

ATM Controller Administrator Manual

Contents

INTRODUCTION	1
CHAPTER 1. ATM CONTROLLER DICTIONARIES	2
Customising ATM Controller Dictionaries	2
ATM Types Dictionary	2
ATM Denominations Dictionary	3
Fixed Dictionaries	5
ATM Protocols Dictionary	5
ATM Operations Dictionary	6
ATM Hardware Types Dictionary	7
ATM Message Types Dictionary	8
CHAPTER 2. DESCRIPTION AND CONFIGURATION OF A NEW ATM	11
Setting up an ATM Contract and its Device	11
Setting up the Executable Range of ATM Operations	11
Configuring ATM Hardware Components	12
Managing ATM State	14
Specifying Encryption Keys	14
Enabling MAC-signature Mode	16
Additional Device Parameters	16
Configuring the ATM Connection with the WAY4 Host	17
Preparing and Loading ATM Configurations	18
Preparing the Configuration Files	18
Sending a Configuration to an ATM	20
Sending a Configuration to all ATMs	20
CHAPTER 3. CASH DISPENSATION	21
Configuring the ATM	21
Configuring the Receipt	21
CHAPTER 4. ATM CASH ACCEPTANCE	23
Configuring the ATM	23
Configuring the Receipt	24
CHAPTER 5. STANDING ORDERS FOR PUBLIC UTILITIES AND OTHER SERVICES	25
Configuring the ATM and Receipt	25
Configuring the ATM	25
Configuring the Receipt	26
Describing Public Utilities in the System	26
Creating a New Public Utility Type	26
Creating a Standing Order for Utility Payments	28
Utility Payments Made by the Cardholder	28
CHAPTER 6. ADDITIONAL ONLINE OPERATIONS	29
Configuring the ATM and Receipts	29
Configuring the Receipt	29
Configuring the WAY4 System for Online Operation Support	30
Configuring the Controller for Additional Online Operations	33
Configuring Request Routing through a Payment Acceptance System Communication Channel	35
CHAPTER 7. RECEIVING BALANCES AND MINI-STATEMENTS	37
Configuring Balances on Card Accounts	37
Configuring Balances	37
Configuring the Receipt Format for Balance Inquiries on Card Accounts	37
Configuring Mini-statements on Card Accounts	37
Configuring Mini-statements	37

Configuring the Receipt Format for Mini-statements	38
Configuring the Screen Display	38
CHAPTER 8. CHANGING THE PIN CODE	39
Configuring the ATM	39
Configuring the Receipt Format for PIN Code Changes	39
CHAPTER 9. AUTOMATIC REVERSAL MESSAGE CREATION	40
CHAPTER 10. ADMINISTRATIVE OPERATIONS AND REPLENISHMENT	41
Financial Cycles	41
Configuring the ATM Replenishment Receipt Format	41
Configuring the Replenishment Officer's Receipt for Collecting Client-Deposited Funds	42
CHAPTER 11. SETTLEMENT SCHEME FOR ATM OPERATIONS	43
CHAPTER 12. ATM CONTROLLER CONFIGURATION FILES	46
Controller Configuration File	46
Configuration Files for Controller Interaction with the ATM	48
Functions Used in Files Intended for Configuring Interaction Between Controllers and ATMs	48
Request Processing Configuration File	50
Response Message Configuration File	54
CHAPTER 13. ATM RECEIPT AND SCREEN FORMAT DESCRIPTION LANGUAGE	60
The Use of Functions in Receipt and Screen Format Descriptions	60
Use of Conditional Operators	61
Examples of Conditional Statements	62
Use of Special Characters	63
Variables Used in Receipt and Screen Templates	63
Example of a Receipt Template File	80
Loading the ATM Controller Configuration	82
CHAPTER 1. DISPLAYING/PRINTING ADDITIONAL INFORMATION	83
Using Contract Address Data	83
Use of Service Package Message Templates	84

Introduction

The ATM controller is a WAY4™ NetServer software component.



The ATM controller is used to support interaction between an ATM network and a processing centre. 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 centre employees) responsible for configuring the ATM network.

In working with this document, we recommend that users refer to the following source material from OpenWay's documentation series:

- DB Manager Manual
- Daily Procedures
- Acquiring Module User Manual
- Issuing Module User Manual
- ATM Network Monitoring
- WAY4™ Service Packages
- Configuration of Client Messages

This document uses the following conventions:

- Field labels in screen forms are shown in *italics*.
- Button labels in screen forms are indicated in square brackets, for example [Approve].
- Sequences for selecting user menu items are shown with arrows, such as "Issuing → Contracts Input & Update";
- Sequences for selecting system menu items are shown with arrows, as in "Database => Change password";
- Key combinations used in DB Manager are shown in angular brackets, such as <Ctrl>+<F3>.
- Warnings indicating the danger of incorrect input are indicated with the symbol .
- Messages marked with  sign contain information about important features, additional facilities or the optimal use of certain functions of the system.

Chapter 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.

Customising ATM Controller Dictionaries

ATM Types Dictionary

All types of ATMs interacting with WAY4 must be registered in a special ATM types dictionary.

An ATM type is set by selecting it from a list of options during device configuration (see the section "Configuring Devices" in the document "Acquiring Module User Manual").

The ATM type dictionary (see Fig. 1) is accessed by selecting the following options in the user menu "Full → Configuration Setup → Merchant Device Setup → ATM Types".

Code	Name	Brand	Model	Conf File	Outgoing Console	assette Account Cod	ash Account Cod	maining Account Cod	EN
BanQit_DDC	BanQit DDC	BANQIT		conf/atm/config	Outgoing Console	ATM Cassette	Cash Dispenser		MF
BanQit_NDC	BanQit NDC	BANQIT		conf/atm/ndc_c	Outgoing Console	ATM Cassette	Cash Dispenser		MF
BULL	BULL	BULL		conf/atm/config	Outgoing Console	ATM Cassette	Cash Dispenser		
BULL_NDC	BULL NDC+	BULL		conf/atm/ndc_c	Outgoing Console	ATM Cassette	Cash Dispenser		
CINEO_C4040	CINEO C4040	WINCOR	CINEO C404	conf/atm/ndc_c	Outgoing Console	ATM Cassette	Cash Dispenser		MF
DEC2	DEC (2 Cassette)	DEC		conf/atm/config	Outgoing Console	ATM Cassette	Cash Dispenser		
DEC4	DEC (4 Cassette)	DEC		conf/atm/config	Outgoing Console	ATM Cassette	Cash Dispenser		
DIEBOLD1064	Diebold 1064x	DIEBOLD	1064x	conf/atm/config	Outgoing Console	ATM Cassette	Cash Dispenser		MF

Fig. 1. Form containing ATM types registered in WAY4

The form 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.
- *Configuration 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 for accounts that show the activity of funds when replenishing the ATM (see "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 in this form, click [Ins]; to delete a record, click [Del].

When deleting records from the "ATM Types" form that correspond to the type of ATM for which the contract device is registered inWAY4 (see the section "Creating New Device Contracts" in the document "Acquiring Module User Manual"), a warning will appear on the screen.

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 "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 "ATM Hardware Types Dictionary").

ATM Denominations Dictionary

Each ATM in the system is assigned a denomination type that defines the type of cassette that can be used by the ATM, the face value and currency of notes/coins stored in the cassette during device configuration, as well as some parameters for cash withdrawal.

