument3 is the sequential number of a symbol in the initial string that is the last symbol of the sub-string. If this argument is missing, the last symbols of the initial string and sub-string are the same.
- matchstr(argument1,argument2) – function returning FALSE if argument1 doesn't match argument2, and TRUE otherwise; the value of argument2 can be set using a mask; for example, the function matchstr(argument1, '***A') will return TRUE if argument1 contains the letter "A" in the fourth position.
- abs(argument1) – the calculation of the absolute value of a number.

- boolean(argument1) – the function returning FALSE, if the argument is missing, and TRUE – otherwise.
- strlen(argument1) or string-length(argument1) – the function returning the number of symbols in an argument (string length). If the argument is missing, the number equals "0".
- uc(argument1) – the conversion of all letters in an argument to upper case.
- rtrim(argument1) – the removal of a space at the end of a string.
- ltrim(argument1) – the removal of a space at the start of a string.
- GetDataFromTxtBuffer(argument1,argument2) – the function returning the value of the tag determined by argument2 contained in the string determined by argument1.
- SetDataToTxtBuffer(argument1,argument2,argument3) – in the string defined by argument1, a tag is set with the name defined by argument2 and the value specified in argument3.
- Set_BerTLV_Data(argument1, argument2) – the function returning a string in the BerTLV format, where the tag name is determined by argument1 and the value of the tag – by argument2.
- GetTagAndValue(argument1,argument2,argument3) – the function accepts a TAG=VALUE; string on input (argument 1) and returns the tag name and its value as the values of argument2 and argument3, respectively.

  For example:

```
<PARAMETER Name="TotalNotes" Value="''"/>
<PARAMETER Name="WorkString" Value="'type1=134;type2=245;type3=221'"/>
<While test="not_null(WorkString)">
  <PARAMETER Name="WorkString" Value="GetTagAndValue(WorkString, INFO_STR_0,
INFO_STR_1 )"/>
  <PARAMETER Name="TotalNotes" Value="sum(TotalNotes,INFO_STR_1)"/>
</While>
```

in the cycle from the "WorkString" parameter, the values of INFO_STR_1 for all tags are determined and totalled in the "TotalNotes" variable.

What should be kept in mind is that the values of functions are calculated left to right. For instance, minus(argument1,argument2,argument3) detraction function is calculated as follows: argument2 is detracted from argument1, argument3 is detracted from the difference, etc. Same for the division function div(argument1,argument2,...,argumentN).

12.2.2 Request processing configuration file

This file contains a description of rules for processing requests from the ATM (Operation Key Buffer), for their further conversion to ISO format.

The file name is specified as the parameter value in the ATM controller configuration file (see the section "Controller configuration file", OPERATION_KEY_FILE parameter).

ATM requests are generated as a sequence of 8 characters (positions).

Rules for processing ATM requests are described in the configuration file by the following elements:

- Condition with the OPERATION_KEY attribute – this element determines the request value mask (Operation Key Buffer) in the following format:

```
   <Condition OPERATION_KEY="<attribute value>">
<element body>
      </Condition >
```

The body of the Condition element determines a set of parameters for the appropriate values of a request (Operation Key Buffer) and may include nested Condition elements specifying a set of parameters for a certain value of the request.

The following symbols may be used for specifying the values of the OPERATION_KEY attribute of the Condition element:

- "A", "B", "C", "D", "F", "G", "I" – are used in requests for the respective codes of Latin alphabetical symbols.
- "*" – indicates the presence of any symbol in the request.
- "~" or " " (space) – indicates the presence of a space in the request.

When specifying the values of the OPERATION_KEY attribute an abbreviated format may be used, for instance:

```
<Condition OPERATION_KEY="A">
```

is an equivalent of:

```
<Condition OPERATION_KEY="A*******">
```

The entry:

```
<Condition OPERATION_KEY="~*A">
```

is an equivalent of:

```
<Condition OPERATION_KEY=" *A*****">
```

- Condition with attributes LUNO, BRAND, ACCOUNT, PROTOCOL:

```
<Condition LUNO="<attribute value>">
<element body>
      </Condition >
```

The body of the Condition element determines a set of parameters for the appropriate values of LUNO, BRAND, ACCOUNT and PROTOCOL and may include nested Condition elements specifying a set of parameters for a certain value of the request.

To set the value of Condition element attributes, the following symbols can be used:

- "*" – indicates the presence of any symbol in the request.
- "~" or " " (space) – indicates the presence of a space in the request.

When setting the value of attributes LUNO, BRAND, ACCOUNT, a "mask" can be used:

```
<Condition LUNO="IBM*">
<Condition ACCOUNT="56**43**">
<element body>
</Condition>
</Condition>
```

- Condition with the CONFIG_ID attribute:

```
<Condition CONFIG_ID="<attribute value>">
<element body>
      </Condition>
```

The body of the Condition element determines a set of parameters for the appropriate value of CONFIG_ID and may include nested Condition elements specifying a set of parameters for a certain value of the request.

- Condition with the TransCondition attribute:

```
<Condition TransCondition="<attribute value>">
<element body>
      </Condition>
```

The body of the Condition element determines a set of parameters for the appropriate value of TransCondition and may include nested Condition elements specifying a set of parameters for a certain value of the request.

The TransCondition element can have the following values:

- "EMV" – transaction with an EMV smart-card.
- "PBT" – PIN-based transaction with an magnetic-stripe card.
- "Cardless" – an operation without the use of a bank card.
- "Manual" – an operation involving the manual entering of bank card data.

- PROCESS – this element may be represented in the following format:

```
<Process Name="<name of process>", <additional parameter>="value"/>
```

The PROCESS element determines the name of the process that must be run. For example:

- "Start Operation" – run for all operations; generates an acquiring document in the Way4 database.
- "Authorisation Request" – makes an authorization request.

- "Check Retail Request" – makes a request to check a payment; MTID can be used as an additional parameter (for example, MTID="PayerAuthRequest").
- "Financial Retail Advice" – makes a request to make a payment.
- "Close ATM Cycle" – closes a financial cycle, used in REPLENSHMENT and COLLECTION operations; Type can be used as an additional parameter (for example, Type="CB").
- "Send Terminal Command" – sends a command to the ATM; MTID can be used as an additional parameter (for example, MTID="Go out-of-service").
- "Send Reversal Advice" – makes a request to reverse the current operation; MTID can be used as an additional parameter (for example, MTID="PayerAuthReversal").

For instance, a timeout may be used as an additional parameter of the PROCESS element:

```
... Timeout="20"/>
```

- PARAMETERS – this element can be presented in the following format:

```
<PARAMETERS <attribute>="<attribute value>"/>
```

The following attributes may be used in this element:

- OPERATION – the value of the attribute specifies the type of an operation; possible values:
  - "CASH_WITHDRAWAL" – cash dispense.
  - "BALANCE_INC" – balance inquiry.
  - "MINI_STATEMENTS" – request a mini-statement for an account.
  - "PIN_CHANGE" – PIN change (only when using protocol "NDC+").
  - "DEPOSIT" – accept a deposit.
  - "NOTE_ACCEPTANCE" – note acceptance operation.
  - "FUNDS_TRANSFER" – transfer funds from one account to another.
  - "PERSON_TO_PERSON" – transfer funds from the account of one bank card to the account of another card.
  - "RETAIL" – payment of a retail operation through an ATM with the use of a bank card.
  - "PERSONAL_MENU" – work in the "personal office".
  - "CASH_PAYMENT" – a cash payment through an ATM to an outside service provider.
  - "CASH_PAYMENT_WITH_CHANGE" – pay for third-party services in cash at an ATM and get change.
  - "EXCHANGE" – FX operations made at an ATM.
  - "CARD_CONTROL_REQUEST" – card management operations.
  - "CARD_SERVICE_REQUEST" – operations for issuing activation passwords.
  - "COLLECTION" – operation to remove accepted cash from an ATM.
  - "ATM_SERVICE" – ATM technical service operations.

- "REPLENISHMENT" – replenish ATM cassettes.
- "END_OF_DAY" – statement reporting on the state of ATM counters.
- "VOUCHER_CODE_REQUEST" – withdraw cash using a special code.

