Intellect Software Integration Guide (HTTP API, IIDK, ActiveX)

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Download DEMO module

1 Intellect Software Integration Guide. Introduction

This document provides the information needed for Intellect software interaction with external systems. Intellect software has the following interfaces for this:

1. IIDK Interface: intended for integration of functional modules that perform the following tasks:
    a. Adding new security hardware to the system.
    b. Implementing new service functions (security hardware management).

    The module integration steps are explained using a demonstration module, DEMO, as an example (its source code may be found in an appendix to the documentation).
    DEMO module can also be downloaded in section Intellect Software Integration Guide (HTTP API, IIDK, ActiveX) of the online documentation.
2. CamMonitor.ocx ActiveX Control: the component is similar in every way to the Video monitor interface object. It allows you to manage cameras, view the archive, etc.
3. HTTP API: the program interface allows to send commands and receive data from Intellect software by HTTP requests.
4. RabbitMQ: send and receive messages in *Intellect* using the RabbitMQ message broker.

2 Hardware and Software Module Integration

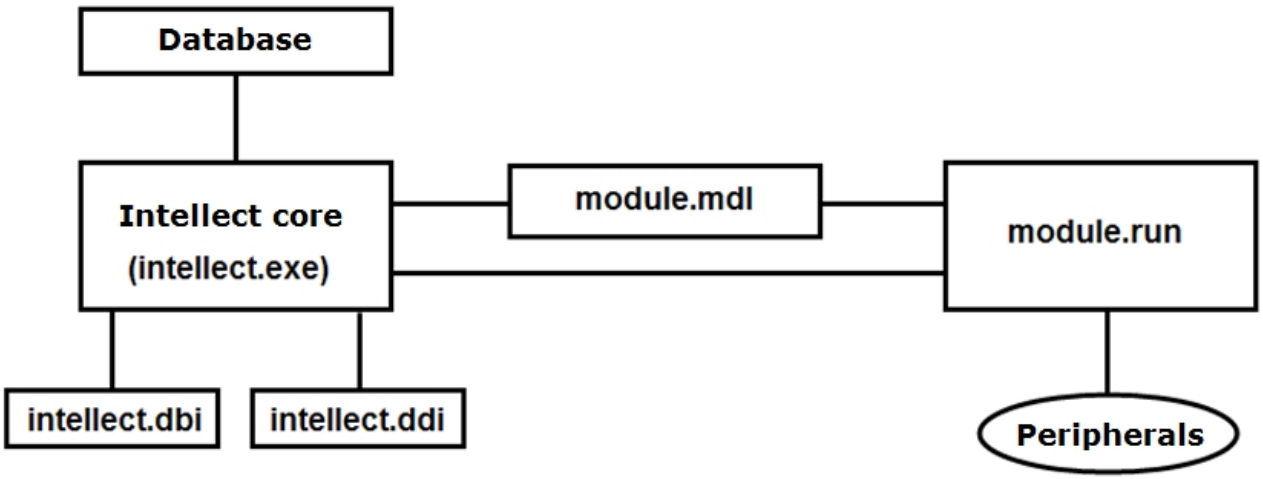
2.1 Integrating hardware and software modules with Intellect

2.1.1 General information on hardware and software modules integrating

To integrate a hardware and software (functional) module into Intellect, perform the following steps:

1. Edit the DBI file.
2. Edit the DDI file.
3. Prepare a module.mdl file, where “module” is the name of the module to be integrated (this file is a transformed DLL file).
4. Prepare an executable file, module.run, where “module” is the name of the module to be integrated (this file is a transformed EXE file).
5. Copy module.mdl and module.run to the *Intellect*|*Modules* folder.

Figure below shows a diagram of interaction between a functional module and the system core.



The DBI and DDI files contain information on the integrated functional modules (objects); this information is needed for the operation of the system core. The DBI file describes the structure of Intellect's configuration database. The DDI file describes the objects and their parameters. When an object is integrated, the name of the object, its parameters, and the related system events and reactions are added to these files.
The MDL file is used for working with one type of objects: it allows you to create, delete, and modify object parameters (during setup or operation), save them in the database, and perform several special operations. The MDL file also ensures that the parameters of created/modified objects are sent to the executable file (the RUN file), and contains the configurations of the object setup panels.

The executable RUN file interacts with devices, passes event information to the core, and enables device management.

In this document, we describe the steps for module integration by using the *DEMO* module, which emulates working with virtual hardware. This module includes devices with unique addresses for accessing and polling these devices. Thus the system includes a configuration consisting of 2 main objects: a parent object, **DEMO,** with the **COM port** parameter, and a child object, **DEMO_DEVICE**, with the **Address** parameter. The system allows you to perform a number of actions with devices and to pass all their events to the system core.

2.1.2 Editing the DBI file

The intellect.dbi file contains the master list of the tables and fields of the database. We recommend that you create your own database template in a separate file and name it intellect.xxx.dbi, where xxx is a unique sequence in the filename. By using a separate file, you avoid double inclusion of the tables and fields after an update to the Intellect software package. On startup of the software package, the DBI files are merged.

2.1.2.1 Adding Objects to Intellect.dbi

Objects are added to intellect.dbi as follows:

1. Go to *Intellect's* root folder and open the intellect.dbi file with a text editor.
2. Add the objects to intellect.dbi. For each object, you must supply its name (used for identification) in brackets and then declare its fields. Below is the field declaration syntax:
   <Field name>, <Type> [, <Size>]

   > **Note.**
   >
   > The **Size** may be set for fields of the CHAR type only.

   The table below shows the fields mandatory for all objects in *Intellect.*

Field	Description
id	Unique object ID
name	Object name
parent_id	Parent object ID
flags	Parameter for internal system use

   > **Attention!**
   >
   > The flags field may not be used by external applications.

   The following table describes the allowed data types.