The ATM denomination type can be set choosing the appropriate user menu items when configuring the device (see the section "Configuring Devices" from the document "Acquiring Module User Manual").

The ATM denominations dictionary (see Fig. 2) can be accessed by selecting the following: "Full → Configuration Setup → Merchant Device Setup → ATM Denominations".

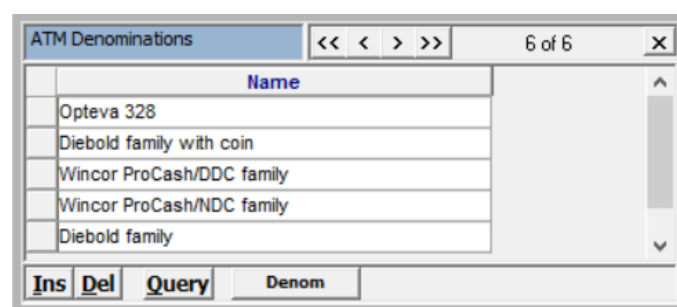


Fig. 2. Denominations dictionary

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

When attempting to delete a record from the "ATM Denominations" form that corresponds to the type of denomination used for the ATM registered in WAY4 (see the section "Creating New Device Contracts" in the document "Acquiring Module User Manual"), a warning will be displayed.

Every denomination type corresponds to certain parameters that define the way the cassette is loaded with cash/coins and the algorithm for dispensing cash. To access the form 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>" form will be displayed (see Fig. 3).

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		

Fig. 3. Parameters for loading a cassette with notes

The form 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 a cassette for cash acceptance (for example, for rejected notes from the current cassette).
- *Currency* – list for selecting the abbreviated name of the currency that is loaded in the cassette.
- *Denom* – denomination of notes/coins loaded in the cassette.
- *Limit* – the maximum number of notes/coins (from 0 to 999) that can be dispensed from a cassette during one operation.
- *Dispense Parameters* – rule for compiling a set of notes/coins for dispensing; set with 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 of the increase in the penalty for the first, second and third algorithm 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 "Request Processing Configuration File") using the DispenseAlgorithm parameter, for example, as follows: `<PARAMETER Name="DispenseAlgorithm" Value="1"/>`.

Various combinations of notes are selected from the ATM's cassette when dispensing cash in accordance with an algorithm that minimizes the valuation function (the penalty) for dispensing some combinations of notes while considering the dispensation limit.

The value of the valuation function 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 – the number of cassettes from which notes are selected.
- n_i – the number of notes selected from the i -th cassette.
- CST_FEE_i – the penalty for dispensing notes from the i -th cassette (value of the PENALTY tag for the selected algorithm).
- $CST_FEE_INCREASE_i$ – 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).

Fixed Dictionaries

ATM Protocols Dictionary

ATM protocols regulate the message format and rules for information exchange between ATMs and the processing center.

The ATM protocols dictionary is contained in the form "ATM Protocols" (see Fig. 4).

ATM Protocols	
Name	Code
Diebold 912	MDS912
NDC+	NDC+

Ins Del Query

Fig. 4. Types of protocols for connecting ATMs to the processing center

The form contains the following fields:

- *Name* – the name of the protocol
- *Code* – the protocol code indicated within the system
- Currently, the system supports protocols Diebold 912 ("MDS912") and NDC/NDC+ ("NDC+").

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 necessary for those operations (see "ATM Hardware Types Dictionary").

The ATM operations dictionary is contained in the form "ATM Operations" (see Fig. 5).

Name	Code	Transaction Type	Trans Cond	Request	Category	Service Class	Checkable	Downgradable	To Requires	Cassette	Online	Use Coin	Special P
Pay by Cash	T-Y1	Pay by Cash		Advice	Authorisation	Transaction			No	No	No		Pt_A
CE: Conversion	T-X1_D	CE: 5. Conversion		Advice	Authorisation	Transaction			No	No	No		
CE: Rounding	T-X1_C	CE: 4. Rounding		Advice	Authorisation	Transaction			No	No	No		
CE: Cash Dispense (Che)	T-X1_B	CE: 3. Cash Dispense		Advice	Authorisation	Transaction			Yes	No	Yes		
CE: Cash Dispense	T-X1_A	CE: 2. Cash Dispense		Advice	Authorisation	Transaction			Yes	No	Yes		
CE: Currency Exchange	T-X1	CE: Currency Exchange		Advice	Authorisation	Transaction			No	No	No		OPER
PWC: Rounding	T-W1_C	PWC: 3. Rounding		Advice	Authorisation	Transaction			No	No	No		
PWC: Cash Dispense (CT)	T-W1_B	PWC: 2. Cash Dispense		Advice	Authorisation	Transaction			Yes	No	Yes		

Ins Del Query Fill Default Required

Fig. 5. List of ATM operations

The form contains the following fields:

- *Name* – the name of the operation.
- *Code* – the operation 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/authorisation message category.
- *Service Class* – the bank's classification of transactions; the value of this parameter determines the way documents are handled by the system. By default, in the absence of other values, the value of the parameter *Service Class* will be "Transaction".

- *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.
- *Is 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" in the document "ATM Network Monitoring".

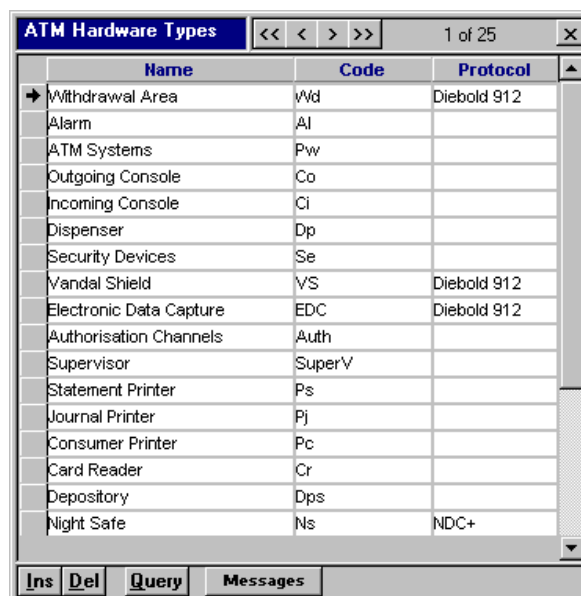
The [Required] button is used to call up the form "Required for <name of operation>", which contains a list of ATM components (see "ATM Hardware Types Dictionary") necessary for fulfilling a given operation.

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

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 "ATM Operations Dictionary").

The ATM Hardware Types dictionary is contained in the form "ATM Hardware Types" (see Fig. 6).



The screenshot shows a window titled "ATM Hardware Types" with a table of hardware components. The table has columns for Name, Code, and Protocol. The components listed include Withdrawal Area, Alarm, ATM Systems, Outgoing Console, Incoming Console, Dispenser, Security Devices, Vandal Shield, Electronic Data Capture, Authorisation Channels, Supervisor, Statement Printer, Journal Printer, Consumer Printer, Card Reader, Depository, and Night Safe. The table is currently showing page 1 of 25.