- CURRENCY – the value of the attribute specifies the ISO code of the currency of an operation.
- REQUEST_CURRENCY – the value of the attribute specifies the ISO code of the currency requested for an operation.
- EXPONENT – specifies the number of digits to the right of the floating point in the amount initially sent by a terminal.
- RECEIPT – the value of the attribute specifies the flag of a request for a check.
- FROM_ACCOUNT – the value of the attribute specifies the code that identifies the type of the account debited by the operation.
- TO_ACCOUNT – the value of the attribute specifies the code that identifies the type of the account credited by the operation.
- LANGUAGE – the value of the attribute specifies the language selected for the ATM interface.
- ACCOUNT_ID_1 – the value of the attribute specifies the content of the 102 (Account Identification field of an ISO message.
- ACCOUNT_ID_2 – the value of the attribute specifies the content of the 103 (Account Identification field of an ISO message.
- TRN_DESC – the value of the attribute specifies the content of the 104 (Transaction Description) field of an ISO message.
- SERVICE_DESC – the value of the attribute specifies the values of additional parameters used in service operations.
- RID – the value of the attribute specifies the content of the 100 (Receiving Institution ID Code) field of an ISO specific transactions message.
- BillingRID – the value of the attribute specifies the content of the 100 (Receiving Institution ID Code) field of an ISO for requests to Billing Systems message.
- SERVICE_ID – the value of the attribute specifies the ID of a specific transactions service.

- PARAMETER – this element determines a generic parameter and can be shown in the following format:

```
<PARAMETER Name="<parameter name>" Value="<parameter value>" [DEFAULT="<default
value>" Format="<value format>" Size="<value size>"]/>
```

The parameter value can be set, for example, as follows:

- Assign a constant value:

```
<PARAMETER Name="PRM1" Value="'901'"/>
```

- Assign the value of a parameter declared earlier:

```
<PARAMETER Name="PRM2" Value="PRM1"/>
```

- Assign a value using supported functions (see the section "Functions used in files for setup of interaction between controllers and ATMs"):

```
<PARAMETER Name="PRM3" Value="GetDataFromTxtBuffer(SCREEN_DATA,'Tag1')"/>
```

  Optional attributes:

  - DEFAULT – default value of the parameter, if a value was not assigned.
  - Size – size (in bytes) allocated for the parameter value.
  - Format – format for showing data, for example: "RJSPS" – right-pad with zeros to a value of the specified size; 'LJZER" – left-pad with zeros to a value of the specified size.

- DEFINE – this element defines a generic parameter without assigning a value and can be shown in the following format:

```
<DEFINE Name="<parameter name>"/>
```

> The controller supports the ability to create up to 128 adjustable parameters.

Configuration files may include comments in the following format:

```
        <!--<comment text>-->
```

12.2.3 Response message configuration file

This file contains a description of parameters used to create the controller commands that are sent to the ATM depending on the type of response code. The response code is received from an external authorization system or is created by the ATM controller.

The name of the response message configuration file is indicated in the ATM controller configuration file (see the section "Controller configuration file", RC_TABLE parameter).

Rules for generating response messages depending on the results of processing a request (response code) are described in the configuration file through the following elements:

- Condition with the RC attribute – this element defines the authorization system response code in the format:

```
   <Condition RC="<attribute value>">
<element body>
      </Condition >
```

The body of the Condition element defines the set of parameters for a response code and may contain nested element Condition, which specifies the set of parameters for a specific response code.

To set values of the RC attribute for the Condition element, a number value may be selected for the response code within the range of 00 to 99 (a code by standard ISO 8385) and 100 to 200 (for an internal ATM controller code).

- Condition with the ExtendedRC attribute – this element defines an addition to the response code in the format:

```
   <Condition ExtendedRC="<attribute value>">
<element body>
      </Condition >
```

As an addition to the response code, the configuration file may indicate a response code received from interface channels, for example, from the bank's billing gateway providing interfaces to service provider systems (see the section "Support of additional online services"). In this case, to process a response received directly form a payment acceptance system, use Condition with the DiagnosticRC element:

```
   <Condition DiagnosticRC="<attribute value>">
<element body>
      </Condition >
```

The body of the Condition element determines the set of parameters for an additional code and may contain nested Condition elements, which further define a set of parameters for a specific value in the additional code.

- Condition with the OPERATION attribute – this element determines the type of operation which will cause a response code to be created, in the format:

```
<Condition OPERATION="<attribute value>">
<element body>
      </Condition >
```

The body of the Condition element determines the operation type and may contain the nested Condition elements, which specify a set of parameters for a specific value of the operation type.

The OPERATION attribute may have the following values:

- "CASH_WITHDRAWAL" – cash dispense.
- "BALANCE_INC" – balance inquiry.
- "MINI_STATEMENTS" – request a mini-statement for an account.
- "PIN_CHANGE" – PIN change (only when using protocol "NDC+").
- "DEPOSIT" – accept a deposit.
- "NOTE_ACCEPTANCE" – note acceptance operation.

- "FUNDS_TRANSFER" – transfer funds from one account to another.
- "PERSON_TO_PERSON" – transfer funds from the account of one bank card to the account of another card.
- "RETAIL" – payment of a retail operation through an ATM with the use of a bank card.
- "PERSONAL_MENU" – work in the "personal office".
- "CASH_PAYMENT" – a cash payment through an ATM to an outside service provider.
- "CASH_PAYMENT_WITH_CHANGE" – pay for third-party services in cash at an ATM and get change.
- "EXCHANGE" – FX operations made at an ATM.
- "CARD_CONTROL_REQUEST" – card management operations.
- "CARD_SERVICE_REQUEST" – operations for issuing activation passwords.
- "COLLECTION" – operation to remove accepted cash from an ATM.
- "ATM_SERVICE" – ATM technical service operations.
- "REPLENISHMENT" – replenish ATM cassettes.
- "END_OF_DAY" – statement reporting on the state of ATM counters.
- "VOUCHER_CODE_REQUEST" – dispense cash according to a special code.

- Condition with the RECEIPT attribute– this element determines whether the cardholder selected receipt printing; this attribute has two values: "Yes" – prints a receipt, "No" – receipt is not printed:

```
<Condition RECEIPT="<attribute value>">
<element body>
      </Condition>
```

The body of the Condition element determines a set of parameters for the attribute value and can contain the Condition elements, that further define a set of parameters for a specific value of the receipt printing attribute.

- Condition with the RETAIN_CARD element – this element determines whether a bankcard will be retained (with a "Yes" value) when the operation is being executed. By default, the attribute is set to "No":

```
<Condition RETAIN_CARD="<attribute value>">
<element body>
      </Condition>
```

The body of the Condition element determines a set of parameters for the attribute value and can contain the nested Condition elements that further define a set of parameters for a specific value of the attribute.

- Condition with attribute PHASE – this element determines the operation phase during which the response code will be created, in the format:

```
<Condition PHASE="<attribute value>">
<element body>
      </Condition>
```

The body of the Condition element determines a set of parameters for the attribute value and can contain the nested Condition elements that further define a set of parameters for a specific value of the attribute.

The PHASE attribute may have one of the following values:

- "APPROVE" – operation execution phase, corresponding to the first command the controller sends to the ATM as a response to the request.
- "DECLINE" – operation execution phase, corresponding to a negative code the controller sends to the ATM.
- "DUMP" – operation execution phase, corresponding to a controller command through which the ATM dumps diverted banknotes.
- "RETRY" – operation execution phase, corresponding to the continuation of the cash dispense operation after the controller receives a status message from the ATM.
- "NEGOTIATION" – the phase of coordinating the conditions of an operation with a client.

Most variables used for describing receipt formats are attributes of element Condition (see the section "Variables used in receipt and screen templates").

Most often the following variables are used as attributes:

- Condition with attributes LUNO, BRAND, ACCOUNT, PROTOCOL:

```
<Condition LUNO="<attribute value>">
<element body>
      </Condition>
```

The body of the Condition element determines the set of parameters for values LUNO, BRAND, ACCOUNT, PROTOCOL and can contain the nested Condition elements that further define a set of parameters for a specific value of the attribute.

To set the value of Condition element attributes, the following symbols can be used:

- "*" – indicates the presence of any symbol in the request.
- "~" or " " (space) – indicates the presence of a space in the request.