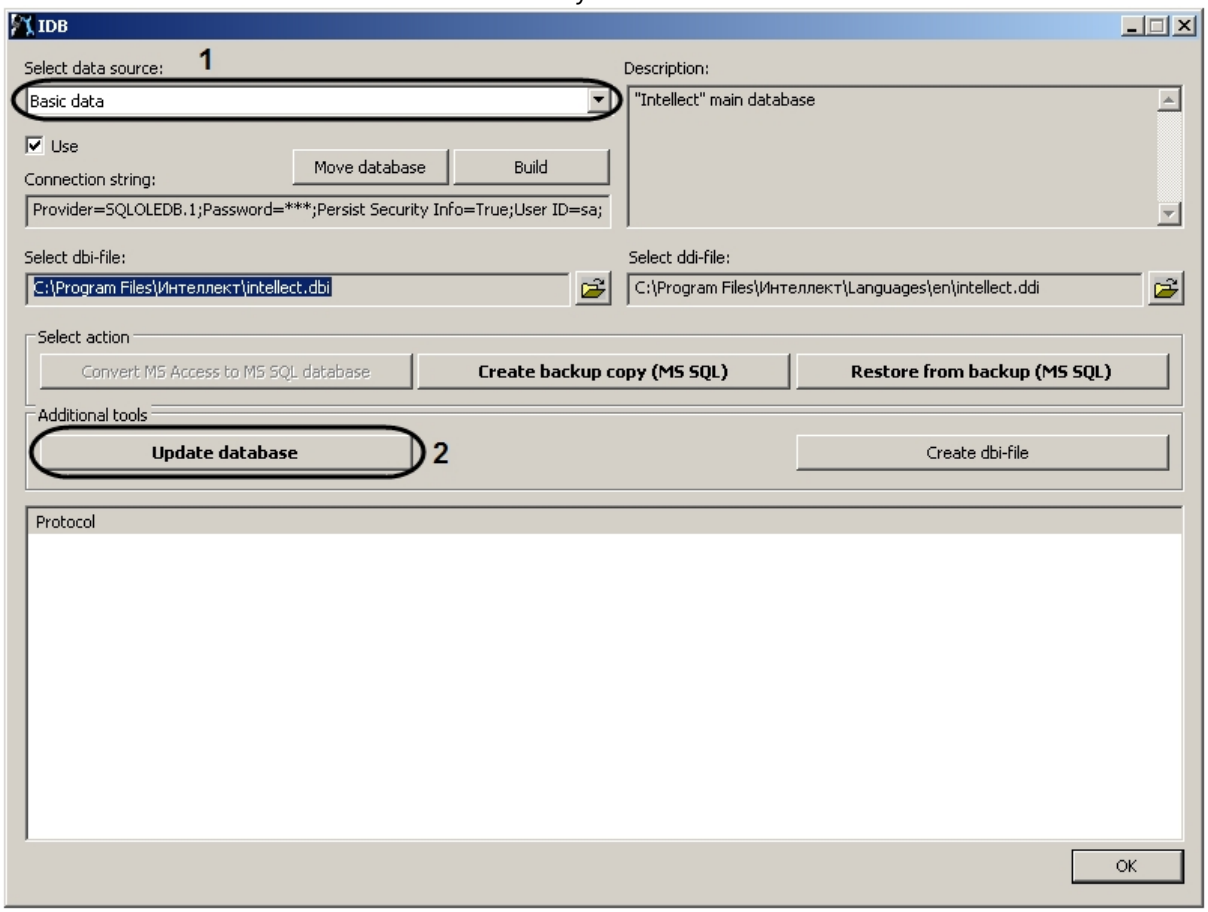
Data type	Description
BIT	Used for creating a flag field that takes a logical value, Yes or No.
CHAR	Used for fields that contain short character sequences.
DATETIME	Used for fields that contain dates and times. The date format is YYYY-MM-DD and the time format is HH:MM:SS.XXX.
DOUBLE	Used for fields that contain floating-point numbers.
INTEGER	Used for fields that contain integer numbers.
TEXT	Used for fields that contain text strings.

   Beside the mandatory fields, the objects of the DEMO module contain the following fields:
   a. **port** – COM port address;
   b. **address** – device address.

Figure below shows sample object additions and field declarations in intellect.dbi.

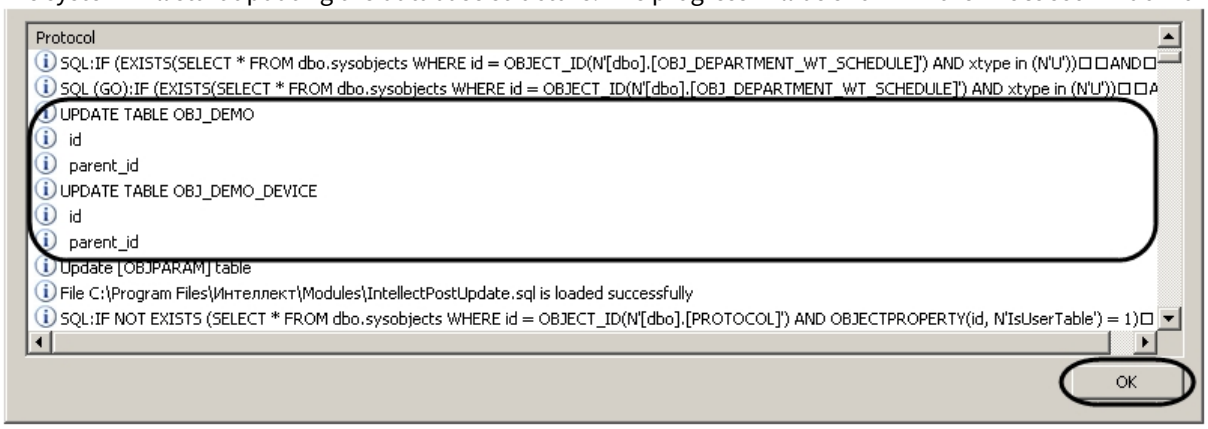
```
[OBJ_DEMO]
id, CHAR, 16
name, CHAR, 60
parent_id, CHAR, 16
flags, INTEGER
port, CHAR, 5

[OBJ_DEMO_DEVICE]
id, CHAR, 16
name, CHAR, 60
parent_id, CHAR, 16
flags, INTEGER
address, INTEGER
```

3. Save the changes to the intellect.dbi file.
4. Go to Intellect's root folder and run the idb.exe utility.



5. In the **Select data source** list, select **Basic data** (1).

6. Click the **Update database** button (2).
   The system will start updating the database structure. The progress will be shown in the **Protocol** window of idb.exe.



7. Click **OK** to close idb.exe.

As a result of the database structure update, tables are created in *Intellect's* configuration database.

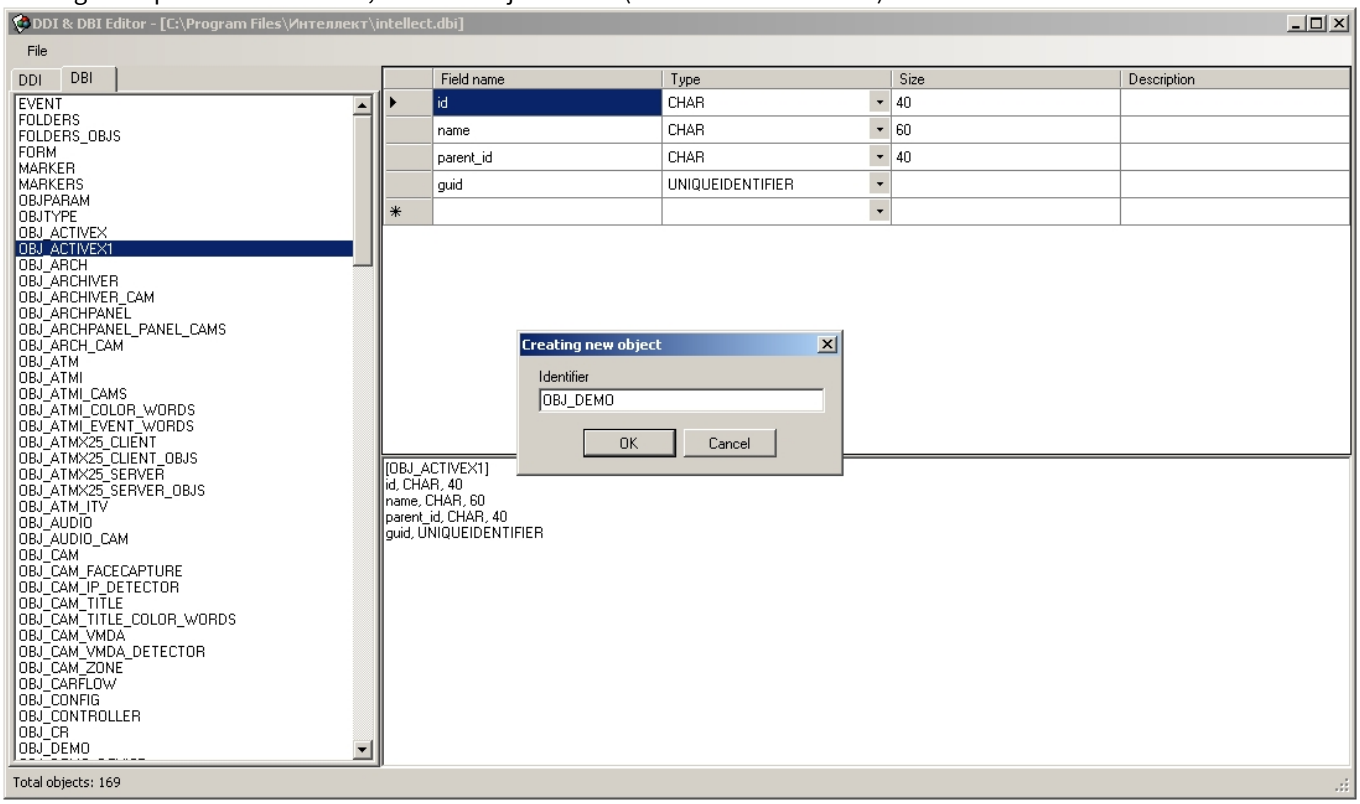
2.1.2.2 Using the ddi.exe Tool to Work with DBI files