Name	Code	Protocol
Withdrawal Area	Wld	Diebold 912
Alarm	Al	
ATM Systems	Pw	
Outgoing Console	Co	
Incoming Console	Ci	
Dispenser	Dp	
Security Devices	Se	
Vandal Shield	VS	Diebold 912
Electronic Data Capture	EDC	Diebold 912
Authorisation Channels	Auth	
Supervisor	SuperV	
Statement Printer	Ps	
Journal Printer	Pj	
Consumer Printer	Pc	
Card Reader	Cr	
Depository	Dps	
Night Safe	Ns	NDC+

Fig. 6. Form showing ATM hardware components

The form 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 form "Messages for <name of component>", which contains a list of messages formed by the system when working with the given component (see "ATM Message Types Dictionary").

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

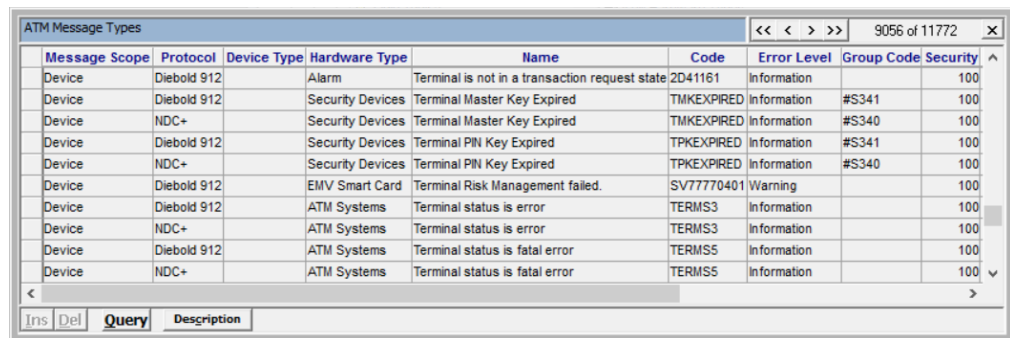
ATM Message Types Dictionary

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 "Changing ATM Status and Managing ATMs" in 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 are recorded for the corresponding ATM in the WAY4 database; each message belonging to a certain ATM component.

The dictionary of possible ATM message types is contained in the form "ATM Message Types" (see Fig. 7).



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

Fig. 7. Messages generated during ATM operation

The form contains the following fields:

- *Message Scope* – message recipient/source:
 - "Device" – ATM.
 - "Device Group" – ATM group.
 - "Physical Channel" – controller.
- *Protocol* – the name of the protocol (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 "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* – the 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") – the component status is "OK"; the ATM status is "OK" if no errors have occurred other components; the ATM status is "Information" if there are no errors in other components, but there was an error in this component; the ATM status is "Information", "Warning", or "Error" depending on the status of other components.
 - "Information" (code "1") – component and ATM status does not change.
 - "Warning" (code "2") – component status is "Warning"; ATM status is "Information".
 - "Error" (code "3") – components status is "Error", ATM status is "Warning".
 - "Not Configured" (code "4") – component status is "Not Configured"; ATM status is "Information".
 - "Unavailable" (code "6") – components status is "Unavailable", ATM status is "Information".
 - "Fatal Error" (code "5") – component 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 form "User Groups and Users - View" (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.

Chapter 2. Description and Configuration of a New ATM

Setting up an ATM Contract and its Device

A description of how a new ATM contract is entered may be found in the paragraph "Creating New Device Contracts" in the document "Acquiring Module User Manual".

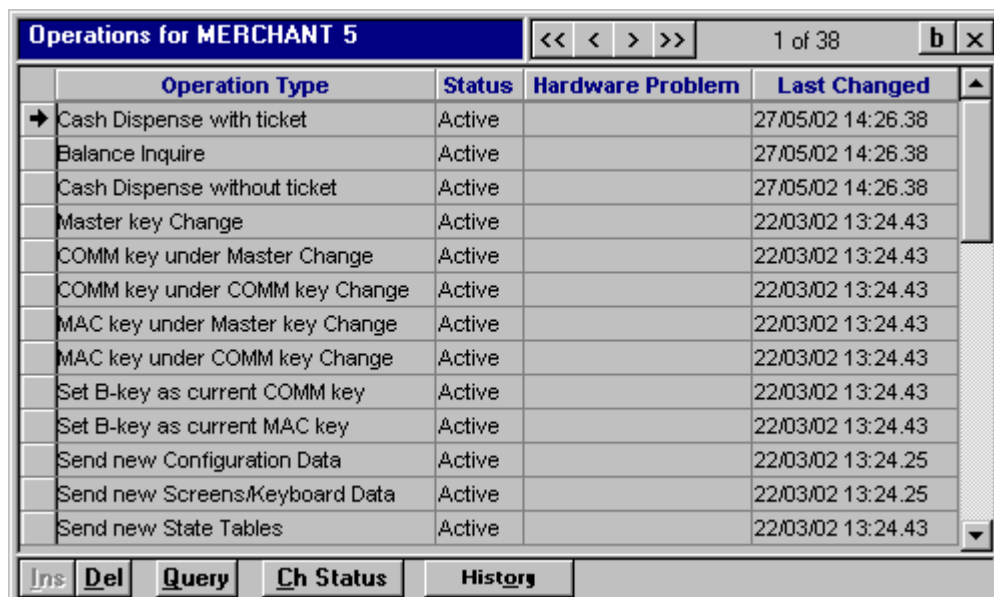
Setup of devices for ATM contracts is described in the section "Configuring Devices" of the document "Acquiring Module User Manual").

Setting up the Executable Range of ATM Operations

The executable range of ATM operations is set up through the form "Operations for <name of ATM>" (see Fig. 8).

The form can be invoked 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 contract 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.



Operations for MERCHANT 5				1 of 38	
Operation Type	Status	Hardware Problem	Last Changed		
→ Cash Dispense with ticket	Active		27/05/02 14:26.38		
Balance Inquire	Active		27/05/02 14:26.38		
Cash Dispense without ticket	Active		27/05/02 14:26.38		
Master key Change	Active		22/03/02 13:24.43		
COMM key under Master Change	Active		22/03/02 13:24.43		
COMM key under COMM key Change	Active		22/03/02 13:24.43		
MAC key under Master key Change	Active		22/03/02 13:24.43		
MAC key under COMM key Change	Active		22/03/02 13:24.43		
Set B-key as current COMM key	Active		22/03/02 13:24.43		
Set B-key as current MAC key	Active		22/03/02 13:24.43		
Send new Configuration Data	Active		22/03/02 13:24.25		
Send new Screens/Keyboard Data	Active		22/03/02 13:24.25		
Send new State Tables	Active		22/03/02 13:24.43		

Buttons: Ins, Del, Query, Ch Status, History

Fig. 8. List of executable ATM operations

An operation can be deleted from the list by selecting the desired row in the form 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.

