



# Programming Guide

PSIM 1.0.0-1.0.1 (english)

Last update 06/02/2023

## Table of Contents

<b>1</b>	<b>Programming guide. Introduction .....</b>	<b>5</b>
<b>2</b>	<b>Programming tools in Axxon PSIM .....</b>	<b>6</b>
<b>3</b>	<b>Description of syntax .....</b>	<b>7</b>
<b>4</b>	<b>Appendix 1. Priorities of start and stop recording commands.....</b>	<b>8</b>
<b>5</b>	<b>Appendix 2. Defining param_id and param_value values for SET_IPINT_PARAM reaction .....</b>	<b>9</b>
<b>6</b>	<b>Programming Guide. Conclusion .....</b>	<b>10</b>
<b>7</b>	<b>Programming guide. Introduction .....</b>	<b>11</b>
7.1	Purpose of Axxon PSIM software.....	11
7.2	Setting logical interactions between objects in Axxon PSIM .....	11
7.3	Purpose and structure of the guide .....	12
<b>8</b>	<b>Programming tools in Axxon PSIM .....</b>	<b>13</b>
8.1	The Program system object.....	13
8.2	Debug window .....	14
8.3	Syntax analyser .....	15
8.4	Recommended procedure of writing programs.....	16
8.4.1	Setting a general task .....	16
8.4.2	Outlining the task into subtasks.....	16
8.4.3	Writing subtasks and debugging them .....	16
8.4.4	Finding and fixing bugs.....	17
<b>9</b>	<b>Description of syntax .....</b>	<b>18</b>
9.1	Description of variables .....	18
9.2	Description of procedures .....	18
9.2.1	Standard procedures .....	18
9.2.2	Creating custom procedures .....	20
9.3	Description of operators.....	21
9.4	Operators and expressions.....	23
9.5	Description of functions .....	26
9.6	Examples of scripts .....	45

9.6.1	Example 1 .....	45
9.6.2	Example 2 .....	45
9.6.3	Example 3 .....	46
9.6.4	Example 4 .....	46
9.6.5	Example 5 .....	46
9.6.6	Example 6 .....	47
9.6.7	Example 7 .....	48
9.6.8	Example 8 .....	49
9.6.9	Example 9 .....	50
9.6.10	Example 10 .....	51
9.6.11	Example 11 .....	52
9.6.12	Example 12 .....	52
9.7	Description of system object reactions .....	53
9.7.1	GRABBER .....	53
9.7.2	CAM .....	58
9.7.3	MONITOR .....	71
9.7.4	PLAYER .....	82
9.7.5	OLXA_LINE .....	83
9.7.6	DIALOG .....	86
9.7.7	MMS .....	87
9.7.8	MAIL_MESSAGE .....	88
9.7.9	VMS .....	90
9.7.10	GRELE .....	91
9.7.11	GRAY .....	93
9.7.12	VNS .....	95
9.7.13	SMS .....	98
9.7.14	TELEMETRY .....	99
9.7.15	TELEMETRY_EXT .....	104
9.7.16	MACRO .....	109
9.7.17	TIME_ZONE .....	111
9.7.18	SSS_WATCHDOG .....	112
9.7.19	SLAVE .....	113
9.7.20	DISPLAY .....	119
9.7.21	GATE .....	120
9.7.22	CAM_VMDA_DETECTOR .....	121

9.7.23 ARCH .....	123
9.7.24 CORE .....	124
9.7.25 IPJOYSTICK.....	125
9.7.26 TITLEVIEWER .....	125
9.7.27 MAP .....	126
9.7.28 FAILOVER .....	129
9.7.29 OPERATORPROTOCOL.....	130
9.7.30 PERSON .....	132
9.7.31 EVENT_VIEWER.....	133
9.7.32 CAM_TITLE.....	133
9.7.33 CAM_FACECAPTURE.....	134
9.7.34 IPSTORAGE .....	135
9.7.35 TELEGRAM .....	136
9.7.36 BACNET.....	137
Examples .....	139
9.7.37 CAM_IP_DETECTOR.....	141
9.7.38 SIP_TERMINAL.....	142
9.7.39 INC_MANAGER.....	143
9.7.40 INC_SERVER.....	144
<b>10 Appendix 1. Priorities of start and stop recording commands.....</b>	<b>147</b>
<b>11 Appendix 2. Defining param_id and param_value values for SET_IPINT_PARAM reaction .....</b>	<b>149</b>
<b>12 Programming Guide. Conclusion .....</b>	<b>152</b>

# 1 Programming guide. Introduction

## 2 Programming tools in Axxon PSIM

- The Program system object
- Debug window
- Syntax analyser
- Recommended procedure of writing programs

## 3 Description of syntax

- Description of variables
- Description of procedures
  - Standard procedures
  - Creating custom procedures
- Description of operators
- Operators and expressions
- Description of functions
- Examples of scripts
- Description of system object reactions
  - GRABBER
  - CAM
  - MONITOR
  - PLAYER
  - OLXA\_LINE
  - DIALOG
  - MMS
  - MAIL\_MESSAGE
  - VMS
  - GRELE
  - GRAY
  - VNS
  - SMS
  - TELEMETRY
  - TELEMETRY\_EXT
  - MACRO
  - TIME\_ZONE
  - SSS\_WATCHDOG
  - SLAVE
  - DISPLAY
  - GATE
  - CAM\_VMDA\_DETECTOR
  - ARCH
  - CORE
  - IPJOYSTICK
  - TITLEVIEWER
  - MAP
  - FAILOVER
  - OPERATORPROTOCOL
  - PERSON
  - EVENT\_VIEWER
  - CAM\_TITLE
  - CAM\_FACECAPTURE
  - IPSTORAGE
  - TELEGRAM
  - BACNET
  - CAM\_IP\_DETECTOR
  - SIP\_TERMINAL
  - INC\_MANAGER
  - INC\_SERVER

## 4 Appendix 1. Priorities of start and stop recording commands

## 5 Appendix 2. Defining param\_id and param\_value values for SET\_IPINT\_PARAM reaction

## 6 Programming Guide. Conclusion

## 7 Programming guide. Introduction

### 7.1 Purpose of Axxon PSIM software

*Axxon PSIM* software is designed for the deployment of industrial scalable, flexible (adjustable) integrated security systems, based on the digital video surveillance and audio monitoring systems.

*Axxon PSIM* software has the following basic features:

1. Integration of digital video surveillance and audio monitoring systems with the existing data systems, various security equipment, third-party software, using integrated open interfaces of the data exchange.
2. Compatibility with diverse security devices and data systems, in particular, with the fire and security alarm and access control systems, video surveillance cameras, data analysis systems and systems for recognition of objects (events) and identification by their images.
3. Single-source registration and processing of events, generation of notifications and controlling response in compliance with the flexibly modified logics.
4. Ultimately unlimited capabilities for scaling, solution—specific adjustments, re-distribution of resources with changes in the number or quality of tasks in monitoring protected facilities and operating various equipment.

### 7.2 Setting **logical interactions between objects** in Axxon PSIM

*Axxon PSIM* capabilities are based on logical **interactions between objects**. **General information on ways of setting logical interactions are represented in the table:**

Method of setting logical interaction	Description	Implementation	Example
Setting panels of system objects	Base configuration of interaction between system objects	Implemented using functionality of system objects—see <a href="#">Administrator's Guide</a>	Configuring video displaying in the <b>Monitor</b> box
Macro	Configuration of simple interactions between objects if their functionality can not perform the required actions	Implemented using the <b>Macro</b> object—see <a href="#">Administrator's Guide</a>	Enabling actuator (relay) when sensor is closed
Program	Configuration of complex interactions between objects if functionality of the <b>Macro</b> object cannot perform the required actions	Implemented using the <b>Program</b> object as the code in the embedded programming language—see this guide	Reset PTZ cameras and snapshot every 15 minutes
Script		Implemented using the <b>Script</b> object as JScript code—see <a href="#">Programming Guide (JScript)</a>	

## 7.3 Purpose and structure of the guide

Programming Guide is a reference and information handbook on programming in embedded *Axxon PSIM* software language, which is designed for system administrators, installation and configuration technicians, users with administrator rights to the digital video surveillance and audio monitoring systems, developed on the basis of *Axxon PSIM* software.

Programming in *Axxon PSIM* enables automatic system control by setting up complex logical interactions between objects.

The [guide](#) contains the information on:

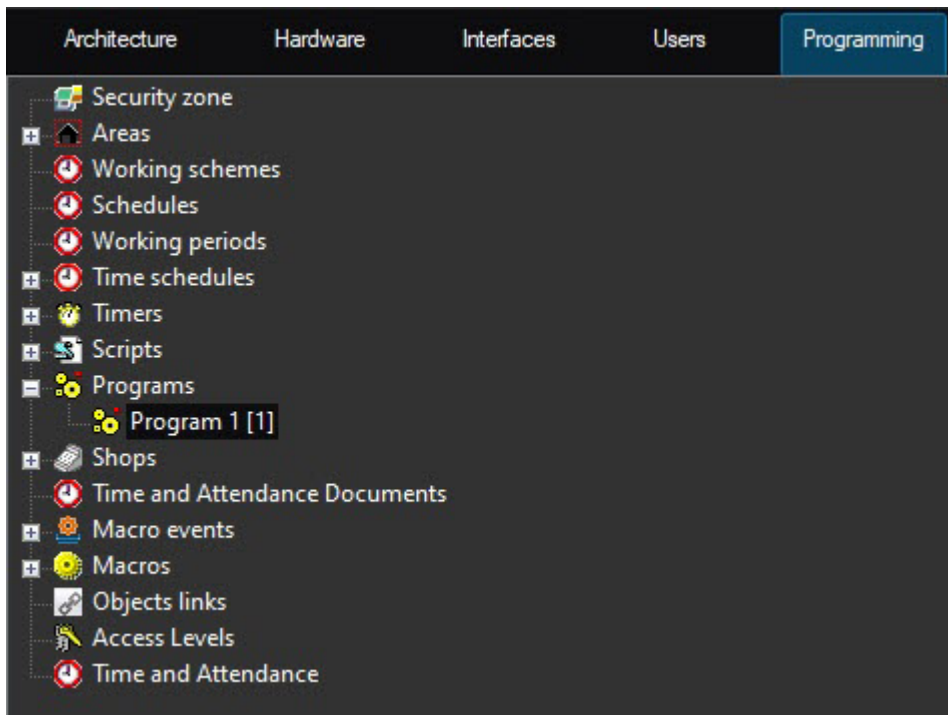
1. Programming tools;
2. Description of embedded programming language syntax;
3. Examples of programs in the embedded language.

## 8 Programming tools in Axxon PSIM

### 8.1 The Program system object

The **Program** system object is designed to initialize the program written in JScript (or Axxon PSIM programming language) in Axxon PSIM and set its parameters.

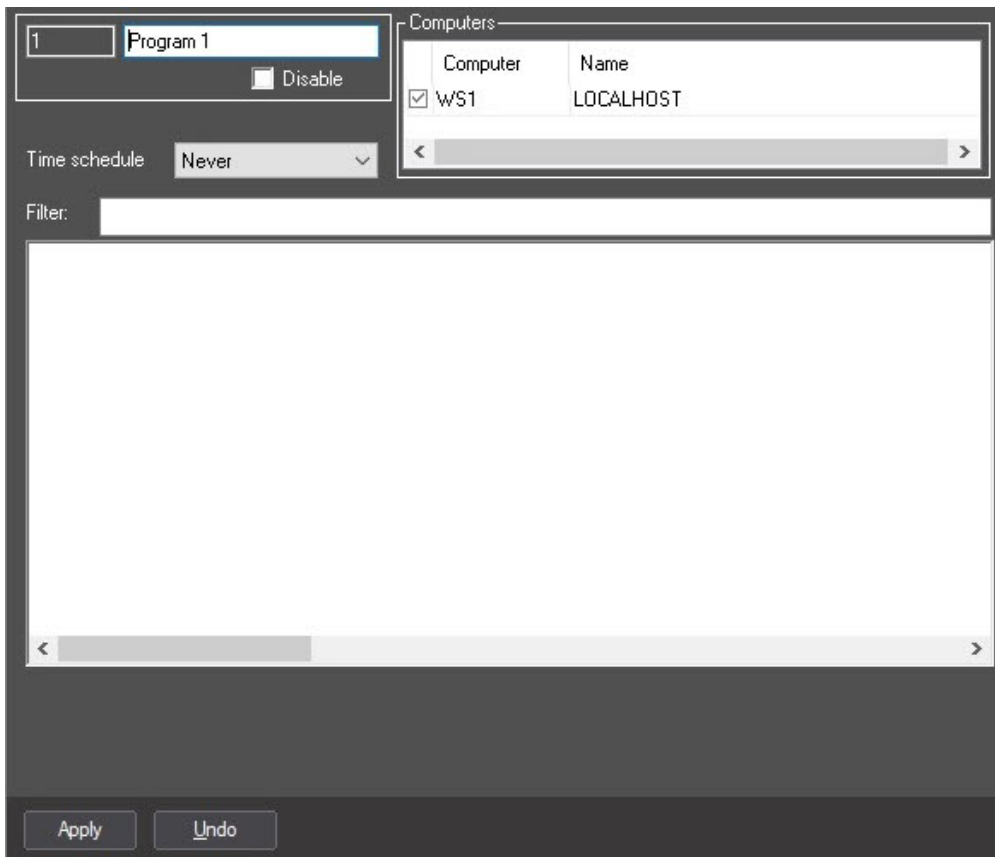
The **Program** system object is created under the **Programs** object in the **Programming** tab of the **System settings** dialog box.



#### **⚠ Important!**

Creation of more than 100 **Program** system objects can cause system instability.

See the settings panel of the **Program** system object in the figure below:



On the settings panel of the **Program** system object specify the time zone of program execution and computers (cores) on which the program is to be executed.

**Note.**

To set all checkboxes checked, select one in the column and click Ctrl+A. To set all checkboxes unchecked select one and click Shift+A.

To pre-filter events processed by the program, set the value in the **Filter** field. The filter format is TYPE|ID|EVENT divided by semicolon, for example CAM||MD\_STOP;CAM||MD\_START to filter **Alarm** and **Alarm end** events from all **Camera** objects.

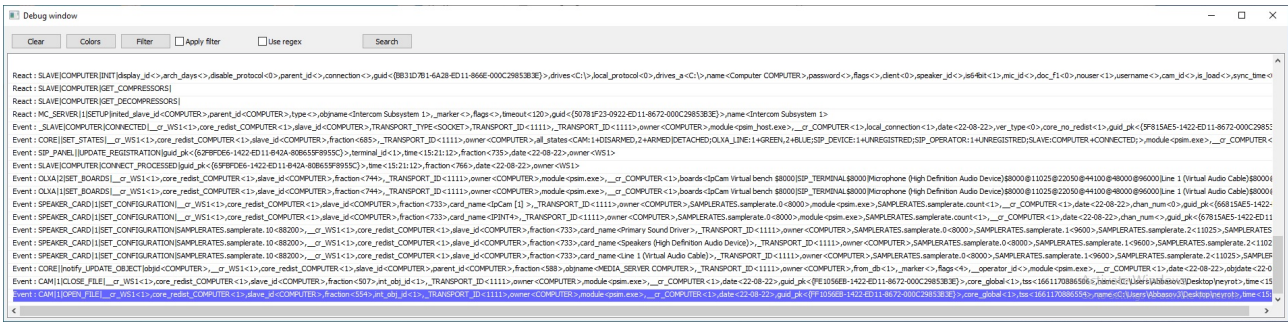
There is the word processor on the settings panel of the **Program** system object. It is used for writing and editing the program code.

You can undo or redo some action using hotkeys in the word processor on the settings panel of the **Program** system object. To undo some action click **Alt+Backspace**, to redo – **Ctrl+Y**.

## 8.2 Debug window

The Debug window is designed to view data about all events logged in the system.

Call the **Debug** window using the **Debug** command in the **Run** menu on the Main Control Panel. The Axxon PSIM **Debug** window appears at the bottom of the screen.



By default the **Debug window** is not available. Enable the **Debug window** using the *tweaki.exe* utility (see [The Debug window](#) section of [Programming Guide \(JScript\)](#)).

### 8.3 Syntax analyser

Embedded syntax analyser enables spell check of basic registered words, such as OnEvent, DoReact, OnTime, Wait, Sleep, etc. These registered words are black-marked in the text field. It is noteworthy that the analyser does not check if command parameters are written correctly, so you should be very attentive in these cases.

```

OnEvent ("MACRO", "2", "RUN")
{
  fn="D:\Intellect\Bmp\Person\1.bmp";

DoReact ("MONITOR", "1", "EXPORT_FRAME", "cam<1>, file<"+fn+">");
DoReact ("DIALOG", "operator", "CLOSE_ALL");
Sleep (500);
DoReact ("DIALOG", "operator", "RUN");
}

OnEvent ("MACRO", "3", "RUN")
{
  fn="D:\Intellect\Bmp\Person\1.bmp";

DoReact ("MONITOR", "1", "EXPORT_FRAME", "cam<2>, file<"+fn+">");
    
```

To change the font size use the key combinations **CTRL** and **+** to make font larger

```

OnInit ()
{
  n1a="0";
  n1v="0";
}

OnEvent ("OLXA_LINE", "1", "ACCU_START")
{
  n1a="1";
DoReact ("CAM", "1", "REC");
}
    
```

**CTRL** and – to make font smaller

```
OnInit ()
{
  rlx="0";
  rly="0";
}

OnEvent ("OLXA_LINE", "1", "ACCU_START")
{
  rlx="1";
  DoReact ("CMF", "1", "REC");
}
```

## 8.4 Recommended procedure of writing programs

### On the page:

- [Setting a general task](#)
- [Outlining the task into subtasks](#)
- [Writing subtasks and debugging them](#)
- [Finding and fixing bugs](#)

1. Set a general task.
2. Outline the task into subtasks.
3. Write subtasks and debug them.
4. Find and fix bugs.

### 8.4.1 Setting a general task

There should be a clear vision of what is to be done in the system as a result of specific events. Specify the ID of devices that participate in creating events and actions.

### 8.4.2 Outlining the task into subtasks

If several events are to be processed in one task, then it must be clear what to do with each event. If possible exclude the possibility of loop script execution, i.e. exclude any recursive actions if they are not related to task execution.

### 8.4.3 Writing subtasks and debugging them

The most difficult part of writing scripts is creating the list of actions with possible use of logic and loop operations. Debugging of this part of programming takes much time. Events generation that needs processing is not usually easy-to-use, especially on a real object, for example fire sensor triggering – from the server to the system core. In this case, it is recommended to generate an event manually at the stage of debugging, the best way is to run an

empty macro. After the body of the script is debugged there is a real event instead of running the empty macro. Moreover, one may check and vice versa – make sure whether the event is written correctly events without starting the action list – run an empty macro and watch its performance in the debug window.

#### 8.4.4 Finding and fixing bugs

At startup embedded syntax analyzer checks if names of functions are spelled correctly, but does not check the position of key characters – commas, semicolons and nested *parentheses*, etc. In order to track the bugs in the program, if any, it is necessary to activate the **Debug 4** debug mode (see [Enabling and configuring the debug mode of Axxon PSIM software](#)). In there are syntax errors, the **Critical errors** window will be displayed at the stage of the program body execution. This window lists the names of functions with incorrect syntax and other debugging information.



**Note**

If the syntax is correct, but the program still does not work or works with errors, it is recommended to rewrite the program in JScript (see [Programming Guide \(JScript\)](#)).

## 9 Description of syntax

Script consists of the set of procedures.

All operators executed inside procedures are enclosed in {...} blocks.

If a comment is to be written, then put // reserved characters before the comment.

### 9.1 Description of variables

All variables in the system are string variables.

To compare string variables and values use bool strequal (string1,string2) function. The strequal function returns the nonzero value if strings are equal (see [Description of functions](#) section).

To do integer operations use str(string1) function (see [Description of functions](#) section).

### 9.2 Description of procedures

#### 9.2.1 Standard procedures

There are 3 standard procedures that can be performed when the corresponding event occurs:

1. OnInit() – used for initialization of variables (setting initial values) that will be used in scripts. It is executed before starting all modules of the system. It is recommended to call the procedure once for all scripts.

Example use:

```
OnInit(){
  flag=1;
  num=8; //variables will be initialized at startup
}
```

2. OnTime (DOW (1-7), day-month-year, hours, minutes, seconds) – Running at specific time.

```
OnTime(W,D,X,Y,H,C,S)
{
  //W - DOW (0 - Monday, 6 - Sunday);
  //D - date in the day-month-year format, 16 August 2001 is "16-08-01"
  //X,Y - reserved
  //H - hour
  //C - minutes
  //S - seconds
  // COMPARING WITH PARAMETERS, THE ACTION IS SPECIFIED FURTHER
}
```

Examples use:

```
OnTime(W,"16-08-01",X,Y,"11","11","30")
{
  //the code will be executed on 16 August, 2001 at 11:11:30
}
```

```
}

```

```
OnTime(W,D,X,Y,"11","11","30")
{
  //the code will be executed every day at 11:11:30
}
```

```
OnTime(W,"16-08-01",X,Y,H,C,S)
{
  //the code will be executed on 16 August, 2001
  //every second
}
```

```
OnTime(W,"16-08-01",X,Y,"11","11",S)
{
  //the code will be executed on 16 August, 2001
  //every second from 11:11 to 11:12
}
```

```
OnTime("0",D,X,Y,"21","0","0")
{
  //the code will be executed every Monday
  // at 21:00:00
}
```

3. OnEvent(source type, number,event) – running if there is a specific event from the system object. This is the main procedure of creating scripts.

Examples use:

```
OnEvent("GRAY","1","ON")
{
  //will be executed when closing sensor 1
}
```

```
OnEvent("CAM","12","MD_START")
{
  //will be executed when motion detection tool of camera 12 triggers
}
```

Each procedure that has parameters can be seen in a code many times with various parameters. When an event occurs, the system will execute those of them that have the same parameters as one that has occurred.

The procedure parameter can be defined or not. If it is defined, then its value is in quotes, otherwise the parameter is written in the Latin alphabet and the procedure will be executed for all events for which it can be defined.

Examples use:

```
OnEvent("GRAY","1","ON") // will be executed when closing sensor 1
{
  i=1;
  i=i+1; //as variables are string, then the sum will be 11
  j=1;
  j=str(j+1); // str is a number-to-string conversion function. Inside the str
  //function all string variables (if any) are converted to integers and
  //then all integers are added together, therefore, the sum will be 2.
}
```

```
OnEvent("GRAY",N,"ON") //will be executed when any sensor is closed
{
  if(strequal(N,"3")
  {
    // will be executed if this is sensor 3
  }
}
```

## 9.2.2 Creating custom procedures

All custom procedures described in the script are to be in the same program body and before procedures in which they are called.

```
procedure ProcedureName(list of parameters){
  //procedure body
}
```

### Important!

The names of parameters are to consist of one uppercase character.

Examples use:

```
procedure ProcedureName(A,B)
{
  n=A+" "+B;
  //when running macro 1 n=«Macro 1», when running macro 16 n=«Macro 16»
}

OnEvent("MACRO",N,"RUN")
{
  a1=N;
```

```
a2="Macro";
ProcedureName(a2,a1);
}
```

## 9.3 Description of operators

The list of operators used to describe actions:

1. DoReact (object type, number, action[,Parameters]) – execute action  
Example use:

```
OnEvent("GRAY","1","ON")
{
  DoReact("GRELE","1","ON"); //close relay 1 when closing sensor 1
}
```

2. DoCommand(command line) – run the command line  
Examples use:

```
OnEvent("GRAY","1","ON")
{
  DoCommand("notepad.exe"); //when sensor 1 is closed run "Notepad"
}
```

3. Wait(number of seconds) – wait for N seconds.  
Sleep(number of milliseconds) – wait for N milliseconds.  
Await operators are to be in a single thread. Single thread is to be inside square brackets.  
Example. When Sensor 1 is closed, Relay 1 is closed for 5 seconds.

```
OnEvent("GRAY","1","ON")
{
  [
    DoReact("GRELE","1","ON");
    Wait(5);
    DoReact("GRELE","1","OFF");
  ]
}
```

4. Checking the state function:  
CheckState(object type, number, state) – the result is 1, if the state of an object is factually accurate, otherwise 0.  
Expressions can be used as parameters. Constant values are quoted.  
Example. Check the state of camera 2 when closing sensor 1 and if the state is “Alarmed“, then close relay 1

```
OnEvent("GRAY","1","ON")
{
  if(CheckState("CAM","2","ALARMED"))
  {
    DoReact("GRELE","1","ON");
  }
}
```

```
}
}
```

#### 5. Conditional operator:

```
If (expression)
{
  ... // if the result is not equal to 0
}
else
{
  ... // if the result is equal to 0
}
```

else {} part can be absent.

Example use:

```
OnEvent("MACRO","1","RUN"){
  x=5;
  if(x>10) {y=2;} // if "x" is greater than 10, then y=2
  else {y=3;} //otherwise y=3
}
```

#### 6. For operator:

```
For(expression 1; expression 2; expression 3){
  ...
}
```

Expression1 is executed at the beginning of the loop; loop body is executed if expression2 is true; expression3 is executed after each execution of the loop body.

Example. When sensor1 is closed, relay1 is closed and opened every second and it will happen 10 times.

```
OnEvent
("GRAY","1","ON")
{
  [
    for(i=0;i<10;i=str(i+1))
    {
      DoReact("GRELE","1","ON");
      Wait(1);
      DoReact("GRELE","1","OFF");
      Wait(1);
    }
  ]
}
```

#### 7. DoReactGlobal (object type, number, state) – function that creates reactions of system objects. Meanwhile, the created reaction is sent to all cores connected over the network.