When setting the value of attributes LUNO, BRAND, ACCOUNT, a "mask" can be used:

```
<Condition LUNO="IBM*">
<Condition ACCOUNT="56**43**">
<element body>
</Condition>
</Condition>
```

- Condition with the CONFIG_ID attribute:

```
<Condition CONFIG_ID="<attribute value>">
<element body>
      </Condition>
```

The body of the Condition element determines the set of parameters for value CONFIG_ID and can contain nested Condition elements that further define the parameter set for a concrete attribute value.

- Condition with the TRANS_CONDITION attribute:

```
<Condition TRANS_CONDITION="<attribute value>">
<element body>
      </Condition>
```

The body of the Condition element determines the set of parameters for the TransCondition value and can contain nested Condition elements that further define the parameter set for a specific attribute value.

The TransCondition element can have the following values:

- "EMV" – transaction with an EMV smart-card.
- "PBT" – PIN-based transaction with an magnetic-stripe card.
- "Cardless" – an operation without the use of a bank card.
- "Manual" – an operation when data as to a bank card is entered manually.

If other variables used for receipt format descriptions need to be used as element Condition attributes, consult with OpenWay representatives.

- PARAMETERS – this element can be presented in the following format:

```
<PARAMETERS <attribute>="<attribute value>"/>
```

This parameter can use the following attributes:

- Next StateID – the attribute value determines the next ATM base state when a controller command has been successfully executed.
- RC_DESCRIPTION – the attribute value defines the description of the response code of an external authorization system or ATM controller.
- Screen<number> – the attribute value determines the number of the screen which will be displayed while the controller command is being executed.
- Printer<number> – the attribute value determines from which one of two ATM printer buffers data will be sent to be printed.
- PrnTemplate<number> – the attribute value determines which template will be used for printing; the template number is matched with a concrete file in the ATM configuration file (see the section "Controller configuration file").

- ScrTemplate<number> – the attribute value determines which screen template will be used to display data.
- RETAIN_CARD – the attribute value determines that the bank card has been retained (if value is "Yes") while the operation is executed; the value of this parameter by default is "No".

12.3 ATM receipt and screen format description language

The format of information for display on screens and printing in receipts is set in special template files. Template files names are defined in the ATM controller's configuration file (see the section "Controller configuration file", CONSUMER_RECEIPT, JOURNAL_RECEIPT, STATEMENT_RECEIPT, ADMIN_RECEIPT, and SCREENS_TEMPLATE parameters).

Screen and receipt templates have the same description format. A template file consists of sections enclosed in angular brackets that contain information on the format of the printed receipt or on the format of information shown on the ATM screen. Conditional statements determine how the information contained in any given section of the template file is used. An example of a receipt template file section is given in the section "Example of a receipt template file".

12.3.1 Use of functions in receipt and screen format description

The following functions may be used when describing the formats of receipts and screens:

- %Base64toString(TextDetails1)% – the function that converts the "TextDetails1" Unicode Base24 string into a string of symbols that ATMs can display. This conversion is done according to the value of the MAP_TABLE parameter of the configuration file (see the section "Controller configuration file").
- %amount(<iso amount>, <iso currency code>,<format>)% – the function that returns amounts, in the formats determined by its argument, also indicating the currency.
- %CurrencySwiftCode(<iso currency code>)% – the function that converts currency codes from the digital into alphabetic format, like converting the "840" code into the "USD" code.

In these functions, a variable, such as CURRENCY, or a constant placed in single quotes, like '810', '840', etc. may be used as the <iso currency code> argument (see the section "Variables used in receipt and screen templates").

The %amount(...)% as <iso amount> function uses amounts represented in minimal currency units in accordance with the ISO format allowing the use of signs. For instance $10.00 may be represented as "1000", or D1000, or "+1000", while minus $10.00 may be shown as "C1000" or "1000".

The <format> argument placed, in the %amount(...)% function, in single quotes determines the format, in which amounts are represented. Possible values of the <format> argument are shown in the table:

<format> argument value	**The representation of amounts when the value of the <iso amount> argument equals +1000/-1000, for currencies where two decimal digits are used to the right of the floating point.**
0.< >< >	10.00
0.00	10.00
0.00	10.00/-10.00
-0.00	< >10.00/-10.00
+0.< >< >	+10/-10
< >< >< >< >< >0	< >< >< >< >10
< >,< >< >< >,< >< >0	< >< >< >< >< >10 (the amount of 1000000 will be represented as < >< >10,000)
000000.00	000010.00
000000.00	+000010.00/-000010.00
-000000.00	+000010.00/-000010.00
000000.00+	000010.00+/000010.00-
000000.00-	000010.00/000010.00-
C000000.00	C000010.00/D000010.00
D000000.00	000010.00/D000010.00
000000.00C	000010.00C/000010.00D
000000.00D	000010.00/000010.00D
000000	000010
0,000,000	0,000,010

<format> argument value	The representation of amounts when the value of the <iso amount> argument equals +1000/-1000, for currencies where two decimal digits are used to the right of the floating point.
0,000,000.00	0,000,010.00
0-000-000.00	0-000-010.00
< >-< >< >< >-< >< >0.00	< >< >< >< >< >< >10.00

12.3.2 Use of conditional operators

In the current version of Way4, the following conditional operators may be used when describing receipt and screen templates:

- "=" – equal to.
- "!=", "<>" – not equal to.
- "i" – set inclusive.
- "!i" – not set inclusive.

When using the operators "equal to" and "not equal to", an additional criterion, "matches" (or "does not match") can be added to the first "n" symbols.

> ⚠ At least one space must be entered before the conditional operators "!=", "i" and "!i" in the receipt or screen template file text.

12.3.2.1 Examples of conditional statements

The following conditional statements can be used to show data from the template file section on the ATM screen or include it in the receipt according to the ATM type (see the section "ATM types dictionary"):

- The section data will be used to display information on the screen or print a receipt if the ATM brand is "NCR":

```
<BRAND="NCR"
...
>
```

- The section data will be used to display information on the screen or print a receipt if the ATM brand is not "NCR":

```
<BRAND !="NCR"
...
>
```

- The section data will be used to display information on the screen or print a receipt if the ATM brand begins with "NC":

```
<BRAND="NC%"
...
>
```

- The section data will be used to display information on the screen or print a receipt if the ATM brand does not begin with "NC":

```
<BRAND !="NC%"
...
>
```

- Section data will be used to display information on the screen or print a receipt if the value of the VAR variable is not set:

```
<VAR !="%"
...
>
```

- The section data will be used to display information on the screen or print a receipt if the ATM brand is "NCR", "IBM", or "DEC":

```
<BRAND i"NCR,IBM,DEC"
...
>
```

- The section data will be used to display information on the screen or print a receipt if the ATM brand is not "NCR", "IBM", or "DEC":

```
<BRAND !i"NCR,IBM,DEC"
...
>
```

The template file section can begin with a tag and without a conditional statement; for example:

```
<CASH_WITHDRAWAL
...
>
```

In this case, the given section will be used to display information on the screen or print a receipt if a corresponding flag is set up on the NetServer when the data is processed; for example, CASH_WITHDRAWAL =YES.

The list of variables used in format descriptions for screens and receipts is presented in the section "Variables used in receipt and screen templates".

12.3.3 Use of special characters

In a number of cases when describing the format of a receipt or screen characters must be used that are part of template syntax. For example, the "<" and ">" characters are used to limit section boundaries.