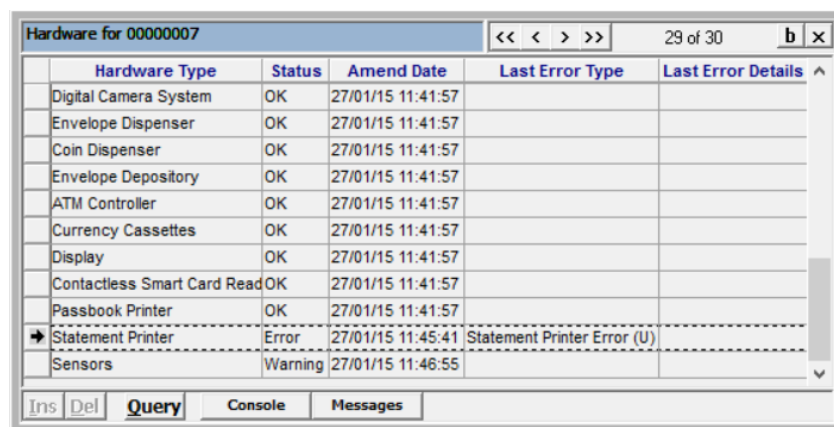
To restore the list of allowed operations (according to the "ATM Operations" dictionary) after rows have been deleted from the table, click the [Setup] button and choose the [Check and Fill] context menu item in the "ATM Device Management" form or the "ATM for <device identifier>" device configuration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

Configuring ATM Hardware Components

ATM components can be configured through the form "Hardware for <name of ATM>" (see Fig. 9).

This form can be invoked 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 contract 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.



Hardware Type	Status	Amend Date	Last Error Type	Last Error Details
Digital Camera System	OK	27/01/15 11:41:57		
Envelope Dispenser	OK	27/01/15 11:41:57		
Coin Dispenser	OK	27/01/15 11:41:57		
Envelope Depository	OK	27/01/15 11:41:57		
ATM Controller	OK	27/01/15 11:41:57		
Currency Cassettes	OK	27/01/15 11:41:57		
Display	OK	27/01/15 11:41:57		
Contactless Smart Card Reader	OK	27/01/15 11:41:57		
Passbook Printer	OK	27/01/15 11:41:57		
Statement Printer	Error	27/01/15 11:45:41	Statement Printer Error (U)	
Sensors	Warning	27/01/15 11:46:55		

Fig. 9. Form 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 "ATM Hardware 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 "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 form and click on the [Console] button. By this command the screen will display the form "Console for <name of component>" (see Fig. 10). Select in the *Command* field of the form the desired control command, for example, "<name of component> OK", and click on the [Run] button.

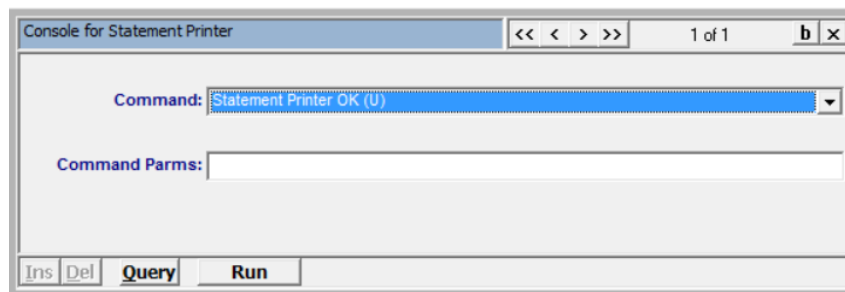


Fig. 10. Form for entering ATM component management commands

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 (see Fig. 10) and click the [Run] button. For more information about ATM management commands, see the section "ATM Management Commands" in the document "ATM Monitoring".

Information on the history of messages related to this component can be found in the form "Messages for <name of component>" (see Fig. 11). The form is invoked from the table "Hardware for <name of ATM>" after choosing the desired row and clicking on the [Messages] button.

Record ID	Message Time	Message Text	Message Type	Error Level	Code	Status	Hardware
3773	27/01/15 11:45:41		Statement Printer Error (U)	Error	1VE003	Posted	Statement Printer
3771	27/01/15 11:44:54		Statement Printer OK (U)	OK	1VE0	Posted	Statement Printer
3769	27/01/15 11:44:18		Statement Printer Fatal Error (U)	Fatal Error	1VE004	Posted	Statement Printer
1796	18/11/14 14:43:31		Statement Ribbon - Not Configured	Not Configured	2F1S220	Posted	Statement Printer
1795	18/11/14 14:43:31		Statement Paper - Not Configured	Not Configured	2F1S210	Posted	Statement Printer
1773	18/11/14 14:43:31		Statement printer - Routine error	Information	2F1F211	Posted	Statement Printer
1749	18/11/14 14:43:30		Statement Ribbon - Not Configured	Not Configured	2F1S220	Posted	Statement Printer
1748	18/11/14 14:43:30		Statement Paper - Not Configured	Not Configured	2F1S210	Posted	Statement Printer
1726	18/11/14 14:43:30		Statement printer - No error	OK	2F1F210	Posted	Statement Printer

Fig. 11. Form containing system messages generated during changes in ATM component status

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).

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>" (see Fig. 12).

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.

Key Algorithm	Key Type	Key Name	DES Key	Key Check	Used as MK	Storage MK	Serial Number	Is Active	Date From	Date To	Max Usage
3DES ABA	Terminal Authentication	Terminal Authentication	U9CB60C31A96C7425AE541					Active	18/11/14 00:00:00/00	0	0
3DES ABA	Terminal PIN Key	Terminal PIN Key	UD387E838B70E8FA6A7223F					Active	18/11/14 00:00:00/00	0	0
3DES ABA	Terminal Authentication	Terminal Authentication						Inactive	20/11/14 00:00:00/00	0	0

Fig. 12. Form for the specification of ATM encryption keys

The form contains the following fields for entering encryption key values:

- *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 form, click the [Ins] button; to delete a record, click [Delete]

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.

Additional Device Parameters

The list of device configuration parameters can be expanded by specifying additional parameters in the "Enh Parms for <ATM name>" form (see Fig. 13). This form is opened by clicking the [Enh Parms] button in the "ATM for <ATM name>" form or "ATM Device Management" form.

Parameter	Value
Configuration File	conf/atm/ndc_conf/ncr_add.cfg
Debug Level	ON
EJ Acknowledgement Timer	30
EJ Upload Block Size	350
EJ Retry Threshold	2

Buttons: Ins, Del, Query, Send Task

Fig. 13. 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.

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 "Configuring Devices" in the document "Acquiring Module. User Manual").

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.

Fig. 14 shows the scheme for connecting ATMs to NetServer over leased lines using the TCP/IP protocol.

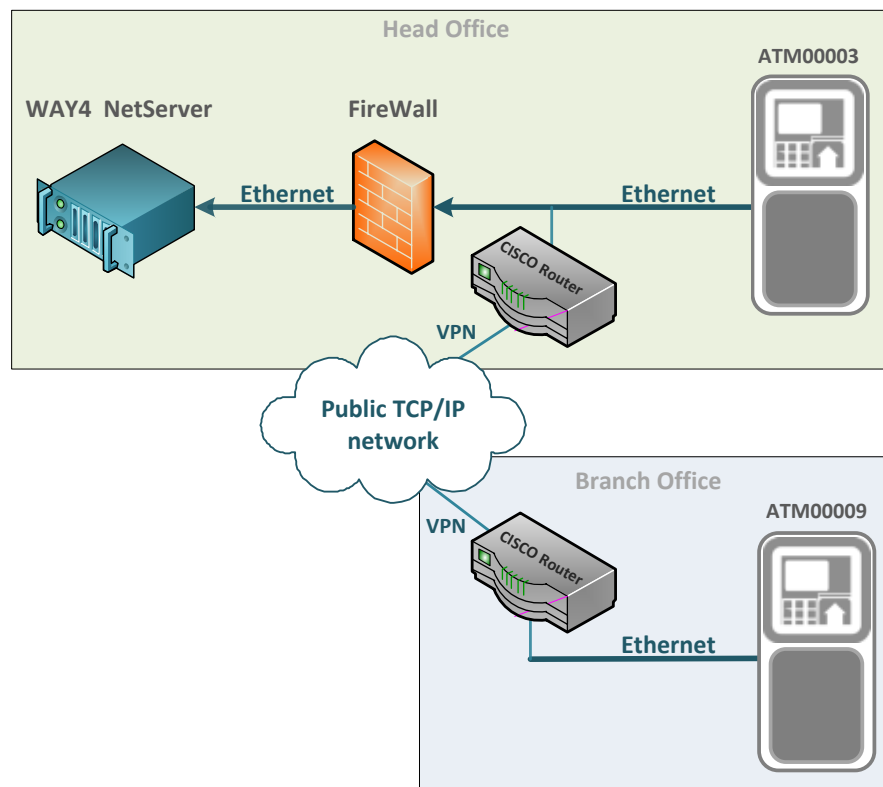


Fig. 14. ATMs connected to NetServer on leased lines using the TCP/IP protocol.