To add an object to the DBI file by using the *ddi.exe* utility, do the following:

1. Go to the *Intellect|Tools* folder and run *ddi.exe*.
2. In the program window, select the **DBI** tab.
3. In the **File** menu, select **Open**. The **Open** dialog box appears.
4. Go to Intellect's root folder and select the intellect.dbi file. The *ddi.exe* window shows a list of objects.
5. To add the new object, in the list's context menu, select **Add**.

> **Note:**
>
> You may add a new object by pressing the **Insert** key as well.

6. A dialog box opens. In the **ID** field, enter an object name (used for identification) and click **OK.**

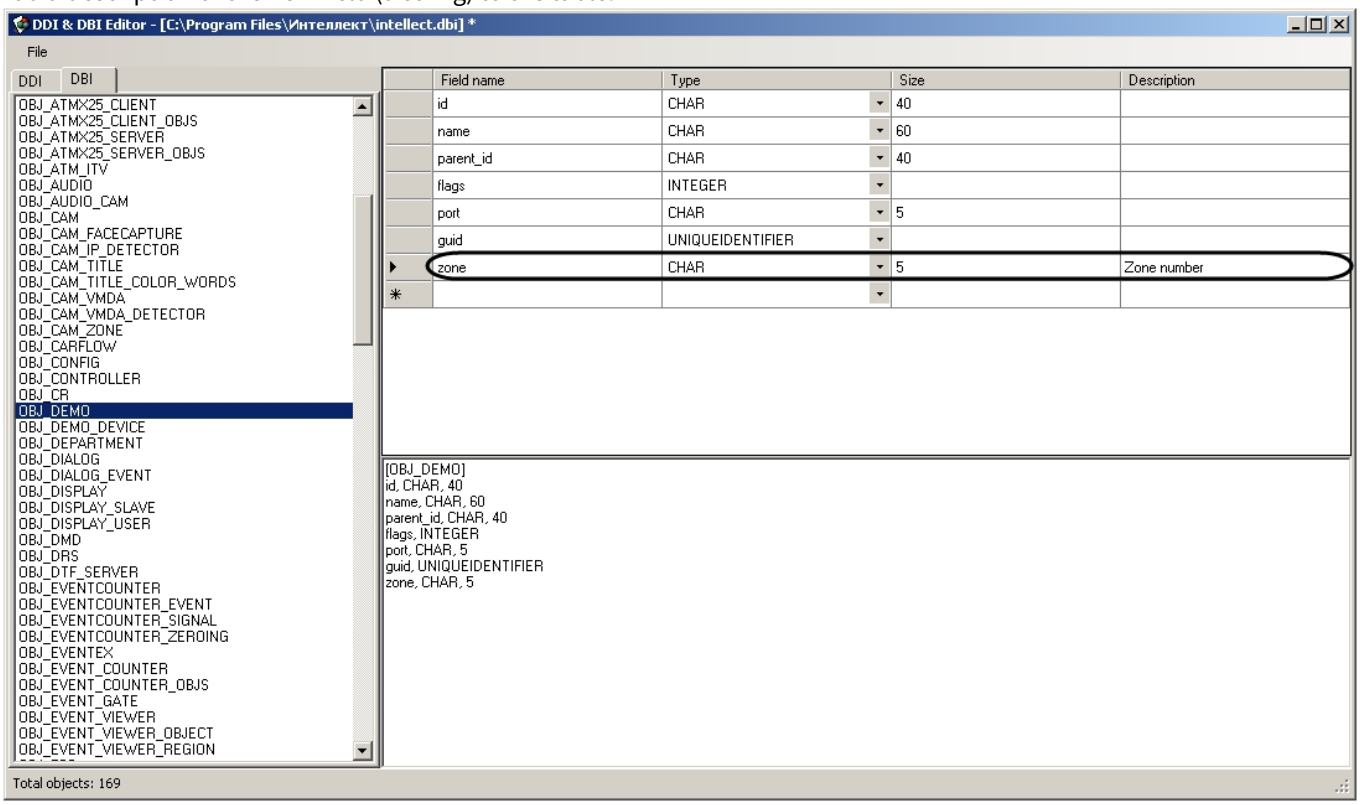


> **Note:**
>
> The mandatory fields are automatically added to the created object (see Section Adding Objects to Intellect.dbi).

The object has now been added to the DBI file.

To add a field:

1. In the left part of the *ddi.exe* window, select an object.
2. Add a description of the new field (a string) to the table.



3. To save the changes, in the **File** menu, select **Save.**

The new field is now added.

> **Attention!**
>
> After making changes to the DBI file, you must update the database structure by using idb.exe (see Adding Objects to Intellect.dbi).

2.1.3 Editing the DDI file

The DDI file is an XML file that contains the following object information:

1. Reactions (that is, actions that the objects may perform).
2. Events that the objects may generate.
3. States of the objects.
4. Event-driven rules for state transition.
5. The names of the BMP files that are used for visualizing the objects on the *Map*.

The intellect.ddi file contains the properties of Intellect's main objects. For your own objects, we recommend creating a separate file, intellect.xxx.ddi, where xxx is a unique part of the filename. By using a separate file, you avoid double inclusion of the properties after an update of the Intellect software package. On startup of the software package, the DDI files are merged.

If an object is duplicated in several ddi-files, then at Intellect software startup the properties of the object from the last file are applied in accordance with the sorting of files by name. For example, if an object is described in files intellect.xxx.ddi, intellect.xxx1.ddi and intellect.xxx2.ddi, the properties from the intellect.xxx2.ddi will be applied.

2.1.3.1 Adding Object Information to intellect.ddi

This section shows how to add information on the **DEMO** object to intellect.ddi by using a text editor.