To exclude the risk of improperly processing templates allowing the "#", "$", "%", "<", ">", "&" characters to be output to the receipt or template, the "&" symbol must be used as an escape character. For example to display the text:

COMPANY B&P

TEL:+7<812>232-4693

Special characters must be escaped in the template as follows:

COMPANY B**&**&P

TEL:+7&<812&>232-4693

12.3.4 Variables used in receipt and screen templates

Name	Tag	Variable	Description	Values
ATM_SERVICE	+	–	Operator request for the execution of a service operation	
BALANCE_INQ	+	–	Issuing of card account balance	
CASH_PAYMENT	+	–	Payment in cash for services	
COLLECTION	+	–	Operator request for notes from cardholders to be collected from the ATM	
END_OF_DAY	+	–	Request for ATM's balance	
EXCHANGE	+	–	A request for a currency exchange operation	
RETAIL	+	–	Retail transaction	
FUNDS_TRANSFER	+	–	Online payment from a card account	
ICC_DISPENSE	+	–	Cash dispense through bank card authorized by alternative Controller in the following order: cash → receipt → card	
MINI_STATEMENTS	+	–	Issuing of mini-statements on a card account for the last ten operations	

Name	Tag	Variable	Description	Values
PAYMENT	+	–	Replenishment of funds to a card account	
PIN_CHANGE	+	–	Request to change PIN	
REPLENISHMENT	+	–	Operator request to replenish the ATM	
STATEMENTS	+	–	Issuing of card account statement	
CASH_WITHDRAWAL	+	–	Cash dispense through bank card	
ACCOUNT	+	+	Full bank card number	
ACCOUNT_ID_1	+	+	Identification #1 of the cardholder account (generated by contents of field 102 in the ISO message)	
ACCOUNT_ID_2	+	+	Identification #2 of the cardholder account (generated by contents of field 103 in the ISO message)	
ACCT_TYPE	+	–	Code identifying the type of account to/from which funds are transferred through the operation	00 – is not used or is not defined 10 – savings account 20 – checking account 30 – credit account 40 – universal account

Name	Tag	Variable	Description	Values
ACCT_TYPE1	+	–	Code identifying the account type for the first subgroup of the field containing information on available funds (generated by contents of field 54 of ISO message)	00 – is not used or is not defined 10 – savings account 20 – checking account 30 – credit account 40 – universal account
ACCT_TYPE2	+	–	Code identifying the account type for the second subgroup the field containing information on available funds (generated by contents of field 54 of ISO message)	00 – is not used or is not defined 10 – savings account 20 – checking account 30 – credit account 40 – universal account
ACCT_TYPE3	+	–	Code identifying the account type for the third subgroup of the field containing information on available funds (generated by contents of field 54 of ISO message)	00 – is not used or is not defined 10 – savings account 20 – checking account 30 – credit account 40 – universal account
ACCT_TYPE4	+	–	Code identifying the account type for the fourth subgroup of the field containing information on available funds (generated by contents of field 54 of ISO message)	00 – is not used or is not defined 10 – savings account 20 – checking account 30 – credit account 40 – universal account

Name	Tag	Variable	Description	Values
ACCT_TYPE5	+	–	Code identifying the account type for the fifth subgroup of the field containing information on available funds (generated by contents of field 54 of ISO message)	00 – is not used or is not defined 10 – savings account 20 – checking account 30 – credit account 40 – universal account
ACCT_TYPE6	+	–	Code identifying the account type for the sixth subgroup of the field containing information on available funds (generated by contents of field 54 of ISO message)	00 – is not used or is not defined 10 – savings account 20 – checking account 30 – credit account 40 – universal account
ACQ_BANK_CODE	+	-	Internal code of the acquirer financial institution	
ADVERTISING_TEXT	–	+	The text of an advertisement	
AID	+	+	Acquirer ID	
AMOUNT	–	+	Amount withdrawn from the cardholder's account	
AMOUNT0	–	+	Request for mini-statement: the amount of the first of last ten operations	
AMOUNT1	–	+	Request for mini-statement: the amount of the second of last ten operations	

Name	Tag	Variable	Description	Values
AMOUNT2	–	+	Request for mini-statement: the amount of the third of last ten operations	
AMOUNT3	–	+	Request for mini-statement: the amount of the fourth of last ten operations	
AMOUNT4	–	+	Request for mini-statement: the amount of the fifth of last ten operations	
AMOUNT5	–	+	Request for mini-statement: the amount of the sixth of last ten operations	
AMOUNT6	–	+	Request for mini-statement: the amount of the seventh of last ten operations	
AMOUNT7	–	+	Request for mini-statement: the amount of the eighth of last ten operations	
AMOUNT8	–	+	Request for mini-statement: the amount of the ninth of last ten operations	
AMOUNT9	–	+	Request for mini-statement: the amount of the tenth of last ten operations	

Name	Tag	Variable	Description	Values
AMOUNT_TYPE1	+	–	Code identifying the amount type for the first subgroup of the field containing information on available funds (generated by contents of field 54 of ISO message)	01 – amount remaining 02 – funds available 03 – outstanding credit 04 – outstanding credit requiring immediate repayment 40 – amount received from merchant during a retail transaction 41 – amount paid for goods and services 90 – available funds under the credit limit 91 – credit limit
AMOUNT_TYPE2	+	–	Code identifying the amount type for the second subgroup of the field containing information on available funds (generated by contents of field 54 of ISO message)	01 – amount remaining 02 – funds available 03 – outstanding credit 04 – outstanding credit requiring immediate repayment 40 – amount received from merchant during a retail transaction 41 – amount paid for goods and services 90 – available funds under the credit limit 91 – credit limit

Name	Tag	Variable	Description	Values
AMOUNT_TYPE3	+	–	Code identifying the amount type for the third subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	01 – amount remaining 02 – funds available 03 – outstanding credit 04 – outstanding credit requiring immediate repayment 40 – amount received from merchant during a retail transaction 41 – amount paid for goods and services 90 – available funds under the credit limit 91 – credit limit
AMOUNT_TYPE4	+	–	Code identifying the amount type for the fourth subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	01 – amount remaining 02 – funds available 03 – outstanding credit 04 – outstanding credit requiring immediate repayment 40 – amount received from merchant during a retail transaction 41 – amount paid for goods and services 90 – available funds under the credit limit 91 – credit limit

Name	Tag	Variable	Description	Values
AMOUNT_TYPE5	+	–	Code identifying the amount type for the fifth subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	01 – amount remaining 02 – funds available 03 – outstanding credit 04 – outstanding credit requiring immediate repayment 40 – amount received from merchant during a retail transaction 41 – amount paid for goods and services 90 – available funds under the credit limit 91 – credit limit
AMOUNT_TYPE6	+	–	Code identifying the amount type for the sixth subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	01 – amount remaining 02 – funds available 03 – outstanding credit 04 – outstanding credit requiring immediate repayment 40 – amount received from merchant during a retail transaction 41 – amount paid for goods and services 90 – available funds under the credit limit 91 – credit limit

Name	Tag	Variable	Description	Values
ATM, BRAND	+	+	Trade name of the ATM manufacturer	'DIEBOLD', 'NCR', 'NCR3G', 'NCR4G', 'PersonaS', 'BULL', 'OLIVETTI', 'WINCOR', 'DEC', 'BANQIT'
AUTHCODE	–	+	Authorization code	
BALANCE1	+	+	Balance for the first subgroup of the field containing information on available funds (generated by the contents of field54 of ISO message)	
BALANCE2	+	+	Balance for the second subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	
BALANCE3	+	+	Balance for the third subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	
BALANCE4	+	+	Balance for the fourth subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	
BALANCE5	+	+	Balance for the fifth subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	

Name	Tag	Variable	Description	Values
BALANCE6	+	+	Balance for the sixth subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	
BillingRID	+	+	Receiving Institution ID Code in a billing system	
BIN	+	+	ID of the acquirer bank in Way4	
CARD_CHANNEL	+	+	Issuer channel ID	
CARDNUM	–	+	Abbreviated bank card number, containing the first and last few digits of the full number	
CARDSTR	–	+	Bank card type	Cirrus/Maestro Private, VISA Gold, EC/MC Gold, etc.
CARDS_PICKUP	–	+	Quantity of retained cards	
SIC	+	+	Type of retail outlet	
City	–	+	City where ATM is located	
CST_CYCLE1	+	+	ID of replenishment cycle for the first cassette	
CST_CYCLE2	+	+	ID of replenishment cycle for the second cassette	
CST_CYCLE3	+	+	ID of replenishment cycle for the third cassette	