Preparing and Loading ATM Configurations

Preparing the 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 at 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 "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
	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  J05500005505500000000000000000000
300000      0000000003203000116000_000_006075070020807509072
510000000  000103098004255255000000132000000000003113800
@10000001  C04ZZZZ5ZZ9699
A00000      000_006075070020807509072
B10000      00000000000000000000000000000000
G00000D0010 034
*00000#S332

```

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" in the document "ATM Monitoring").

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" in 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 "Configuring Devices" in the document "Acquiring Module User Manual").

Chapter 3. Cash Dispensation

Configuring the ATM

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

- Entering of the PIN code of the cardholder;
- Selection of the language in which the ATM screen will present information; the given selection can be done automatically by the ATM, for example, depending on the card number;
- Filtration by financial institutions;
- 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);
- Entering the amount of the operation;
- Request to print a receipt;
- Reaction to response from the processing center (for example, regarding the absence of funds in the account of 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.

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:

- Name and address of the bank;
- ATM name;
- Date and time of the operation;
- Bank card number;
- Unique operation identification number;
- Authorization code;
- Amount and currency of the operation;

- Amount and currency of the acquiring fee (if such is determined);
- Balance on the card account (when present).

The indicated fields should appear in the receipt template (see "ATM Receipt and Screen Format Description Language").

Chapter 4. ATM Cash Acceptance

The WAY4 system 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 produces a negative return, the system returns 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.

Configuring the ATM

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

- Entering of the PIN code of the cardholder;
- Selection of the language in which the ATM screen will present information; the given selection can be done automatically by the ATM, for example, depending on the card number;
- Filtration by financial institutions;
- Selection of operations;
- Selection of account type by the cardholder;
- Selection of currency for the operation (for multi-currency ATMs);
- Entering the amount of the operation;
- 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.

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:

- Name and address of the bank;
- ATM name;
- Date and time of the operation;
- Bank card number;
- Unique operation identification number;
- 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).

The indicated fields should appear in the receipt template (see "ATM Receipt and Screen Format Description Language").

Chapter 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" in the document "Issuing Module User Manual").

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 code 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 document "Daily Procedures"), after which the funds are debited from the cardholder account and credited to the account of the recipient.

Configuring the ATM and Receipt

Configuring the ATM

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

- Entering of the PIN code of the cardholder;
- Selection of the language in which the ATM screen will present information; the given selection can be done automatically by the ATM, for example, depending on the card number;
- Filtration by financial institutions;
- Selection of operations;
- Selection of account type by the cardholder;

- Selection of additional conditions of payment;
- Selection of currency for the operation;
- Entering the amount of the operation;
- 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;
- Amount of payment;
- Currency of payment;
- Language in which the receipt for the given operation was printed;
- Additional conditions of payment.

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.

- Name and address of the bank;
- ATM name;
- Date and time of the operation;
- Type of payment;
- Abbreviated bank card number;
- Unique operation identification number;
- Authorization code;
- Amount of the payment;
- Balance on the card account (when present).

The indicated fields should appear in the receipt template (see "ATM Receipt and Screen Format Description Language").

Describing Public Utilities in the System

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 form "Payment on Account Types" (see Fig. 15).

Payment on Account Types		<< < > >>	1 of 4	X
	Payment Name	Code		
→	Public Utilities Telephone	010		
	Public Utilities Electricity	020		
	Public Utilities Gas	030		
	Mobile Telephone Payment	040		
Ins	Del	Query	Payees	

Fig. 15. Table of public utilities

The table contains the following fields:

- *Payment Name* – the name of the kind of payment;
- *Code* – a 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 table, 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" form 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>" form will open (see Fig. 16).

Payees for Public Utilities Telephone					<< < > >>		1 of 1		b x		
	Name	Member ID	Contract Number	Code	Payee Details 1	Payee Details 2					
→	Municipal Utilities Tel Services	BIC	7654321	010							
Ins	Del	Query									

Fig. 16. Table of payment recipients

- *Name* – name of the payment recipient;
- *Member ID* – the 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" in the document "Acquiring Module User Manual");
- *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* – the payment code from the form "Payment on Account Types" (see Fig. 15);
- *Payee Details 1, Payee Details 2* – field for entering additional information on the payment recipient.

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

If the user attempts to delete a record from the table "Payees for <name of payment" which happens to correspond with the recipient name used for registering the standing order in the system (see the section "Creating a Standing Order for Utility Payments"), the screen will display a warning.

Creating a Standing Order for Utility Payments

The creation of a standing order for utility payments is described in the section "Standing Payment Orders" in the document "Issuing Module User Manual".

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 code;
- 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.

Chapter 6. Additional Online Operations

WAY4 allows acquirers to support additional online operations through an ATM. These operations include, among others, payments to mobile service providers, purchasing Internet cards, etc.

Configuring the ATM and Receipts

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

- PIN code 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 centre:

- 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 will be printed;
- Additional payment requisites: client ID (for example, the mobile phone number).

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 operation ID;
- 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).

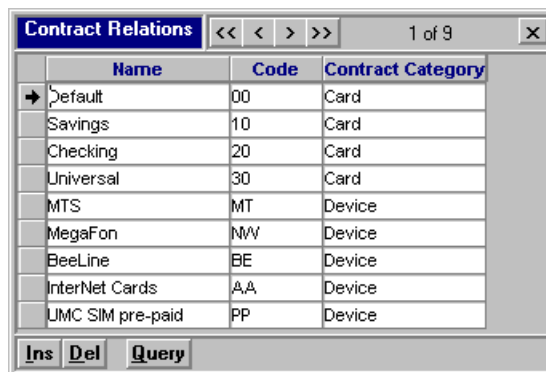
These fields should be configured in the receipt template (see "ATM Receipt and Screen Format Description Language").

Configuring the WAY4 System for Online Operation Support

The WAY4 system should be configured in the following way to work with payment acceptance systems, for example, for mobile connection services.

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" form will open (see Fig. 17).



Name	Code	Contract Category
Default	00	Card
Savings	10	Card
Checking	20	Card
Universal	30	Card
MTS	MT	Device
MegaFon	NV	Device
BeeLine	BE	Device
InterNet Cards	AA	Device
UMC SIM pre-paid	PP	Device

Buttons: Ins, Del, Query

Fig. 17. Creating new contract relations

Fill in the following fields in the form:

- *Name* – name of relation type;
- *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.

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" form will open (see Fig. 18).

Fig. 18. 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 "Request Processing Configuration File"); pre-paid cards should be indicated in the following format: "service provider code: service code". For example, "MEGAFON:LITE05".

In the example shown in Fig. 18, 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 "Additional Online Operations").

- *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 pre-paid card purchase.
- *Is Personal* – for online services with a payment acceptance system, this field should display "From Template" selected from the drop-down list, for pre-paid cards, this field should display "Token".
- *Extra Doc Tags* – additional parameters for an operation; set in a "tag=value" list, delimited by semi-colons; the example in Fig. 18 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 Fig. 17) 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" form, click the [Templates] button to finish configuring the new additional online service type. This will open the "Templates for <service name>" form (see Fig. 18). 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 pre-paid cards, for example, for replenishing card units for mobile phone services, data are 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>" form.



It is forbidden for users to edit the data in files received on pre-paid services.

After data is loaded into the table, a number of rows will be added corresponding to the number of pre-paid services, for example, the number of pre-paid mobile phone services cards that can be activated.

In this case, the grid 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 pre-paid cards, for example, the activation code for pre-paid mobile phone services cards;
- *Date From* and *Date To* – fields indicating the start and end dates for the pre-paid service;
- *Service Info* – additional public information on the pre-paid service;
- *Status* – after files are loaded, the field will automatically show value "Waiting"; after the service has been activated, the field will show "Posted".

3. Create a new device contract "ATM Retail".

The last step in configuring WAY4 to support online services is creating a related contract, "ATM Retail" (see the section "Creating New ATM Retail Contracts" in the "Acquiring Module User Manual").

To indicate the relations type between the "ATM Retail" contract and the ATM contract, use the value registered in the "Contract Relations" table (see Fig. 17) in step 1.

Configuring the Controller for Additional Online Operations

For additional online operations to be possible, rules for determining the code of the service specified in the "Additional Online Services" form must be set in the request processing configuration file (see "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 Fig. 18, these are the BillingRID and ACCOUNT_ID_2 parameters:

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