Example. When running macro 1, camera 1 is armed.

```
OnEvent("MACRO","1","RUN")
{
  DoReactGlobal("CAM","1","ARM");
}
```

8. NotifyEventGlobal (object type, number, state) – function that creates events. Meanwhile, the created events are sent to all cores connected over the network.  
Example. When running macro 1, create event “Recording” for camera 1. The command is sent to all cores as an event in order to be logged.

```
OnEvent("MACRO","1","RUN")
{
  NotifyEventGlobal("CAM","1","REC");
}
```

**Note.**

If there is no need to send event to all cores, then use the NotifyEvent function.

## 9.4 Operators and expressions

The table below lists and describes comparison, arithmetic and conditional operators.

Operator	General description, example use
<b>Comparison operators</b>	
>	Comparison operator – greater. See example in <a href="#">Description of operators</a> section.
<	Comparison operator – greater. See example in <a href="#">Description of operators</a> section.
<b>Arithmetic operators</b>	
+	Addition. Example use: <pre>OnEvent ("MACRO","1","RUN") {   x=5;   y=10;   i=x+y; // add strings, i.e. 5+10=510   e=str(x+y); // add integers 5+10=15 }</pre>

Operator	General description, example use
-	<p>Subtraction. Example use:</p> <pre data-bbox="555 427 1422 734"> OnEvent ("MACRO","1","RUN") {   x=5;   y=10;   i=x-y; // subtract integers 5-10=-5   e=str(x-y); // subtract integers 5-10=-5 } </pre>
*	<p>Multiplication. Example use:</p> <pre data-bbox="555 831 1422 1111"> OnEvent ("MACRO","1","RUN") {   x=5;   y=10;   i=x*y; // multiply integers 5*10=50   e=str(x*y); // multiply integers 5*10=50 } </pre>
/	<p>Division. Example use:</p> <pre data-bbox="555 1207 1422 1487"> OnEvent ("MACRO","1","RUN") {   x=5;   y=10;   i=x/y; // divide integers 5/10=0.5   e=str(x/y); // divide integers 5/10=0.5 } </pre>
%	<p>Remainder after integer division. Example use.</p> <pre data-bbox="555 1583 1422 1919"> OnEvent ("MACRO","1","RUN") {   a=1120.0;   b=100;   e=a%b; // remainder after integer division, i.e 1100 is          // divided by 100 and 20 is remainder.          // if there is division without remainder, then result          // is 0 } </pre>

Operator	General description, example use
()	<p>Group of arithmetic operators. Example use.</p> <pre data-bbox="555 427 1422 607"> OnEvent ("MACRO","1","RUN") {   x=100/((5*8)/1.028); }</pre>
<b>Logical operators</b>	
&&	<p>Logical AND operator. Example use:</p> <pre data-bbox="555 786 1422 1279"> OnEvent ("MACRO","1","RUN") {   a=1;   b=2;   z=3;   if((a&lt;b)&amp;&amp;(b&lt;z))   {     y=1; //if false, then else   }   else   {     x=0;   } }</pre>
!	<p>Logical inversion operator. Example use:</p> <pre data-bbox="555 1384 1422 1787"> OnEvent ("CAM",N,"MD_START") {   if(!(strequal(N,"1",))   {     DoReact("GRELE","1","ON)   }   else   {     DoReact("GRELE","2","ON)   } }</pre>

## 9.5 Description of functions

General description and examples use of math functions, conversion functions, as well as format functions and string functions are represented in the table.

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
<b>MATH</b>	
sin[1]	Trigonometric function: the sine of an angle. Format: $y=\sin(x)$ ; where $y$ – function value, $x$ – argument of function (in radians) Example: $y=\sin(1.6)$ Event received: Event : CORE VAR_CHANGED nt_obj_id<1>,value<0.997495>,name<y>,time<15:26:41>,date<21-09-04>
cos[1]	Trigonometric function: the cosine of an angle. Format: $y=\cos(x)$ ; where $y$ – function value, $x$ – argument of function(in radians) Example: $y=\cos(2.2)$ Event received: Event : CORE VAR_CHANGED int_obj_id<1>,value<-0.588501>,name<y>,time<16:00:45>,date<21-09-04>
tan[1]	Trigonometric function, returns the tangent of an angle. Format: $y=\tan(x)$ ; where $y$ – function value, $x$ – argument of function(in radians) Example: $y=\tan(1)$ Event received: Event : CORE VAR_CHANGED int_obj_id<1>,value<1.557408>,name<y>,time<16:43:45>,date<21-09-04>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
asin[1]	<p>Returns the arc sine of the specified numeric expression.</p> <p>Format: <math>y = \text{asin}(x)</math>; where <math>y</math> – function value (in radians), <math>x</math> – argument</p> <p>Example:</p> <p><math>y = \text{asin}(0.5)</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED  int_obj_id&lt;1&gt;,value&lt;0.523599&gt;,name&lt;y&gt;,time&lt;16:46:39&gt;,date&lt;21-09-04&gt;</p>
acos[1]	<p>Returns the arc cosine of the specified numeric expression.</p> <p>Format: <math>y = \text{acos}(x)</math>; where <math>y</math> – function value (in radians), <math>x</math> – argument</p> <p>Example:</p> <p><math>y = \text{acos}(0.55)</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED  int_obj_id&lt;1&gt;,value&lt;0.988432&gt;,name&lt;y&gt;,time&lt;16:46:39&gt;,date&lt;21-09-04&gt;</p>
atan[1]	<p>Returns the arc tangent of the specified numeric expression.</p> <p>Format: <math>y = \text{atan}(x)</math>; where <math>y</math> – function value (in radians), <math>x</math> – argument</p> <p>Example:</p> <p><math>y = \text{atan}(1.2)</math></p> <p>Event received:</p> <p>Event : Event : CORE VAR_CHANGED  int_obj_id&lt;1&gt;,value&lt;0.876058&gt;,name&lt;y&gt;,time&lt;17:07:09&gt;,date&lt;21-09-04&gt;</p>
sinh[1]	<p>The sinh function returns hyperbolic sine of the argument value.</p> <p>Format: <math>y = \text{sinh}(x)</math>; where <math>y</math> – function value, <math>x</math> – argument of function</p> <p>Example:</p> <p><math>y = \text{sinh}(0.8)</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED  int_obj_id&lt;1&gt;,value&lt;0.888106&gt;,name&lt;y&gt;,time&lt;17:12:26&gt;,date&lt;21-09-04&gt;</p>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
cosh[1]	<p>The cosh function returns hyperbolic cosine of the argument value.</p> <p>Format: <math>y = \cosh(x)</math>; where y – function value, x – argument of function</p> <p>Example:</p> <p><math>y = \cosh(0.35)</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED  int_obj_id&lt;1&gt;,value&lt;0.336376&gt;,name&lt;y&gt;,time&lt;17:25:25&gt;,date&lt;21-09-04&gt;</p>
tanh[1]	<p>Trigonometric function of an angle.</p> <p>Format: <math>y = \tanh(x)</math>; where y – function value, x – argument of function</p> <p>Example:</p> <p><math>y = \tanh(0.35)</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED  int_obj_id&lt;1&gt;,value&lt;1.419068&gt;,name&lt;y&gt;,time&lt;17:25:25&gt;,date&lt;21-09-04&gt;</p>
exp[1]	<p>Returns function value <math>e^x</math>, where x – specified numeric expression.</p> <p>Format: <math>y = \exp(x)</math>; where y-function value, x- argument</p> <p>Example:</p> <p><math>y = \exp(1.65)</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED  int_obj_id&lt;1&gt;,value&lt;5.20698&gt;,name&lt;y&gt;,time&lt;17:39:22&gt;,date&lt;21-09-04&gt;</p>
log[1]	<p>Returns the natural logarithm (base-e) of the specified numeric expression.</p> <p>Format: <math>y = \log(x)</math>; where y – function value, x – argument</p> <p>Example:</p> <p><math>y = \log(0.65)</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED  int_obj_id&lt;1&gt;,value&lt;-0.430783&gt;,name&lt;y&gt;,time&lt;17:43:22&gt;,date&lt;21-09-04&gt;</p>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
log10[1]	<p>Returns the common logarithm (base-10) of the specified numeric expression.</p> <p>Format: <math>y=\log_{10}(x)</math>; where y – function value, x – argument</p> <p>Example:</p> <p><math>y=\log_{10}(0.05)</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;-1.30103&gt;,name&lt;y&gt;,time&lt;17:46:28&gt;,date&lt;21-09-04&gt;</p>
sqrt[1]	<p>Returns the square root of the specified numeric expression.</p> <p>Format: <math>y=\sqrt{x}</math>; where y – function value, x – argument</p> <p>Example:</p> <p><math>y=\sqrt{9}</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;3&gt;,name&lt;y&gt;,time&lt;17:25:25&gt;,date&lt;21-09-04&gt;</p>
abs[1]	<p>The abs function returns the absolute value of the argument.</p> <p>Format: <math>y=\text{abs}(x)</math>; where y – function value, x – argument.</p> <p>Example:</p> <p><math>y=\text{abs}(-1)</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;1&gt;,name&lt;y&gt;,time&lt;13:39:37&gt;,date&lt;22-09-04&gt;</p>
deg[1]	<p>Trigonometric function of an angle. Returns the grade measure.</p> <p>Format: <math>y=\text{deg}(x)</math>; where y – function value in grades, x – argument value in radians.</p> <p>Example:</p> <p><math>y=\text{deg}(3.14)</math></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;179.908748&gt;,name&lt;y&gt;,time&lt;13:13:51&gt;,date&lt;22-09-04&gt;</p>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
rad[1]	<p>Trigonometric function of an angle.</p> <p>Format: <code>y=rad(x)</code>; where <code>y</code> – function value in radians, <code>x</code> – argument value in grades.</p> <p>Example:  <code>y=rad(180)</code></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED  value&lt;3.141593&gt;,name&lt;y&gt;,time&lt;15:04:17&gt;,date&lt;17-03-08&gt;</p>
<b>CONVERSION</b>	
floor[1]	<p>Integer conversion function (rounding <i>downward</i>).</p> <p>Format: <code>x= floor(y)</code>; where <code>x</code> – function value, <code>y</code> – fraction or integer.</p> <p>Example:  <code>x= floor(5.55)</code></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED  int_obj_id&lt;1&gt;,value&lt;5&gt;,name&lt;x&gt;,time&lt;20:51:48&gt;,date&lt;21-09-04&gt;</p>
ceil[1]	<p>Integer conversion function (rounding <i>upward</i>).</p> <p>Format: <code>x= ceil (y)</code>; where <code>x</code> – function value, <code>y</code> – fraction or integer.</p> <p>Example:  <code>x= ceil(5.55)</code></p> <p>Event received:</p> <p>Event : CORE VAR_CHANGED  int_obj_id&lt;1&gt;,value&lt;6&gt;,name&lt;x&gt;,time&lt;20:51:48&gt;,date&lt;21-09-04&gt;</p>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
str[1]	<p>Integer-to-string conversion function.</p> <p>Format: x=str(y); where x – function value, y – argument</p> <p>Example:</p> <pre>z=(9); a=str(z); b=sqrt(a);</pre> <p>Events received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;9&gt;,name&lt;z&gt;,time&lt;14:27:31&gt;,date&lt;22-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;9&gt;,name&lt;a&gt;,time&lt;14:27:31&gt;,date&lt;22-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;3&gt;,name&lt;b&gt;,time&lt;14:27:31&gt;,date&lt;22-09-04&gt;</p>
atof[1]	<p>String-to-integer conversion function.</p> <p>Format: x=atof(y); where x – function value, y – argument</p> <p>Example:</p> <pre>x="0"; x=str(atof(x)+10);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED value&lt;0&gt;,name&lt;x&gt;,time&lt;15:34:44&gt;,date&lt;17-03-08&gt;</p> <p>Event : CORE VAR_CHANGED value&lt;10&gt;,name&lt;x&gt;,time&lt;15:34:44&gt;,date&lt;17-03-08&gt;</p>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
val[1]	<p>Integer-to-string conversion function.</p> <p>Format: x=val(y); where x – function value, y – argument</p> <p>Example:</p> <pre>x="10"; x=str(val(x)+2);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED value&lt;10&gt;,name&lt;x&gt;,time&lt;15:34:44&gt;,date&lt;17-03-08&gt;  Event : CORE VAR_CHANGED value&lt;12&gt;,name&lt;x&gt;,time&lt;15:34:44&gt;,date&lt;17-03-08&gt;</pre>
int[1]	<p>Conversion of fraction into integer (without fractional part)</p> <p>Format: x=int(y); where x – function value, y – argument (fraction for conversion)</p> <p>Example:</p> <pre>y=(2.33); x=int(y);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;2.33&gt;,name&lt;y&gt;,time&lt;16:05:28&gt;,date&lt;22-09-04&gt;  Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;2&gt;,name&lt;x&gt;,time&lt;16:05:28&gt;,date&lt;22-09-04&gt;</pre>
long2time[1]	<p>It is used to convert specified number of seconds into time.</p> <p>Format: x=long2time(y); where x – function value(time), y – number in seconds</p> <p>Format of the initial recording (argument): &lt;MM&gt;</p> <p>Format of final recording: &lt;HH:MM:SS&gt;</p> <p>Example:</p> <pre>x=long2time(12345);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;03:25:45&gt;,name&lt;x&gt;,time&lt;13:53:02&gt;,date&lt;20-09-04&gt;.</pre>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
time2long[1]	<p>Convert time into a number of seconds</p> <p>Format: x=time2 long(y); where x – value in seconds, y – time in the &lt;hours&gt;.&lt;minutes&gt;. format.</p> <p>Example:</p> <pre>y=(0.15); x=time2long(y);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;0.15&gt;,name&lt;y&gt;,time&lt;19:39:49&gt;,date&lt;22-09-04&gt;</pre> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;900&gt;,name&lt;x&gt;,time&lt;19:39:49&gt;,date&lt;22-09-04&gt;</pre>
scalar2date[1]	<p>Convert a number of days into a date. (number of days is since AD)</p> <p>Format: x= scalar2date (y); where x – value(date), y – number of days.</p> <p>Example:</p> <pre>y=(731500); x=scalar2date(y);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;731500&gt;,name&lt;y&gt;,time&lt;19:57:46&gt;,date&lt;22-09-04&gt;</pre> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;12-10-03&gt;,name&lt;x&gt;,time&lt;19:57:46&gt;,date&lt;22-09-04&gt;</pre>
scalar[1]	<p>Convert date to number of days. (The number of days is calculated AD.)</p> <p>Format: x=scalar(y); where x – numerical value (in days), y – date.</p> <p>Recording format: &lt;DD.MM.YYYY&gt;</p> <p>Example:</p> <pre>x=scalar("19.10.2004")</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;10&gt;,value&lt;731873&gt;,owner&lt;WS1&gt;,name&lt;x&gt;,time&lt;15:24:11&gt;, guid_pk&lt;{42E93AF5-4862-485E-AEF6-D14C7BF79C5B}&gt;,date&lt;08-12-09&gt;</pre>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
convert_num[1]	<p>Convert a number into the string.</p> <p>Format: x=convert_num(y); where x – string value of the number, y – convertible number.</p> <p>Example:</p> <pre>y=(24009921); x=convert_num(y);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;24009921&gt;,name&lt;y&gt;,time&lt;12:37:20&gt;,date&lt;23-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;Twenty four million nine thousand nine hundred twenty-one &gt;,name&lt;x&gt;,time&lt;12:37:20&gt;,date&lt;23-09-04&gt;</p>
convert_cur[1]	<p>Convert a number (sum of money) into the string and add rubles and copecks.</p> <p>Format: x=convert_cur(y); where x – string value of the sum of money, y – number (sum of money).</p> <p>Recording format: &lt;RR.KK&gt;</p> <p>Example:</p> <pre>y=(17999.98); x=convert_cur(y);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;17999.98&gt;,name&lt;y&gt;,time&lt;12:49:30&gt;,date&lt;23-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;Seventeen thousand nine hundred ninty-nine roubles ninty-eight copecks &gt;,name&lt;x&gt;,time&lt;12:49:30&gt;,date&lt;23-09-04&gt;</p>
<b>FORMATTING</b>	

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
number_frm[2]	Formatting a number Format: x=number_frm(y,z); where x – function value, y – initial number, z – number of figures after the decimal. Example: y=(17999.09998); x=number_frm(y,3); Event received: Event : CORE VAR_CHANGED int_obj_id<1>,value<17999.09998>,name<y>,time<14:21:24>,date<23-09-04> Event : CORE VAR_CHANGED int_obj_id<1>,value<17999.100>,name<x>,time<14:21:24>,date<23-09-04>
int_frm[2]	Formatting number Format: x=int_frm(y,z); where x – value, y – operand, z – number of output digits. Example: y=(17999.99); x=int_frm(y,10); Event received: Event : CORE VAR_CHANGED int_obj_id<1>,value<17999.99>,name<y>,time<14:31:46>,date<23-09-04> Event : CORE VAR_CHANGED int_obj_id<1>,value<0000017999>,name<x>,time<14:31:46>,date<23-09-04>
currency_std[1]	Formatting currency value (from '.' to '-'). Format: x=currency_std(y); where x – function value with modified format, y – number (sum of money). Example: x=currency_std(3.62); Event received: Event : CORE VAR_CHANGED int_obj_id<1>,value<3-62>,name<x>,time<13:40:01>,date<23-09-04>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
IsVarExist[1]	<p>The function that checks a specified parameter in the event.</p> <p>Format: <code>y=IsVarExist("x");</code> where <code>y</code> – value, <code>x</code> – parameter</p> <p>If the parameter exists, then "1" returns, otherwise "0".</p> <p>Example:</p> <pre>p=IsVarExist("param0")</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;10&gt;,value&lt;0&gt;,owner&lt;WS1&gt;,name&lt;p&gt;,time&lt;12:02:11&gt;, guid_pk&lt;{6A8B5BC9-919C-4098-844A-FBF78FA20820}&gt;,date&lt;14-12-09&gt;</pre>
GetObjectIdByParam [3]	<p>The function that returns the first object ID found by a specified parameter.</p> <p><code>Id=GetObjectIdByParam ("x","y","z");</code> where <code>id</code> – returned value, <code>x</code> – object type, <code>y</code> – parameter, <code>z</code> – parameter value.</p> <p>Example:</p> <pre>Id=GetObjectIdByParam("CAM","color","0");</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED date&lt;28-02-11&gt;,value&lt;2&gt;,int_obj_id&lt;1&gt;,fraction&lt;218&gt;,name&lt;Id&gt;, guid_pk&lt;{F903A28C-3243-E011-901F-6CF049E58698}&gt;, time&lt;15:02:04&gt;,owner&lt;D-IVANOV&gt;</pre> <p>* <code>Id=2</code> (see <code>value&lt;2&gt;</code>), if the function returns empty value (<code>value&lt;&gt;</code>), then check if it and its parameters are written correctly.</p>
<b>STRING</b>	

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
strequal[2]	<p>Comparing strings</p> <p>Format: <code>x= strequal(z,y)</code>; where x – value, z and y – compared strings.</p> <p>Example:</p> <pre>z=str(1019); y=str(1019); x=strequal(z,y);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;1019&gt;,name&lt;z&gt;,time&lt;16:51:45&gt;,date&lt;23-09-04&gt; Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;1019&gt;,name&lt;y&gt;,time&lt;16:51:45&gt;,date&lt;23-09-04&gt; Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;1&gt;,name&lt;x&gt;,time&lt;16:51:45&gt;,date&lt;23-09-04&gt;</pre> <p>* «value&lt;1&gt;» (see example above) – in the received event we get «value&lt;&gt;» - compared strings differ, or «value&lt;1&gt;» - compared strings are the same.</p>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
strstr[2]	<p>Define if there is a substring in the string.</p> <p>Format: <code>x=strsub(y,z)</code>; where <code>x</code> – value, <code>y</code> – string in which the search is performed, <code>z</code> – substring.</p> <p>Example 1:</p> <pre>z=str(888123); y=str(123); x=strsub(z,y);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;888123&gt;,name&lt;z&gt;,time&lt;16:07:07&gt;,date&lt;23-09-04&gt; Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;123&gt;,name&lt;y&gt;,time&lt;16:07:07&gt;,date&lt;23-09-04&gt; Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;4&gt;,name&lt;x&gt;,time&lt;16:04:34&gt;,date&lt;23-09-04&gt;</pre> <p>Example 2:</p> <pre>z="67hb8vc56"; y="vc"; x=strsub(z,y);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED value&lt;67hb8vc56&gt;,name&lt;z&gt;,time&lt;12:15:09&gt;,date&lt;18-03-08&gt; Event : CORE VAR_CHANGED value&lt;vc&gt;,name&lt;y&gt;,time&lt;12:15:09&gt;,date&lt;18-03-08&gt; Event : CORE VAR_CHANGED value&lt;6&gt;,name&lt;x&gt;,time&lt;12:15:09&gt;,date&lt;18-03-08&gt;</pre> <p>* "value&lt;4&gt;" (see example 1) – index in the initial string. Starting from this index the first occurrence of the substring in the string is detected. If the search result is negative, the function returns value&lt;&gt;.</p>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
strempy[1]	<p>Define if the string is empty.</p> <p>Format: <code>x=strempy(y)</code>; where <code>x</code> – value (1 if string is empty), <code>y</code> – string.</p> <p>Example:</p> <pre>y=""; x=strempy(y);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED value&lt;&gt;, name&lt;y&gt;,time&lt;12:27:32&gt;,date&lt;18-03-08&gt;</p> <p>Event : CORE VAR_CHANGED value&lt;1&gt;,name&lt;x&gt;,time&lt;12:27:32&gt;,date&lt;18-03-08&gt;</p> <p>* function value value &lt;&gt; means that string is not empty.</p>
straleft[2]	<p>Left alignment</p> <p>Format: <code>x=straleft(y,z)</code>; where <code>x</code> – aligned string, <code>y</code> – string, <code>z</code> – alignment value.</p> <p>Example:</p> <pre>y=str(123456789); x=straleft(y,5);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;123456789&gt;,name&lt;y&gt;,time&lt;18:04:05&gt;,date&lt;23-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;12345&gt;,name&lt;x&gt;,time&lt;18:04:05&gt;,date&lt;23-09-04&gt;</p> <p>Note. If <code>z</code> is bigger than the number of symbols in the string, then the function adds spaces to the initial string on the right until its length becomes <code>z</code>.</p>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
strmid[3]	<p>Get substring</p> <p>Format: <code>x=strmid(y,z,w)</code>; where <code>x</code> – string value, <code>y</code> – string, <code>z</code> – string position, <code>w</code> – substring length.</p> <p>Example:</p> <pre>z=(7);//position w=(9);//length x=strmid("get substring (1 - string, 2 - position, 3 - length)",z,w); y=strmid("get substring (1 - string, 2 - position, 3 - length)",17,10);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;6&gt;,name&lt;z&gt;,time&lt;14:18:08&gt;,date&lt;24-09-04&gt;  Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;9&gt;,name&lt;w&gt;,time&lt;14:18:08&gt;,date&lt;24-09-04&gt;  Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;substring&gt;,name&lt;x&gt;,time&lt;14:18:08&gt;,date&lt;24-09-04&gt;  Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;1 - string&gt;,name&lt;y&gt;,time&lt;14:18:08&gt;,date&lt;24-09-04&gt;</pre>
strleft[2]	<p>Get left <i>side</i> of <i>string</i></p> <p>Format: <code>y=strleft(s,w)</code>; where <code>y</code> – string value, <code>s</code> – string, <code>w</code> – length (from string beginning)</p> <p>Example:</p> <pre>w=(5);//length s("Get left side of string");//string y=strleft(s,w);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;5&gt;,name&lt;w&gt;,time&lt;14:54:31&gt;,date&lt;24-09-04&gt;  Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;Get left side of string&gt;,name&lt;s&gt;,time&lt;14:54:31&gt;,date&lt;24-09-04&gt;  Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;Get&gt;,name&lt;y&gt;,time&lt;14:54:31&gt;,date&lt;24-09-04&gt;</pre>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
strright[2]	<p>Get right <i>side</i> of <i>string</i> (1 - string, 2 - length)</p> <p>Format: <code>y=strright(s,w)</code>; where <code>y</code> – string value, <code>s</code> – string, <code>w</code> – length (from string end)</p> <p>Example:</p> <pre>w=(6);// length s("Get right side of string");//string y=strright(s,w);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;6&gt;,name&lt;w&gt;,time&lt;15:10:36&gt;,date&lt;24-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;Get right side of string&gt;,name&lt;s&gt;,time&lt;15:10:36&gt;,date&lt;24-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;strings&gt;,name&lt;y&gt;,time&lt;15:10:36&gt;,date&lt;24-09-04&gt;</p>
strnleft[2]	<p>Get without left <i>side</i> of <i>string</i>.</p> <p>Format: <code>y=strnleft(s,w)</code>; where <code>y</code> – string value, <code>s</code> – string, <code>w</code> – length of left side that will be cut.</p> <p>Example:</p> <pre>w=(6);//length s("get without left side of string");//string y=strnleft(s,w);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;6&gt;,name&lt;w&gt;,time&lt;15:32:38&gt;,date&lt;24-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;get without left side of string&gt;,name&lt;s&gt;,time&lt;15:32:38&gt;,date&lt;24-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;without left side of string&gt;,name&lt;y&gt;,time&lt;15:32:38&gt;,date&lt;24-09-04&gt;</p>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
strnright[2]	<p>Get without right <i>side</i> of <i>string</i>.</p> <p>Format: <code>y=strnright(s,w);</code> where <code>y</code> – string value, <code>s</code> – string, <code>w</code> – length of right side that will be cut.</p> <p>Example:</p> <pre>w=(6);//length s=("get without right side of string");//string y=strnright(s,w);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;6&gt;,name&lt;w&gt;,time&lt;15:44:31&gt;,date&lt;24-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;get without right side of string&gt;,name&lt;s&gt;,time&lt;15:44:31&gt;,date&lt;24-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt; get without right side of&gt;,name&lt;y&gt;,time&lt;15:44:31&gt;,date&lt;24-09-04&gt;</p>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
get_substr[3]	<p>Get substring (1 - string, 2 – substring to start with, 3 – substring to end with, "\r" – end of string)</p> <p>Format: y=get_substr(s,w,x); where y – value(substring), s – string, w – substring to start with, x – substring to end with("\r" – end of string)</p> <p>Recording format: &lt;NN.NN&gt;</p> <p>Example:</p> <pre>s=("get substring 1234567890");//string w("to");// substring to start with x("\r");//substring to end with, "\r" – end of string y=get_substr(s,w,x);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;get substring 1234567890&gt;,name&lt;s&gt;,time&lt;16:34:13&gt;,date&lt;24-09-04&gt; Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;sub&gt;,name&lt;w&gt;,time&lt;16:34:13&gt;,date&lt;24-09-04&gt; Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;\r&gt;,name&lt;x&gt;,time&lt;16:34:13&gt;,date&lt;24-09-04&gt; Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;substring 1234567890&gt;,name&lt;y&gt;,time&lt;16:34:13&gt;,date&lt;24-09-04&gt;</pre> <p>Example:</p> <pre>s("get substring 1234567890");//string w("to");// substring to start with x(1);//substring to end with, "\r" – end of string y=get_substr(s,w,x);</pre> <p>Event received:</p> <pre>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;get substring 1234567890&gt;,name&lt;s&gt;,time&lt;16:36:26&gt;,date&lt;24-09-04&gt; Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;sub&gt;,name&lt;w&gt;,time&lt;16:36:26&gt;,date&lt;24-09-04&gt; Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;1&gt;,name&lt;x&gt;,time&lt;16:36:26&gt;,date&lt;24-09-04&gt; Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;substring &gt;,name&lt;y&gt;,time&lt;16:36:26&gt;,date&lt;24-09-04&gt;</pre>

<b>Functions</b> <b>(The number of executable parameters is specified in square brackets)</b>	<b>General description, example use</b>
strltrim[1]	<p>Remove spaces on the left</p> <p>Format: <code>y=strltrim(w)</code>; where <code>y</code> – result string value, <code>w</code> – string.</p> <p>Example:</p> <pre>w=("remove spaces on the left");//string y=strltrim(w);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;remove spaces on the left&gt;,name&lt;w&gt;,time&lt;17:07:49&gt;,date&lt;24-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;remove spaces on the left&gt;,name&lt;y&gt;,time&lt;17:07:49&gt;,date&lt;24-09-04&gt;</p>
strrtrim[1]	<p>Remove spaces on the right</p> <p>Format: <code>y=strrtrim(w)</code>; where <code>y</code> – result string value, <code>w</code> – string.</p> <p>Example:</p> <pre>w=("Remove spaces on the right");//string y=strrtrim(w);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;Remove spaces on the right&gt;,name&lt;w&gt;,time&lt;17:18:35&gt;,date&lt;24-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;Remove spaces on the right&gt;,name&lt;y&gt;,time&lt;17:18:35&gt;,date&lt;24-09-04&gt;</p>
stratrim[1]	<p>Remove spaces on both sides</p> <p>Format: <code>y=stratrim(w)</code>; where <code>y</code> – result string value, <code>w</code> – string.</p> <p>Example:</p> <pre>w=("remove spaces on both sides");//string y=stratrim(w);</pre> <p>Event received:</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;remove spaces on both sides&gt;,name&lt;w&gt;,time&lt;17:27:44&gt;,date&lt;24-09-04&gt;</p> <p>Event : CORE VAR_CHANGED int_obj_id&lt;1&gt;,value&lt;remove spaces on both sides&gt;,name&lt;y&gt;,time&lt;17:27:44&gt;,date&lt;24-09-04&gt;</p>

**Note.**

The date<DD-MM-YY> and time<HH:MM:SS> functions return the current date and time. The pi<3,1415926535897932384626433832795> function returns the value of  $\pi$ .