Name	Tag	Variable	Description	Values
CST_CYCLE4	+	+	ID of replenishment cycle for the fourth cassette	
COLLECTION_CYCLE	-	+	ID of the current collection cycle (for inclusion in the replenishment officer's receipt)	
CONFIG_ID	+	+	Configuration ID	0001...9999
CSP_Data	–	+	The variable contains a new PIN block in a key change operation	
CURRENCY	+	+	SWIFT code of the currency of the operation	
DATE	+	+	Operation date in format DD/MM/YYYY	DD – calendar date (01–31) MM – month (01-12) YYYY – year
DD	+	+	Date of operation (day of month)	01-31
DD0	–	+	Date (day of month) when the first of last ten operations was completed	01-31
DD1	–	+	Date (day of month) when the second of last ten operations was completed	01-31
DD2	–	+	Date (day of month) when the third of last ten operations was completed	01-31

Name	Tag	Variable	Description	Values
DD3	–	+	Date (day of month) when the fourth of last ten operations was completed	01-31
DD4	–	+	Date (day of month) when the fifth of last ten operations was completed	01-31
DD5	–	+	Date (day of month) when the sixth of last ten operations was completed	01-31
DD6	–	+	Date (day of month) when the seventh of last ten operations was completed	01-31
DD7	–	+	Date (day of month) when the eighth of last ten operations was completed	01-31
DD8	–	+	Date (day of month) when the ninth of last ten operations was completed	01-31
DD9	–	+	Date (day of month) when the tenth of last ten operations was completed	01-31
DENOM1	+	+	Denomination of first cassette	
DENOM2	+	+	Denomination of second cassette	
DENOM3	+	+	Denomination of third cassette	
DENOM4	+	+	Denomination of fourth cassette	

Name	Tag	Variable	Description	Values
DENOM_ID1	+	+	Code of note denomination in first cassette	
DENOM_ID2	+	+	Code of note denomination in second cassette	
DENOM_ID3	+	+	Code of note denomination in third cassette	
DENOM_ID4	+	+	Code of note denomination in fourth cassette	
DISPENSED1	–	+	Quantity of notes dispensed from first cassette	
DISPENSED2	–	+	Quantity of notes dispensed from second cassette	
DISPENSED3	–	+	Quantity of notes dispensed from third cassette	
DISPENSED4	–	+	Quantity of notes dispensed from fourth cassette	
DIVERTED1	–	+	Quantity of diverted notes from first cassette	
DIVERTED2	–	+	Quantity of diverted notes from second cassette	
DIVERTED3	–	+	Quantity of diverted notes from third cassette	
DIVERTED4	–	+	Quantity of diverted notes from fourth cassette	

Name	Tag	Variable	Description	Values
DIVERTED_CASH1	–	+	Amount of diverted cash dispensed from first cassette	
DIVERTED_CASH2	–	+	Amount of diverted cash dispensed from second cassette	
DIVERTED_CASH3	–	+	Amount of diverted cash dispensed from third cassette	
DIVERTED_CASH4	–	+	Amount of diverted cash dispensed from fourth cassette	
REQUEST_AMOUNT	–	+	Amount requested by the cardholder	
EXPIRY_DATE	–	+	Card expiration date	
FEE	+	+	Amount of acquirer’s fee	
FEE_CURRENCY	+	+	The ISO code of the currency of the acquirer's fee, if different from the currency of the operation.	
FREE_TEXT	–	+	Reserved value	
FALL_BACK_OPERATION_CODE	–	+	The code of the operation that may be performed while performing the current operation is impossible.	
HH	–	+	Time of operation (hour)	00-23
HH12	–	+	Time of operation (hour)	00-12

Name	Tag	Variable	Description	Values
ISO_CST_CUR1	+	+	ISO code of currency in first cassette	
ISO_CST_CUR2	+	+	ISO code of currency in second cassette	
ISO_CST_CUR3	+	+	ISO code of currency in third cassette	
ISO_CST_CUR4	+	+	ISO code of currency in fourth cassette	
ISO_CUR0	+	+	ISO code of currency used in the first of last ten operations	
ISO_CUR1	+	+	ISO code of currency used in the second of last ten operations	
ISO_CUR2	+	+	ISO code of currency used in the third of last ten operations	
ISO_CUR3	+	+	ISO code of currency used in the fourth of last ten operations	
ISO_CUR4	+	+	ISO code of currency used in the fifth of last ten operations	
ISO_CUR5	+	+	ISO code of currency used in the sixth of last ten operations	
ISO_CUR6	+	+	ISO code of currency used in the seventh of last ten operations	

Name	Tag	Variable	Description	Values
ISO_CUR7	+	+	ISO code of currency used in the eighth of last ten operations	
ISO_CUR8	+	+	ISO code of currency used in the ninth of last ten operations	
ISO_CUR9	+	+	ISO code of currency used in the tenth of last ten operations	
ISO_CURRENCY1	+	+	ISO code of currency for the first subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	
ISO_CURRENCY2	+	+	ISO code of currency for the second subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	
ISO_CURRENCY3	+	+	ISO code of currency for the third subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	

Name	Tag	Variable	Description	Values
ISO_CURRENCY4	+	+	ISO code of currency for the fourth subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	
ISO_CURRENCY5	+	+	ISO code of currency for the fifth subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	
ISO_CURRENCY6	+	+	ISO code of currency for the sixth subgroup of the field containing information on available funds (generated by the contents of field 54 of ISO message)	
LANGUAGE	+	+	Selected language for the ATM interface	
LIMIT_NOTES	–	+	The limit on the quantity of all types of notes dispensed by the ATM at one time	
LOADED1	–	+	Quantity of notes loaded into the first cassette	
LOADED2	–	+	Quantity of notes loaded into the second cassette	
LOADED3	–	+	Quantity of notes loaded into the third cassette	

Name	Tag	Variable	Description	Values
LOADED4	–	+	Quantity of notes loaded into the fourth cassette	
LOADED_CASH1	–	+	Amount of cash funds loaded into the first cassette	
LOADED_CASH2	–	+	Amount of cash funds loaded into the second cassette	
LOADED_CASH3	–	+	Amount of cash funds loaded into the third cassette	
LOADED_CASH4	–	+	Amount of cash funds loaded into the fourth cassette	
LUNO	+	+	Unique ID of the ATM	
MAX_DENOM	–	+	Maximal face value of notes in the ATM	
MERCHANT_NAME	–	+	ATM location	
MI	–	+	Operation time (in minutes)	00-59
MIN_DENOM	–	+	Minimal face value of notes in the ATM	
MM	+	+	Month of the operation	01-12
MM0	–	+	Month when the first of last ten operations was completed	01-12

Name	Tag	Variable	Description	Values
MM1	–	+	Month when the second of last ten operations was completed	01-12
MM2	–	+	Month when the third of last ten operations was completed	01-12
MM3	–	+	Month when the fourth of last ten operations was completed	01-12
MM4	–	+	Month when the fifth of last ten operations was completed	01-12
MM5	–	+	Month when the sixth of last ten operations was completed	01-12
MM6	–	+	Month when the seventh of last ten operations was completed	01-12
MM7	–	+	Month when the eighth of last ten operations was completed	01-12
MM8	–	+	Month when the ninth of last ten operations was completed	01-12
MM9	–	+	Month when the tenth of last ten operations was completed	01-12
NOTE_ACCEPTANCE	+	–	Operation replenishing the card account	

Name	Tag	Variable	Description	Values
BILLS_NUMBER1	–	+	Quantity of notes that should be dispensed from the first cassette	
BILLS_NUMBER2	–	+	Quantity of notes that should be dispensed from the second cassette	
BILLS_NUMBER3	–	+	Quantity of notes that should be dispensed from the third cassette	
BILLS_NUMBER4	–	+	Quantity of notes that should be dispensed from the fourth cassette	
OP0	+	+	Type of first of last ten operations	A – authorization F – financial transaction
OP1	+	+	Type of second of last ten operations	A – authorization F – financial transaction
OP2	+	+	Type of third of last ten operations	A – authorization F – financial transaction
OP3	+	+	Type of fourth of last ten operations	A – authorization F – financial transaction
OP4	+	+	Type of fifth of last ten operations	A – authorization F – financial transaction
OP5	+	+	Type of sixth of last ten operations	A – authorization F – financial transaction

Name	Tag	Variable	Description	Values
OP6	+	+	Type of seventh of last ten operations	A – authorization F – financial transaction
OP7	+	+	Type of eighth of last ten operations	A – authorization F – financial transaction
OP8	+	+	Type of ninth of last ten operations	A – authorization F – financial transaction
OP9	+	+	Type of tenth of last ten operations	A – authorization F – financial transaction
PREF_AMOUNT	+	+	Amount to be dispensed in the event that the requested amount cannot be dispensed	
PROTOCOL			Protocol code, unique to the system	'MDS912' – Diebold 912 'NDC+' – NDC/NDC+
RC	+	+	Response code	
RC_DESCRIPTION	–	+	Description of response code	
RECEIPT	+	–	Receipt request flag	
RELATIVE_TIME	–	+	Time operation was completed according to the NetServer	
REPLACE_AMOUNT	+	+		
REQUEST_CURRENCY	+	+	The ISO code of the currency requested by the client.	