```

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 "Configuring the Controller for Additional Online Operations"), 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 "Configuring the Controller for Additional Online Operations"), 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 "Configuring the Controller for Additional Online Operations"); 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").

Chapter 7. Receiving Balances and Mini-statements

Configuring Balances on Card Accounts

Configuring Balances

The rules for giving out balances according to card accounts are set up when working with the issuing module of the WAY4 system, 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 "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" in the document "ATM Monitoring").

Configuring the Receipt Format for Balance Inquiries on Card Accounts

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 the operation;
- Abbreviated bank card number;
- Amount of available funds;
- Credit limit.

The above-mentioned fields should be indicated in the receipt template (see "ATM Receipt and Screen Format Description Language").

Configuring Mini-statements on Card Accounts

Configuring Mini-statements

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 issuing module of the WAY4 system 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 account (see WAY4™ Service Packages Administrator Manual.)

The ATM receipt template file (see "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.

Blocks on mini-statements, including mini-statements on card accounts, can be configured by changing the status of the corresponding operation or the ATM component (see the sections "ATM Operations" and "ATM Hardware" in the document "ATM Monitoring").

Configuring the Receipt Format for Mini-statements

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 the operation;
- Bank card number;
- Amount of available funds.

The above-mentioned fields should be indicated in the receipt template (see "ATM Receipt and Screen Format Description Language").

Configuring the Screen Display

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 "Response Message Configuration File"). Add this text:

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

Chapter 8. Changing the PIN Code

WAY4 allows to change their card PIN code at ATMs. This functionality is not part of the standard setup for WAY4 and is provided through special agreement with OpenWay representatives.

Configuring the ATM

To change the PIN code, 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 code by the cardholder;
- Filtration by financial institutions;
- Selection of operations;
- Entering of the new PIN code by the cardholder;
- Confirming of the new PIN code 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 code 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.

Configuring the Receipt Format for PIN Code Changes

The receipt given out for PIN code changes can contain fields that correspond to the following data, received from the processing center:

- Bank name and address;
- ATM number;
- Date and time of the operation;
- Bank card number;
- Operation's unique identification number.

The above-mentioned fields should be indicated in the receipt template (see "ATM Receipt and Screen Format Description Language").

Chapter 9. Automatic Reversal Message Creation

Fig. 19 shows the exchange of messages when an operation is executed.

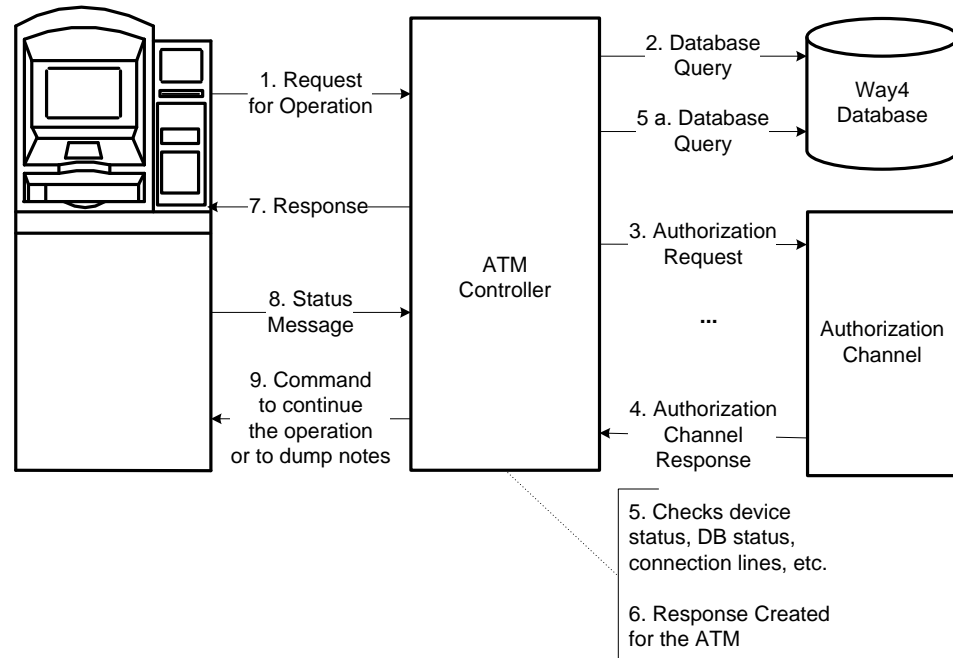


Fig. 19. Message exchange while executing ATM operations

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

In stage 4 of the operation (see Fig. 19): if there is no response from the authorization channel within a specified time (50 sec).

In stage 5 of the operation (see Fig. 19) 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 (see Fig. 19): 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 (see Fig. 19): if a corresponding status message is received, for example, that the amount selected has not been dispensed to the cardholder.

Chapter 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" in 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 chapter "Issuing Service Cards" in the document "Acquiring Module User Manual").

Financial Cycles

Financial cycles are intervals of time between the ATM's replenishment. The system allows for observing the 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" in 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.

Configuring the ATM Replenishment Receipt Format

The receipt received by the replenishment officer, detailing the results of ATM replenishment, can contain fields corresponding to the following data received from the processing center:

- Bank name and address;

- ATM number;
- Date and time of operation;
- 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;
- Number of the financial cycle.