## 9.6 Examples of scripts

### On the page:

- [Example 1.](#)
- [Example 2.](#)
- [Example 3.](#)
- [Example 4.](#)
- [Example 5.](#)
- [Example 6.](#)
- [Example 7.](#)
- [Example 8.](#)
- [Example 9.](#)
- [Example 10.](#)
- [Example 11.](#)
- [Example 12.](#)

Below one can find some examples of scripts.

### 9.6.1 Example 1.

Display active camera on the analogue monitor.

#### Implementation:

```
OnEvent ("MONITOR", "1", "ACTIVATE_CAM")
{
  DoReact("CAM", cam, "MUX1");
}
```

### 9.6.2 Example 2.

Start and stop PTZ patrolling using macros.

#### Implementation:

```
OnEvent("MACRO", "1", "RUN")
{
  DoReact("TELEMETRY", "1.1", "PATROL_PLAY", "tel_prior<1>");
}
```

```
OnEvent("MACRO","2","RUN")
{
  DoReact("TELEMETRY","1.1","STOP","tel_prior<1>");
}
```

### 9.6.3 Example 3.

Display an alarm camera in the single monitor mode.

#### Implementation:

```
OnEvent ("CAM",N,"MD_START")
{
  DoReact("MONITOR","1","ACTIVATE_CAM","cam<"+N+">");

  DoReact("MONITOR","1","KEY_PRESSED","key<SCREEN.1>");
}
```

### 9.6.4 Example 4.

Here is an example of an infinite loop and how to stop it. Macro1 starts the loop and macro2 ends it.

#### Implementation:

```
OnEvent("MACRO","1","RUN") //macro1 is run
{
  //square brackets are needed to isolate wait statement to individual stream
  [
    flag=1;
    for(a=1;flag<2;a=1) //cycle statement
    {
      Sleep(500); //wait statement creates pause of 500 milliseconds
      ff="!!!!!!!!!!!!!!!!!!!!!!!!!!!!";
    }
  ]
}

OnEvent("MACRO","2","RUN") // macro2 is run
{
  flag=2;
}
```

### 9.6.5 Example 5.

An alarm monitor the video from the alarm camera is always on.

#### Implementation:

```

OnInit()

{
  counter=0;
}

OnEvent("CAM",T,"MD_START")

{
  if(strequal(counter,"0"))
  {
    DoReact("MONITOR","2","REMOVE_ALL");
    DoReact("MONITOR","2","ADD_SHOW","cam<"+T+">");
  }
  counter=str(counter+1);
}

OnEvent("CAM",M,"MD_STOP")
{
  counter=str(counter-1);
  if(strequal(counter,"0"))
  {
    DoReact("MONITOR","2","ADD_SHOW","cam<"+M+">");
  }
}

```

### 9.6.6 Example 6.

An audio file is to be played back starting from the moment when one event appears until the moment of another event appearance (macro is run in this case).

#### Important!

An audio file mustn't be longer than the number of seconds specified in the Wait operator.

#### Implementation:

```

OnEvent("MACRO","1","RUN")
{
  flag=1;

  [
  for(i=1;flag;i=1)
  {
    DoReact("PLAYER","1","PLAY_WAV","file<C:\Program Files\Axxon
PSIM\Wav\cam_alarm_1.wav>");
    Wait(3);
  }
  ]
}

```

```

}

OnEvent("MACRO","8","RUN")
{
  flag=0;
}

```

### 9.6.7 Example 7.

There are 2 cameras with PTZ devices. Every 15 minutes a camera is to rotate to the position of preset 1 and a snapshot is to be made. Current time is the name for a file.

#### Implementation:

```

OnTime(W,D,X,Y,H,M, "01")
{
  if(strequal(M,"0"))
  {
    name=H+"_"+M+"_"+S+".jpg";
    //Camera 1 PTZ device 1.1
    name1="Camera1"+name;
    DoReact("TELEMETRY","1.1","GO_PRESET","preset<1>,tel_prior<1>");
    DoReact("MONITOR","1","EXPORT_FRAME","cam<1>,file<d:\"+name1);
    //Camera 2 PTZ device 1.2
    name="Camera2"+name;
    DoReact("TELEMETRY","1.2","GO_PRESET","preset<1>,tel_prior<1>");
    DoReact("MONITOR","1","EXPORT_FRAME","cam<2>,file<d:\"+name);
  }

  if(strequal(M,"15"))
  {
    name=H+"_"+M+"_"+S+".jpg";
    //Camera 1 PTZ device 1.1
    name1="Camera1"+name;
    DoReact("TELEMETRY","1.1","GO_PRESET","preset<1>,tel_prior<1>");
    DoReact("MONITOR","1","EXPORT_FRAME","cam<1>,file<d:\"+name1);
    //Camera 2 PTZ device 1.2
    name="Camera2"+name;
    DoReact("TELEMETRY","1.2","GO_PRESET","preset<1>,tel_prior<1>");
    DoReact("MONITOR","1","EXPORT_FRAME","cam<2>,file<d:\"+name);
  }

  if(strequal(M,"30"))
  {
    name=H+"_"+M+"_"+S+".jpg";
    //Camera 1 PTZ device 1.1
    name1="Camera1"+name;
    DoReact("TELEMETRY","1.1","GO_PRESET","preset<1>,tel_prior<1>");

```

```

DoReact("MONITOR","1","EXPORT_FRAME","cam<1>,file<d:\"+name1);
//Camera 2 PTZ device 1.2
name="Camera2"+name;
DoReact("TELEMETRY","1.2","GO_PRESET","preset<1>,tel_prior<1>");
DoReact("MONITOR","1","EXPORT_FRAME","cam<2>,file<d:\"+name);

}

if(strequal(M,"45"))

{
name=H+"_"+M+"_"+S+".jpg";
//Camera 1 PTZ device 1.1
name1="Camera1"+name;
DoReact("TELEMETRY","1.1","GO_PRESET","preset<1>,tel_prior<1>");
DoReact("MONITOR","1","EXPORT_FRAME","cam<1>,file<d:\"+name1);
//Camera 2 PTZ device 1.2
name="Camera2"+name;
DoReact("TELEMETRY","1.2","GO_PRESET","preset<1>,tel_prior<1>");
DoReact("MONITOR","1","EXPORT_FRAME","cam<2>,file<d:\"+name);

}

}

```

### 9.6.8 Example 8.

Audio from microphone (OLXA\_LINE) is not recorded simultaneously with a camera. By default the microphone is not armed. Audio is to be recorded when being activated by sound and being detected by the camera.

**Note.**

RECORD\_START and RECORD\_STOP commands are added to the microphone in version 4.7.0 and later.

Audio recording is initiated by acoustic start (ACCU\_START) and motion detection (MD\_START) and variable flag is increased by 1. When acoustic start and motion detection end, then variable flag is decreased by 1 and audio recording is stopped only if it is 0, i.e. there is no acoustic start or motion.

**Implementation:**

```

OnInit()
{
flag=0;
}

OnEvent("CAM","3","MD_START")
{
flag=str(flag+1);
DoReact("OLXA_LINE","1","RECORD_START");
}

```

```

OnEvent("OLXA_LINE", "1", "ACCU_START")
{
    flag=str(flag+1);
    DoReact("OLXA_LINE", "1", "RECORD_START");
}

OnEvent("OLXA_LINE", "1", "ACCU_STOP")
{
    flag=str(flag-1);
    if (!(flag))
    {
        DoReact("OLXA_LINE", "1", "RECORD_STOP");
    }
}

OnEvent("CAM", "3", "MD_STOP")
{
    flag=str(flag-1);
    if (!(flag))
    {
        DoReact("OLXA_LINE", "1", "RECORD_STOP");
    }
}

```

### 9.6.9 Example 9.

There are some cameras (num). Operation of motion detection on all cameras is to be checked (can also be used to check security sensors).

To solve this issue emulation of linear array of symbols (string) is in use, i.e. array of symbols is filled in ("N" here). When the motion detection is triggered on the camera, the corresponding element of the array (camera ID) changes (to "Y"). Thus, as a result we have array of "N" symbols (was not triggered) and of "Y" (was triggered).

The number of triggerings is counted and the message about total number of cameras and number of cameras on which the detection tool was triggered. The check is initiated by Macro1 and stopped by Macro2.

#### Implementation:

```

OnInit()
{
    run=0;
}

OnEvent("MACRO", "1", "RUN")
{
    run=1; flag=""; num=8;
    for(i=1; i<str(num+1); i=str(i+1))
    {
        DoReact("CAM", i, "DISARM");
        DoReact("CAM", i, "REC_STOP");
        DoReact("CAM", i, "ARM");
        flag=flag+"N";
    }
}

```

```

    if(i<num)
    {
        flag=flag+"|";
    }
}

OnEvent("CAM",N,"MD_START")
{
    if(run)
    {
        nn=str((N*2)-1);
        flag=strleft(flag,str(nn-1)+"Y"+strright(flag,str(((num*2)-1)-nn));
    }
}

OnEvent("MACRO","2","RUN")
{
    run=0; fin=0;
    for(i=1;i<str(num+1);i=str(i+1))
    {
        tmp=extract_substr(flag,"|",str(i-1));
        if(strequal(tmp,"Y"))
        {
            fin=str(fin+1);
        }
        DoReact("CAM",i,"DISARM");
    }

    tmp="Total:"+str(num)+"Triggered:"+str(fin);
    rez=MessageBox("",tmp,0);
}

```

### 9.6.10 Example 10.

Patrol several zones using PTZ device presets; motion detection is to be enabled in some area of these zones.

Camera1. 5 detection zones and 5 presets. These parameters are set with *n* variable. Macro1 initiates algorithm execution. Macro2 ends algorithm execution. Flag - internal variable.

When the algorithm is started, the camera goes to preset1 and arms the 1<sup>st</sup> detection zone. The delay between these commands is 200 milliseconds (for the camera to go to preset). 5 seconds later the 1<sup>st</sup> zone is disarmed and the loop starts again but with the 2<sup>nd</sup> zone and preset2. And so on. Then it starts from the very beginning. The algorithm stops if variable flag resets to zero (using Macro2).

#### Implementation:

```

OnEvent("MACRO","1","RUN")
{
    flag=1;
    n=5;

```

```

[
  for(i=1;flag;i=str(i+1))
  {
    DoReact("TELEMETRY","1.1","GO_PRESET","preset<"+i+">,tel_prior<3>");
    Sleep(200);
    DoReact("CAM_ZONE","1"+i,"ARM");
    Wait(5);
    DoReact("CAM_ZONE","1"+i,"DISARM");
    if(strequal(i,n) {i=0;}
  }
]

OnEvent("MACRO","2","RUN")
{
  flag=0;
}

```

### 9.6.11 Example 11.

There are 2 displays – the first displays a virtual monitor with cameras, the second displays the **Map** object with *Bolid* sensors. When alarm is triggered by the camera – Display 1 is shown, when alarm is triggered by the sensor – Display 2 is shown, but on the CLIENT only.

#### Implementation:

```

OnEvent("CAM",N,"MD_START")
{
  DoReact("DISPLAY","2","DEACTIVATE","macro_SLAVE_id<CLIENT>");
  DoReact("DISPLAY","1","ACTIVATE","macro_SLAVE_id<CLIENT >");
}

OnEvent("BOLID_ZONE",M,"ALARM")
{
  DoReact("DISPLAY","1","DEACTIVATE","macro_SLAVE_id<CLIENT >");
  DoReact("DISPLAY","2","ACTIVATE","macro_SLAVE_id<CLIENT >");
}

```

### 9.6.12 Example 12.

When an alarm event appears on camera 1, add subtitles to video from this camera. When the alarm event ends, add subtitles about the alarm end.

#### Implementation:

```

OnEvent("CAM","1","MD_START")
{
  DoReact("CAM","1","CLEAR_SUBTITLES","title_id<1>"); //clear all subtitles from the
  video
}

```

```

DoReact("CAM","1","ADD_SUBTITLES","command<Camera 1 Alarm " + time +
"\r>,page<BEGIN>,title_id<1>"); //time parameter adds the time of event registering
to subtitles
}
OnEvent("CAM","1","MD_STOP")
{
DoReact("CAM","1","ADD_SUBTITLES","command<Camera 1 Alarm end " + time +
"\r>,page<END>,title_id<1>");
}

```

**Note.**

When page<BEGIN> and page<END> parameters are in use, the corresponding fields of the subtitles database are filled in – this enables data search using the **Search by titles** interface object.

## 9.7 Description of system object reactions

All reactions for main objects of system are specified in this section.

**Note**

It is possible to view events for system objects by one of the following ways:

1. Viewing the Axxon PSIM.ddi file using the ddi.exe utility (see [Getting the list of object names, reactions and events in Axxon PSIM](#)).
2. Viewing events for the selected object of system using the control panel of the **Macro** system object (see [Creating and configuring Macro events](#)).

### 9.7.1 GRABBER

The **Grabber** object corresponds to the **Video Capture Device** system object.

The **Grabber** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the video capture device:

```
OnEvent("GRABBER","_id_", "_event_")
```

Description of events of the **Grabber** object.

Event	Description
"+12V"	Voltage error +12V
"+3.3V"	Voltage error +3.3V
"+5V"	Voltage error +5V

<b>Event</b>	<b>Description</b>
"-12V"	Voltage error -12V
"-5V"	Voltage error -5V
"CPU_FAN"	Number of ventilator rotations
"CPU_TEMP"	Temperature of processor
"SYS_TEMP"	Temperature of MB chipset
"UPS_COMMLOST"	Connection lost
"UPS_FATAL_ERROR"	Error of connection
"UPS_LOWBATT"	Battery low
"UPS_ONBATT"	Switch to battery supply
"UPS_ONLINE"	Restoring the main supply
"UPS_REPLACEBATT"	Battery changing is required
"UPS_SHUTTING"	Shutdown
"VCORE"	Voltage of processor core
"AUDIO_SIG_LOST"	Sound lost
"CONNECT_FAIL"	Connection error
"CONNECT_OK"	Connected
"NETWORK_FAILURE"	Connection lost
"STATE_CONNECTED"	Connection restored

Operator format to describe actions with the video capture device is:

```
DoReact("GRABBER", "_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **Grabber** object is presented in the following table:

<b>Command – command description</b>	<b>Parameters</b>	<b>Description of parameters</b>
"SETUP" – sets parameters of video capture device	chan<>	Number of PCI slot (0,1,2,...,32)
	mode<>	Speed of grabber/digitising (0 – maximal, 1 – average, 2 – minimal)
	resolution<>	Resolution (0– standard, frame quarter (384x288); 1 – high, half-frame (768x288); 2 – maximal frame (768x576))
	format<>	Format of video signal (PAL, NTSC)
	drives<>	Disks for video archive record (DRIVE1:\, DRIVE2:\ ... DRIVEN:\)
	cams<>	Number of connected video cameras
	auth<>	
	ip<>	IP-address of video input network card
	name<>	Name of object
	flags<>	Flags
	ip_port<>	IP-port
	password<>	Password
	type<>	Type of digitising
username<>	Login	

Command – command description	Parameters	Description of parameters
	watchdog<>	WatchDog shutdown (0 – disabled, 1 – enabled)
"SET_DRIVES" – sets disks for video archive record	drives<>	Disks for video archive record
"MUX1_OFF" – disables video output through the analog output 1	-	-
"MUX2_OFF" – disables video output through the analog output 2	-	-
"MUX3_OFF" – disables video output through the analog output 3	-	-
<p>"SET_IPINT_PARAM" – Sets (change) parameters of IP-device. Reaction allows changing of IP-device settings not entering its web-interface.</p> <p><i>Note. For reaction operation it is required to enable the mode of multi-flow video signal - see. <a href="#">Administrator's Guide</a>, section <a href="#">Configuration of multistream video</a>, and <a href="#">Appendix 2. Defining param_id and param_value values for SET_IPINT_PARAM reaction</a></i></p>	param_id<>	Name of parameter. Set of parameters for each camera is individual - see <a href="#">Appendix 2. Defining param_id and param_value values for SET_IPINT_PARAM reaction</a>
	param_value<>	Value of parameter. Set of parameters for each camera is individual - see <a href="#">Appendix 2. Defining param_id and param_value values for SET_IPINT_PARAM reaction</a>
	cam_id<>	Camera ID in the <i>Axxon PSIM</i> software package
	vstream_id<>	Number of video-flow (optional parameter). Is given by "Number of camera". "Number of flow", for example 1.1, 1.2
"START" – start playing video file in a <a href="#">virtual video capture device</a>	-	-
"STOP" – stop playing video file in a <a href="#">virtual video capture device</a>	-	-

Command – command description	Parameters	Description of parameters
"ENABLE" – enable object (uncheck the <b>Disable</b> box in the object settings panel)	recursive<>	Possible parameter values: 0 – enable only <b>Video capture device</b> 1 – enable the <b>Video capture device</b> and all <b>Camera</b> objects created under it
"DISABLE" – disable object (check the <b>Disable</b> box in the object settings panel)	recursive<>	Possible parameter values: 0 – disable only <b>Video capture device</b> 1 – disable the <b>Video capture device</b> and all <b>Camera</b> objects created under it

Properties of the **GRABBER** object are shown in the table.

Properties of the GRABBER object	Description of properties
ID<>	Object ID
PARENT_ID<>	Number of video capture device

Examples of using events and reactions of the **Video capture Device** object:

1. It is required to set the first channel for the first video capture device, maximal speed of digitizing, resolution is half-frame and PAL format while starting the first macro.

```
OnEvent("MACRO","1","RUN") // start macro 1
{
  DoReact("GRABBER","1", "SETUP", "chan<1>,mode<0>,resolution<1>,format<PAL>");
  //set channel 1 for the first video capture device, speed of digitizing is
  maximal, resolution is half-frame, format is PAL
}
```

**Note.**

Description of the MACRO object is follows (see the MACRO section).

2. Set disks D:\ and F:\ for video archive record while starting the third macro.

```
OnEvent("MACRO","3","RUN") //start macro 3
{
  DoReact("GRABBER","1","SET_DRIVES","drives<D:\,F:\>"); //record the video
  archive on disks D:\ and F:\
```

```
}

```

- It is required to display the first video camera on the first analog output and disable first analog outputs of the first and second cards while error of connection to the second video capture device.

```
OnEvent("GRABBER","2"," UPS_FATAL_ERROR") //error of connection to the video
capture device 2
{
  DoReact("CAM","1","MUX1"); //display video camera 1 on the 1-st analog output
of card
  Wait(5);
  DoReact("GRABBER","1","MUX1_OFF"); //disable 1-st analog output of the first
card
  DoReact("GRABBER","2","MUX1_OFF"); //disable 1-st analog output of the second
card
}
```

**Note.**

If analog outputs of two or more cards are connected in parallel and video camera 1 belongs to the first grabber and video camera2 belongs to the second grabber than while triggering the «DoReact("CAM","1","MUX1");» command it is required to trigger the «DoReact("GRABBER","2","MUX1\_OFF");» command at first, and correspondingly while triggering the «DoReact("CAM","2","MUX1");» command it is required to trigger the «DoReact("GRABBER","1","MUX1\_OFF");» command at first. Otherwise signal overlaying will happened.

**Note.**

Description of the **CAM** object is follows (see the [CAM](#) section).

- It is required to disable the second analog output of the video capture device while restoring the main supply.