Name	Tag	Variable	Description	Values
RESPONSE_DATA	+	+		
RETRACTED1	–	+	Quantity of notes dispensed from the first cassette but not taken by the client and therefore retracted	
RETRACTED2	–	+	Quantity of notes dispensed from the second cassette but not taken by the client and therefore retracted	
RETRACTED3	–	+	Quantity of notes dispensed from the third cassette but not taken by the client and therefore retracted	
RETRACTED4	–	+	Quantity of notes dispensed from the fourth cassette but not taken by the client and therefore retracted	
RETRACTED_CASH1	–	+	Amount of cash, dispensed from the first cassette but not taken by the client and therefore retracted	
RETRACTED_CASH2	–	+	Amount of cash, dispensed from the second cassette but not taken by the client and therefore retracted	
RETRACTED_CASH3	–	+	Amount of cash, dispensed from the third cassette but not taken by the client and therefore retracted	

Name	Tag	Variable	Description	Values
RETRACTED_CASH4	–	+	Amount of cash, dispensed from the fourth cassette but not taken by the client and therefore retracted	
RID	+	+	Receiving Institution – the ID Code of the NetServer channel to be used for transmitting a request for authorization to the network of a payment system	
RRN	–	+	Operation's unique reference number	
Scenario	+	+	The name of the current operation script	
SEQCODE	–	+	Operation's unique reference number: the last six symbols of RRN	
SERVICE_TYPE	–	+	Additional field for a service operation	
SS	–	+	Operation time (seconds)	00-59
STAN	–	+	Reference number generated by the value in the NetServer's counter; this value can be changed by its corresponding module in the Way4 system according to the rules of the payment system	

Name	Tag	Variable	Description	Values
TIME	+	+	Operation time in format HH:MI:SS	HH – hours (0-24) MI – minutes (0-59) SS – seconds (0-59)
TOTAL_AMOUNT1	–	+	The variable containing the total amount 1.	
TOTAL_AMOUNT2	–	+	The variable containing the total amount 2.	
TOTAL_AMOUNT3	–	+	The variable containing the total amount 3.	
TOTAL_AMOUNT4	–	+	The variable containing the total amount 4.	
TOTAL_AMOUNT5	–	+	The variable containing the total amount 5.	
TOTAL_AMOUNT6	–	+	The variable containing the total amount 6.	
TOTAL_AMOUNT7	–	+	The variable containing the total amount 7.	
TOTAL_AMOUNT8	–	+	The variable containing the total amount 8.	
TT	–	+	Time format	AM – until noon PM – afternoon
TransCondition	+	+	Transaction conditions	
TRN_DESC	–	+	Description of the transaction (generated by contents of field 104 of ISO message)	

Name	Tag	Variable	Description	Values
TRN_INFO_0		+	Number and denomination of notes for the first currency	
TRN_INFO_1		+	Number and denomination of notes for the second currency	
TRN_INFO_2		+	Number and denomination of notes for the third currency	
WEEKDAY	+	+	Serial number of day in the week when the operation was executed	0 (Sunday) – 6(Saturday)
YY	–	+	Year operation was executed	00-99
YYYY	+	+	Year operation was executed	19xx-20xx
YY0	–	+	Year when first of last ten operations was executed	00-99
YY1	–	+	Year when second of last ten operations was executed	00-99
YY2	–	+	Year when third of last ten operations was executed	00-99
YY3	–	+	Year when fourth of last ten operations was executed	00-99
YY4	–	+	Year when fifth of last ten operations was executed	00-99

Name	Tag	Variable	Description	Values
YY5	–	+	Year when sixth of last ten operations was executed	00-99
YY6	–	+	Year when seventh of last ten operations was executed	00-99
YY7	–	+	Year when eighth of last ten operations was executed	00-99
YY8	–	+	Year when ninth of last ten operations was executed	00-99
YY9	–	+	Year when tenth of last ten operations was executed	00-99
CR (0x0D hex)	–	+	Screen control character for Diebold/ NDC protocols	Positions the cursor to the first position of the current line
ESC (0x1B hex)	–	+	Esc-order ID	
FF (0x0C hex)	–	+	Screen control character for Diebold protocols	Clears screen and moves cursor to the coordinate position "@", "@"
			Screen control character for NDC protocols	Clears screen and positions the cursor to the upper left corner of the screen. Turns off the blinking of the cursor and sets a default value for foreground and background screen colors

Name	Tag	Variable	Description	Values
			Printer control character for Diebold protocols	For paper with black marks indicating the beginning and end of receipt: causes a feed to the beginning of the next black mark, cuts and delivers the receipt to the client. For paper with no black mark indicating the beginning and end of receipt, causes a feed over a number of lines determined by the PRT DIT value in the ATM's configuration, cuts and presents the receipt to the client.
			Printer control character for NDC protocols	For the receipt printer: when black marks are present indicating the beginning and end of the receipt – causes a feed to the next black mark, cuts and delivers the receipt to the client. When using paper with no black marks, causes a feed of 24 lines (for a regular printer) or feed to the length of the longest print line in sideways printing mode up to a maximum of 80 columns, cuts and delivers the receipt to the client.
				For the journal printer: causes a line feed
FS (0x1C hex)	–	+	Field separator	
GS (0x1D hex)	–	+	Group separator	

Name	Tag	Variable	Description	Values
HT (0x09 hex)	–	+	Screen control character for Diebold/ NDC protocols	Causes the screen to display the name encoded on Track 1 of the magnetic card, beginning at the position of the current cursor position.
			Printer control character for NDC protocols	When printing receipts, sets the position of the next character one tab stop later. Tab stops are set every 8 columns, starting from the left margin. A character with a tab stop beyond the right margin is printed from the starting position of the next line. Characters can be moved by several tab stops.
			Printer control character for NDC protocols	Print the next character on the next line at the starting position determined by ATM settings.
SI (0x0F hex)	–	+	Screen control character	Moves the cursor to the position determined by two characters following the control character. The first character determines the line number, the second character, the column number.
SO (0x0E hex)			Screen control character for NDC protocols	Insertion of screen corresponding to the screen template, called by the three characters following the control character. Screens can be nested to five levels.

Name	Tag	Variable	Description	Values
			Printer control character for Diebold/ NDC protocols	The quantity of entered symbols is determined by a symbol from the ASCII table, numbers from 31 to 3F (1, 2, 4... <, =, >, ?) following the control character
RS (0x1E hex)	–	+	Record separator	
VT (0x0B hex)	–	+	Control character for NDC protocols	Next character will be presented using the alternative character set

12.3.5 Example of a receipt template file

The template described below contains parameters for printing information when operations are made:

- CASH_WITHDRAWAL – dispense cash; the following data is printed:
- Acquirer fee amount and currency.
- Amount and currency of funds requested.
- Authorization code and RRN (Retrieval Reference Number).
- Amount debited from the cardholder's account.
- FUNDS_TRANSFER – transfer funds from one account to another; the following data is printed:
- Code identifying the type of account to which funds were transferred as the result of the operation ("Telephone", "Electricity", "Gas").
- Authorization code and RRN.
- Amount debited from the cardholder's account.