To add information on the **DEMO** object, do the following:

1. Go to *Intellect*|*Languages*|en folder and open the intellect.dbi file with a text editor.
2. Into the **<DataSetDDI>** section, add a child element, **<Objects>**, which contains an object description.

```
<Objects>
  <ObjectName>DEMO</ObjectName>
  <VisibleName>Demo object</VisibleName>
  <GroupName></GroupName>

  <Events>
    <EventName>LOST</EventName>
    <EventDescription>Connection lost</EventDescription>
    <IsSoundEnabled>false</IsSoundEnabled>
    <IsNetworkDisabled>false</IsNetworkDisabled>
    <IsProtocolDisabled>false</IsProtocolDisabled>
    <IsWindowsLogEnabled>false</IsWindowsLogEnabled>
  </Events>
  <Events>
    <EventName>RESTORE</EventName>
    <EventDescription>Connection restored</EventDescription>
    <IsSoundEnabled>false</IsSoundEnabled>
    <IsNetworkDisabled>false</IsNetworkDisabled>
    <IsProtocolDisabled>false</IsProtocolDisabled>
    <IsWindowsLogEnabled>false</IsWindowsLogEnabled>
  </Events>
  <Icons>
    <FileName>demo</FileName>
    <IconName>demo</IconName>
  </Icons>
  <States>
    <StateName>DETACHED</StateName>
    <ImgName>detached</ImgName>
    <StateDescription>Armed</StateDescription>
    <IsStateFlashing>false</IsStateFlashing>
  </States>
  <States>
    <StateName>NORMAL</StateName>
    <ImgName>normal</ImgName>
    <StateDescription>Disarmed</StateDescription>
    <IsStateFlashing>false</IsStateFlashing>
  </States>
  <Rules>
    <EventName>RESTORE</EventName>
    <FromStateName>DETACHED</FromStateName>
    <ToStateName>NORMAL</ToStateName>
  </Rules>
  <Rules>
    <EventName>LOST</EventName>
    <FromStateName>NORMAL</FromStateName>
    <ToStateName>DETACHED</ToStateName>
  </Rules>
</Objects>
```

Note.

For the **DEMO** object, the <**Reacts**> sections is missing, because this object does not perform any actions.

> **Note.**
>
> The DDI file elements are described in detail in APPENDIX 1. DDI file structure.

3. Save the changes to the intellect.ddi file.

The information on the **DEMO** object has now been added to intellect.ddi.

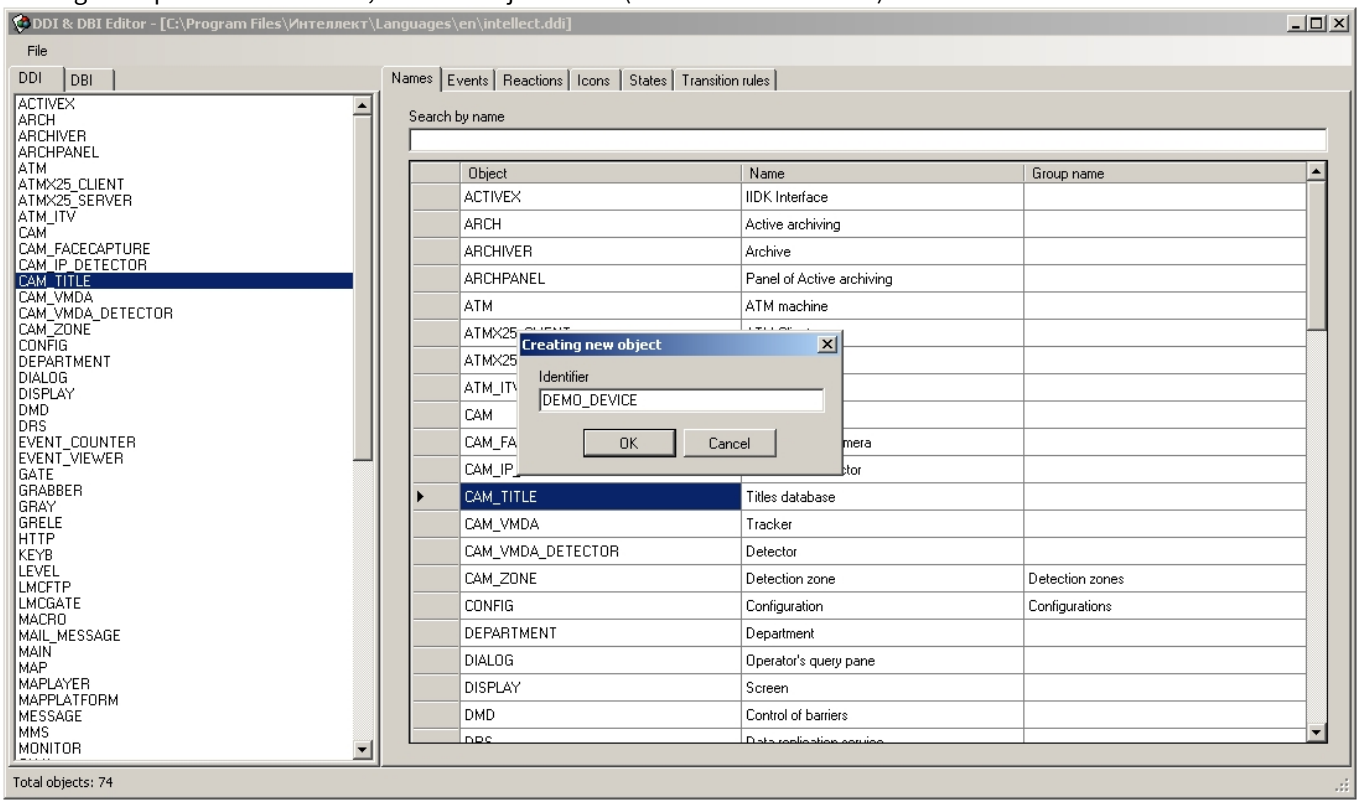
> **Attention!**
>
> After making changes to the DDI file, you must update the database structure by using idb.exe (see Steps 4–7 in Section Adding Objects to Intellect.dbi).

2.1.3.2 Using the ddi.exe Tool to Work with DDI files

This section shows how to add information on the **DEMO_SERVICE** object to intellect.ddi by using the *ddi.exe* tool.