The above-mentioned fields should be indicated in the receipt template (see "ATM Receipt and Screen Format Description Language").

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 operation ID;
- Amount of deposited funds in each currency;
- Amount of deposited notes in each denomination;
- Financial cycle number.

The fields should be configured in the receipt template (see "ATM Receipt and Screen Format Description Language").

Chapter 11. Settlement Scheme for ATM Operations

During an ATM's operation (dispensing/accepting cash, replenishment) accounting entries are generated in WAY4 that reflect fund activity.

An ATM contract's Accounting Scheme determines the types of accounts between which entries are made. The acquiring module contains the standard Accounting Scheme "001-Default ATM Scheme" (see acquiring Product Accounting Schemes in the menu item "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 Accounting 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 Accounting 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 Accounting 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:

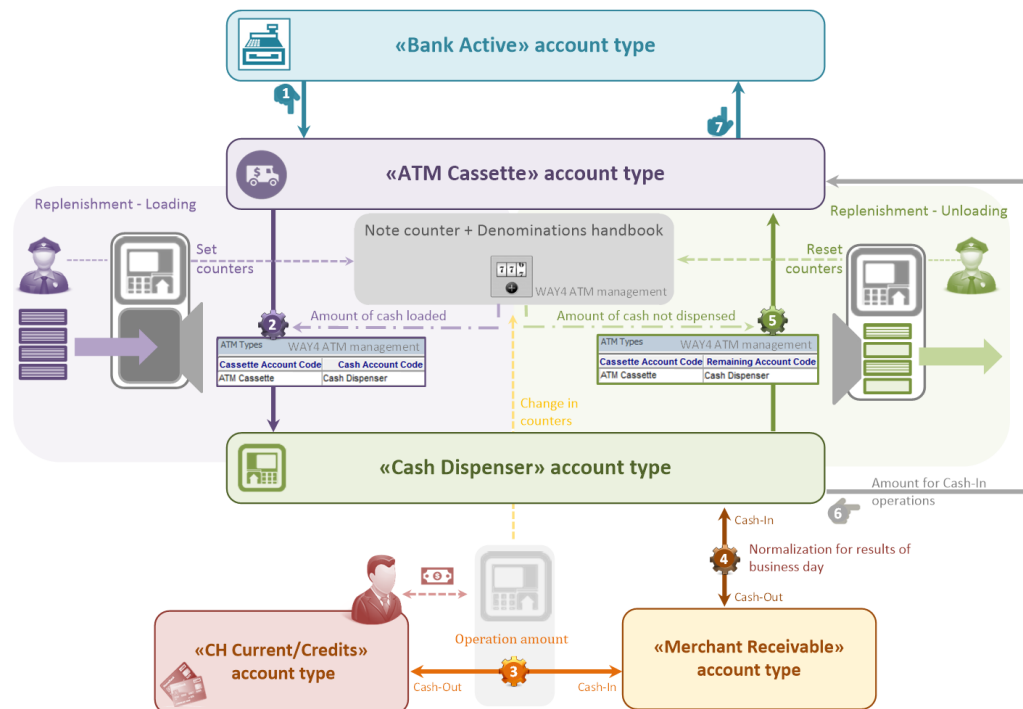


Fig. 20. Settlement scheme for ATM operations

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 generated between accounts of the following types:

- Dt "ATM Cassette" Ct "Bank Active"

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

i 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.

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 "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 "ATM Types Dictionary"):

- Dt "Cash Dispenser" Ct "ATM Cassette"

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.

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.



5. The "ENTRY_GROUPING" tag can be used to show cash dispensing and cash acceptance turnover in a "Merchant Receivable" account for a financial cycle. To do so, in the appropriate Accounting Scheme (menu item "Full → Configuration Setup → Products → Acquiring Products → Acquiring Account Schemes") specify "ENTRY_GROUPING=BY_BATCH;" in the Template Details field for the "Merchant Receivable" account. 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 "ATM Types Dictionary").

6. Dt "ATM Cassette" Ct "Cash Dispenser" 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"

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.

Chapter 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

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
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.

Parameter	Description
RC_TABLE	The name of the configuration file for response codes (see the section "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 "Response Message Configuration File")
MAX_START_PAN_PRN	Specifies the quantity of the first digits of the bank card number printed in the receipt
MAX_END_PAN_PRN	Specifies the quantity of the last digits of the bank card number printed in the receipt
RESOURCE_LIMIT	Maximum number of ATMs that can be logged into the ATM controller
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

Configuration Files for Controller Interaction with the ATM

Setup of controller interaction with ATMs (see Fig. 21) 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 "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 "Response Message Configuration File").

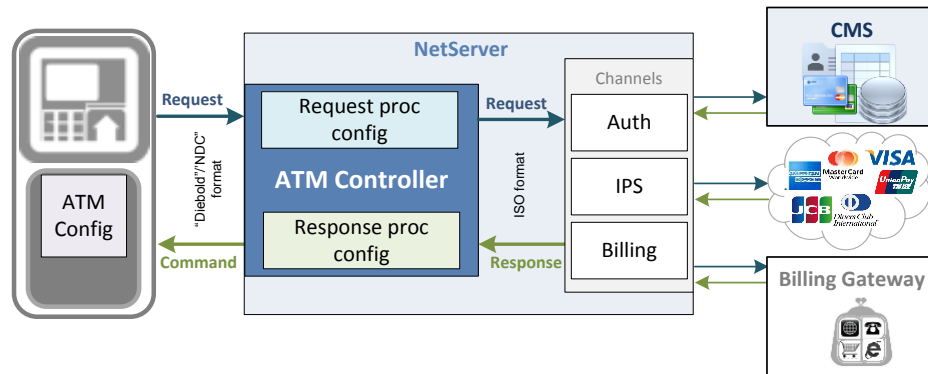


Fig. 21. ATM interaction with the controller

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

Functions Used in Files Intended for Configuring 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 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)` deduction function is calculated as follows: argument2 is detracted from argument1,

argument3 is detracted from the difference, etc. Same for the division function $\text{div}(\text{argument1}, \text{argument2}, \dots, \text{argumentN})$.

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 "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="<the value of the attribute>">
<the body of the element>
</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;
- "*" – signifies the use of any symbol in the request;
- "~" or " " (space) – signifies the use 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">
```

which is an equivalent of:

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

The entry:

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

is an equivalent of:

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

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

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

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

- "*" – signifies the use of any symbol in the request;
- "~" or " " (space) – signifies the use of a space in the request;

When specifying the values of the LUNO, BRAND and ACCOUNT attributes, the following mask notation may be used:

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

- Condition with the CONFIG_ID attribute:

```
<Condition CONFIG_ID="<the value of the attribute>">
<the body of the element>
</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>">
<the body of the element>
</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 attribute may assume the following values:

- "EMV" – an EMV smart card transaction;
- "PBT" – a transaction involving a magnetic strip card and entering a PIN code;
- "Cardless" a transaction involving no bank cards;