```
OnEvent("GRABBER","1","UPS_ONLINE") //restoring the main supply
{
  DoReact("GRABBER","1","MUX2_OFF"); //disable analog output 2
}
```

## 9.7.2 CAM

The **CAM** object corresponds to the **Camera** system object.

The **CAM** object sends the events given in the table. The procedure is started when the corresponding event occurs.

Format of the event procedure for the **Camera** object:

```
OnEvent("CAM","_id_", "_event_")
```

Description of the events from the **CAM** object.

Events	Description	Comment
ARM	Camera is armed	If arming was performed by the Operator from the <b>Map</b> or <b>Video surveillance monitor</b> , the user_id<> parameter contains the identifier of the user who performed this action
ATTACH	Connecting	
BLINDING	Camera is sealed	
DETACH	Break	Event is generated when the input signal from the camera on the video capture device is lost
DISARM	Camera is disarmed	If disarming was performed by the Operator from the <b>Map</b> or <b>Video surveillance monitor</b> , the user_id<> parameter contains the identifier of the user who performed this action
FILE_REC_ERROR	Error of recording on disk	Event is generated when an error occurs when writing the video archive to disk
MD_START	Alarm	
MD_STOP	End of alarm	
PRINT	Print frame	
REC	Recording on disk	If recording was initiated by the Operator from the <b>Map</b> or <b>Video surveillance monitor</b> , the user_id<> parameter contains the identifier of the user who performed this action
REC_STOP	Stop recording on disk	If recording was stopped by the Operator from the <b>Map</b> or <b>Video surveillance monitor</b> , the user_id<> parameter contains the identifier of the user who performed this action
UNBLINDING	Camera is opened	
RECORDER_ON	Record is enabled	
RECORDER_OFF	Record is disabled	

Events	Description	Comment
DISC_MOUNT	Disk is mounted	
DISC_UNMOUNT	Disk is unmounted	
FINISHED_AVI_EXPORT	Video export is completed	If the video export fails, the event has the non-null error_result parameter. In the param<0> parameter there is additional information displayed in the corresponding column of the <b>Event Viewer</b> , in the following format: "ComputerName;ExportPeriod;UserName;UserID", for example, param0<LOCALHOST;04-06-18 16:50:55_04-06-18 16:55:55;Smith;1>
MD_LIMIT	Object count in a frame exceeded	The event is generated when the number of objects detected by the tracker in the frame is exceeded (see <a href="#">Creating and configuring the Tracker object</a> section of the <a href="#">Administrator's Guide</a> for details on how to set this parameter). An event is generated whenever the number of objects is changed (up or down), until it is less than the threshold.  The object_count<> parameter is the number of objects in the frame that the tracker detected, exceeds the specified limit, and differs from the previous value.  See also the description of the NEW_OBJECT event below
NEW_OBJECT	New object on a frame detected by tracker	Among others, it contains the following parameters: <ul style="list-style-type: none"> <li>total&lt;&gt; is the total number of objects in the frame at the time the event occurred</li> <li>new_id&lt;&gt; is the identifier of the detected object</li> </ul>
ARCH_DELETE	Record deletion	Deletion of the record from the camera archive from the <b>Video surveillance monitor</b>
OPEN_FILE	File opening	Opening a file for playback by a <a href="#">virtual video capture device</a> . Indicates that playback of the next file from the selected folder starts.  Among others, the event contains the following parameters: <ul style="list-style-type: none"> <li>name&lt;&gt; is the name of the file being played back</li> <li>tss&lt;&gt; is the time in UTC format in milliseconds from 1/1/1970</li> </ul>
CLOSE_FILE	File closing	Finishing a file playback in a <a href="#">virtual video capture device</a> . Indicates that playback of a file is ended.  Among others, the event contains the following parameters: <ul style="list-style-type: none"> <li>name&lt;&gt; is the name of the file that finished being played back</li> <li>tss&lt;&gt; is the time in UTC format in milliseconds from 1/1/1970</li> </ul>

Events	Description	Comment
ARCH_PROTECTED	File protected from rewriting	<p>The event is displayed when a user protects the file from being overwritten.</p> <p>The param&lt;0&gt; parameter contains additional information about the computer name, fragment, user name and user id, which is displayed in the <b>Add. Info</b> column in the <b>Event Viewer</b> in the following format:</p> <p>"ComputerName;ProtectionPeriod;UserName;UserID", for example, param0&lt;LOCALHOST;04-06-18 16:50:55.612_04-06-18 16:55:55.612;Smith;1&gt;</p>
ARCH_UNPROTECTED	Rewrite protection removed from file	<p>The event is displayed when a user removes protection of the file from being overwritten.</p> <p>The param&lt;0&gt; parameter contains additional information about the computer name, fragment, user name and user id, which is displayed in the <b>Add. Info</b> column in the <b>Event Viewer</b> in the following format:</p> <p>"ComputerName;ProtectionPeriod;UserName;UserID", for example, param0&lt;LOCALHOST;04-06-18 16:50:55.612_04-06-18 16:55:55.612;Smith;1&gt;</p>
FRAME_SKIPPED	Frame skipped	<p>The event occurs in <i>Axxon PSIM</i> if there is a problem with frame skipping. A separate event for each skipped frame.</p> <p>This event can be disabled using the <code>FileSystem.NotifyCoreFrameSkipped</code> registry key (see <a href="#">Registry keys reference guide</a>)</p>
ARCH_BOOKMARKED	Bookmark created	<p>The event is displayed when a user adds a bookmark.</p> <p>The param&lt;0&gt; (i.e. the <b>Add. Info</b> column in the <b>Event Viewer</b>) parameter contains the comment to the bookmark</p>
ARCH_UNBOOKMARKED	Bookmark deleted	<p>The event is displayed when a user deletes a bookmark</p>
TEMPERATURE_ALARM	Temperature threshold	<p>The param&lt;0&gt; parameter contains the temperature value received from the thermal camera</p>
IGNORE_KEEP_NO_LESS	Ignoring "Keep no less than"	<p>The event is generated when a video fragment is deleted from the archive before expiration of the time period set by the <b>Keep no less than</b> parameter. See also <a href="#">Configuring video camera archive depth</a></p>

Events	Description	Comment
AVAILABILITY	Availability of the key position in the license file and the number of objects	<p>The event occurs in response to the GET_AVAILABILITY command and contains information about the number of objects added to the license key for the given position. Parameters:</p> <ul style="list-style-type: none"> <li>• qty_localpriority&lt;&gt; is the number of allowed objects of the specified type on this computer (local key)</li> <li>• qty&lt;&gt; is the total number of allowed objects of the specified type in the license (generic key)</li> <li>• pos&lt;&gt; is the position number in the license key</li> </ul> <p>If there is no position in the key, the event will have a zero value</p>
WRITING_FAILED	Writing error	
FILESYSTEM_FAILED	File system error	<p>Contains mandatory parameter error_msg&lt;&gt;—error text; can also contain parameters cam&lt;&gt;—camera ID and error_code&lt;&gt;—error code. Example:</p> <p>CAM -1 FILESYSTEM_FAILED error_msg&lt;Failed to delete index file: D:\VIDEO\INDEX\14061608.idx, error code: 5.&gt;,error_code&lt;5&gt;</p>

Operator format to describe actions with the camera is:

```
DoReact("CAM","_id","_command" [,"_parameters"]);
```

The list of commands and parameters for the **CAM** object is given in the following table:

Command—command description	Parameters	Description of parameters
SETUP—sets (changes) the parameters of a camera	rec_priority<>	Record priority (from 0 to 3, 0—standard, 3—all resources)
	compression<>	Compression ration (0—no compression, 1—maximum quality, ..., 5—minimum quality)
	sat_u<>	Value of color (0—min, 10—max)
	proc_time<>	Append period (0–30 sec)
	manual<>	Control brightness and contrast settings (0—manual; 1—auto; 2—auto, but close to values specified manually)
	contrast<>	Contrast (0—min, 10—max)

<b>Command—command description</b>	<b>Parameters</b>	<b>Description of parameters</b>
	md_size<>	Size of motion detection objects (1–16)
	md_mode<>	Mode of pause record (1—enabled, 0—disabled)
	audio_type<>	Type of sound accompaniment
	pre_rec_time<>	Time of pre-record (0–20 sec)
	bright<>	Brightness (0—min, 10—max)
	audio_id<>	Number of a microphone (empty parameter if there is no microphone)
	rec_time<>	Record speed (1–30 FPS, 0—not used)
	alarm_rec<>	Record of alarms (1—enabled, 0—disabled)
	hot_rec_time<>	Time of hot record (0–30 sec)
	hot_rec_period<>	Period of hot record (0–20 sec)
	mux<>	Number of channel (0 – 1 channel, 15 – 16 channel)
	color<>	Color (0—black and white, 1—multicolor)
	activity<>	-
	arch_days<>	Number of archive days
	blinding<>	Camera is sealed
	config_id<>	-
	decoder<>	-
	flags<>	Flags

<b>Command—command description</b>	<b>Parameters</b>	<b>Description of parameters</b>
	fps<>	Speed of record (0—not used, 1–30 FPS)
	ifreq<>	Frequency of key frames in sequence (1—each frame is key, 2—100th frame)
	mask 0, mask1, mask2, mask3, mask4	Detection tool mask
	md_contrast<>	Sensitivity of motion detection tool (0–15)
	motion<>	Estimation of compressor motion (5–255)
	name<>	Object name
	password_crc<>	Video archive password
	priority<>	Priority of record resource (0—auto, 1—manual)
	resolution<>	Resolution (0—standard CIF, 1—high 2CIF, 2—maximum 4CIF)
	type<>	Type of object
	yuv<>	Color schema of video signal coding (0—YUV4:2:0, 1—YUV4:2:2)
DELETE—disables camera	-	-
START_VIDEO—enables video stream for the current camera	slave_id<>	Name of the computer to which the camera is connected
	comress<>	Level of compression
	register_only<>	-
STOP_VIDEO—disables video stream for the current camera	slave_id<>	Name of computer to which camera is connected

Command—command description	Parameters	Description of parameters
REQUEST_MASK	mask<>	Mask
MUX1, MUX2, MUX3—display the image of a camera on 1, 2, 3 analog outputs	-	-
ACTIVATE—display camera on monitor	monitor<>	Number of a monitor
ARM—arm camera	-	-
DISARM—disarm camera	-	-
REC—start recording from a camera	time<>	Time of record in seconds, if null than only one frame is recorded
	rollback<>	If 1, the record is performed with a rollback
	priority<>	Sets priority of command to start recording. See <a href="#">Appendix 1. Priorities of start and stop recording commands</a>
	stream_id<>	Sets an identification number of a stream for recording. The stream ID is set as "n.m" where n is the camera ID, m is the number of the stream.  <i>Note. If the specified stream isn't used for any purpose other than record by command (and custom on clients), make sure that the <b>Lock disabling streams not in use</b> checkbox is set for it—see <a href="#">The Settings panel of the Camera object</a></i>
REC_STOP—stop recording from a camera	priority<>	Sets priority of a command to stop recording. See <a href="#">Appendix 1. Priorities of start and stop recording commands</a>
	user_id<>	If recording was stopped by a user from the Video surveillance monitor, the parameter contains the user ID. Otherwise the parameter is absent
	from_macro<>	If recording was stopped by a macro, the parameter contains the macro ID. Otherwise the parameter is absent

Command—command description	Parameters	Description of parameters
SET_MASK—set mask	mask<>	Mask
ADD_SUBTITLES—add titles	command<>	Test of imposed titles
	title_id<>	The ID of the <b>Captioner</b> object which is used to impose
	page<>	Required parameter to allow recording titles to the titles database to provide search by titles. Available values: BEGIN (start of recording in the database), END (end of recording in the database)
SIP_CONNECT—Sip connected	-	-
SIP_DISCONNECT—Sip disconnected	-	-
SET_IPINT_PARAM—set (change) the parameters of an IP device. Reaction allows changing the IP device settings without going into its web-interface.  <i>Note. For reaction operation it is required to enable the mode of multi-flow video signal—see Configuration of multistream video and Appendix 2. Defining param_id and param_value values for SET_IPINT_PARAM reaction</i>	param_id<>	Name of a parameter. Set of parameters for each camera is individual—see <a href="#">Appendix 2. Defining param_id and param_value values for SET_IPINT_PARAM reaction</a>
	param_value<>	Value of a parameter. Set of parameters for each camera is individual—see <a href="#">Appendix 2. Defining param_id and param_value values for SET_IPINT_PARAM reaction</a>
	vstream_id<>	Number of a video stream (optional parameter). It is given by “Number of camera”. “Number of a stream”, for example 1.1, 1.2
GET_FRAME—get frame from a camera even if it is not displayed in the Video surveillance monitor	path<>	Path to save a frame. If there is no parameter, the FRAME_SENT event with the data parameter will be formed in the system. Processing of this event is described in <a href="#">The SaveToFile method of the Programming Guide (JScript)</a>

Command—command description	Parameters	Description of parameters
	stream<>	<p>Optional parameter. Sets <i>Axxon PSIM</i> stream to get a frame from. The stream can be specified by a number or purpose. Possible purposes:</p> <ul style="list-style-type: none"> <li>• stream_archive—stream for archive recording</li> <li>• stream_alarm—stream for archive recording by alarms</li> <li>• stream_client—stream for displaying</li> <li>• stream_analytic—stream for video analytics</li> </ul> <p>Stream number consists of a camera ID and a stream ID divided by dot, for example, 4.3 is for stream 3 from camera 4</p>
	time<>	<p>Optional parameter. It is set to request video frame from the archive. Format: DD-MM-YYYY hh:mm:ss. Example: time&lt;19-09-2017 11:35:34&gt;</p>
	gate<>	<p>Optional parameter. Specifies the network name of the <b>Videogate</b> from the archive of which to get the frame</p>
	arch<>	<p>Optional parameter. Specifies the network name of the <b>Backup archive</b> to get the frame from</p>
	slave_id<>	<p>Optional parameter. Specifies the network name of the Server to get the frame from</p>
	password_crc<>	<p>Optional parameter. Specifies the CRC sequence to be recorded to the file together with the frame</p>
ARCH_DEL_RECORD—delete archive recordings over the specified period.	fromTime<>	<p>Mandatory parameter. Time in the YYYY-MM-DDTHH:MM:SS.NNN format, where NNN—milliseconds. The recordings will be deleted (starting with the first one containing the specified time and ending with the last one containing the toTime time). If no time is specified in the toTime parameter, then only one recording will be deleted</p>
	toTime<>	<p>Optional parameter. Time in the YYYY-MM-DDTHH:MM:SS.NNN format, where NNN—milliseconds. See description above</p>

Command—command description	Parameters	Description of parameters
REC_RESTART—restart recording	-	-
ARCH_BOOKMARK_RECORD—create a bookmark	time1<>	The date of the archive period beginning included in the bookmark in the DD-MM-YY HH: MM: SS.NNN format, where NNN - milliseconds
	time2<>	The date of the archive period ending included in the bookmark in the DD-MM-YY HH: MM: SS.NNN format, where NNN—milliseconds
	comment<>	Comment to a bookmark
	slave_id<>	Computer and <b>Video surveillance monitor</b> IDs using which the bookmark will be created. Parameter format: <computer id>.<monitor id>.  For example, slave_id<WS2.1>—WS2 is a computer ID and 1 is Video surveillance monitor ID
CRUISE_START—auto cruise	cruise_id<>	Route name on a camera
	action<>	Executed action: <ul style="list-style-type: none"> <li>• CRUISE_START—start cruising along the specified route</li> <li>• PATROL_PLAY—start patrolling along the specified route</li> </ul>
	cam_id<>	Camera ID
GET_DEPTH—get the archive depth. The ARCHIVE_DEPTH event from the SLAVE object (see <a href="#">SLAVE</a> ) is created in the system as the response to this reaction. If one or both parameters are absent it means that there is the archive depth request for all possible parameters	drive<>	Disk or network path to request the archive depth.  The disk name is set in the "<disk letter>:\\" format, for example drive<D:\>  <i>Note. The "\" character is an escape character.</i>  The network path is set in the UNC format

Command—command description	Parameters	Description of parameters
	arch	Get the backup archive depth. Example. DoReactStr("CAM","2","GET_DEPTH","drive<D:\\>,cam<2>,arch");
	gate	Get the videogate archive depth. Example. DoReactStr("CAM","1","GET_DEPTH","drive<V:\\>,gate");
CLEAR_SUBTITLES—remove all titles from the video image	title_id<>	The ID of the <b>Captioner</b> object
GET_AVAILABILITY—check the availability of the key position	pos<>	The position number in the license key

Properties of the **CAM** object are shown in the table.

Properties of the CAM object	Description of the object properties
ID<>	Object ID
PARENT_ID<>	Parent object ID
TELEMETRY_ID<>	Telemetry module ID (PTZ ID)
REGION_ID<>	Region ID

Examples of using events and reactions of the **Camera** object:

1. Switch camera to the colored mode and start recording from it when arming the first camera.

```
OnEvent("CAM","1","ARM") //first video camera is armed
{
  DoReact("CAM","1","SETUP","color<1>"); // set colored mode of video camera
  DoReact("CAM","1","REC"); //record from the first camera
}
```

2. Arm the first video camera when disabling the fifth video camera.

```
OnEvent("CAM","5","DETACH") // fifth video camera is disabled
{
```

```
DoReact("CAM","1","ARM"); //first video camera is armed
}
```

- Use half of resources when recording from the first camera (i.e. if 4 video cameras are connected through the first video capture device than the first camera will record with speed 6 FPS, and other three cameras—with speed 2-2,5 FPS) if it is in alarm state.

```
OnEvent("CAM","1","MD_START") //first video camera is in alarm state
{
  DoReact("CAM","1","SETUP","rec_priority<2>"); // use half of resources while
  recording
}
```

- Set maximal compression synchronously with the fourth microphone of audio card on the first video camera when recording from the first video camera on disk.

```
OnEvent("CAM","1","REC") //first video camera recording on disk
{
  DoReact("CAM","1", "SETUP", "compression<5>, audio_type<OLXA_LINE>,
  audio_id<4>"); //first video camera, maximal compression, synchronously with
  forth microphone of audio card.
}
```

- Start recording from the first camera with minimum quality in black and white mode when it stopped to be in alarm.

```
OnEvent("CAM","1","MD_STOP") // first camera stopped to be in alarm state
{
  value = 5;
  DoReact("CAM", "1", "SETUP", "compression<" + value + ">,color<0>");
  //start record from the first video camera with minimal quality in black and
  white mode.
}
```

- Start recording from the first camera in the “rollback” mode when it is disarmed.

```
OnEvent("CAM","1","DISARM") //first video camera is disarmed
{
  DoReact("CAM","1","REC","rollback<1>"); // Start record from the first video
  camera in the "rollback" mode
}
```

- Set new parameters of video signal when connecting the first video camera.

```
OnEvent("CAM","1","ATTACH") //first video camera is connected
{
  VIDEO_CANAL_ID = GETOBJECTPARAM("CAM","1","PARENT_ID"); // define ID of video
  channel to which the first camera belongs
  DoReact("GRABBER",VIDEO_CANAL_ID,"SETUP","chan<0>,mode<0>,resolution<1>,format
  <pal>"); //set new parameters of video channel.
```

```
}

```

8. Start auto cruising on Camera 1 when Macro 2 is run.

```
OnEvent ("MACRO","2","RUN")
{
  DoReact("CAM","1","CRUISE_START","cruise_id<1>,action<CRUISE_START>,cam_id<1>")
;
}
```

Check function of the **CAM** object state:

```
CheckState("CAM","number","state")
```

The **CAM** object can be in the following states.

State of CAM object	Description
ALARMED	Camera is in alarm mode.
DISARM_DETACHED	No signal from camera
DETACHED	No signal from camera
ARMED	Camera is armed
DISARMED	Camera is disarmed

### 9.7.3 MONITOR

The **MONITOR** object corresponds to the **Monitor** system object.

The **MONITOR** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of event procedure for the **Monitor** object:

```
OnEvent("MONITOR","_id_", "_event_")
```

List of commands and parameters for the **MONITOR** object is presented in the following table:

Event	Description	Comment
-------	-------------	---------

STARTED_AVI_EXPORT	Video export started	<p>Among others, the event has the following parameters:</p> <p>slave_id&lt;&gt; – operator who started the export</p> <p>param1&lt;&gt; – number of camera on which the export is performed, date and time of export period beginning. The parameter value is like "&lt;RecNo.&gt; Camera &lt;id&gt; (dd-mm-yy hh:mm:ss)", for example param1&lt;01 Camera 1 (05-10-17 10:23:21)&gt;</p> <p>time&lt;&gt; – time when export started</p>
FINISHED_AVI_EXPORT	Video export finished	<p>Among others, the event has the following parameters:</p> <p>slave_id&lt;&gt; – operator who started the export</p> <p>param1&lt;&gt; – number of camera on which the export is performed, date and time of export period ending. The parameter value is like "&lt;RecNo.&gt; Camera &lt;id&gt; (dd-mm-yy hh:mm:ss)", for example param1&lt;01 Camera 1 (05-10-17 10:23:21)&gt;</p> <p>time&lt;&gt; – time when export ended</p> <p>param&lt;0&gt; – additional information displayed in the corresponding column of the Event Viewer, in the following format: "ComputerName;ExportPeriod;UserName;UserID", for example, param0&lt;LOCALHOST;04-06-18 16:50:55_04-06-18 16:55:55;Smith;1&gt;</p>
AVI_EXPORT_RESULT	Video export result	<p>The event has the same parameters as START_AVI_EXPORT with additional error_result&lt;&gt; having one of the following values:</p> <p>0 - export successful</p> <p>1 - unknown</p> <p>2 - busy</p> <p>3 - not ready</p> <p>4 - invalid interval</p> <p>5 - file error</p>
PLAY_START	-	Start the archive fragment playback
PLAY_STOP	-	Stop the archive fragment playback
INTERFACE_MANIPULATION	Visualization change	param<0> – additional information displayed in the corresponding column of the Event Viewer, contains the identifier of the camera that was moved around the layout
LAYOUT_DEL	Deleting layout	param<0> – additional information displayed in the corresponding column of the Event Viewer, contains the name of the deleted layout
LAYOUT_ADD	Adding layout	param<0> – additional information displayed in the corresponding column of the Event Viewer, contains the name of the added layout
LAYOUT_ACTIVATED	Changing active layout	param<0> – additional information displayed in the corresponding column of the Event Viewer, contains the name of the activated layout

REPLACE_CAM	Changing the camera position	param<0> – additional information displayed in the corresponding column of the Event Viewer, in the following format: <Camera 1 name> → <Camera 2 name>
ACTIVATE_CAM	Camera activated	auto_switch<> – indicates whether slide show (auto paging, auto scrolling) was enabled at the time of camera activation. This parameter can be used to turn off slide show when activating a Video surveillance window
CAM_EXPAND	The Video Surveillance Window expanded to the entire Monitor	The event is generated if the following registry keys are set (see <a href="#">Registry keys reference guide</a> ): <ul style="list-style-type: none"> <li>MaximizeCameraOnDbIClk=1</li> <li>MinimizeCameraOnDbIClk=1</li> </ul> Event parameters: param0<> – camera ID user_id<> – the ID of the user who performed the action
CAM_COLLAPSE	The Video Surveillance Window collapsed back	The event is generated if the following registry keys are set (see <a href="#">Registry keys reference guide</a> ): <ul style="list-style-type: none"> <li>MaximizeCameraOnDbIClk=1</li> <li>MinimizeCameraOnDbIClk=1</li> </ul> Event parameters: param0<> – camera ID user_id<> – the ID of the user who performed the action

Operator format to describe actions with the monitor is:

```
DoReact("MONITOR", "_id_", "_command_"[, "_parameters_"]);
```

List of commands and parameters for the **MONITOR** object is presented in the table.

Command – command description	Parameters	Description
"REMOVE" – removes camera from monitor.	cam<>	ID of camera in the settings tree which
	show<>	Optional parameter. Possible values: 0 – do not update the layout in the M 1 – update the layout in the Monitor a
"REMOVE_ALL" – removes all cameras from monitor	-	-
"STOP_VIDEO" – stops video flow of camera	cam<>	ID of camera in the settings tree vide

Command – command description	Parameters	Description
"REPLACE" – removes all cameras from monitor and triggers the specified camera	slave_id<>	Name of computer to which monitor
	cam<>	ID of camera in the settings tree which
	name<>	Name of camera which is to be displa
	audio_type<>	-
	audio_id<>	-
	arch_id<>	-
	control<>	0 only archive viewing, 1 – it is also p
"ADD_SHOW" – adds cameras on the monitor <i>Note. See also PLACE_CAM_IN_LAYOUT_CELL</i>	cam<>	ID of camera in the settings tree which
	name<>	Object name which is to be displayed
	arch_id<>	-
	control<>	0 only archive viewing, 1 – it is also p
	gate_id<>	ID of the video gate to receive video t <a href="#">configuring the cameras for the Video</a>
	slave_id<>	ID of the computer to which the com
"ACTIVATE_CAM" – activates camera	cam<>	ID of camera in the settings tree which
"ARCH_FRAME_TIME" – search of video archive by date and time	cam<>	-
	date<>	-
	time<>	-

Command – command description	Parameters	Description
	mode<>	Can take the following values: 0 – Video Gate, if it is set (if not set, th 1 – Video Server 2 – Backup archive 10 + Object ID External storage in the
"SETUP" – sets parameters of monitor	no_update<>	-
	overlay<>	Disable the mode of speed-up displa
	x<>	Coordinate of top-left corner (0 – 100
	y<>	Coordinate of top-left corner (0 – 100
	w<>	Size in horizontal direction (0 – 100)
	h<>	Size in vertical direction (0 – 100)
	max_cams<>	Maximum allowable number of came
	min_cams<>	Minimum allowable number of came
	compress<>	-
	panel<>	Show control panel (0 – disabled, 1 –
	panel_type<>	-
	s<>	-
	layout<>	-
	gate<>	-
map_id<>	-	
enable<>	-	

Command – command description	Parameters	Description
	topmost<>	1 – show screen always on top
	type<>	Type of <b>Monitor</b> object
	allow_move<>	Allows moving of window
	arch_id<>	Archive ID
	cycle<>	Delay while auto scrolling (1 – 20 sec)
	flags<>	Flags
	name<>	Name of object
	overlay<>	Enable the mode of speed-up display
	tel_prior<>	Telemetry priority
	gststream_version<>	If the value is not set, the function for If the value is <b>minBPS</b> , then the stream is <a href="#">displaying</a>
"ACTIVATE" – activates control panel of monitor	user_id<>	User ID
	panel_active<>	-
"DEACTIVATE" – deactivates control panel of monitor	-	-
"EXPORT_FRAME" – exports frame in JPG-file	cam<>	-
	file	-
"KEY_PRESSED" – controls buttons of video surveillance monitor and video records archive	number<>	-
	cam_id<>	The ID of the camera to the Video surveillance applied to the active Video surveillance

Command – command description	Parameters	Description
	key<>	<p>Possible values:</p> <p>"ARCH_EDIT_DATE" – change date of</p> <p>"ARCH_EDIT_TIME" – change time of</p> <p>"ARCH_EDIT_ENTER" – enter change</p> <p>"ARCH_EDIT_ESCAPE" – cancel editing</p> <p>"ARCH_EDIT_BACK";</p> <p>"ARCH_EDIT_REPLACE";</p> <p>"WINDOW_ZOOM_IN" – expand window</p> <p>"WINDOW_ZOOM_OUT" – hide window</p> <p>"ZOOM_IN" – image incoming;</p> <p>"ZOOM_OUT" – image removal;</p> <p>"CYCLE_REW" – scrolling back of video</p> <p>"CYCLE_FF" – scrolling straight of video</p> <p>"LEFT" – move the frame left in the Z</p> <p>"RIGHT" – move the frame right in th</p> <p>"UP" – move the frame up in the Zoo</p> <p>"DOWN" – move the frame down in th</p> <p>"MODE_VIDEO" – video surveillance m</p> <p>"MODE_ARCH" – mode of archive vid</p> <p>"MODE_ARCH2" - mode of archive vic</p> <p>"MASK_SHOW" – show mask;</p> <p>"MASK_HIDE" – remove mask;</p> <p>"ARM" – arm camera;</p> <p>"DISARM" – disarm camera;</p> <p>"REW" – rewind;</p> <p>"PLAY" – play;</p> <p>"PLAY_NONSTOP" – non-stop playba</p> <p>"PLAY_FAST" – speed up video recor</p> <p>"FF" – forward wind;</p> <p>"RECORD" – record;</p> <p>"RECORD_MIC" – record from microp</p> <p>"STOP" – stop;</p> <p>"REC_STOP" – stop record;</p>

Command – command description	Parameters	Description
		"PAUSE" – pause; "MIC_ON" – microphone On; "MIC_OFF" – microphone Off; "PRINT" – print the frame; "SELECT_LAYOUT" – control layout of "START_CYCLE_FF" – enable function while configuring the Monitor interface "STOP_CYCLE" – stop of slide show control "EXPORT_DO" – open the AviExport dialog "PROTECT_DO" – open the dialog box "PROTECT_VIEW" – show the bookmark
"START_AVI_EXPORT" – starts video export <i>Note. See the example as follows</i>	start<>	Start time
	finish<>	End time
	avi_path<>	Path to created file.
	cam<>	Camera ID.
"STOP_AVI_EXPORT" – stops video export	monitor<>	Number of monitor
"START_AVI_SCHEDULE" – start bookmarks export	-	-
"STOP_AVI_SCHEDULE" – stop bookmarks export	-	-
"CONTROL_TELEMETRY" – Telemetry control. See <a href="#">Mouse PTZ control</a>	cam<>	ID of camera where mouse PTZ control
	on<>	0 – disable mouse PTZ control 1 – enable mouse PTZ control
"SET_REC_RESTART" – set recording restart when entering the archive	-	-
"RESET_REC_RESTART" – reset recording restart when entering the archive	-	-
"SET_ARCH_ENTER_PAUSE" – enable playback pause when entering the archive	-	-

Command – command description	Parameters	Description
"RESET_ARCH_ENTER_PAUSE" – disable playback pause when entering the archive	-	-
"DISABLE_TELEMETRY" – disable telemetry control from Video surveillance monitor	-	-
"ENABLE_TELEMETRY" – enable telemetry control from Video surveillance monitor	-	-
"INCREASE_VIEW" – increase camera window size in the Video surveillance monitor	cam<>	Camera identifier
"DECREASE_VIEW" – decrease camera window size in the Video surveillance monitor	cam<>	Camera identifier
"SHOW_LAYOUT" – show layout with the specified ID	layout_id<>	Layout ID in database
"GO_LIVE" – switch all cameras on the monitor to live video mode	-	-
"GO_ARCH" – switch all cameras on the monitor to archive mode	arch_time<>	Optional parameter. Sets the time per record
"SAVE_AS" – export selected archive fragment	-	-
PLACE_CAM_IN_LAYOUT_CELL – add camera to the specific cell on the specific layout on the Monitor	cam<>	ID of camera in the object tree which corresponding cell will be hidden
	layout_name<>	ID or name of the layout to add camera
	cell<>	The number of the cell on the layout from the top-left corner of the layout. <b>Important!</b> Cells are numbered starting from 1. If some other camera has already been placed in this cell, the command will fail.
SET_TITLES – show captions over a video image in any display mode. Such captions are not archived and are displayed until CLEAR_TITLES command is applied or Monitor is reset	cam<>	The ID of the camera to the Video surveillance monitor
	titles<>	The caption text that should be displayed
	title_id<>	Captioner ID
CLEAR_TITLES – disable the captions created with the help of the SET_TITLES command	cam<>	The ID of the camera to the Video surveillance monitor
	title_id<>	Captioner ID

Properties of the **MONITOR** object are displayed in the table.

Properties of the <b>MONITOR</b> object	Description of properties
ID<>	Object ID
PARENT_ID<>	Parent object ID

Examples of using events and reactions of the **Monitor** object:

1. Play record from video camera 1 on the monitor 4 with specified date and time while the first macro starting.