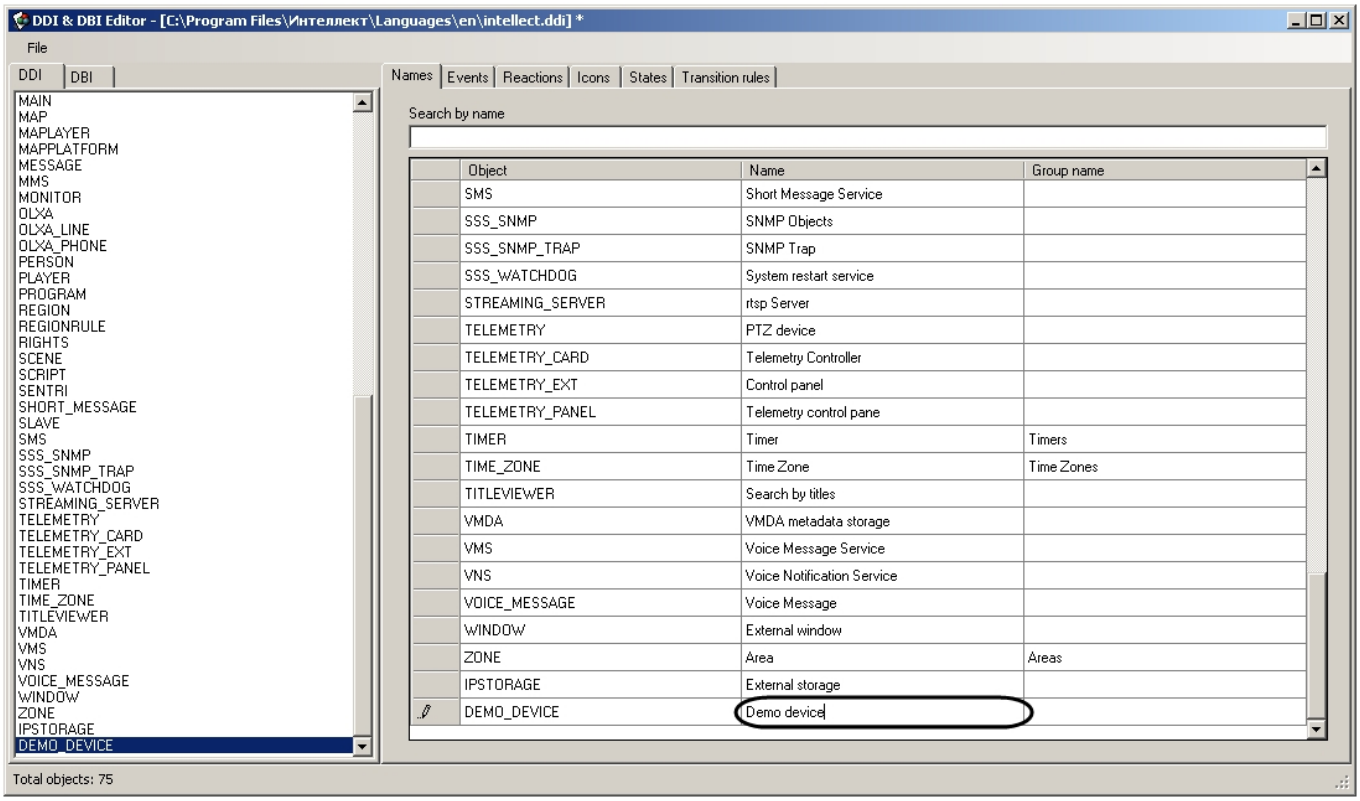
To add information on the **DEMO_DEVICE** object, do the following:

1. Open intellect.ddi file in one of the following ways:
   a. Go to the *Intellect*|*Tools* folder and run *ddi.exe*.
      i. In the program window, select the **DDI** tab.
      ii. In the **File** menu, select **Open**. The **Open** dialog box appears.
      iii. Go to the *Intellect*|*Languages*|en folder and select intellect.ddi. The window of *ddi.exe* shows a list of objects.
   b. Open the *Intellect*|*Tools* folder in Windows Explorer or any other file manager, then double-click the intellect.ddi file.
2. Add the object by selecting **Add** in the list's context menu or by pressing the **Insert** key.
3. A dialog box opens. In the **ID** field, enter an object name (used for identification) and click **OK**.

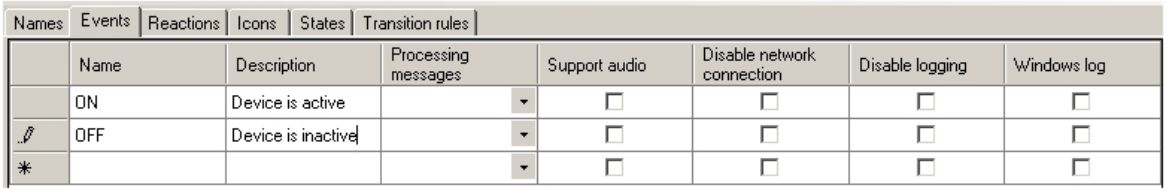


The DEMO_DEVICE object is now shown in the list of objects.

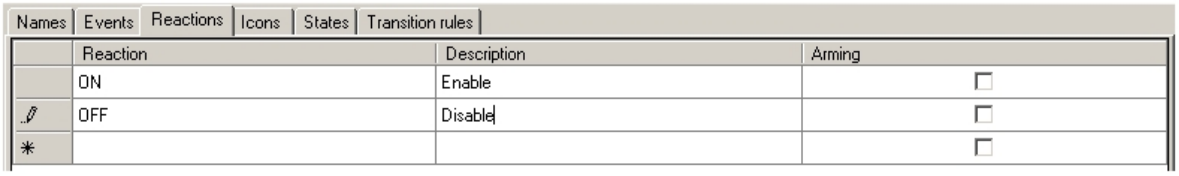
4. In the **Names** tab, enter an object name.



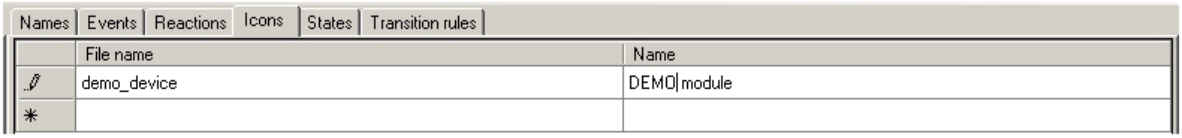
5. In the relevant tabs, add information on the DEMO_DEVICE object.
   a. In the **Events** tab, add the **ON** and **OFF** events.



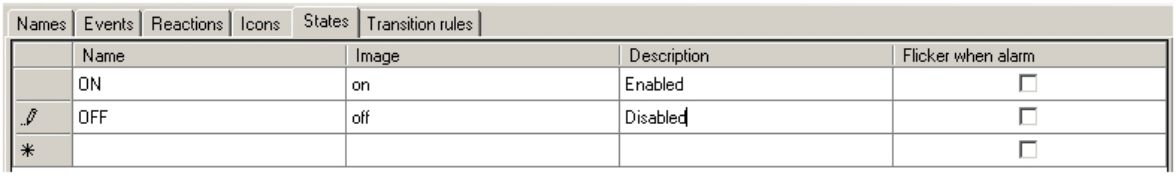
   b. In the **Reactions** tab, add the **ON** and **OFF** actions.



   c. In the **Icons** tab, enter a BMP file name (the part that serves as an image ID). Image IDs allow you to use multiple BMP files to show objects of the same type on the **Map.**



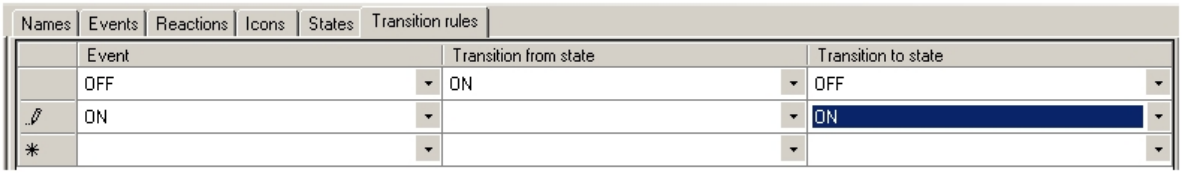
   d. In the **States** tab, add the **ON** and **OFF** states. To show an object state on the **Map,** enter a BMP file name (the part that serves as an ID of the state).