The following information is shown at the end of the receipt:

- Amount available
- Credit limit amount available
- Account balance
- Credit limit amount

For all output of amounts, numeric currency codes are converted to alphabetical codes.

```
<BRAND="DIEBOLD%"
<LANGUAGE="Eng"
  5TESTBANK, TEST_CITY
   Tel.TEST_NUMBER
DATE       TIME
%DD%-%MM%-%YY%  %TIME%
Card Nr.    ATM N.
%CARDNUM%      %LUNO%
(%CARDSTR%)
<CASH_WITHDRAWAL
<FEE
Acq Fee: %amount(FEE, CURRENCY,'0.  ')% %CurrencySwiftCode(CURRENCY)%
Dispensed:%amount(REQUEST_AMOUNT,REQUEST_CURRENCY,'0.  ')%
%CurrencySwiftCode(REQUEST_CURRENCY)%
>
Auth.Code       Amount
%AUTHCODE%/%RRN%  %amount(AMOUNT,CURRENCY,'0.  ')% %CurrencySwiftCode(CURRENCY)%
>
<FUNDS_TRANSFER
OPERATION: TRANSFER OF PAYMENT (%TO_ACCOUNT%)
<ACCOUNT_ID_2="100"
Telephone
>
<ACCOUNT_ID_2="020"
Electricity
>
<ACCOUNT_ID_2="030"
Gas
>
Auth.Code/RRN           Amount
   %AUTHCODE%/%RRN%  %%amount(AMOUNT,CURRENCY,'0.  ')% %CurrencySwiftCode(CURRENCY)%
>
<BALANCE1
<AMOUNT_TYPE1="02"
AVAILABLE BALANCE:>
<AMOUNT_TYPE1="90"
AVAILABLE CREDIT: >
<AMOUNT_TYPE1="01"
LEDGER BALANCE:   >
<AMOUNT_TYPE1="91"
CREDIT LIMIT:     >
%amount(BALANCE1, ISO_CURRENCY1, '+       0.  ')%
%CurrencySwiftCode(ISO_CURRENCY1)%>
<BALANCE2
<AMOUNT_TYPE2="02"
AVAILABLE BALANCE:>
<AMOUNT_TYPE2="90"
AVAILABLE CREDIT: >
<AMOUNT_TYPE2="01"
LEDGER BALANCE:   >
<AMOUNT_TYPE2="91"
CREDIT LIMIT:     >
%amount(BALANCE2, ISO_CURRENCY2, '+       0.  ')%
%CurrencySwiftCode(ISO_CURRENCY2)%>
<BALANCE3
```

```
<AMOUNT_TYPE3="02"
AVAILABLE BALANCE:>
<AMOUNT_TYPE3="90"
AVAILABLE CREDIT: >
<AMOUNT_TYPE3="01"
LEDGER BALANCE:   >
<AMOUNT_TYPE3="91"
CREDIT LIMIT:     >
%amount(BALANCE3, ISO_CURRENCY3, '+       0.   ')%
%CurrencySwiftCode(ISO_CURRENCY3)%>
<BALANCE4
<AMOUNT_TYPE4="02"
AVAILABLE BALANCE:>
<AMOUNT_TYPE4="90"
AVAILABLE CREDIT: >
<AMOUNT_TYPE4="01"
LEDGER BALANCE:   >
<AMOUNT_TYPE4="91"
CREDIT LIMIT:     >
%amount(BALANCE4, ISO_CURRENCY4, '+        0.   ')%
%CurrencySwiftCode(ISO_CURRENCY4)%>
  Thank You!
```

12.4 Loading ATM controller configurations

ATM controller configuration files can be loaded without restarting the corresponding NetServer channel. If it is necessary to use changed settings, select the menu item "Full → Online Monitoring → Physical Channels" and click on the [Command] button in the "Physical Channels" form. An option for loading the configuration can be selected in the context menu:

- "To one channel" – execute the command for a selected channel.
- "To all channels" – execute the command for all channels.

Both menu items open the "Select Channel Command" form for executing the following commands:

- "Load Operation Key file" – load the request processing configuration file.
- "Load Response Codes file" – load the response message configuration file.
- "Set DB access trace level" – set the trace level.
  In the *Parameters* field, specify the logging level: LEVEL=N (where N is a value from 0 to 10).
- "Load receipt template file" – load a specific type of screen template or receipt template file.
  Specify the template type in the *Parameters* field: TYPE=N (where N is one of the following values: CONSUMER, JOURNAL, ADMIN, STATEMENT, ADDITIONAL, SCREENS).

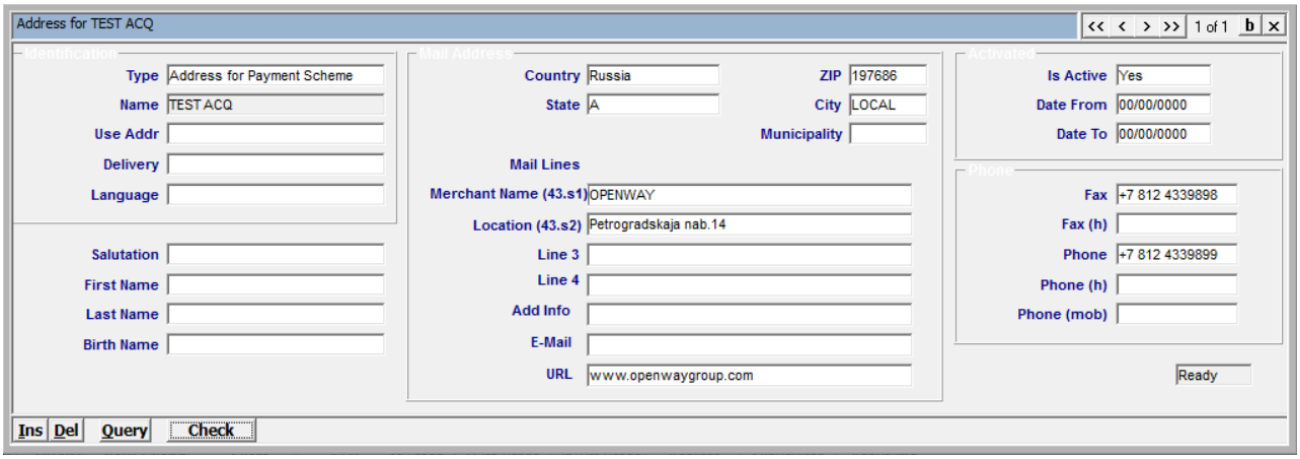
Before loading the configuration that was changed using the specified method, it is recommended to check it in the test environment. New settings for the purpose of testing must be applied by restarting the corresponding NetServer channel. If testing is successful, configuration files can be loaded to the production system using the described commands.

13 Displaying/printing additional information

The controller makes it possible to display additional information on the ATM screen and print in on receipts: address data, advertisements, payment information, etc. Information can be shown depending on the language selected at the ATM.

13.1 Use of contract address data

ATM contract address data can be shown on the ATM screen or printed on a receipt (Acquiring → Acquiring Contracts → Acquiring Contracts → Devices → Address).



Device contract address data

For example, to use the values of the *Phone*, *Location*, *ZIP* and *URL* fields in receipt and screen templates, define the corresponding parameters in the response message configuration file (see the section "Response message configuration file") or in the request processing configuration file, after execution of the "Start Operation" process (see the section "Request processing configuration file"):

```
<PARAMETER Name="PHONE"
                   Value="GetDataFromTxtBuffer(TextTAGs,'PHONE')"/>
<PARAMETER Name="TRANS_LOCATION"
                   Value="GetDataFromTxtBuffer(TextTAGs,'TRANS_LOCATION')"/
<PARAMETER Name="POSTAL_CODE"
                   Value="GetDataFromTxtBuffer(TextTAGs,'POSTAL_CODE')"/>
<PARAMETER Name="MERCH_URL"
                   Value="GetDataFromTxtBuffer(TextTAGs,'MERCH_URL')"/>
```

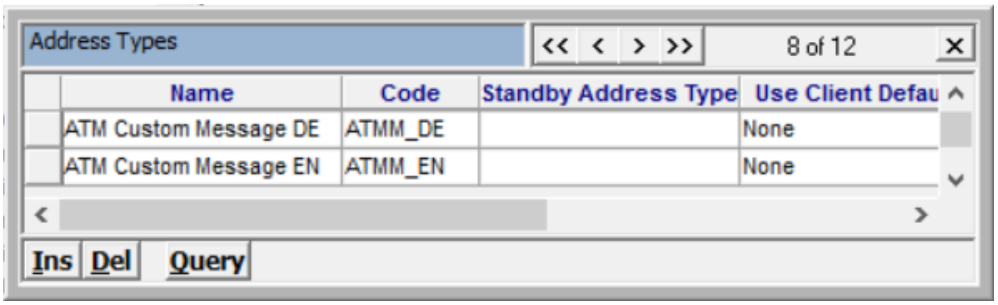
After doing so, the variables %PHONE%, %TRANS_LOCATION%, %POSTAL_CODE%, and %MERCH_URL% can be used in receipt and form templates.