- "Manual" – an operation involving the manual entering of bank card data;
- PROCESS – this element may be represented in the following format:

```
<Process Name="<process name>", <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 REPLENISHMENT 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 may be represented 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" – dispense cash.
 - "BALANCE_INQ" – balance inquiry.
 - "MINI_STATEMENTS" – request a mini-statement for an account.
 - "PIN_CHANGE" – change a PIN (only when the "NDC+" protocol is used).
 - "DEPOSIT" – accept a deposit.
 - "NOTE_ACCEPTANCE" – accept cash and count the notes.
 - "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" – pay for third-party services using a bankcard at an ATM.

"PERSONAL_MENU" – work in a "personal office".

"CASH_PAYMENT" – pay for third-party services in cash at an ATM.

"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 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 1) field of an ISO message;
- ACCOUNT_ID_2 – the value of the attribute specifies the content of the 103 (Account Identification 2) 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 "Functions Used in Files Intended for Configuring 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:

```
<!--<the text of a comment>-->
```

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 "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 "Additional Online Operations"). In this case, to process a response received directly from 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" – account mini-statement request;
 - "PIN_CHANGE" – PIN code change (only when using protocol "NDC+").
 - "DEPOSIT" – deposit operation.
 - "NOTE_ACCEPTANCE" – note acceptance operation.
 - "FUNDS_TRANSFER" – transfer of funds from an account to another account.
 - "PERSON_TO_PERSON" – a money transfer from a card account to another card account.
 - "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" – cash payment through an ATM to a third-party service provider, with change.
 - "EXCHANGE" – a currency exchange operation conducted through an ATM.
 - "CARD_CONTROL_REQUEST" – a card management operation.
 - "CARD_SERVICE_REQUEST" – operation to issuer activation passwords.
 - "COLLECTION" – collection of deposited cash from the ATM.
 - "ATM_SERVICE" – ATM service operation.
 - "REPLENISHMENT" – ATM cassette replenishment.
 - "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 "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 "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".

Chapter 13. 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 "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 "Example of a Receipt Template File".

The Use of Functions in Receipt and Screen Format Descriptions

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 "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 "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. Its possible values are shown in Table 1.

Table 1. The use of the <format> argument (for the purposes of this table, the space symbol is represented as "< >".

<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
0,000,000.00	0,000,010.00
0-000-000.00	0-000-010.00
< >-< >< >< >-< >< >>0.00	< >< >< >< >< >>10.00

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.
- "li" – 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 "li" in the receipt or screen template file text.

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 "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 is beginning with "NC":

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

- The section data will be used to display information on the screen or print a receipt if the ATM brand is not beginning 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 "Variables Used in Receipt and Screen Templates".

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

Variables Used in Receipt and Screen Templates

Name	Tag	Variable	Description	Value
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	

Name	Tag	Variable	Description	Value
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	
PAYMENT	+	–	Replenishment of funds to a card account	
PIN_CHANGE	+	–	Request to change PIN code	
REPLENISHMENT	+	–	Operator request to replenish the ATM	
STATEMENTS	+	–	Issuing of card account statement	
CASH_WITHDRAWAL	+	–	Cash dispense through bank card with magnetic strip in the following order: card → cash → receipt	
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
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

Name	Tag	Variable	Description	Value
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
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 Request during replenishment: the quantity of notes dispensed from the first cassette	
AMOUNT1	–	+	Request for mini-statement: the amount of the second of last ten operations Request during replenishment: the quantity of notes dispensed from the second cassette	
AMOUNT2	–	+	Request for mini-statement: the amount of the third of last ten operations Request during replenishment: the quantity of notes dispensed from the third cassette	

Name	Tag	Variable	Description	Value
AMOUNT3	–	+	Request for mini-statement: the amount of the fourth of last ten operations Request during replenishment: the quantity of notes dispensed from the fourth cassette	
AMOUNT4	–	+	Request for mini-statement: the amount of the fifth of last ten operations Request during replenishment: the quantity of notes dispensed in the first currency	
AMOUNT5	–	+	Request for mini-statement: the amount of the sixth of last ten operations Request during replenishment: the quantity of notes dispensed in the second currency	
AMOUNT6	–	+	Request for mini-statement: the amount of the seventh of last ten operations Request during replenishment: the quantity of notes dispensed in the third currency	
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	
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

Name	Tag	Variable	Description	Value
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
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	Value
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
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 field 54 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)	

Name	Tag	Variable	Description	Value
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)	
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 the WAY4 system	
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	
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	

Name	Tag	Variable	Description	Value
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
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	
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	

Name	Tag	Variable	Description	Value
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	
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
ISO_CST_CUR1	+	+	ISO code of currency in first cassette	
ISO_CST_CUR2	+	+	ISO code of currency in second cassette	

Name	Tag	Variable	Description	Value
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	
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 generated by contents of field 54 of ISO message)	

Name	Tag	Variable	Description	Value
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	
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

Name	Tag	Variable	Description	Value
MM0	–	+	Month when the first of last ten operations was completed	01-12
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	
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	Value
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.	
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	

Name	Tag	Variable	Description	Value
RETRACTED_CASH3	–	+	Amount of cash, dispensed from the third cassette but not taken by the client and therefore retracted	
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	
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.	

Name	Tag	Variable	Description	Value
TOTAL_AMOUNT8	-	+	The variable containing the total amount 8.	
TT	-	+	Time format	AM – until noon PM – afternoon
TransCondition	+	+	The conditions of the completion of a transaction.	
TRN_DESC	-	+	Description of the transaction (generated by contents of field 104 of ISO message)	
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
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

Name	Tag	Variable	Description	Value
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
			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.

Name	Tag	Variable	Description	Value
				For the journal printer: causes a line feed
FS (0x1C hex)	–	+	Field separator	
GS (0x1D hex)	–	+	Group separator	
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 a statement, positions the next graphic character in the next tab column. Tabs are defined to be in every eighth column from the left margin. A tab past the right margin positions the character in the first position of the next line. Multiple tabs are permitted.
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.
			Printer control character for Diebold/NDC protocols	Entering of a given number of space (empty) characters after current position of cursor. 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	

Name	Tag	Variable	Description	Value
VT (0x0B hex)	-	+	Control character for NDC protocols	Next character will be presented using the alternative character set

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 are printed:
 - Acquirer fee amount and currency.
 - Amount and currency of funds requested.
 - Authorisation 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 are printed:
 - Code identifying the type of account to which funds were transferred as the result of the operation ("Telephone", "Electricity", "Gas");
 - Authorisation 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!
```

Loading the ATM Controller Configuration

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).

Chapter 1. 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.

Using 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").

Fig. 22. Device contract address data

For example, to use the values of the *Phone*, *Location*, *ZIP* and *URL* fields (see Fig. 22) in receipt and screen templates, define the corresponding parameters in the response message configuration file (see "Response Message Configuration File") or in the request processing configuration file, after execution of the "Start Operation" process (see "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.

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:

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

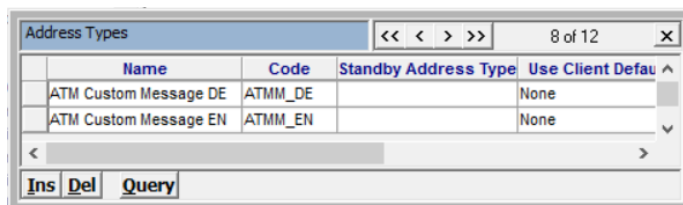


Fig. 23. Address types, for example, for information in German and English

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"):

Fig. 24. Data for showing information in English

i 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 2* of the "Address for <client name>" field for the given address type.

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

Fig. 25. 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 operations (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 Fig. 18).

- *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 (shown in red in Fig. 24) 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.

4. In the request processing configuration file (see "Request Processing Configuration File") 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>
```

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.