> **Note.**
>
> The names of the BMP files in the Intellect\Bmp folder must have the following format:
> <Image ID>_<State ID>
> If an image ID is not set, the BMP file name must be the following:
> <Object ID>_<State ID>

> **Note.**
>
> The Map may show objects using lines (that is, without using BMP files). In this case, when an object changes its state, the line color changes. For a state, the color (RGB) is set as follows:
> <State>$R:G:B

e. In the **Transition Rules** tab, set a rule for transitioning from one state to another after a certain event.



> **Note.**
>
> If the **Transition from state** field is left blank, the rule will apply to all starting states.

6. To save changes, in the **File** menu, select **Save.**

The information on the DEMO_DEVICE object is now added.

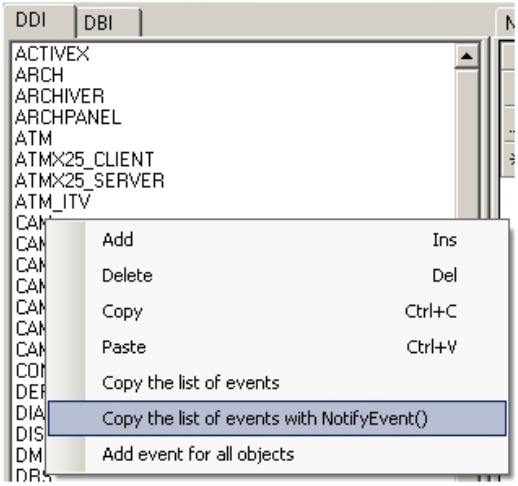
> **Note:**
>
> The fields of the ddi.exe tables are described in detail in APPENDIX 1. DDI file structure.

> **Attention!**
>
> After making changes to the DDI file, you must update the database structure by using idb.exe (see Steps 4–7 in Section Adding Objects to Intellect.dbi).

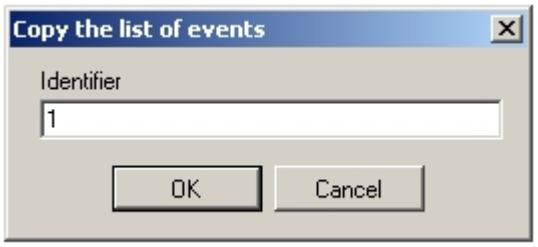
2.1.4 Additional Functionality of the ddi.exe Utility

The *ddi.exe* tool allows you to conveniently delete, add, and edit object properties (such as events and reactions), and copy them to the clipboard. In addition, you can copy object events to the clipboard, as a parameter of the *NotifyEvent* function. To do this, follow the steps below:

1. In the object list's context menu, select **Copy the list of events with NotifyEvent()**.



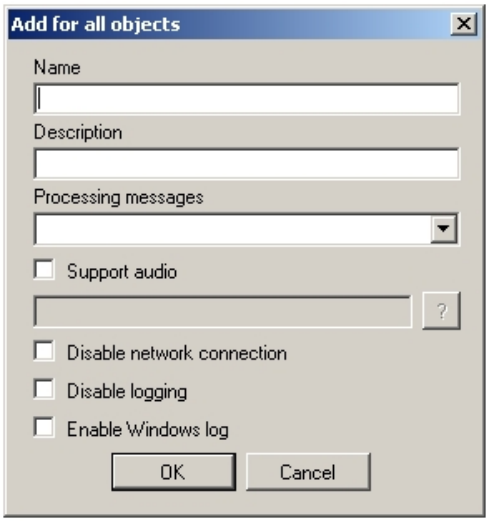
2. A dialog box opens. In the dialog box, enter the object ID to be used by the NotifyEvent function and click **OK.**



The event list is now copied. The clipboard contains object events in the format shown in the figure below.

```
NotifyEvent("CAM","1","ARM");
NotifyEvent("CAM","1","ATTACH");
NotifyEvent("CAM","1","BLINDING");
NotifyEvent("CAM","1","DETACH");
NotifyEvent("CAM","1","DISARM");
NotifyEvent("CAM","1","DISC_MOUNT");
NotifyEvent("CAM","1","DISC_UNMOUNT");
NotifyEvent("CAM","1","FILE_REC_ERROR");
NotifyEvent("CAM","1","MD_START");
NotifyEvent("CAM","1","MD_STOP");
NotifyEvent("CAM","1","PRINT");
NotifyEvent("CAM","1","REC");
NotifyEvent("CAM","1","REC_STOP");
NotifyEvent("CAM","1","RECORDER_OFF");
NotifyEvent("CAM","1","RECORDER_ON");
NotifyEvent("CAM","1","UNBLINDING");
```

To add an event for all objects, in the context menu, select **Add Event for All Objects**. The **Add for All Objects** dialog box opens. In the dialog box, specify the parameters of the new event.



To add objects from other DBI and DDI files, in the **File** menu, select **Insert from File**.

2.1.5 Creating MDL files

To create an MDL file, use two classes:

1. *NissObjectDLLExt*. All objects inherit from this class, whose virtual methods are redefined.
2. *CoreInterface*. The methods of this class are used to get parameters of the system's objects.

The declared classes and methods are contained in the nissdlle.h header file. The code contained in the nissdlle.h file is shown in APPENDIX 2. NissObjectDLLExt and CoreInterface class declarations.

> **Note:**
>
> The methods of a class are the procedures and functions declared in its body.

The methods of the *NissObjectDLLExt* class are described in the table below.

Method	Description	Example
CoreInterface* m_pCore	A pointer to the core interface	
virtual BOOL IsWantAllEvents()	Returns TRUE if the OnEvent function receives events from all objects; returns FALSE if the function receives events from its own object only.	If "CAM,GRABBER" is passed as a parameter, when settings of these objects are modified, the DEMO object receives the following messages: DEMO|1|UPDATE_CAM|parameters of the camera DEMO|1|UPDATE_GRABBER|parameters of the video capture card
virtual CString DescribeSubscribeObjectsList()	The method accepts a comma-separated list of objects. When an object from the list is modified, the current object is notified.	
virtual CString GetObjectType()	Returns the object type	`virtual CString GetObjectType()` `{ return "DEMO"; }`

Method	Description	Example
virtual CString GetParentType()	Returns the parent object type	`virtual CString GetParentType()` `{ return "SLAVE"; }`

virtual int GetPos()	Returns the position of the object in the *intellect.sec* key file.
	Attention! This parameter must be set in consultation with AxxonSoft.
		`virtual int GetPos()`
		`{ return -1; }`
		*Note: If Intellect is run in the demo mode, the function returns **-1***

virtual CString GetPort()	Returns the number of the port used for communication between the object and the core. ***Attention! This parameter must be set in consultation with AxxonSoft.***	`virtual CString GetPort()` `{ return "1100"; }`
virtual CString GetProcessName()	Returns the process name. Used by the core to search for and automatically run the executable module on startup of the system and initialization of the module	`virtual CString GetProcessName()` `{ return "demo"; }`
virtual CString GetDeviceType()	Determines the type of the object and its behavior. ACD – objects of this type receive all events related to the creation, modification, and deletion of the following objects: **Users**, **Time Zone**, and **Access Levels** ACD2 – a type similar to ACD, providing the additional (provided by the core) functionality of deleting temporary (fixed-term) cards The ACR type means that the object is a reader	All objects of the ACR type are available in the **Access Point** drop-down list
virtual BOOL HasChild()	Returns TRUE if the object has child objects, FALSE otherwise.	`virtual BOOL HasChild()` `{ return TRUE; }`
virtual UINT HasSetupPanel()	Returns TRUE if the object has a setup panel, FALSE otherwise	`virtual UINT HasSetupPanel()` `{ return TRUE; }`
virtual void OnPanelInit(CWnd *)	Used when the object's setup panel is initialized. The parameter is a pointer to the setup panel's window.	