```
OnEvent("MACRO", "1", "RUN")
{
  DoReact("MONITOR", "4", "ARCH_FRAME_TIME", "cam<1>,date<"+date+">,time<11:00:00>")
;
  DoReact("MONITOR", "4", "KEY_PRESSED", "key<PLAY>");
}
```

2. Switch to the mode of video archive viewing on the first video camera of monitor 4 while printing the frame from the first camera and then go on 10 frames further starting from the specified date and time.

```
OnEvent("CAM", "1", "PRINT")
{
  DoReact("MONITOR", "4", "ARCH_FRAME_TIME", "cam<1>,date<"+date+">,time
<11:00:00>");
  for(i=0;i<10;i=i+1)
  {
    DoReact ("MONITOR", "4", "KEY_PRESSED", "key<FF>");
  }
}
```

3. Zoom in the video image on the monitor screen if video camera is in alarm state and reset it when alarm is finished.

```
OnEvent("CAM", "1", "MD_START")
{
  DoReact("MONITOR", "1", "KEY_PRESSED", "key<ZOOM_IN>");
}

OnEvent("CAM", "1", "MD_STOP");
{
  DoReact("MONITOR", "1", "KEY_PRESSED", "key<ZOOM_OUT>");
}
```

4. Enter the layout number one on the monitor screen while triggering macro.

```
OnEvent("MACRO", "1", "RUN")
{
```

```
DoReact("MONITOR", "1", "KEY_PRESSED", "key<SELECT_LAYOUT>, number<1>");
}
```

5. Command of starting the video export from Camera 1 in the Monitor 1, starting from 24-10-14 17:10:38 and to 24-10-14 17:10:50 to the c:\aaa.avi file.

Examples of export starting in three ways: using the IIDK (port 900 and 1030) and using script:

a. **IIDK (port 900)**

```
MONITOR|1|START_AVI_EXPORT|start<24-10-14 17:10:38>,finish<24-10-14 17:10:50>,avi_path<c:\aaa.avi>,cam<1>
```

b. **IIDK (port 1030)**

```
CORE||DO_REACT|
source_type<MONITOR>,source_id<1>,action<START_AVI_EXPORT>,params<4>,param0_name<avi_path>,param0_val<c:\aaa.avi>,param1_name<cam>,param1_val<1>,param2_name<finish>,param2_val<24-10-14 17:10:50>,param3_name<start>,param3_val<24-10-14 17:10:38>
```

c. **Script (start by Macro 1)**

```
OnEvent("MACRO", "1", "RUN")
{
  DoReact("CORE", "", "DO_REACT", "source_type<MONITOR>,source_id<1>,action<START_AVI_EXPORT>,params<4>,param0_name<avi_path>,param0_val<c:\aaa.avi>,param1_name<cam>,param1_val<1>,param2_name<finish>,param2_val<24-10-14 17:10:50>,param3_name<start>,param3_val<24-10-14 17:10:38>");
}
```

6. When macro 1 is run, enable mouse PTZ control on Camera 4 at Monitor 10. Disable it on Macro 2.

```
OnEvent("MACRO", "1", "RUN")
{
  DoReact("MONITOR", "10", "CONTROL_TELEMETRY", "cam<4>,on<1>");
}

OnEvent("MACRO", "2", "RUN")
{
  DoReact("MONITOR", "10", "CONTROL_TELEMETRY", "cam<4>,on<0>");
}
```

7. When macro 1 is run, display the text

“NNN

Titles”

(with line break) over the video image of camera 1 using the captioner 1. When macro 2 is run, disable this text.

```
if (Event.SourceType == "MACRO" && Event.SourceId == "1" && Event.Action == "RUN")
{
  DoReactStr("MONITOR", "1", "SET_TITLES", "titles<NNN \r Titles>,cam<1>,title_id<1>");
}
```

```

if (Event.SourceType == "MACRO" && Event.SourceId == "2" && Event.Action ==
"RUN")
{
DoReactStr("MONITOR", "1", "CLEAR_TITLES", "cam<1>,title_id<1>");
}

```

## 9.7.4 PLAYER

The **PLAYER** object corresponds to the **Audio Player** system object.

Operator format to describe actions with audio player is following:

```
DoReact("PLAYER", "_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **PLAYER** object is presented in the table.

Command – command description	Parameters	Description
"PLAY_WAV" – plays back the audio file	file<>	Full path to the audio file in the .wav format (with the name of the file being played back. For example: C:\Program Files (x86)\Axxon PSIM\Wav\cam_alarm_1.wav)
	from_macro<ID>	Response flag of the audio file being played back. The response is sent from the macro (specifying the ID of the existing macro, ID > 0).  <i>Note. The parameter isn't mandatory if the voice notification channel is configured in the <b>Audio Player</b> object interface (see <a href="#">Setting up the voice notification using Audio player object</a>)</i>
"SETUP" – sets the audio player parameters	board<>	Sound unit of the archive player
	flags<>	Flags
	h<>	Height of settings dialog (0 – 100)
	name<>	Object name
	voice<>	Sound notification
	voice_board<>	Sound unit of notification

Command – command description	Parameters	Description
	w<>	Width of settings dialog (0 – 100)
	x<>	Left top corner of settings dialog (0 – 100)
	y<>	Left top corner of settings dialog (0 – 100)
"STOP_WAV" – stops audio file playback	-	-

Properties of the **PLAYER** object are given in the following table.

Properties of the <b>PLAYER</b> object	Description of properties
ID<>	Object ID
PARENT_ID<>	Parent object ID

Examples of using the events and reactions of the **Audio Player** object:

1. Playback the audio file when the camera stops recording:

```
OnEvent("CAM",N,"REC_STOP")
{
    DoReact("PLAYER","1","PLAY_WAV","file<C:\Program Files (x86)\Axxon
PSIM\Wav\cam_alarm_"+N+".wav>,from_macro<1>");
}
```

2. Stop playing back the audio file when the camera starts recording:

```
OnEvent("CAM",N,"REC")
{
    DoReact("PLAYER","1","STOP_WAV");
}
```

### 9.7.5 OLXA\_LINE

The **OLXA\_LINE** object corresponds to the **Microphone** system object.

The **OLXA\_LINE** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of event procedure for the microphone:

```
OnEvent("OLXA_LINE ", "_id_", "_event_")
```

Event	Description
"ACCU_START"	Sound activated recording ON
"ACCU_STOP"	Sound activated recording OFF
"ARM"	Record ON
"DISARM"	Record OFF
"INCOMING_NUMBER"	Incoming telephone number
"OUTGOING_NUMBER"	Outgoing telephone number
"REC"	Start of record
"REC_STOP"	End of record
"RESET"	Microphone connecting

Operator format to describe actions with the microphone is:

```
DoReact("OLXA_LINE ", "_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **OLXA\_LINE** object is presented in the following table:

Command – command description	Parameters	Description
"ARM" – turn on the microphone to record	-	-
"DISARM" – turn off the record from microphone	-	-
"SETUP" – setting of microphone parameters	type<>	Type of line
	accu_start <>	Operating threshold of sound detection
	accu_stop<>	Holding time of detection triggering
	amp<>	Gain

Command – command description	Parameters	Description
	aru<>	Automatic gain control
	aru_dyn<>	Level of AGC
	aru_time<>	AGC attack time
	chan<>	Number of microphone sound channel
	compression<>	Type of compression
	flags<>	Flags
	name<>	Object name
	rec<>	Start of record

Properties of the **OLXA\_LINE** object are given in the table.

Properties of the OLXA_LINE object	Description of properties
ID<>	Object ID
PARENT_ID<>	Parent object ID

Check function of the **OLXA\_LINE** object state:

```
CheckState("OLXA_LINE", "number", "state")
```

The **OLXA\_LINE** object can be in the following states:

State of the OLXA_LINE object	State description
"BLUE"	Microphone disarmed
"GREEN"	No signal from microphone
"YELLOW"	Microphone armed
"RED"	Start of record

Examples of using events and reactions of the **Microphone** object:

1. Turn on the first microphone when the sound activated recording is enabled.

```
OnEvent("OLXA_LINE","1","accu_start") //enable sound activated recording
{
  DoReact("OLXA_LINE","1","ARM"); //disable record from microphone
}
```

2. Set minimal compression on microphone while disabling record of audio signal.

```
OnEvent("OLXA_LINE","1","DISARM") // disable record from microphone
{
  DoReact("OLXA_LINE","1","SETUP","compression<5>"); //minimal compression is
  set up
}
```

## 9.7.6 DIALOG

The **DIALOG** object corresponds to the **Operator query pane** system object:

Operator format to describe actions with the operator query pane is:

```
DoReact("DIALOG","_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **DIALOG** object is presented in the following table:

Command – command description	Parameters	Description
"SETUP" – set up of operator query pane	x<>	Coordinate of left top corner (0 - 100)
	y<>	Coordinate of left top corner (0 - 100)
	allow_move<>	0 – forbid moving, 1 – allow moving
"RUN" – show operator query pane	-	-
"RUN_MODAL" – run operator query pane in modal mode	-	-
"CLOSE" – close last opened operator query pane	-	-
"CLOSE_ALL" – close all opened operator query panes	-	-

Examples of using reactions of the **Operator query pane** object:

- Using macro 1 set coordinates of left top corner of the operator query pane (ptz video camera PANASONIC-850) in center of screen, forbid its moving and display it.

```
OnEvent("MACRO","1","RUN")
{
  DoReact("DIALOG","PANASONIC-850","SETUP","x<50>,y<50>,allow_move<0>");
  DoReact("DIALOG","PANASONIC-850","RUN");
}
```

- Close the operator query pane using macro 2.

```
OnEvent("MACRO","2","RUN")
{
  DoReact("DIALOG","PANASONIC-850","CLOSE");
}
```

### 9.7.7 MMS

The **MMS** object corresponds to the **Mail Message Service** system object.

The **MMS** object sends events presented in the table. Procedure is started when the corresponding event appears.

OnEvent("MMS","_id_", "_event_")	
Event	Description
"SET_CONNECTIONS"	List of available connections

Format of operator to describe actions with mail message service is following:

```
DoReact("MMS","_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the MMS object is given in the table:

Command – command description	Parameters	Description
"SETUP" – settings for mail message service	smtp<>	Address of SMTP server
	connection<>	Type of connection
	smtp_username<>	User name

Command – command description	Parameters	Description
	smtp_password<>	Password
	port<>	Port number
	flags<>	Flags
	name <>	Object name
"GET_CONNECTIONS" – get the list of available connections	-	-

Properties of the **MMS** object are shown in the table:

Properties of the MMS object	Description
ID<>	Object ID
PARENT_ID<>	Parent object ID

Example of using reactions of the **Mail Message Server** object.

1. Set port number of the mail message server is 25 while triggering macro 1. OnEvent("MACRO","1","RUN")

```
{
  DoReact("MMS", "1", "SETUP", "port<25>");
}
```

## 9.7.8 MAIL\_MESSAGE

The **MAIL\_MESSAGE** object corresponds to the **Mail message** system object.

The **MAIL\_MESSAGE** object sends events presented in the table. Procedure is started when the corresponding event appears.

OnEvent("MAIL_MESSAGE", "_id_", "_event_")	
Event	Description
"SEND_ERROR"	Error of message sending
"SENT"	Message is sent

Format of operator to describe actions with mail message is following:

```
DoReact("MAIL_MESSAGE","_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **MAIL\_MESSAGE** object is given in the table:

Command – command description	Parameters	Description
"SETUP" – settings for mail message	from<>	Source address
	to<>	Destination address
	cc<>	Copies
	subject<>	Message subject
	body<>	Message body
	attachments<>	Attachments. If several files are attached, their addresses are semicolon separated
	flags<>	Flags
	name<>	Object name
	pack<>	Way of attachments packing
	is_body_html<>	Specifies if HTML markup is to be applied when sending. Possible values: 1 or 0
	inline<>	Specifies if attachments are only shown in the message text text (value of 1) or both in text and "Attachments" section (value of 0)
"SEND" – send mail message	-	-
"SEND_RAW" – send e-mail with parameters	same as for SETUP	see <a href="#">Examples of scripts in JScript language</a>

Properties of the **MAIL\_MESSAGE** object are shown in the table.

Properties of the MAIL_MESSAGE object	Description
ID<>	Object ID

PARENT_ID<>	Parent object ID
-------------	------------------

Example of using reactions of the **MAIL\_MESSAGE** object.

1. Send message with image from video camera when it switches to alarm state while motion detection triggering.

```
OnInit(){
  i=0; //counter is used to avoid overwriting of images from one camera
}

OnEvent("CAM",N,"REC") //video camera is in alarm state

{
  filename = "c:\\" + N + "_msg_"+str(i)+".jpg";
  i=i+1;
  DoReact("MONITOR","1","EXPORT_FRAME","cam<"+ N + ">,file<" + filename+ ">");
  DoReact("MAIL_MESSAGE", "1", "SETUP", "body<camera is triggered"+ N + ">,
subject<alarm by camera>, from<john.smith@AxxonSoft.com>,
to<mary.foreman@AxxonSoft.com>,attachments<" + filename + ">");
  DoReact("MAIL_MESSAGE","1","SEND");
}
```

### 9.7.9 VMS

The **VMS** object corresponds to the **Voice Message Service** system object.

Operator format to describe actions with the voice message service is:

```
DoReact("VMS","_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **VMS** object is presented in the following table:

Command – command description	Parameters	Description of parameters
"SEND" – send message.	modem<>	Name of device
	pulse<>	Type of dialing (0 – tonal, 1 – pulse)
	name<>	Object name
	redial_attempts<>	Number of call attempts
	redial_delay<>	Pause between call attempts

Command – command description	Parameters	Description of parameters
	waitfordialtone<>	Waiting for line signal (0 - no, 1 - yes)
	flags<>	Flags

Properties of the **VMS** object are shown in the table.

Properties of the VMS object	Description of properties
ID<>	Object ID
PARENT_ID<>	Parent object ID

Examples of using events and reactions of the **Voice Message service** object:

1. It is required to send message while performing macro 1 if modem is connected to COM2 port, type of dialing is tonal, do not wait for tonal signal.

```
OnEvent("MACRO", "1", "RUN")
{
  DoReact("VMS", "1", "SEND", "modem<2>,pulse<1>,waitfordialtone<0>");
}
```

### 9.7.10 GRELE

The **GRELE** object corresponds to the **Relay** system object.

The **GRELE** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the relay:

OnEvent("GRELE", "_id_", "_event_")	
Event	Description
"OFF"	Relay Off
"ON"	Relay On
"SIGNAL_LOST"	Connection lost.

Operator format to describe actions with the relay is:

```
DoReact("GRELE", "_id_", "_command_");
```

List of commands and parameters for the **GRELE** object is presented in the following table:

Command – command description	Parameters	Description
"ON" – enable relay	-	-
"OFF" – disable relay	-	-
"SETUP" – settings for relay	chan <>	Output number (0 – 15)
	flags<>	Flags
	name<>	Object name

Properties of the **GRELE** object are shown in the table.

Properties of the GRELE object	Description of properties
ID<>	Object ID
PARENT_ID<>	Parent object ID
REGION_ID<>	Region ID

Check function of the **GRELE** object state:

```
CheckState("GRELE", "number", "state")
```

The **GRELE** object can be in the following states:

State of the GRELE object	State description
"ON"	Relay ON
"OFF"	Relay OFF
"DETACHED_ON"	Connection lost
"DETACHED_OFF"	Connection lost

Examples of using events and reactions of the **Relay** object:

1. Enable relay 2 while connection with relay 1 is lost.

```
OnEvent("GRELE","1","SIGNAL_LOST")
{
  DoReact("GRELE", "2", "ON");
}
```

### 9.7.11 GRAY

The **GRAY** object corresponds to the **Sensor** system object.

The **GRAY** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the sensor:

```
OnEvent("GRAY","_id_", "_event_")
```

Event	Description
"ALARM"	Alarm. This event is received while opening or closing the sensor (it depends on object settings) if sensor is armed. If sensor is disarmed then Sensor opened and Sensor closed events are received correspondingly
"ARM"	Sensor is armed
"CONFIRM"	Alarm received
"DISARM"	Sensor is disarmed
"NOT_VALID_STATE"	Zone is not ready
"OFF"	Sensor opened. This event is received while sensor opening if sensor is disarmed
"ON"	Sensor closed. This event is received while sensor closing if sensor is disarmed
"SIGNAL_LOST"	Connection with sensor is lost

Operator format to describe actions with the sensor is:

```
DoReact("GRAY","_id_", "_command_");
```

List of commands and parameters for the **GRAY** object is presented in the following table:

Command – command description	Parameters	Description
"ARM" – arm sensor.	-	-
"DISARM" – disarm sensor.	-	-
"CONFIRM" – confirm alarm.	-	-
"SETUP" – settings for sensor.	chan<>	Output number (0 – 15)
	flags<>	Flags
	name<>	Object name
	type<>	Type of sensor object (0 – on closing, 1 – on opening)

Properties of the **GRAY** object are shown in the table.

Properties of the GRAY object	Description of properties
ID<>	Object ID
PARENT_ID<>	Parent object ID
REGION_ID<>	Region ID

Check function of the **GRAY** object state:

```
CheckState ("GRAY", "number", "state")
```

The **GRAY** object can be in the following states:

State of the GRAY object	State description
"ARMED"	Sensor is armed
"DISARME"	Sensor is disarmed
"ALARMED"	Alarm
"CONFIRMED"	Alarm confirmed

State of the GRAY object	State description
"DISARMED_ALARM"	Not ready
"DETACHED_ARMED"	Connection lost
"DETACHED_DISARM"	Connection lost
"OFF"	Normal

Examples of using events and reactions of the **Sensor** object:

1. It is required to switch over the second sensor to the second input if connection with the first sensor is lost.

```
OnEvent("GRAY","1"," SIGNAL_LOST") //connection with first sensor is losst
{
  DoReact("GRAY","2","SETUP","chan<2>"); //sensor is on the second input
}
```

2. Open the second sensor and enable the rollback record of the first video camera in case of the first sensor is closed.

```
OnEvent("GRAY","1"," ON") //first sensor is closed
{
  DoReact("GRAY","2","SETUP","type<1>"); //open the second sensor
  DoReact("CAM","1","REC","rollback<1>");//perform rollback record from the
  first video camera
}
```

### 9.7.12 VNS

The **VNS** object corresponds to the **Voice notification service** system object.

Operator format to describe actions with the sensor is:

```
DoReact("VNS","_id_","_command_" [,"_parameters_"]);
```

List of commands and parameters for the **VNS** object is presented in the following table:

Command – command description	Parameters	Description
"SETUP" – settings of the voice notification service	card<>	Name of sound device.  Note. Card name is to be correspond to name which is specified in settings of sound card of the <b>Voice notification service</b>

<b>Command – command description</b>	<b>Parameters</b>	<b>Description</b>
	level<>	Level of signal. Value of parameter is from 0 to 15. On default it is 8
	channel<>	Set of sound channels. Available values of parameter: 0 – no sound channel; 1 – left playback channel; 2 – right playback channel; 3 – left and right playback channels (both channels)
	flags<>	Flags
	ip<>	IP-address of network device
	name<>	Object name
	pass<>	Password
	user<>	User name
"PLAY" – play audio file	file<>	<p>Full path to the audio file in .wav format (indicating the name of the file being played. For example: C:\Program Files (x86)\Axxon PSIM\Wav\cam_alarm_1.wav).</p> <p>Note. If only file name is specified then path to it will be taken from registry in HKEY_LOCAL_MACHINE\SOFTWARE\AxxonSoft\PSIM section (HKEY_LOCAL_MACHINE\Software\Wow6432Node\AxxonSoft\PSIM for 64-bits system), in value of the «InstallPath» parameter. In this parameter it is possible to play several audio files using the «+» operation</p>
"STOP" – stop playing audio file	-	-
<b>Command – command description</b>	<b>Parameters</b>	<b>Description</b>
"ARM" – arm sensor	-	-
"DISARM" – disarm sensor	-	-
"CONFIRM" – confirm alarm	-	-

Command – command description	Parameters	Description
“SETUP” – settings for sensor	chan<>	Output number (0 – 15)
	flags<>	Flags
	name<>	Object name
	type<>	Type of sensor object (0 – on closing, 1 – on opening)

Properties of the **VNS** object are shown in the table.

Properties of the VNS object	Description of properties
ID<>	Object ID
PARENT_ID<>	Parent object ID

Examples of using events and reactions of the **Voice notification service** object:

1. Play the audio file when video camera stops recording:

```
OnEvent("CAM",N,"REC_STOP")
{
    DoReact("VNS","1","PLAY","file<C:\Program Files (x86)\Axxon
PSIM\Wav\cam_alarm_"+N+".wav>");
}
```

2. Stop playing the audio file when the camera starts recording:

```
OnEvent("CAM",N,"REC")
{
    DoReact("VNS","1","STOP");
}
```

3. When a predetermined time zone starts, change the volume control value to a lower one, and then after it ends, set the average volume control value:

```
OnEvent("TIME_ZONE","1","ACTIVATE")
{
    DoReact("VNS","1","SETUP","level<2>");
}
```

```
OnEvent("TIME_ZONE","1","DEACTIVATE")
{
    DoReact("VNS","1","SETUP","level<8>");
}
```

**Note.**

The **TIME\_ZONE** object is described as follows (see [TIME\\_ZONE](#) section).

### 9.7.13 SMS

The **SMS** object corresponds to the **Short Message Service** system object.

The **SMS** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the **Short Message Service** object:

```
OnEvent("SMS","_id_", "_event_")
```

Description of events of the **SMS** object.

Event	Description	Comment
RECEIVE	Message is received	<p>Use the ProcessFromSim registry key if event is not received while message receiving (see <a href="#">Registry keys reference guide</a>).</p> <p>Text of sent message is in the <b>message</b> &lt;&gt; parameter.</p> <p>The telephone number in the +7XXXXXXXXXX format from which message was sent is in the phone&lt;&gt; parameter.</p>

Operator format to describe actions with the short message service is:

```
DoReact("SMS","_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **SMS** object is presented in the following table:

Command – command description	Parameters	Description of parameters
"SETUP" – settings of short message service	device<>	SMS device
	flags<>	Flags
	message<>	Message text

Command – command description	Parameters	Description of parameters
	name<>	Object name
	phone<>	Telephone number

Properties of the **SMS** object are shown in the table.

Properties of the SMS object	Description of properties
ID<>	Object ID
PARENT_ID<>	Parent object ID

Examples of using events and reactions of the **Short Message service** object:

1. It is required to send short message to the “89179190909” number while alarm on the first video camera.

```
OnEvent("CAM", "1", "MD_START")
{
    DoReact("SMS", "1", "SETUP", "phone<+79179190909>,message<camera 1, alarm>");
}
```

2. Set device for message delivery and send message to the “89179190909” number while alarm on the first sensor.

```
OnEvent("GRAY", "1", "CONFIRM") //confirm alarm from sensor 1
{
    DoReact("SMS", "1", "SETUP", "device<>"); //set device for message delivery
    DoReact("SMS", "1", "SETUP", "phone<+79179190909>,message<sensor 1, alarm>"); //
    send message about alarm on the sensor 1 to telephone number
}
```

3. Play the c:\Windows\Media\Tada.wav audio file while receiving sms using the **Mail Message Service 2**.

```
OnEvent("SMS", "2", "RECEIVE")
{
    DoReact("PLAYER", "3", "PLAY_WAV", "file<c:\Windows\Media\Tada.wav>");
}
```

## 9.7.14 TELEMETRY

The **TELEMETRY** object corresponds to the **PTZ device** system object.