The aforementioned method for including additional information in screen and receipt templates is simple, but only Latin characters may be used. To generate messages depending on a selected language, use of a more flexible mechanism is recommended. This mechanism is described in the next section.

13.2 Use of Service Package message templates

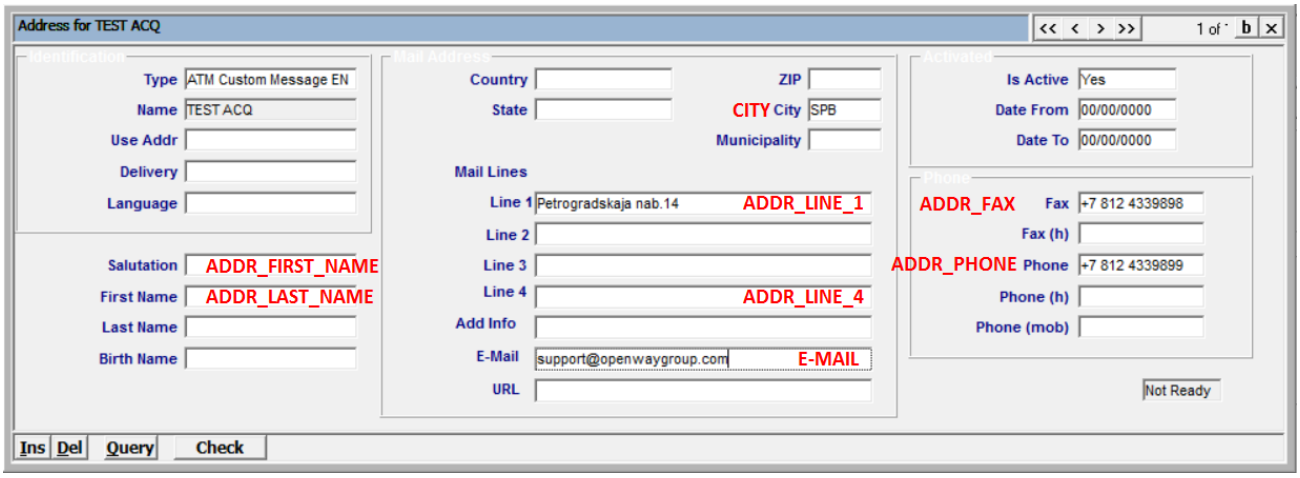
Message templates set up in device Service Packages can be used to get required information. The mechanism for using these templates is as follows:

Step 1. New address types are created for each language that will be used in information messages (Full → Configuration Setup → Client Classifiers → Address Types):



Address types, for example, for information in German and English

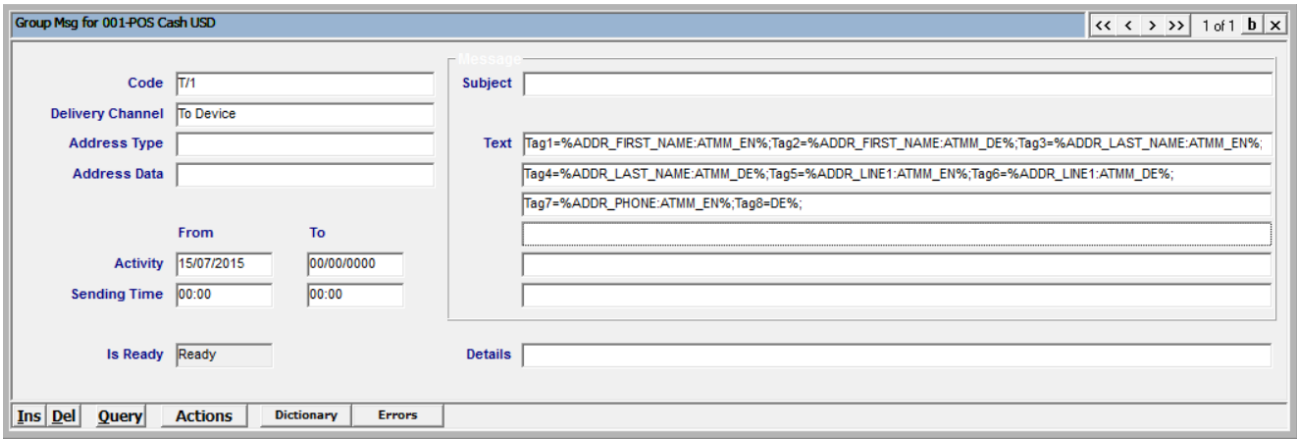
Step 2. For each address type in the corresponding language, the "Address for <client name>" form fields are filled in (Acquiring → Acquiring Contracts → Acquiring Contracts → Devices → Address):



Data for showing information in English

There is an alternate way to prepare data depending on message language for the steps described above: one address type is created and options are specified for messages in different languages, for example, in the fields *Line 1* – *Line 4* of the "Address for <client name>" field for the given address type.

Step 3. Message templates are set up in a device's Service Packages (Full → Configuration Setup → Products → Acquiring Products → Device Service Packs → Details → Group Msg):



Template for messages generated at the start of a transaction

- *Code* – message code in the format <Code>/N, where:
  - <Code> is the value of the CHEQUE_CODE tag for the transaction sub-type and if it is absent – the transaction type code according to existing classification: "T" – "Transaction", "B" – "Balance Inquiry", etc.
  - N is the procedure for using the template: "1" – at the start of the transaction, when the <Process Name="Start Operation"/> instruction is executed; "2" – at the end of the transaction, when the <Process Name="Response Processing"/> instruction is executed. After execution of "Start Operation", configured messages will be assigned to the SCREEN_DATA variable, after execution of "Response Processing" they will go into the RECEIPT_DATA variable.

  For additional online services, the value of the *Code* field must correspond to the format <Code>/<Additional Service Code>/N. Here <Additional Service Code> is the code of the additional online service (see the section "Configuring Way4 to support additional online services").
- *Delivery Channel* – the "To Device" value must be set.
- *Text* – list of tags in the format: Tag1=Value1;Tag2=Value2;...

  User-defined tag names (Tag1, Tag2, ...) are further used in controller settings to define the parameters of receipt and screen templates (examples are given below in this section). Variables containing contract device data (the list of possible variables is given in the section "Use of Variables" of the document "Configuration of Client Messages") can be used as tag values.

Step 4. In the request processing configuration file (see the section "Configuration files for controller interaction with the ATM"), define parameters for getting the values of the tags set in step 3 according to the language set at the ATM. For example, as follows:

```
<OperationKeys>
   …
  <Condition OPERATION_KEY="*******A">
    <PARAMETER Name="TextTAGs"
                Value="SetDataToTxtBuffer(TextTAGs,'LANG','ru')"/>
  </Condition>
  <Process Name="Start Operation"/>
  <PARAMETER Name=“FIRST_NAME"
                  Value="GetDataFromTxtBuffer(SCREEN_DATA,'Tag2')"/>
  <PARAMETER Name="LAST_NAME"
                  Value="GetDataFromTxtBuffer(SCREEN_DATA,'Tag4')"/>
   ...
</OperationKeys>
```

Step 5. Parameters defined in step 4 can be used in receipt and screen templates, for example, as the following variables:

%UTF8toString(FIRST_NAME)%

%UTF8toString(LAST_NAME)%

Required data may also be obtained directly from the SCREEN_DATA and RECEIPT_DATA variables, for example, as follows:

%UTF8toString(SCREEN_DATA (Tag7))%

%UTF8toString(RECEIPT_DATA(Tag5))%

For information to be printed/shown correctly, the table for converting characters must be set up in the file netserv/conf/atm/encoding.xml.