Method	Description	Example

virtual void OnPanelLoad(CWnd*,Msg&)	Used when the setup panel is loaded for setting the parameters of the object. The parameters are the setup panel's window and a message used to pass the parameters and fill in the relevant fields of the setup panel.	`virtual void OnPanelLoad(CWnd* pwnd,Msg& params)`
		
		`{`
		
		`CString s;`
		
		`s = arams.GetParam("port");`
		
		`pwnd->GetDlgItem(IDC_PORT)-> SetWindowText(s);`
		
		`}`

virtual void OnPanelSave(CWnd*,Msg&)	Used when the setup panel is saved for saving the parameters of the object. The parameters are a pointer to the setup panel's window and a reference to a message used to pass the parameters and save them in a database.	`virtual void OnPanelSave(CWnd* pwnd,Msg& params)`
		
		`{`
		
		`CString s;`
		
		`pwnd-> GetDlgItem(IDC_PORT)-> GetWindowText(s);`
		
		`params.SetParam("port",s);`
		
		`}`

virtual void OnPanelExit(CWnd*)	Used when the object's setup panel is closed ("exited"). The parameter is a pointer to the setup panel's window.	

<table>
<tr><th>Method</th><th>Description</th><th>Example</th></tr>
<tr><td rowspan="2">virtual void OnPanelButtonPressed(CWnd*,UINT)</td><td>Used to handle clicks on the setup panel's buttons. The parameters are a pointer to the setup panel's window and a button ID.

Note: A button ID must be a number equal to or greater than 1151. For example, the Resource.h file defines the ID of the Test button as follows:

#define IDC_TEST 1151</td><td><pre>Virtual void
 OnPanelButtonPressed (CWnd*
pwnd,UINT id)

{

if(id==IDC_TEST)

{ React react("DEMO",Id,"TEST");

m_pCore->DoReact(react); }

}</pre></td></tr>
<tr><td>If a button click is to open your own dialog box created in the same MDL file, you must first use the code shown in the example below.</td><td><pre>HINSTANCE prev_hinst =
AfxGetResourceHandle();

HMODULE hRes =
GetModuleHandle("demo.mdl");

If (hRes) AfxSetResourceHandle
(hRes);

//Code for showing a dialog box:

CXXXDialog dlg;

dlg.DoModal();

AfxSetResourceHandle(prev_hinst)
;</pre></td></tr>
<tr><td>virtual BOOL IsRegionObject()</td><td>Shows whether the object supports Intellect's regions. Regions are used to group objects. They can also be used in the report system.</td><td></td></tr>
<tr><td>virtual BOOL IsProcessObject()</td><td>Shows whether the object supports starting and running multiple executable modules simultaneously. For example, this may be used for starting a separate module for each COM port.

Note: We recommend using one RUN file. This makes it easier to debug and modify the module.</td><td></td></tr>
</table>

Method	Description	Example

virtual void OnCreate(Msg&)	Used when the object is created. The parameter is a reference to a message that contains object information. The method is also used to set default parameters.	`virtual void OnCreate (Msg& msg)`
		`{`
		`msg.SetParam ("port","COM1");`
		`}`

virtual void OnInit(Msg&)	Used when the object is initialized. The parameter is a reference to a message that contains object information.	`virtual void OnInit (Msg& msg)`
		`{`
		`OnChange (msg, msg);`
		`}`

virtual void OnChange(Msg&, Msg&)	Used when the object is changed. The first and second parameters are references to messages that contain object information before and after the change, respectively.	`virtual void OnChange(Msg& msg, Msg& prev)`
		`{`
		`React react (msg.GetSourceType(), msg.GetSourceId(),"INIT");`
		`react.SetParam("port",msg.GetParam("port"));`
		`m_pCore->DoReact(react);`
		`}`

Method	Description	Example

virtual void OnDelete(Msg&)	Used when the object is deleted. The parameter is a reference to a message that contains object information.	`virtual void OnDelete (Msg& msg)`
		`{`
		`React react (msg.GetSourceType(), msg.GetSourceId(),"EXIT");`
		`m_pCore-> DoReact(react);`
		`}`

virtual void OnEnable(Msg&)	Used to handle clicks on the **Disable** button of Intellect's panel when the object is enabled. The parameter is a reference to a message that contains object information.	
virtual void OnDisable(Msg&)	Used to handle clicks on the **Disable** button of Intellect's panel when the object is disabled. The parameter is a reference to a message that contains object information.	

Method	Description	Example

virtual BOOL OnEvent(Event&)	Used to handle the events that are passed as the parameter.	virtual BOOL
		
		OnEvent(Event& event)
		
		{
		
		If
		
		(event.GetAction() == "ACCESS_IN" ||
		
		event.GetAction() == "ACCESS_OUT")
		
		{
		
		Msg per = m_pCore-> FindPersonInfoByCard(event.GetParam("facility_code"),
		
		event.GetParam("card"));
		
		event.SetParam
		
		("param0", ! per.GetSourceId().IsEmpty() ?
		
		per.GetParam("name") : event.GetParam("facility_code") + event.GetParam("card"));
		
		event.SetParam("param1", per.GetSourceId());
		
		}
		
		Else
		
		If (event.GetAction() == "NOACCESS_CARD")
		
		{
		
		event.SetParam

Method	Description	Example
		("param0",event.GetParam("facility_code") + event.GetParam("card")); } return TRUE; }
virtual BOOL OnReact(React&)	Used to handle the reactions that are passed as the parameter.	

The *CreateNissObject(CoreInterface* core)* global function creates instances of the described objects, places them in an array (an instance of *CNissObjectDLLExtArray),* and returns a pointer to this array. This function is used to receive a pointer to the core interface. This pointer is later used by objects to call interface methods:

```
CNissObjectDLLExtArray* APIENTRY CreateNissObject(CoreInterface* core)
{
        CNissObjectDLLExtArray* ar = new CNissObjectDLLExtArray;
        ar->Add(new NissObjectDemo(core));
        ar->Add(new NissObjectDemoDevice(core));
        return ar;
}
```

After loading a DDL file, the core calls the CreateNissObject function and receives pointers to all the objects in use.

All object setup panels are stored in resources as dialogs. Each dialog ID has the format **IDD_object_SETUP**, where **object** is the name of the corresponding object. For example, the ID of the **DEMO object** is **IDD_DEMO_SETUP**, and the ID of the **DEMO_DEVICE** object is **IDD_DEMO_DEVICE _SETUP.**

> **Note:**
>
> If you want for the settings tree to show a special icon for a particular object, in the resources of the DLL file, create a 14x14 **BITMAP** that contains the object name,.

2.1.5.1 MDL File Creation Wizard

To automate the creation of MDL files, use intellect_mdl.awx (see the *Wizard* folder in archive on page Intellect Software Integration Guide (HTTP API, IIDK, ActiveX)).

Use the Wizard to create an MDL file as follows:

1. Copy intellect_mdl.awx to the folder *Program Files|Microsoft Visual Studio|Common|MSDev98|Template*.
2. Start *Microsoft Visual C++.*
3. Create a new project with the name of **INTELLECT MDL WIZARD**.
4. Follow the instructions of the project configuration wizard.