The **TELEMETRY** object sends events presented in the table. The procedure is started when the corresponding event occurs.

Format of the events procedure for the **PTZ device** object:

```
OnEvent("TELEMETRY", "_id_", "_event_")
```

Description of the events from the **TELEMETRY** object.

Event	Description	Comment
LOCKED	Locked	Event is received after the LOCK command (see the table below)
UNLOCKED	Unlocked	Event is received after the UNLOCK command (see the table below)

Operator format to describe actions with the PTZ devices is:

```
DoReact("TELEMETRY", "_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **TELEMETRY** object is presented in the following table:

Command—command description	Parameters	Description
AUTOFOCUS_ON—enable autofocus	tel_prior<>	Priority (1—low, 2—medium, 3—high)
AUTOPAN_END_P—specify the end point of autopan	tel_prior<>	Priority (1—low, 2—medium, 3—high)
AUTOPAN_START—start autopan	tel_prior<>	Priority (1—low, 2—medium, 3—high)
AUTOPAN_START_P—specify the start point of autopan	tel_prior<>	Priority (1—low, 2—medium, 3—high)
AUTOPAN_STOP—stop autopan	tel_prior<>	Priority (1—low, 2—medium, 3—high)
CLEAR_PRESET—clear the selected preset	tel_prior<>	Priority (1—low, 2—medium, 3—high)
	preset<>	Preset
D2OFF—disable the additional dynamic settings for Panasonic PTZ video cameras used to increase the quality of analog video signal	tel_prior<>	Priority (1—low, 2—medium, 3—high)

<b>Command—command description</b>	<b>Parameters</b>	<b>Description</b>
D2ON—enable the additional dynamic settings for Panasonic PTZ video cameras used to increase the quality of analog video signal	tel_prior<>	Priority (1—low, 2—medium, 3—high)
DOWN—rotate video camera lens down	tel_prior<>	Priority (1—low, 2—medium, 3—high)
FOCUS_IN—zoom in	tel_prior<>	Priority (1—low, 2—medium, 3—high)
FOCUS_OUT—zoom out	tel_prior<>	Priority (1—low, 2—medium, 3—high)
FOCUS_STOP—stop zooming in/out of image	tel_prior<>	Priority (1—low, 2—medium, 3—high)
GO_PRESET—rotate video camera to the position specified on the preset	tel_prior<>	Priority (1—low, 2—medium, 3—high)
	preset<>	Preset
HOME—rotate video camera to the initial (home) position	tel_prior<>	Priority (1—low, 2—medium, 3—high)
IRIS_CLOSE—close diaphragm	tel_prior<>	Priority (1—low, 2—medium, 3—high)
IRIS_OPEN—open diaphragm	tel_prior<>	Priority (1—low, 2—medium, 3—high)
IRIS_STOP—stop diaphragm	tel_prior<>	Priority (1—low, 2—medium, 3—high)
LEFT—rotate video camera lens to the left	tel_prior<>	Priority (1—low, 2—medium, 3—high)
LEFT_DOWN—rotate video camera lens to the left and down	tel_prior<>	Priority (1—low, 2—medium, 3—high)
LEFT_UP—rotate video camera lens to the left and up	tel_prior<>	Priority (1—low, 2—medium, 3—high)
PATROL_LEARN—start procedure of patrol programming performed by recording the video camera actions	tel_prior<>	Priority (1—low, 2—medium, 3—high)
PATROL_PLAY—start patrolling	tel_prior<>	Priority (1—low, 2—medium, 3—high)

Command—command description	Parameters	Description
PATROL_STOP—stop patrolling	tel_prior<>	Priority (1—low, 2—medium, 3—high)
RIGHT—rotate video camera lens to the right	tel_prior<>	Priority (1—low, 2—medium, 3—high)
RIGHT_DOWN—rotate video camera lens to the right and down	tel_prior<>	Priority (1—low, 2—medium, 3—high)
RIGHT_UP—rotate video camera lens to the right and up	tel_prior<>	Priority (1—low, 2—medium, 3—high)
SET_PRESET—record the current position of video camera to the selected preset	tel_prior<>	Priority (1—low, 2—medium, 3—high)
	preset<>	Preset
STOP—stop video camera lens rotation	tel_prior<>	Priority (1—low, 2—medium, 3—high)
UP—rotate video camera lens up	tel_prior<>	Priority (1—low, 2—medium, 3—high)
SETUP—set up PTZ device	address<>	Device address
	cam<>	Camera ID to control
	flags<>	Flag of object operating (0—ON, 1—OFF)
	name<>	Object name of PTZ device
	speed<>	Speed
SEND_BUFFER—send command to COM port in the hexadecimal format	buffer<>	Command in the hexadecimal format
	parent_id<>	ID of <b>Telemetry Controller</b> parent object. The required parameter
	tel_prior<>	Priority (1—low, 2—medium, 3—high). The value of the parameter must be greater than 0

Command—command description	Parameters	Description
LOCK—lock. Switch the telemetry over to the LOCKED state for a specified time	tel_prior<>	Priority (1—low, 2—medium, 3—high). The value of the parameter must be greater than 0. It is forbidden to perform control commands with a lower priority than the specified during the lock time
	duration<>	Lock duration. If the parameter is not specified, the lock is valid until the UNLOCK command is executed
UNLOCK—unlock. Switch the telemetry over to the UNLOCKED state for a specified time	-	-
AUTOFOCUS_OFF—disable autofocus	tel_prior<>	Priority (1—low, 2—medium, 3—high). <input type="checkbox"/> To use this command, you must add it to the <b>Reactions</b> tab for the <b>TELEMETRY</b> object in ddi.exe (see <a href="#">The Reactions tab</a> )

Properties of the **TELEMETRY** object are shown in the table.

Properties of the TELEMETRY object	Description of the object properties
ID<>	Object ID of the PTZ device
PARENT_ID<>	Parent object ID

The **TELEMETRY** object can be in the following states:

State of the TELEMETRY object	Description of the object state
LOCKED—locked	Control of telemetry is locked with some priority. It is forbidden to control telemetry with a priority lower than the specified when locking (see the table above)
UNLOCKED—unlocked	It is allowed to control telemetry with any priority

Examples of using reactions of the **TELEMETRY** object:

1. Set autofocus when video camera is armed.

```
OnEvent("CAM", "1", "ARM")
{
    DoReact("TELEMETRY", "1", "AUTOFOCUS_ON");
}
```

```
}

```

2. Rotate video camera to the position specified in the first preset with the relay enabled.

```
OnEvent("GRELE", "1", "ON")
{
    telemetry_id= GetObjectParam("CAM", "1", "parent_id");
    DoReact("TELEMETRY", "telemetry_id", "SETUP", "GO_preset<1>");
}

```

3. Record the patrol route for Camera 1 corresponding to the PTZ device 1.1. The route consists of two points, such that to go from point 1 to point 2, you need to rotate the camera to the left at speed of 6 for 2 seconds. Patrolling must be performed at speed of 10. The time at each point of the route is 25 seconds. It is supposed that when the program is started, the camera is set to the position corresponding to the first point of the route.

```
OnEvent("MACRO", "1", "RUN")
{
    DoReact("TELEMETRY", "1.1", "PATROL_LEARN", "cam<1>,preset<1>,tel_prior<1>,dwell
<25>,speed<10>,flush_tour<0>");
    Wait(2);
    DoReact("TELEMETRY", "1.1", "LEFT", "speed<6>,tel_prior<1>");
    Wait(2);
    DoReact("TELEMETRY", "1.1", "STOP", "speed<6>,tel_prior<1>");
    Wait(2);
    DoReact("TELEMETRY", "1.1", "PATROL_LEARN", "cam<1>,preset<2>,tel_prior<1>,dwell
<25>,speed<10>,flush_tour<1>");
}

```

### 9.7.15 TELEMETRY\_EXT

The **TELEMETRY\_EXT** object corresponds to the **Keyboard** system object.

The **TELEMETRY\_EXT** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the **Keyboard** object:

OnEvent("TELEMETRY_EXT", "_id_", "_event_")				
Event	Description of event	Parameter	Description of parameter	Range of values
"KEY_PRESSED"	Key is pressed	param0<>	Code of pressed key	See <a href="#">Installing and configuring security system components guide</a>

Event	Description of event	Parameter	Description of parameter	Range of values
		device<>	Device on which key is pressed	0 – Main keyboard <i>AXIS T8312</i> , 1 – <i>AXIS T8313</i> keyboard
"KEY_RELEASED"	Key is released	param0<>	Code of released key	0..21 for <i>AXIS T8312</i> . For <i>BOSCH KBD-Digital</i> , <i>BOSCH KBD-Universal</i> and <i>Panasonic WV-CU950</i> see <a href="#">Installing and configuring security system components guide</a>
		device<>	Device on which key is released	0 – Main keyboard <i>AXIS T8312</i> , 1 – Rotary switch <i>AXIS T8313</i>
"MOVED"	Position is changed	param0<>	Bias value	For wheel of JogDial rotary switch -1.. 1; for wheel of frame-by-frame scrolling Shuttle -7..7  For keyboard <i>Panasonic WV-CU950</i> JogDial -1.. 1; Shuttle -6..6
		device<>	Type of used control mechanism <i>AXIS T8313</i>	0 – wheel of rotary switch, 1 – wheel of frame-by-frame scrolling

Operator format to describe actions with the short message service is:

```
DoReact("TELEMETRY_EXT","_id","_command" [,"_parameters"]);
```

List of commands and parameters for the **TELEMETRY\_EXT** object is presented in the following table:

Command – command description	Parameters	Description
"DRAW_FIGURE" – draw figure on display of <i>BOSCH KBD-Digital</i> or <i>BOSCH KBD-Universal telemetry panel</i>	display<>	0x00 – main display, 0x01 – status display
	x1<>	Start coordinate on X axis (from 0 to 127 for main display, from 0 to 121 for status display)

Command – command description	Parameters	Description
	y1<>	Start coordinate on Y axis (from 0 to 239 for main display, from 0 to 31 for status display)
	x2<>	End coordinate on X axis (from 0 to 127 for main display, from 0 to 121 for status display)
	y2<>	End coordinate on Y axis (from 0 to 239 for main display, from 0 to 31 for status display)
	is_fill<>	0 – do not fill, 1 – fill
	is_set_pixels<>	0 – remove figure from display, 1 – draw figure
	figure<>	0 – line, 1 – rectangle
"PRINT_TEXT" – print text on display of BOSCH KBD-Digital or BOSCH KBD-Universal telemetry panel	display<>	0x00 – main display, 0x01 – status display
	x<>	Coordinate on X axis (from 0 to 127 for main display, from 0 to 121 for status display)
	y<>	Coordinate on Y axis (from 0 to 239 for main display, from 0 to 31 for status display)
	charset<>	Coding: 0 – Latin 1 – Cyrillic 2 – Central european
	style<>	Style: 0 – Normal 1 – Semi-bold

Command – command description	Parameters	Description
	text <>	Test message
"PRINT_TEXT" – print text on display of <i>Panasonic WV-CU950 telemetry panel</i>	y<>	0 – display text on first line 1 – display text on second line
	text<>	Entered text of line, maximum 20 symbols
	flickering<>	<p>Line consists of 6 symbols determining parameters of text flashing: d1 d2 d3 d4 d5 d6</p> <p>d1 determines period of flashing :</p> <p>0 – flashing disabled</p> <p>1 – period 0.25 sec, symbol is changed by white space</p> <p>2 – period 0.5 sec, symbol is changed by white space</p> <p>3 – period 0.75 sec, symbol is changed by white space.</p> <p>4 – period 1 sec, symbol is changed by white space.</p> <p>5 – period 0.25 sec, symbol is changed by white space</p> <p>6 – period 0.5 sec, symbol is changed by white space</p> <p>7 – period 0.75 sec, symbol is changed by white space</p> <p>8 – period 1 sec, symbol is changed by white space</p> <p>d2: 1 – symbols from 1 to 4 are flashing, 0 – these symbols are not flashing.</p> <p>d3: 1 – symbols from 5 to 8 are flashing, 0 – these symbols are not flashing.</p> <p>d4: 1 – symbols from 9 to 12 are flashing, 0 – these symbols are not flashing.</p> <p>d5: 1 – symbols from 13 to 16 are flashing, 0 – these symbols are not flashing.</p> <p>d6: 1 – symbols from 17 to 20 are flashing, 0 – these symbols are not flashing.</p>

Command – command description	Parameters	Description
<p>"CLEAR_DISPLAY" – clear display of <i>BOSCH KBD-Digital</i> or <i>BOSCH KBD-Universal</i> telemetry panel.</p> <p>Reaction without parameters for the <i>Panasonic WV-CU950</i> telemetry panel</p>	display<>	0x00 – main display, 0x01 – status display
<p>"RELE_ON" – turn on the light on the <i>AXIS T8312</i> keyboard or <i>Panasonic WV-CU950</i> panel</p>	rele<>	<p>Code of key with the light, 12..16 for <i>AXIS T8312</i>.</p> <p>For <i>Panasonic WV-CU950</i> see <a href="#">Installing and configuring security system components guide</a>, section <a href="#">Features of Panasonic WV-CU950 control panel configuration and operation</a></p>
<p>"RELE_OFF" – turn off the light on the <i>AXIS T8312</i> keyboard or <i>Panasonic WV-CU950</i> panel</p>	rele<>	Code of key with the light, 12..16
<p>"RESET" – reset of <i>Panasonic WV-CU950</i> panel</p>	type<>	<p>0 – instant reset</p> <p>1 – reset after 100 ms</p> <p>2 – reset after 200 ms</p> <p>3 – reset after 500 ms</p> <p>4 – reset after 1 s</p>

Command – command description	Parameters	Description
"SET_ALARM" – set type of alarm signal of the <i>Panasonic WV-CU950 panel</i>	audio_alarm<>	0 – sound OFF 1 – simple single alarm signal 2 – simple double alarm signal 3 – simple triple alarm signal 4 – single alarm signal lasting 0.1 sec 5 – single alarm signal lasting 0.2 sec 6 – single alarm signal lasting 0.3 sec 7 – single alarm signal lasting 1 sec 8 – simple single tone 9 – simple double tone A – simple triple tone B – single signal lasting 0.1 sec C – single signal lasting 0.2 sec D – single signal lasting 0.3 sec E – single signal lasting 1 sec F – alarm signal

Example of using events and reactions of the **TELEMETRY\_EXT** object:

1. Turn on the light and arm camera 2 after pressing the key 15 on the AXIS T8312 keyboard.

```

OnEvent ("TELEMETRY_EXT", "1", "KEY_PRESSED")
{
  if (strequal(param0, "15")){
    DoReact("TELEMETRY_EXT", "1", "RELE_ON", "rele<15>");
    DoReact("CAM", "2", "ARM");
  }
}

```

## 9.7.16 MACRO

The **MACRO** object corresponds to the **Macros** system object.

The **MACRO** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the **Macros** object:

```
OnEvent("MACRO", "_id_", "_event_")
```

Event	Description	Parameters	Parameter descriptions
"RUN"	Action is performed	src_sender<>	The name of the computer on which the macro was executed.  <i>Note. The value of this parameter is displayed in the <b>Add. info</b> column of the Event viewer in real time. When Axxon PSIM is restarted and event log records are loaded from the database, this information is not displayed in the interface, but remains in the database</i>
		user_id<>	The identifier of the user who executed the macro.  <i>Note. The value of this parameter together with the user name is displayed in the <b>Add. info</b> column of the Event viewer in real time. When Axxon PSIM is restarted and event log records are loaded from the database, this information is not displayed in the interface, but remains in the database</i>

Operator format to describe actions with the macros is:

```
DoReact("MACRO","_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **MACRO** object is presented in the following table:

Properties of the **MACRO** object are shown in the table.

Properties of the MACRO object	Description of properties
ID<>	Object ID
PARENT_ID<>	Parent object ID

The **MACRO** object can be in the following states:

State of the MACRO object	Description
"NORM"	Normal

Examples of using events and reaction of the MACRO object:

1. Set the current position of video camera to preset while performing the macro 1.

```
OnEvent("MACRO","1","RUN")
{
  DoReact("TELEMETRY","1","SET_PRESET","TEL_PRIOR<1>");
}
```

2. Perform macro 2 in case of camera is armed.

```
OnEvent("CAM","1","ARM")
{
  DoReact("MACRO", "2", "RUN");
}
```

### 9.7.17 TIME\_ZONE

The **TIME\_ZONE** object corresponds to the **Time zones** system object.

The **TIME\_ZONE** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the **Time zones** object:

```
OnEvent("TIME_ZONE","_id_", "_event_")
```

Event	Description
"ACTIVATE"	Start.
"DEACTIVATE"	End.

Operator format to describe actions with the time zones is:

```
DoReact("MACRO","_id_", "_command_" [,"_parameters_"]);
```

List of commands and parameters for the **TIME\_ZONE** object is presented in the following table:

Properties of the **TIME\_ZONE** object are shown in the table.

Properties of the TIME_ZONE object	Description of properties
ID<>	Object ID
PARENT_ID<>	Parent object ID

Check function of the **TIME\_ZONE** object state:

```
CheckState ("TIME_ZONE","number","state")
```

The **TIME\_ZONE** object can be in the following states:

State of the <b>TIME_ZONE</b> object	Description
"ACTIVATE"	Active
"INACTIVE"	Inactive

Examples of using events and reactions of the **TIME\_ZONE** object:

1. Display video image from the camera №1 on the monitor while activation of the first time zone.

```
OnEvent("TIME_ZONE","1","ACTIVATE")
{
  DoReact ("CAM", "1", "ACTIVATE", "MONITOR<1>");
}
```

### 9.7.18 SSS\_WATCHDOG

The **SSS\_WATCHDOG** object corresponds to the **System restart service** system object.

The **SSS\_WATCHDOG** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the **System restart service** object:

OnEvent("SSS_WATCHDOG","_id_", "_event_")	
Event	Description
"RESTART_EXCEEDED"	Number of module restart is exceeded
"RESTART_PROCESS"	Module restart

Operator format to describe actions with the system restart service is:

```
DoReact("SSS_WATCHDOG","_id_", "_command_" ["_parameters_"]);
```

List of commands and parameters for the **SSS\_WATCHDOG** object is presented in the following table:

Properties of the **SSS\_WATCHDOG** object are shown in the table.

Properties of the <b>SSS_WATCHDOG</b> object	Description of properties
ID<>	Object ID

PARENT_ID<>	Parent object ID
-------------	------------------

Examples of using events and reactions of the **SSS\_WATCHDOG** object:

1. Activate the third camera on the monitor №5 while module restarting.

```
OnEvent("SSS_WATCHDOG", "1", " RESTART_PROCESS")
{
  DoReact("MONITOR", "5", " ACTIVATE_CAM", "CAM<3>")
}
```

### 9.7.19 SLAVE

The **SLAVE** object corresponds to the **Computer** system object.

The **SLAVE** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the **Computer** object:

OnEvent("SLAVE", "_id_", "_event_")		
Events	Description	Comment
CONNECTED	Connecting	Event is generated when some Client is connected to the Server
DISCONNECTED	Disconnecting	Event is generated when some Client is disconnected from the Server
KEY_IGNORED_HW	Key ignored (mismatch of card codes)	Event is generated if codes of cards (or HID) in the key mismatch to current codes of computer
KEY_IGNORED_SW	Key ignored (limitation exceeded)	Event is generated if there software limitations. For example, if key is accepted but number of created objects in the object tree is more than specified in the key
KEY_UPDATED	Key updated	
PROTOCOL_RCVD	Protocol received	
REBUILD_IN_START	Start of archive re-indexing	
REBUILD_IN_STOP	End of archive re-indexing	

Events	Description	Comment
REGISTER_ATTEMPT	Attempt of unauthorized access	
REGISTER_ERROR	Limit of access attempts is exceeded	Event is generated when user failed to enter the system a lot of times. Some timeout is started after the event when user can't try to enter the system. Number of attempts and timeout can be changed using registry
REGISTER_USER	User registration	This event is generated when user tries to enter the system (while entering login and password)
DISC_EXIST	Disk for archive record exists	
NO_DISC	There is no disk for archive record	
KEY_IGNORED_FR	Key ignored	Event is generated in case of key file is not recorded on the disc
SHUTDOWN	Shutdown	
DISC_MOUNT	Disc connected (mounted)	
DISC_UNMOUNT	Disc disconnected (unmounted)	
ARCHIVE_DEPTH	Archive depth	<p>Event is generated in the midnight and contains information about archive depth on all disks in hours (e.g. depth&lt;&gt; parameter). To raise event manually use GET_DEPTH reaction.</p> <p>Archive depth in format Days:Hours is specified in the <b>Additional information</b> field of the Event viewer while event displaying. Also this information contains in parameter of the param0&lt;&gt; event.</p> <p>Archive depth is counted as discrepancy between date of creation the oldest archive file and date of creation the newest archive file (on disk or by camera)</p>

Events	Description	Comment
FORCED_OFF	Forced offload	The event is generated before the forced unload of <i>Axxon PSIM</i> , for example, if the Guardant security key is removed. Unload is performed after the action caused it (for example, removing the Guardant key) after the time specified by the UnloadDelay registry key—see <a href="#">Registry keys reference guide</a>
DEACTIVATE_ALL_DISP	Hide all displays	The event is generated when <b>Hide all</b> command is executed on a computer set in slave<> parameter. If except<> parameter is present, all displays except the one specified in this parameter are hidden
LIC_EXPIRATION	License expires in	Not generated by default. Set NotifyExpireLic = 1 to enable (see <a href="#">Registry keys reference guide</a> ).  The days<> parameter shows the number of days left till license expiration (can be non-integer). The event is generated at <i>Axxon PSIM</i> start-up and when the day changes
DATABASE_ERROR	Database connection lost	The event is generated when the connection to SQL Server is lost the first time it is accessed after the disconnection
SCRIPT_ERROR	<a href="#">Script</a> execution failed	By default, the event is not generated, since it is not added to the psim.ddi external settings file. In order for the SCRIPT_ERROR event to be generated and added to the PROTOCOL table, it must be added to the psim.ddi table (see <a href="#">Editing the external setting file (Axxon PSIM.ddi) using the ddi.exe utility</a> )

Operator format to describe actions with the computer object is:

```
DoReact("SLAVE","_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **SLAVE** object is presented in the following table:

Command—command description	Parameters	Description
"SETUP" – set up parameters for computer	display_id<>	Display ID
	drives<>	Disks for record of video archive
	drives_a<>	Disks for record of audio information

<b>Command—command description</b>	<b>Parameters</b>	<b>Description</b>
	flags<>	Flags
	arch_days<>	Size of event archive
	connection<>	Connection
	disable_protocol<>	Disable protocol
	ip_address<>	IP-address of device
	is_backup<>	Backup
	is_load<>	Loaded
	local_protocol<>	Local protocol
	modem<>	Modem connection
	name<>	Object name
	password<>	Password
	sync_time<>	Time synchronization
	username<>	User name
"BACKUP"—backup database	-	-
"CONNECT_ONE"—connect to computer. Connects the corresponding computer. It is recommended to avoid using of this reaction manually	-	-
"CONNECT_OTHER"—connect to cores. Connects computer to other cores from configuration. It is recommended to avoid using of this reaction manually	-	-

<b>Command—command description</b>	<b>Parameters</b>	<b>Description</b>
"DISCONNECT_ONE"—disconnect from computer. Disconnects the corresponding computer. Core can be connected automatically in case of disconnection. It is recommended to avoid using of this reaction manually	-	-
"SYNC_PROTOCOL"—run SyncProtocol.exe utility of protocol synchronization. Protocol merging is happened if synchronization is configured	-	-
"SYNC_TIME"—synchronize time. To perform this reaction it is required to create SyncTime parameter with value 1 on the system to which reaction was addressed in the HKEY_LOCAL_MACHINE\SOFTWARE\AxxonSoft\PSIM (HKEY_LOCAL_MACHINE\Software\Wow6432Node\AxxonSoft\PSIM registry section for 64-bits system)	-	-
"CREATE_PROCESS"—run process	command_line <>	Command line. Commands of Windows command line written without hyphens through  , & or && separating characters
"SEND_MY_CONFIG"—send configuration. Send configuration to other computers. The same as "SPREAD_CONFIG"	-	-
"MOVE_CONFIG"—move configuration. Moves configuration created in the objects tree on the basis of the computer – supplier to the computer – recipient	from<>	Supplier
	to<>	Recipient
"SPREAD_CONFIG"—spread configuration. The same as "SEND_MY_CONFIG"	-	-
"GET_DEPTH"—get archive depth. The ARCHIVE_DEPTH event (see table below) is formed in response to reaction in system. Absence of one or both parameters concedes request of depth by records for all values of parameter	cam<>	Camera ID for which archive depth is required

Command—command description	Parameters	Description
	drive<>	Disc or network path on which archive depth is required.  Name of disk is specified in the following format: "<letter of disk>:\\", for example drive<D:\>  <i>Note. The "\" symbol is an escape character.</i>  Network path is specified in the UNC format
"ACTIVATE_DISPLAY"—change the display. The command allows showing the Display with the given identifier on the monitor (monitors) of the computer	display_id<>	The identifier of the corresponding <b>Display</b> object. If an empty value is passed to the parameter, then all displays are hidden when running this command

Properties of the **SLAVE** object are shown in the table.

Properties of the SLAVE object	Description
ID<>	Object ID
PARENT_ID<>	Parent object ID
USER_ID<>	User ID

Examples of using events and reactions of the **SLAVE** object:

1. Stop record from camera №2 if there is no disk for archive record.

```
OnEvent("SLAVE", "1", " NO_DISC")
{
  DoReact("CAM", "2", " REC_STOP");
}
```

2. Get the archive depth by Camera 1 using the macro 1.

```
OnEvent ("MACRO", "1", "RUN"){
  DoReact ("SLAVE", "WS3", "GET_DEPTH", "cam<1>");
}
```

As the result the following string will be displayed in the debug window:

```
Event : SLAVE|WS3|ARCHIVE_DEPTH|
cam<1>,core_global<1>,date<11-07-13>,depth<42>
```

,destination\_id<1>,destination\_source<PROGRAM>,fraction<970>,guid\_pk<{003DFC83-0CEA-E211-A437-0017C401D5C2}>,owner<WS3>,**param0<01:18>**,slave\_id<WS3>,time<13:30:33>.

Besides, the **Archive depth** event will be displayed in the Event viewer and the archive depth in Days:Hours format will be specified in the **Additional information** field. This information is also displayed in the debug window in parameter of the **param0<>** event.

### 9.7.20 DISPLAY

The **DISPLAY** object corresponds to the **Display** system object.

The events presented in the table come from the **DISPLAY** object. Procedures are run when the corresponding event occurs. The event procedure format for the **Display** object looks like this:

```
OnEvent("DISPLAY","_id_", "_event_")
```

Description of events of the **DISPLAY** object:

Event	Description
ACTIVATE	Display is activated
DEACTIVATE	Display is deactivated
ACTIVATED	Display is activated on the remote computer. The computer name is transferred in the param0 <> parameter

Operator format to describe actions with the screen is:

```
DoReact("DISPLAY","_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **DISAPLY** object is presented in the following table:

Command – command description	Parameters	Description
ACTIVATE – show display.	macro_slave_id<>	Name of computer on which display is to be shown
DEACTIVATE – hide display.	macro_slave_id<>	Name of computer on which display is to be hidden

**Note.**  
If «macro\_slave\_id» parameter is not set the command will be performed for all computers in the system.

Properties of the **DISPLAY** object are shown in the table.

Properties of the DISPLAY object	Description
flags	Flags

id	Object ID
name	Object name
parent_id	Parent object ID

Example of using events and reactions of the **DISPLAY** object:

1. Show first display on the **CLIENT** computer while activating the first time zone.

```
OnEvent("TIME_ZONE", "1", "ACTIVATE")
{
  DoReact("DISPLAY", "1", "ACTIVATE", "macro_slave_id< CLIENT >");
}
```

### 9.7.21 GATE

The **GATE** object corresponds to the **Videogate** system object.

The **GATE** object sends events presented in the table. Procedure is started when the corresponding event occurs. Format of the events procedure for the **Videogate** object:

OnEvent("GATE", "id", "event")		
Events	Description	Comment
GATE_LOW_FPS	Input speed on the gate is reduced	
ACTIVE	Gate is active	Event is generated when the list of working cameras corresponds to the list of the Videogate configuration
INACTIVE	Gate is inactive	Event is generated when there are no requests for video streams through the Videogate
ACTIVE_PART	Partial operation of gate	Event is generated when the number of working cameras is less than in the Videogate list

**Example.** Send corresponding messages to all system cores when the input speed on the gate 1 is reduced.

```
OnEvent("GATE", "1", " GATE_LOW_FPS ")
{
  NotifyEventGlobal ("GATE", "1", " GATE_LOW_FPS ");
}
```

Operator format for operations with the Videogate:

```
DoReact("GATE", "id", "command" [, "parameters"]);
```

The list of commands and parameters for the **GATE** object is presented in the table.

Command—command description	Parameters	Parameter description	Features
START_VIDEO—enable camera video stream and start writing to the archive	cam<>	Identifier of the camera by which it is necessary to start or stop recording	The commands work even if the Monitor doesn't display the selected camera.
STOP_VIDEO—stop camera video stream and stop writing to the archive			The commands work if constant recording and active camera recording is enabled in the Videogate —see <a href="#">Configuring the recording to the Videogate archive</a>

## 9.7.22 CAM\_VMDA\_DETECTOR

The **CAM\_VMDA\_DETECTOR** object corresponds to the **VMDA detection** system object.

The **CAM\_VMDA\_DETECTOR** object sends events presented in the table. Procedure is started when the corresponding event occurs.

Format of the events procedure for the **VMDA Detection** object:

```
OnEvent("CAM_VMDA_DETECTOR ", "_id_", "_event_")
```

Event	Description	Parameter	Parameter description
ALARM	Alarm	native_type<>	To enable this parameter, set the following registry keys: VMDA.determineNoise, VMDA.determineGivenTaken, VMDA.determineHumanCar (see <a href="#">Registry keys reference guide</a> ).  Available values: -1—unknown object type (initial state) 0—other  1—human or group of people (depending on the native_value<> parameter: if 1, human; if >1, group of people) 2—car 3—noise 4—object carried into the area 5—object carried out of the area
		native_value<>	To enable this parameter, set the following registry keys: VMDA.determineNoise, VMDA.determineGivenTaken, VMDA.determineHumanCar (see <a href="#">Registry keys reference guide</a> ).  People counter for the "human" object type. Allows determining the quantity of people in the group. For other object types it is equal to -1
		param0<>	String value containing the event parameters from the VMDA detection
ALARM_END	End of alarm		
ARMED	VMDA detection is armed		
DISARMED	VMDA detection is disarmed		

Operator format to describe actions with the VMDA detection is:

```
DoReact("CAM_VMDA_DETECTOR", "_id_", "_command_");
```

List of commands and parameters for the **CAM\_VMDA\_DETECTOR** object is presented in the following table:

Command—command description	Parameters	Description
ARM—arm detection	-	-
DISARM—disarm detection	-	-

**Example** of using events and reactions of the **VMDA Detection** object:

Arm the VMDA Detection 2 while performing macro 1:

```
OnEvent ("MACRO", "1", "RUN")
{
  DoReact("CAM_VMDA_DETECTOR", "2", "ARM");
}
```

**Note**

If cameras are connected using ONVIF Server, the events from the **VMDA detection** and other smart detection tools will be transferred as events from embedded detection tools—see [CAM\\_IP\\_DETECTOR](#).

## 9.7.23 ARCH

The **ARCH** object corresponds to the **Archive** system object.

The **ARCH** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the **Archive** object:

OnEvent("ARCH", "_id_", "_event_")		
Events	Description	Comment
ACTIVE	Archive is active	Event is generated when list of cameras video from which is archived corresponds to the list of Archive configuration
INACTIVE	Archive is inactive	Event is generated when archiving through the Archive is not performed
ACTIVE_PART	Partial work of archive	Event is generated when archiving is enabled not for all cameras specified in the list of Archive

Example. Send corresponding message to all cores of system if archiving through the Archive 1 is not performed.

```
OnEvent("ARCH", "1", "INACTIVE")
```

```
{
  NotifyEventGlobal ("ARCH","1","INACTIVE");
}
```

## 9.7.24 CORE

The CORE object is the global static object realized methods used to control state and to manage system objects of the Axxon PSIM software package. The extended possibilities for working with the CORE object are given when using scripts on JScript programming language – see the [Programming Guide \(JScript\)](#).

The **CORE** object sends events presented in the table. Procedure is started when the corresponding event appears.

Format of events procedure for the **CORE** object:

```
OnEvent("CORE","_id_", "_event_")
```

Event	Description
DO_REACT	<p>Event triggers reaction of some object in the system. Description of action which is to be performed is forwarded in the action parameter of this event. Examples of values of action parameter:</p> <p>SET_MARKRECT – sends when face recognizing on the video image;</p> <p>DEL_MARKRECT – sends when face disappearing from the video image.</p> <p>Can be other parameters of the event which can be monitored using the Debug window (see <a href="#">Programming Guide (JScript)</a>, section <a href="#">The Debug window</a>). For example, if value of action parameter is SET_MARKRECT than number of camera on video image of which face is recognized is forwarding in the param5_val parameter. It shows name of parameter forwarded in the param5_name parameter.</p> <p>For the DEL_MARKRECT value the camera number is forwarding in the param0_val parameter</p>
SLAVE_CHANGED	<p>Event is generated when Failover becomes active. It consists of the following parameters:</p> <p>old_slave_id – ID of the <b>Computer</b> object where cameras are moved from.</p> <p>new_slave_id – ID of the <b>Computer</b> object where cameras are moved to.</p> <p>CAM&lt;n1, n2, ... &gt; – where n1, n2, etc. are IDs of cameras moved to another parent <b>Computer</b> object. For example, CAM&lt;4,6,7&gt; – move cameras with IDs 4, 6, 7</p>
CREATE_OBJECT	<p>Event triggers creation of an object. Parameters:</p> <p>objtype&lt;&gt; – object type, e.g. objtype&lt;PERSON&gt; for user creation.</p> <p>parent_id&lt;&gt; – identification number of the parent object.</p> <p>service_photo&lt;&gt; – when a user is created, the base64-encoded binary image of user photo can be put to this parameter. This is necessary for adding user photo immediately whet creating user in Access Manager</p>

Example.

When a face appears in the frame show the video from corresponding camera on the Monitor 2. When the face disappears – hide video from corresponding camera on the Monitor 2.

```

OnEvent("CORE",N,"DO_REACT")
{
  if (strequal(action,"SET_MARKRECT"))
  {
    DoReact("MONITOR","2","ADD_SHOW","cam<"+param5_val+">");
  }
  if (strequal(action,"DEL_MARKRECT"))
  {
    [
      Wait(2);
      DoReact("MONITOR","2","REMOVE","cam<"+param0_val+">");
    ]
  }
}

```

### 9.7.25 IPJOYSTICK

The **IPJOYSTICK** object corresponds to the **Control device** object.

The **IPJOYSTICK** object sends the events presented in the table. The procedure is started when the corresponding event occurs.

The format of the event procedure for the **IPJOYSTICK** object:

```
OnEvent("JOYSTICK","_id_", "_event_")
```

Description of the events of the **IPJOYSTICK** object.

Events	Parameter	Parameter description
"KEY_PRESSED"—Key pressed	button<>	The code of the key

### 9.7.26 TITLEVIEWER

The **TITLEVIEWER** object corresponds to the **Search by titles** system object.

The events given in the table come from the **TITLEVIEWER** object. When the corresponding event happens, the procedures are run. The event procedure format for the object **Search by titles** system object:

```
OnEvent("TITLEVIEWER","_id_", "_event_")
```

The events coming from the **TITLEVIEWER** object are given in the table.

Event	Event description	Parameters	Parameters description	Comment
-------	-------------------	------------	------------------------	---------

GO_VIDEO	Video request	<cam>	The ID of the camera where the titles were found	The event is generated when left double-clicking the search result line
		<date>	Date	
		<time>	Time	

**Example.**

When double-clicking the search result line in the **Search by titles** system object window, one can display the video archive corresponding to this result on the monitor 4.

```
OnEvent("TITLEVIEWER", "1", "GO_VIDEO")
{
  DoReact("MONITOR", "4", "ARCH_FRAME_TIME", "cam<"+cam+">,date<"+date+">,time<"+time+">");
  DoReact("MONITOR", "4", "KEY_PRESSED", "key<PLAY>");
}
```

**9.7.27 MAP**

The **MAP** object corresponds to the **Map** system object.

The **MAP** object sends the events presented in the table. The procedure is started when the corresponding event occurs. The format of the events procedure for the Map:

```
OnEvent("MAP", "_id_", "_event_" [, "_parameters_"])
```

Event	Description
LAYER_ACTIVATED	Layer activation. This event is received when a layer is selected on the Map. The obj_id<> parameter has the ID of the activated layer

ACTIVATE_OBJECT	<p>Object activation. The event is received when an object is selected (activated by mouse click) on the Map.</p> <p>Parameters:</p> <ol style="list-style-type: none"> <li>1. obj_type &lt;&gt;—object type</li> <li>2. user_id &lt;&gt;—user ID</li> <li>3. module &lt;&gt;—module name, for the Map—map.run</li> <li>4. date &lt;&gt;—date when the event occurred</li> <li>5. time &lt;&gt;—time when the event occurred</li> <li>6. slave_id &lt;&gt;—computer network name</li> <li>7. obj_id &lt;&gt;—object ID</li> <li>8. layer &lt;&gt;—Map layer ID</li> <li>9. fraction &lt;&gt;—millisecond when the event occurred</li> <li>10. owner &lt;&gt;—user who activated the object</li> <li>11. type_of_display &lt;&gt;—object display type, possible values: <ol style="list-style-type: none"> <li>a. IMAGE—image</li> <li>b. IMAGE_AND_INDICATOR—image and indicator</li> <li>c. TEXT—text</li> <li>d. LINE—line</li> <li>e. POLYGON—polygon</li> <li>f. ELIPSIS—ellipse</li> <li>g. TITLE—the name of the object</li> </ol> </li> </ol>
OBJDBLCLK	<p>The event is received when you double click an object on the Map. Contains the same parameters as ACTIVATE_OBJECT</p>

Operator format to describe actions with the Map:

```
DoReact("MAP","_id_", "_command_" [, "_parameters_"]);
```


The list of commands and parameters for the **MAP** object is presented in the table.



Command	Parameters	Description
<b>SET_TOPMOST</b> —Set topmost	-	-
<b>SET_NOTOPMOST</b> —Cancel topmost	-	-
<b>HIDE_OBJECT</b> —Hide/show object icon on the map	objtype<>	Object type. Can be left empty. If the object type is not set, then objects of all types are hidden/shown
	objid<>	Object ID. Can be left empty. If the object ID is not set, then all objects of the specified type are hidden/shown

	hide<>	0—objects are shown on the map 1—objects are hidden on the map
<b>SET_OBJECT_GEOMETRY</b> —Set object location on the map	objtype<>	Object type
	objid<>	Object ID
	x<>	New coordinate of the top left corner of the object icon on the map layer along the X axis in pixels
	y<>	New coordinate of the top left corner of the object icon on the map layer along the Y axis in pixels
	exclude_children<>	By default, when using the SET_OBJECT_GEOMETRY reaction, when moving the object icons, the names of these objects (child objects) also move. If you pass the exclude_children <1> parameter in the reaction, then the object is moved separately from the children, that is, without their names
<b>INSCRIBE</b> —Inscribe to window	-	-
<b>SHOW_MINIMAP</b> —Show a minimap	x<>	The coordinate of the top left corner of the minimap along the X axis in pixels
	y<>	The coordinate of the top left corner of the minimap along the Y axis in pixels
	w<>	Width of the minimap in pixels
	h<>	Height of the minimap in pixels
	monitor<>	Monitor ID
	slave_id<>	Computer network name
<b>SET_ZOOM</b> —Change the Map scale	zoom<>	Map scale ratio
<b>ACTIVATE_OBJECT</b> —Activate object on the Map	obj_type<>	Object type
	obj_id<>	Object ID

	layer<>	Map layer ID. If the parameter is set, the script will work on the specified layer. If the parameter is not set, the scrip will work on the current layer
<b>DRAW_ARROW</b> —Draw a track of movement between objects	first_obj_type<>	Type of the object from which a track will be made
	first_obj_id<>	ID of the object from which a track will be made
	second_obj_type<>	Type of the object to which a track will be made
	second_obj_id<>	ID of the object to which a track will be made
	obj_id<>	ID of the created track
<b>ERASE_ARROW</b> —Erase a track of movement between objects	obj_id<>	ID of the track that should be erased. If you don't specify the parameter, all tracks will be erased

Features of the **DRAW\_ARROW** command execution:

1. When executing the command, a track will be displayed on each layer of the **Map** as arrows  between the objects.
2. If the objects are located on the same layer, the arrow is drawn directly between the specified objects. If the objects are located on different layers, the arrow is drawn by the shortest path.
3. If
  - a. it isn't possible to make a track,
  - b. one of the objects doesn't exist,
  - c. it is possible to make a track, but the arrows cannot be displayed,

then the icon  will be displayed on the first object, and the icon  will be displayed on the second object.

**Example.** Hide the Camera 10 on the Map 1 on the Macro 10.

```
OnEvent("MACRO", "10", "RUN")
{
  DoReact("MAP", "1", "HIDE_OBJECT", "objtype<CAM>, objid<10>, hide<1>");
}
```

## 9.7.28 FAILOVER

The **FAILOVER** object corresponds to the **Failover system object**.

Events from the **FAILOVER** object are given in the table. Procedures are run when a corresponding event happens. The event procedure format for the **Failover** object:

```
OnEvent("FAILOVER","_id_", "_event_")
```

Description of events from the **FAILOVER** object:

Event	Description
START	Objects are moved to a backup Server
STOP	Objects are back to the main Server

Example uses can be found in the [Examples of scripts in JScript language](#) section in [Programming Guide \(JScript\)](#).

The operator format for describing the actions with the Failover is:

```
DoReact("FAILOVER","_id_", "_command_" [, "_parameters_"]);
```

The list of parameters for the **FAILOVER** object is presented in the table below.

Command - command description	Comment
FORCED_START – forced transfer of the main Server configuration to the backup one	The reverse configuration transfer is performed using the FORCED_STOP command or upon restarting/reconnecting the main Server
FORCED_STOP – forced transfer of the backup Server configuration to the main one	

## 9.7.29 OPERATORPROTOCOL

The **OPERATORPROTOCOL** object corresponds to the **Operator protocol** system object.

Find events from the **OPERATORPROTOCOL** object in the table. Procedures are started when the corresponding event occurs. The format of the event procedure for the **Operator protocol** object:

```
OnEvent("OPERATORPROTOCOL","_id_", "_event_")
```

Event	Event description	Event parameters
ACTIVATE_LEFT	Operator left-clicked the event cell in the <b>Operator protocol</b>	
ACTIVATE_RIGHT	Operator right-clicked the event cell in the <b>Operator protocol</b>	
POSTPONE_PRESSED	Operator clicked the <b>Delay</b> button	

Event	Event description	Event parameters
CREATE_REPORT	Operator clicked the <b>Create</b> button on the <b>Create report</b> tab	The user_id<> parameter contains the user ID. The initial_date<> and final_date<> parameters specify the initial and final dates selected in the interface
RESPONSE_ALARM	Operator clicked the <b>Alarm situation</b> button	objtype<>—Object type objid<>—Object ID action<>—Name of the event in the database alarm_time<>—Time when the alarm occurred
RESPONSE_SUSPECT	Operator clicked the <b>Suspicious situation</b> button	
RESPONSE_FALSE	Operator clicked the <b>False alarm</b> button	
ACTIVATE_EVENT	Focusing on the event: click the event in the interface or jump to the required event using the keyboard	

The operator format for description of actions with the **Operator protocol** object:

```
DoReact("OPERATORPROTOCOL","_id_", "_command_" [,"_parameters_"]);
```

The list of commands and parameters for the **OPERATORPROTOCOL** object is given in the table.

Command—command description	Parameters	Parameter description
DEL_ALARM—delete an alarm	objtype<>	Object type (e.g., CAM, GRELE, etc.)
	objid<>	Object ID
	options<>	Possible values: first—delete first alarm last—delete last alarm all or blank—delete all alarms
HIDE_BUTTON – hide the buttons used to assign status to event	button<>	Names of the buttons separated by comma: alarm—Alarm situation suspicious—Suspicious situation false—False alarm Example of setting a parameter: button<alarm,suspicious,false>

hide<>	1—hide the buttons listed in the button parameter 0—show the buttons listed in the button parameter
objtype<>	Object type
objaction<>	Event type
objid<>	Object ID

**Example 1.** Delete the first alarm on Camera 3 in the Operator protocol 1 window on Macro 2.

```
OnEvent ("MACRO", "2", "RUN")
{
  DoReact("OPERATORPROTOCOL", "1", "DEL_ALARM", "objtype<CAM>,objid<3>,options<first>");
}
```

**Example 2.** Hide the Alarm situation, Suspicious situation and False alarm buttons for the Disarm event from Camera 12 in the Operator protocol 1 window on Macro 2.

```
OnEvent ("MACRO", "2", "RUN")
{
  DoReact("OPERATORPROTOCOL", "1", "HIDE_BUTTON", "button<alarm,suspicious,false>,hide<1>,objtype<CAM>,objaction<DISARM>,objid<12>");
}
```

### 9.7.30 PERSON

The **PERSON** object corresponds to the **User** system object.

The events presented in the table come from the **PERSON** object. Procedures are run when the corresponding event occurs. The event procedure format for the **Camera** object looks like this:

```
OnEvent("PERSON", "_id_", "_event_")
```

Description of events of the **PERSON** object:

Event	Description
"REGISTERED"	User enters the system
"UNREGISTERED"	User exits the system

### 9.7.31 EVENT\_VIEWER

The **EVENT\_VIEWER** object corresponds to the **Event Viewer** system object.

The **EVENT\_VIEWER** object sends events given in the table. Procedure is started when the corresponding event appears.

Format of event procedure for the **Event Viewer** object:

```
OnEvent("EVENT_VIEWER","_id_", "_event_")
```

Description of events of the **EVENT\_VIEWER** object.

Events	Description
SHOW_ON_MAP	The operator runs the command "Display on the map"
SHOW_VIDEO	The operator runs the command "Display video"
SHOW_REPORT	The operator runs the command "Show report"
CREATE_REPORT	Generated if the GenerateEventInsteadOfReport registry key is set to 1 and the operator selects the "Show report" command. The report does not open. See also <a href="#">Registry keys reference guide</a>

Format of events procedure for the **Event Viewer**:

```
DoReact("EVENT_VIEWER","_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the **Event Viewer** object is presented in the following table:

Example. Set general background color to black and general text color to white for Event Viewer 1 on Macro 1.

```
OnEvent ("MACRO", "1", "RUN")
{
  DoReactStr("EVENT_VIEWER", "1", "UPDATE_VIEW", "bk_color<#000000>, defclr<#FFFFFF>");
}
```

### 9.7.32 CAM\_TITLE

The **CAM\_TITLE** object corresponds to the **Captioner** system object.

Operator format to describe actions with the Captioner is:

```
DoReact("CAM_TITLE", "_id_", "_command_");
```

The list of commands and parameters for the **CAM\_TITLE** object is given in the following table:

Command – command description	Comment
"REINDEX" – run titles database update	Titles database re-indexation is rut at any value of the <code>_id_</code> parameter.

Example.

Run titles database update on Macro 1.

```
OnEvent("MACRO", "1", "RUN")
{
  DoReact("CAM_TITLE", "2", "REINDEX");
}
```

### 9.7.33 CAM\_FACECAPTURE

The **CAM\_FACECAPTURE** object corresponds to the **Face Detection** system object.

The **CAM\_FACECAPTURE** object sends the events presented in the table below. The procedure is started when the corresponding event appears. The event procedure format for the **CAM\_FACECAPTURE** object:

```
OnEvent("CAM_FACECAPTURE", "_id_", "_event_")
```

Description of events from the **CAM\_FACECAPTURE** object:

Events	Events description
FACE_DETECTED	Face is captured
FACE_LEAVE	Face is lost

The operator format for describing the actions with the Face Detection is:

```
DoReact("CAM_FACECAPTURE", "_id_", "_command_" [, "_parameters_"]);
```

The list of parameters for the **CAM\_FACECAPTURE** object is presented in the table below.

Parameters	Parameters description
owner	The name of the server where the face was captured/lost
fraction	The millisecond when the face was captured/lost
module	The module where the face is captured
date	The date when the face was captured/lost

Parameters	Parameters description
guid_pk	The event ID (generated randomly for each event)
core_global	Distribute to all cores (notify all)
guid	The captured/lost face ID (generated randomly for each event)
time	The time when the face was captured/lost
param0	Same as <b>guid</b> . Used to display the information in the "Add. info" column of the Event viewer

### 9.7.34 IPSTORAGE

The **IPSTORAGE** object corresponds to the **Edge storage** system object.

The operator format for describing the actions with the Failover is:

```
DoReact("IPSTORAGE", "_id_", "_command_" [, "_parameters_"]);
```

The list of parameters for the **IPSTORAGE** object is presented in the table below.

Command – description	Parameter	Parameter description	Comment
IMPORT – import missing Edge storage archive for the period	cam<>	Camera ID	The command can be applied if automatic <a href="#">import for the Edge storage</a> was not successful for some reason. <i>Note. If import is performed at the time of sending the reaction, the command will not be executed. To abort the current import task, first send the UPDATE_TIME command</i>
	datetime_from<>	Date and time to start import from in the following format: <DD-MM-YY HH:MM:SS>	
	datetime_to<>	Date and time to end import on in the following format: <DD-MM-YY HH:MM:SS>	
UPDATE_TIME – stop synchronization and set the time of the last import from external storage in the Settings.xml file	cam<>	Camera ID	The command is used to stop the current import task and execute the IMPORT command to synchronize the specified archive period
	datetime<>	Date and time of the last synchronization to be set in the Settings.xml file	

#### Example.

Import archive from the camera 45 Edge storage for the period from 11-01-19 16:00:55 to 11-01-19 17:00:55 by Macro 10.

```
OnEvent("MACRO", "10", "RUN")
{
```

```
DoReact("IPSTORAGE", "1", "IMPORT", "cam<45>,datetime_from<11-01-19
16:00:55>,datetime_to<11-01-19 17:00:55>");
}
```

### 9.7.35 TELEGRAM

The **TELEGRAM** object corresponds to the **Telegram bot** system object.

The **TELEGRAM** object sends events presented in the table. The procedure is started when the corresponding event occurs. The format of the event procedure for a mail message.

```
OnEvent("TELEGRAM","_id_", "_event_")
```

Event	Description	Comment
ERROR	Message sending error	The error<> parameter contains the test description of the error

The format of the operator to describe actions with a mail message:

```
DoReact("TELEGRAM","_id_", "_command_" [, "_parameters_"]);
```

The list of commands and parameters for the **TELEGRAM** object is given in the table:

Command – command description	Parameters	Description
SEND – send	text<>	Message text
	chat_id<>	Chat identifier
	bot_id<>	Bot identifier
	longitude<>	Geolocation longitude
	latitude<>	Geolocation latitude
	address<>	Geolocation text address
SENDPHOTO – send photo	photo<>	Full path to the image file
	caption<>	File caption
	chat_id<>	Chat identifier
	bot_id<>	Bot identifier
	longitude<>	Geolocation longitude

Command – command description	Parameters	Description
	latitude<>	Geolocation latitude
	address<>	Geolocation text address

Examples of calling the command for sending a message to Telegram using a macro:

```
OnEvent("MACRO","3","RUN") //run macro 3
{
  //Sending with chat_id & bot_id from object settings:
  DoReact("TELEGRAM",1,"SEND","text<Hello world>");

  //Explicit setting chat_id & bot_id in the command:
  DoReact("TELEGRAM",1,"SEND","text<Hello
world>,chat_id<828752651>,bot_id<809045046:AAGtKxtDWu5teRGKW_Li8wFBQuJ-
l4A9h38>");

  //Sending file with chat ID and bot ID:
  DoReact("TELEGRAM",1,"SENDPHOTO","caption<Hello
world>,chat_id<828752651>,bot_id<809045046:AAGtKxtDWu5teRGKW_Li8wFBQuJ-
l4A9h38>,photo<G:\\1.jpg>");

  //Sending geolocation with chat ID and bot ID:
  DoReact("TELEGRAM",1,"SEND","text<Hello
world>,chat_id<828752651>,bot_id<809045046:AAGtKxtDWu5teRGKW_Li8wFBQuJ-
l4A9h38>","longitude<37.3428359>,latitude<55.6841654>,address<First_street>");
}
```

### 9.7.36 BACNET

The **BACNET** object corresponds to the **BacNet** system object.

The **BACNET** object generates events listed in the table below. Procedures start when the corresponding event occurs. The format of the event procedure for the **BacNet** object:

```
OnEvent("BACNET","_id_", "_event_")
```

**BACNET** object events description:

Event	Description
ERROR	Error message received
EVENT_OCCURES	Message acknowledgment
WRITE_OCCURES	Recording confirmation
WRITE_RESULT	Recording result

Operator format for describing actions with the **BacNet** object :

```
DoReact("BACNET", "_id_", "_command_" [, "_parameters_"]);
```

The list of commands and parameters for the **BACNET** object is presented in the table.

Command – description	Parameters	Parameters description
WRITE – send value to BACnet device	bacnet_application_tag<>	Data type. Possible values: NULL = 0 BOOLEAN = 1 UNSIGNED INT = 2 SIGNED INT = 3 REAL = 4 DOUBLE = 5 OCTET STRING = 6 CHARACTER STRING = 7 BIT STRING = 8
	bacnet_value<>	Parameter value
	bacnet_object_type<>	Object type: ANALOG INPUT = 0 ANALOG OUTPUT = 1 ANALOG VALUE = 2 BINARY INPUT = 3 BINARY OUTPUT = 4 BINARY VALUE = 5
	bacnet_instance<>	BACnet unique global device identifier
	bacnet_property_id<>	Property id
	bacnet_device_id<>	BACnet device id in the system
EVENT – send message to BACnet device	event_type<>	Event type
	from_state<>	Change state from
	to_state<>	Change state to

	message_text<>	Event text
--	----------------	------------

## Examples

The examples code is given in JScript, see [Programming Guide \(JScript\)](#)

### Write to an object using a script

```
var msg = CreateMsg();

//bacnet_application_tag
var BACNET_APPLICATION_TAG_NULL = 0;
var BACNET_APPLICATION_TAG_BOOLEAN = 1;
var BACNET_APPLICATION_TAG_UNSIGNED_INT = 2;
var BACNET_APPLICATION_TAG_SIGNED_INT = 3;
var BACNET_APPLICATION_TAG_REAL = 4;
var BACNET_APPLICATION_TAG_DOUBLE = 5;
var BACNET_APPLICATION_TAG_OCTET_STRING = 6;
var BACNET_APPLICATION_TAG_CHARACTER_STRING = 7;
var BACNET_APPLICATION_TAG_BIT_STRING = 8;

//bacnet_objtype
var OBJECT_ANALOG_INPUT = 0;
var OBJECT_ANALOG_OUTPUT = 1;
var OBJECT_ANALOG_VALUE = 2;
var OBJECT_BINARY_INPUT = 3;
var OBJECT_BINARY_OUTPUT = 4;
var OBJECT_BINARY_VALUE = 5;

//bacnet_property_id
var PROP_PRESENT_VALUE = 85;

msg.StringToMsg("BACNETINT|1|WRITE");
msg.SetParam("bacnet_application_tag", BACNET_APPLICATION_TAG_UNSIGNED_INT);
msg.SetParam("bacnet_value", 30);

msg.SetParam("bacnet_objtype", OBJECT_ANALOG_VALUE);
msg.SetParam("bacnet_instance", 0);

msg.SetParam("bacnet_property_id", PROP_PRESENT_VALUE);
msg.SetParam("bacnet_device_id", 12345);

DoReact(msg);
```

In case of successful script execution, an event will appear in the Debug window

```
Event : BACNETINT|1|WRITE_OCCURES|
sender<Udp:47808>,slave_id<ASUS>,fraction<186>,invoke_id<43>,owner<ASUS>,module<bacnetint.vshost.exe>,date<27-11-18>,value<PROP_PRESENT_VALUE>,guid_pk<{E23BD6CB-19F2-E811-8B83-C860008A29F9}>,object_id<OBJECT_ANALOG_VALUE:0>,core_global<1>,adr<192.168.0.197:56747>,time<10:55:33>,source_guid<557367ce-19f2-e811-8b83-c860008a29f9>
```

**Generate event**

```

DebugLogString("Script2");
var msg = CreateMsg();

msg.StringToMsg("BACNETINT|1|EVENT");

msg.SetParam("event_type", "0");
msg.SetParam("from_state", "1");
msg.SetParam("to_state", "0");

msg.SetParam("message_text", "test_text1!");

DoReact(msg);

```

If the module receives an event, the following event will be displayed in the Debug window:

```

Event : BACNETINT|1|EVENT_OCCURES|
sender<Udp:47808>,slave_id<ASUS>,fraction<683>,owner<ASUS>,event_type<EVENT_CHANGE_OF_BITSTRING>,m
odule<bacnetint.vshost.exe>,message_text<test_text1!>,date<27-11-18>,guid_pk<{6D34BA08-1CF2-E811-8B83-
C860008A29F9}>
>,from_state<EVENT_STATE_FAULT>,core_global<1>,adr<192.168.0.197:57878>,to_state<EVENT_STATE_NORMAL>
,time<11:11:34>,source_guid<bd51a40d-1cf2-e811-8b83-c860008a29f9>

```

**Read indicators from an object**

```

var msg = CreateMsg();

//bacnet_application_tag
var BACNET_APPLICATION_TAG_NULL = 0;
var BACNET_APPLICATION_TAG_BOOLEAN = 1;
var BACNET_APPLICATION_TAG_UNSIGNED_INT = 2;
var BACNET_APPLICATION_TAG_SIGNED_INT = 3;
var BACNET_APPLICATION_TAG_REAL = 4;
var BACNET_APPLICATION_TAG_DOUBLE = 5;
var BACNET_APPLICATION_TAG_OCTET_STRING = 6;
var BACNET_APPLICATION_TAG_CHARACTER_STRING = 7;
var BACNET_APPLICATION_TAG_BIT_STRING = 8;

//bacnet_objtype
var OBJECT_ANALOG_INPUT = 0;
var OBJECT_ANALOG_OUTPUT = 1;
var OBJECT_ANALOG_VALUE = 2;
var OBJECT_BINARY_INPUT = 3;
var OBJECT_BINARY_OUTPUT = 4;
var OBJECT_BINARY_VALUE = 5;
var OBJECT_CHARACTERSTRING_VALUE = 40;

//bacnet_property_id
var PROP_PRESENT_VALUE = 85;

```

```
msg.StringToMsg("BACNETINT|1|READ");

msg.SetParam("bacnet_objtype",OBJECT_ANALOG_INPUT);
msg.SetParam("bacnet_instance",0);
msg.SetParam("bacnet_property_id",PROP_PRESENT_VALUE);
msg.SetParam("bacnet_device_id",123456);
DoReact(msg);
```

In case of successful reading, the following event will be displayed in the Debug window:

```
Event :
BACNETINT|1|READ_RESULT|
slave_id<example>,fraction<387>,owner<example>,module<bacnetint.run>,date<10-11-
21>,
guid_pk<{622928D6-3349-EC11-96F2-309C23D50163}
>,core_global<1>,bacnet_value<20,8>,
time<15:26:03>,param0<ok>,source_guid<e8f7ded1-3349-ec11-96f2-309c23d50163>
```

### 9.7.37 CAM\_IP\_DETECTOR

The **CAM\_IP\_DETECTOR** object corresponds to the **Embedded detector** system object.

The **CAM\_IP\_DETECTOR** object sends events given in the table. Procedure is started when the corresponding event occurs.

Format of the event procedure for the **Embedded detector** object:

```
OnEvent("CAM_IP_DETECTOR","_id","_event_")
```

Description of events of the **CAM\_IP\_DETECTOR** object.

Event	Events description	Comment
DETECTED	Event	<p>The event occurs when metadata is received from an embedded detection tool. For example, this event occurs when receiving the data on body temperature from a thermal camera, etc.</p> <p>The event also occurs if the data from detection tools is transferred using Onvif.</p> <p>The param0&lt;&gt; parameter has a string value containing the event parameters. The transferred parameters depend on the embedded detection tool. If you use Onvif, you can configure the contents of the parameter on the <b>Event settings</b> tab of the <b>ONVIF-Server</b> object (see <a href="#">Filtering the ONVIF-Server events</a>)</p>

Examples of events from the embedded detection tools:

```
Example 1

// Event from a thermal camera
Event : CAM_IP_DETECTOR|1|DETECTED|slave_id<QA-T51>,
fraction<16>,owner<QA-T51>,module<video.run>,date<23-04-20>,
```

```

guid_pk<{1345DC60-3485-EA11-8A95-B06EBF8119EF}>,core_global<1>,time<10:31:06>,
param0<TargetList:name=TargetList;type=6;TemperatureValue0:37.4;json0:{
  "BeginTime" : "20200423T073058.000000",
  "EndTime" : "20200423T073100.000000",
  "EventClass" : "FaceEvent",
  "Hypotheses" : [
    {
      "Age" : 0,
      "BestTime" : "20200423T073059.000000",
      "Gender" : "unknown",
      "Rectangle" : [ 0.6380, 0.550, 0.0680, 0.1560 ],
      "TemperatureValue" : 37.40
    }
  ],
  "Id" : 1
}
;>

```

### Example 2

```

// Event from VMDA detection
Event:CAM_IP_DETECTOR|1|DETECTED|param0<Comment:ver_type<0>,objtype<SLAVE>,int_obj_id
<1>,module<video.run>,
core_global<1>,_TRANSPORT_ID<>,time<12:22:30>,objaction<PING>,onvif_event<>,
date<30-03-21>,slave_id<DESKTOP-JHRURJJ>,
objid<DESKTOP-JHRURJJ>;>,int_obj_id<1>,core_global<1>,
guid_pk<{9A989C70-3991-EB11-BDFF-00155DF96D00}>,slave_id<DESKTOP-339SH3U>,time<12:22:3
0>,_timestamp<7520749>,
fraction<465>,date<30-03-21>,owner<DESKTOP-339SH3U>,module<video.run>

```

## 9.7.38 SIP\_TERMINAL

The **SIP\_TERMINAL** object corresponds to the **SIP-terminal** system object.

The **SIP\_TERMINAL** object sends events given in the table. Procedure is started when the corresponding event occurs. Format of the event procedure for the **SIP-terminal** object:

```
OnEvent("SIP_TERMINAL","_id","_event_")
```

Description of events of the **SIP\_TERMINAL** object:

Event	Description	Contents of the param0<> parameter displayed in the Add. info field in the Event Viewer
CALL_EN D	Call end	Number of the subscriber who called

Event	Description	Contents of the param0<> parameter displayed in the Add. info field in the Event Viewer
CALL_EN D_OPERA TOR	Operator call end	Numbers of the subscribers and call duration. For example, if the parameter takes the "903 to 906 (01:04)" value, it means that the subscriber 903 called the subscriber 906, and the call lasted 1 minute and 4 seconds
CALL_EN D_DEVICE	Device call end	
CALL_EN D_VIRTU AL	Special number call end	
CALL_BE GIN	Call start	Numbers of the subscribers: the subscriber who is calling and the subscriber who is being called
CALL_TRY ING	Call attempt	
CALL_BE GIN_VIRT UAL	Start of special number call	
CALL_TRY ING_VIRT UAL	Special number call attempt	

Operator format to describe actions with the SIP-terminal is as follows:

```
DoReact("SIP_TERMINAL", "_id_", "_command_" [, "_parameters_"]);
```

List of commands and parameters for the SIP\_TERMINAL object:

Command—command description	Parameters	Parameters description
END_ALL_CALLS—end all calls on the specified terminal (regardless of whether the connection is established)	-	-

### 9.7.39 INC\_MANAGER

The INC\_MANAGER object corresponds to the **Incident manager** system object.

The INC\_MANAGER object sends events given in the table. Procedures are started when the corresponding event occurs. Format of event procedure for the **Incident manager** object:

```
OnEvent("INC_MANAGER", "_id_", "_event_")
```

Events	Event description	Parameters	Parameter description	Comment
CLOSE_CLICK	Click the <b>Close</b> button in the interface			The event is generated when an incident is closed without being processed by the operator in the <b>Incident manager</b> interface
CLOSE_ALL_CLICK	Click the <b>Close all</b> button in the interface			The event is generated when all incidents are closed without being processed by the operator in the <b>Incident manager</b> interface
SELECT	Click an incident in the interface			The event is generated if the operator left-clicks or right-clicks on the incident in the <b>Incident manager</b> interface
ACTIVATE_EVENT	The operator selected the event (click the event with the mouse)	alarm_time<>	Time when the event occurred	
		event_guid<>	Event ID (generated randomly for each event)	
		objtype<>	Object type (e.g., CAM, GRELE, etc.)	
		action<>	Action type (e.g., MD_START, DISARM, etc.)	

### 9.7.40 INC\_SERVER

The INC\_SERVER object corresponds to the **Incident server** system object.

The INC\_SERVER object sends events presented in the table. The procedure is started when the corresponding event occurs. The format of the event procedure for the **Incident server** object:

```
OnEvent("INC_SERVER", "_id_", "_event_")
```

Events	Events description	Comment
EVENT	The event (incident) is taken into processing in the <b>Incident manager</b> or is being processed by the operator	The event is generated: <ol style="list-style-type: none"> <li>1) when the operator takes the event into processing;</li> <li>2) at each step of the event processing.</li> </ol> The <b>serializeBase64</b> parameter of the event contains JSON with the detailed information about the processed event, including the steps performed by the operator

The operator format for describing the actions with the **Incident server** object:

```
DoReact("INC_SERVER", "_id_", "_command_" [, "_parameters_"]);
```

The list of commands and parameters for the INC\_SERVER object is presented in the table.

Command—description of the command	Parameters	Parameters description	Comment
UPDATE_STATUS—change the status of the event (incident) in the <b>Incident manager</b>	pks<>	Array of event identifiers	Parameters are filters and the presence of at least one parameter is mandatory.  Parameter values can be specified with a delimiter. This means that one OR the other value will be selected.  Example: objids<1 2>
	objtypes<>	Objects types	
	objids<>	Objects identifiers	
	actions<>	Actions	
	status<>	Event status: 0—Waiting to be processed 1—Processing 2—Suspended 3—Completed	
UPDATE_ESCALATE_STATUS—change the status of the event (incident) escalation in the <b>Incident manager</b>	escalated<>	Event escalation status: 0—Waiting to be processed (not escalated) 1—Escalated	
		pks<>, objtypes<>, objids<>, actions<> are the same as for UPDATE_STATUS	

Example 1. On macro 1, change the status of the camera 1 Alarm event to Completed.

```
OnEvent("MACRO","1","RUN")
{
    DoReactStr("INC_SERVER","1","UPDATE_STATUS","status<3>,objtypes<CAM>,objids<1>,actions<MD_START>");
}
```

Example 2. On macro 2, on the Incident server 2 change the escalation status of the camera 1 events to Waiting to be processed (not escalated)

```
if (Event.SourceType == "MACRO" && Event.SourceId == 2 && Event.Action == "RUN")
{
    DoReactStr("INC_SERVER","1","UPDATE_ESCALATE_STATUS",
"escalated<0>,objtypes<CAM>,objids<1>");
}
```


## 10 Appendix 1. Priorities of start and stop recording commands

Start and stop recording commands can have different priorities in *Axxon PSIM*. The priority of start/stop recording commands is set by the `priority<0>` parameter of the REC and REC\_STOP reactions. If you try to stop recording using the command with the priority that is lower than one of the command that initiated recording, then this command will be ignored.

When recording is started/stopped manually or by macro or by the detection tool triggering, the priority is not set. The table shows the behavior of *Axxon PSIM* when various ways to start/stop recording are in use.

Start/stop recording 1	Start/stop recording 2	Behavior
Initiated by the operator using the camera context menu (start/stop recording) or by macro	Start recording at CAM 1 REC  reaction, stop recording at CAM 1 REC_STOP  reaction	The start/stop recording commands 1 and 2 are equal*
Start/stop recording is initiated by the operator using the camera context menu (start/stop recording) or by macro	Start recording at CAM 1 REC  priority<0> reaction, stop recording at CAM 1 REC_STOP  priority<0> reaction	The stop recording command 1 stops recording started using command 2
Start/stop recording is initiated by the operator using the camera context menu (start/stop recording) or by macro	Start recording at CAM 1 REC  priority<1> reaction, stop recording at CAM 1 REC_STOP  priority<1> reaction	The stop recording command 1 stops recording started using command 2
Start/stop recording is initiated by the operator using the camera context menu (start/stop recording) or by macro	Start recording at CAM 1 REC  priority<2> reaction, stop recording at CAM 1 REC_STOP  priority<2> reaction	The start/stop recording commands 1 and 2 are equal*
Start/stop recording is initiated by the operator using the camera context menu (start/stop recording) or by macro	Start/stop recording is initiated by the detection tool (for example, main motion detection tool)	The stop recording command 1 stops recording started using command 2
Start recording at CAM 1 REC  priority<0> reaction, stop recording at CAM 1 REC_STOP  priority<0> reaction	Start/stop recording is initiated by the detection tool (for example, main motion detection tool)	The stop recording command 2 stops recording started using command 1

<p>Start recording at CAM 1 REC priority&lt;1&gt; reaction, stop recording at CAM 1 REC_STOP priority&lt;1&gt; reaction</p>	<p>Start/stop recording is initiated by the detection tool (for example, main motion detection tool)</p>	<p>The following variants are possible:</p> <ol style="list-style-type: none"> <li>1. If a camera is armed, the CAM 1 REC priority&lt;1&gt; command starts recording and the alarm on the camera begins, then recording continues after the alarm has ended. The CAM 1 REC_STOP priority&lt;1&gt; command stops recording.</li> <li>2. If a camera is armed, an alarm is initiated on the camera and the CAM 1 REC priority&lt;1&gt; command is sent, then recording continues after the alarm has ended. The CAM 1 REC_STOP priority&lt;1&gt; command stops recording.</li> <li>3. If a camera is armed, an alarm is initiated on the camera and the CAM 1 REC_STOP priority&lt;1&gt; command is sent, then recording continues and it stops when the alarm has ended</li> <li>4. If a camera is armed and the CAM 1 REC priority&lt;1&gt; command is sent, the recording is started. If an alarm is initiated and the CAM 1 REC_STOP priority&lt;1&gt; command is sent, then recording continues</li> </ol>
<p>Start recording at CAM 1 REC priority&lt;2&gt; reaction, stop recording at CAM 1 REC_STOP priority&lt;2&gt; reaction</p>	<p>Start/stop recording is initiated by the detection tool (for example, main motion detection tool)</p>	<p>The stop recording command 1 stops recording started using command 2</p>

 \* Equivalence of ways means that recording can be stopped using way 1 if it was started using way 2 and vice versa if the recording is started using way 1, then it is possible to stop recording using way 2.

## 11 Appendix 2. Defining param\_id and param\_value values for SET\_IPINT\_PARAM reaction

The values of **param\_id** and **param\_value** parameters, required for SET\_IPINT\_PARAM reaction, can be individual both for each of integrated IP cameras and for their firmwares.

The values of **param\_id** and **param\_value** are defined as follows:

1. Open **C:\Program Files\Common Files\AxxonSoft\Ipint.DriverPack\3.0.0\**.
2. Using any word processor open a file with the **Ipint.<Name of camera driver>.rep** name, for instance Ipint.SonyIpele.rep.

**Note.**

In most cases, the name of driver is the same as the name of the vendor of IP device. Contact AxxonSoft support team in order to obtain more specific information about the driver name.

3. In the file find the name of required model, for instance SNC-DH120T.

```

<model>
  <brand>Sony</brand>
  <name>SNC-DH120T</name>
  <firmware>1.12.03</firmware>
  <firmware>1.74.01</firmware>
  <firmware>1.75.00</firmware>
</model>
<credentialsRef id="creds"/>
<videoSourceRef id="video_source_dh160">
  <videoStreamingRef id="vs-5generation-megapixel-tvStandard" default="true"/>
  <videoStreamingRef id="vs-5generation-secondary-ch120"/>
  <detectorRef id="sony-detector-area-1280x1024" maxCount="1"/>
  <detectorRef id="sony-detector-tamper" maxCount="1"/>
</videoSourceRef>
<telemetryRef id="telemetry_5g"/>
<iodevRef id="iodev-sony-1ray-1relay"/>
</device>

```

4. There is the **<videoSourceRef>** tag within the **<device>** tag that contains the description of the required model like in the **<model>** tag. One more occurrence of the **id** value of this parameter is to be found in the

file (in this example this is video\_source\_dh160 value) in the **videoSource** tag.

```
<videoSource id="video_source_dh160">
  <property id="brightness" xsi:type="PropertyIntRangeType">
    <value>
      <min>0</min>
      <max>10</max>
      <default>5</default>
    </value>
  </property>
  <property id="sharpness" xsi:type="PropertyIntRangeType">
    <value>
      <min>0</min>
      <max>6</max>
      <default>3</default>
    </value>
  </property>
  <property id="saturation" xsi:type="PropertyIntRangeType">
    <value>
      <min>0</min>
      <max>6</max>
      <default>3</default>
    </value>
  </property>
  <property id="contrast" xsi:type="PropertyIntRangeType">
    <value>
      <min>0</min>
      <max>6</max>
      <default>3</default>
    </value>
  </property>
  <property id="monochrome" xsi:type="PropertyBoolType" default="false"/>
  <property id="daynight" xsi:type="PropertyStringEnumType">
    <value default="true">auto</value>
    <value name="night">on</value>
    <value name="day">off</value>
    <value name="timer">timer</value>
    <value name="sensor">sensor</value>
  </property>
  <property id="dayNightAutoThreshold" xsi:type="PropertyStringEnumType">
    <value name="high" default="true">high</value>
    <value name="low">low</value>
  </property>
</videoSource>
```

5. The parameters of IP device and their possible values are described in the **<property>** tags. The description of possible values depends on their type.

In this example the **param\_id="daynight"** parameter can be used to switch the **Day/Night** mode on the camera. In this case the possible values of the **param\_value** parameter are: auto, on, off, timer or sensor.

### **i** Example

Example of using SET\_IPINT\_PARAM reaction:

1. For **Camera** object:  
DoReact("CAM", "1", "SET\_IPINT\_PARAM", "param\_id<daynight>,param\_value<on>");
2. For **Video Capture Device** object:  
DoReact("GRABBER",  
"1", "SET\_IPINT\_PARAM", "param\_id<daynight>,param\_value<on>,cam\_id<1>");

As a result of reactions execution the value of the "daynight" parameter is "on" for Camera 1.

To enable SET\_IPINT\_PARAM reaction, the multistream mode is to be active – see [Configuration of multistream video](#) section of [Administartor's Guide](#). Keep in mind that if only one stream is integrated for the camera, then there will be no video in the multistream mode.

You can find out the number of integrated streams in the list of IP devices integrated with Axxon PSIM software (go to [Documentation Drivers Pack](#) page).

If this way can't be used for any reason, then find out the number of integrated streams as follows:

1. Repeat steps 1-3 of the previous algorithm.

```

<model>
  <brand>Sony</brand>
  <name>SNC-DH120T</name>
  <firmware>1.12.03</firmware>
  <firmware>1.74.01</firmware>
  <firmware>1.75.00</firmware>
</model>
<credentialsRef id="creds"/>
<videoSourceRef id="video_source_dh160">
  <videoStreamingRef id="vg-5generation-megapixel-tvStandard" default="true"/>
  <videoStreamingRef id="vg-5generation-secondary-ch120"/>
  <detectorRef id="sony-detector-area-1280x1024" maxCount="1"/>
  <detectorRef id="sony-detector-tamper" maxCount="1"/>
</videoSourceRef>
<telemetryRef id="telemetry_5g"/>
<iodevRef id="iodev-sony-1ray-1relay"/>
</device>

```

2. The required model is described within the <device> tag, integrated video streams are described in <videoStreamingRef> tags. There should be more than one stream.

## 12 Programming Guide. Conclusion

More detailed information on the Axxon PSIM software package is presented in the documents titled:

1. [Administrator's Guide](#);
2. [Operator's Guide](#);
3. [Installing and configuring security system components guide](#);
4. [Programming Guide \(JScript\)](#).

If you have faced difficulties and problems while operating the given software product, you are welcome to contact us. However, before addressing us, we kindly ask you to answer the following questions:

1. What is the problem?
2. When did the problem occur and what had happened before it occurrence?
3. Which conditions gave rise to the problem?

Remember, that the more detailed and precise information you give us, the faster our experts will resolve your problem.

We are striving to improve the quality of our products, and hence welcome any proposals and suggestions on how to improve our software and documentation.