As a result, a template for the system object is created. The project includes all of the necessary files, including a file that describes the object structure for intellect.dbi.

> **Attention!**
>
> In the project settings, change the output file extension from DLL to MDL.

> **Note:**
>
> For building the project, use **Release.**

2.1.6 Creating RUN files

Devices are managed by exchanging messages (commands) between RUN files and the system core. For implementing this interaction between software modules and the core, use the *Intellect Integration Developer Kit (IIDK),* which is covered in detail in Section Intellect Integration Developer Kit (IIDK). Other information is provided by the source files of the demonstration module; the files may be found in an appendix to this documentation.

Below is an example of how the *IIDK* is used in the *DEMO* module.

```
CString port = "1100";

CString ip = "127.0.0.1";

CString id = "";

BOOL IsConnect = Connect (ip, port, id, myfunc);

if (!IsConnect)

{

// connection failed

AfxMessageBox("Error");

Return;

}

SendMsg(id,"CAM|1|REC"); // turn on recording for camera 1

SendMsg(id, "DEMO|1|RESTORE"); // restore the connection with the DEMO object

//turn on the DEMO_DEVICE with address 1

SendMsg(id,"DEMO_DEVICE|1|ON|params<1>,param0_name<address>,param0_val<1>");

Disconnect(id);
```

> **Attention!**
>
> If an MDL file exists, connecting to Intellect's core does not require creating an IIDK Interface object in the system. The connection ID passed is an empty string (in other words, the ID is "").

When a module is unloaded, it receives the **WM_EXIT** event:

#define WM_EXIT (WM_USER+2000)

Use a WinAPI function, *PostThreadMessage,* to catch this message and ensure that the module is unloaded properly. In *VC++* and *MFC,* the **WM_EXIT** event is caught in a subclass of *CWinApp*; in *Delphi* and *CBuilder,* it is caught in a subclass of *TApplication*.

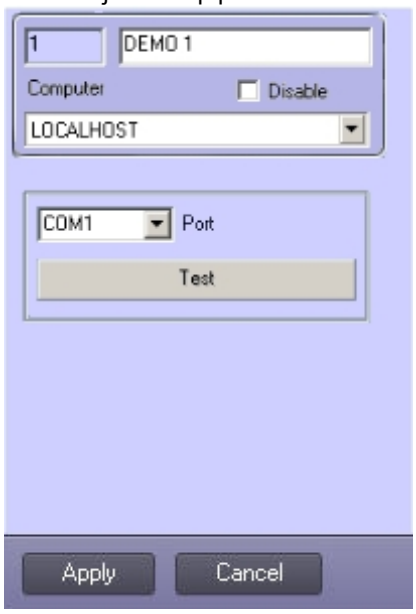
2.1.7 Creating and Configuring Integrated Objects (Modules) in Intellect

To create and configure an integrated object (module) in Intellect:

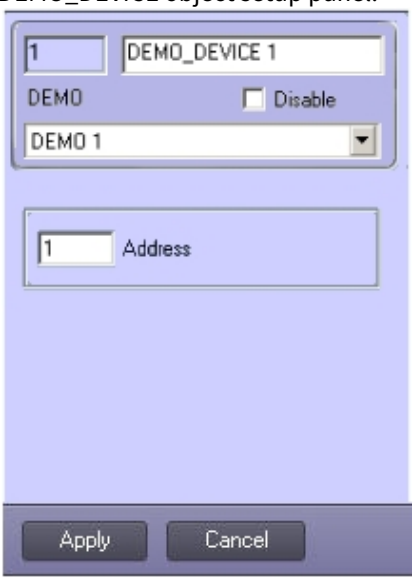
1. Copy the MDL and RUN files to the *Intellect|Modules* folder.
2. Start Intellect.
3. Under the **Computer** object, create the objects added earlier using the software module. For the *DEMO* module, Under the **Computer** object, create the **DEMO** object.

> **Note:**
>
> Under the **DEMO** object, create a child object, **DEMO_DEVICE.**

As a result, the setup panels of the created objects become available.
DEMO object setup panel:



DEMO_DEVICE object setup panel:



4. Set up the objects.

The integrated objects are now created and set up in Intellect.

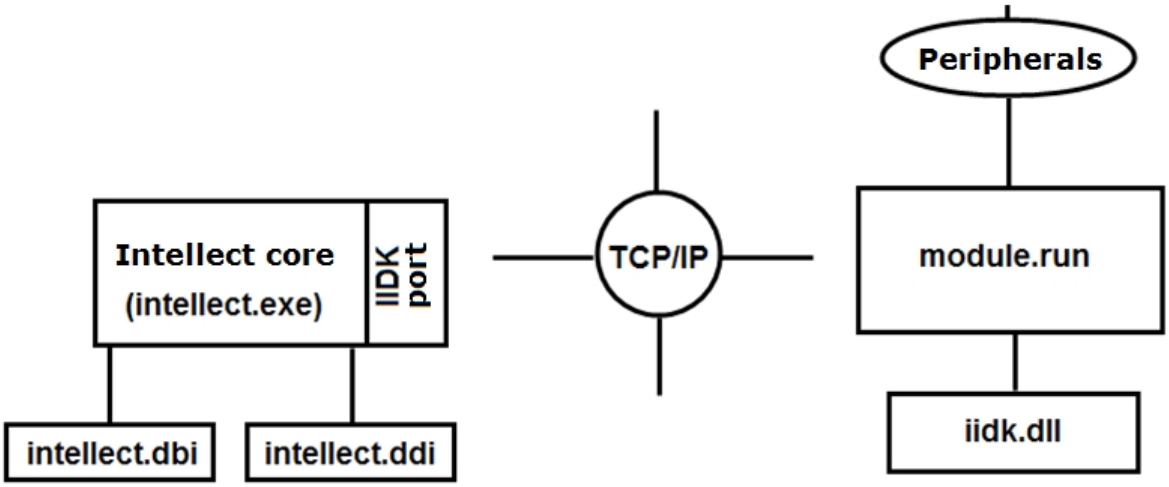
2.2 Intellect Integration Developer Kit (IIDK)

2.2.1 General Information on IIDK

2.2.1.1 Purpose of the IIDK

System expandability is supported by Intellect's software architecture. Expandability allows communication between the core and functional modules (third party information systems) via TCP/IP.

The figure below shows a diagram of interaction between Intellect's core and external software (a functional module).



Interaction is done by exchanging messages in a communication environment; message exchange is implemented by using the *IIDK*.

The *Intellect Integration Developer Kit* (*IIDK*) is a set of development tools for integrating third-party security software into Intellect. This kit allows you to expand the system rapidly and effectively by adding functional modules that support new hardware and new functions.

2.2.1.2 Developer Requirements

To use the *IIDK*, you must:

1. know how to program in C/C++;
2. know the basics of Win32 programming;
3. have an IDE with DLL support (such as *Microsoft Visual C++*, *C++ Builder,* or *DELPHI*).

> **Note:**
>
> When creating LIB files with C++ Builder 5's implib.exe tool, add the "**- a**" option.

2.2.1.3 IIDK Components

The *IIDK* includes the following development tools:

1. *iidk.ocx* – ActiveX control. When installing *Intellect* this file is stored in the Windows\System32 folder and registered in OS.
2. *ddi.exe* – tool used for viewing and editing DDI- and DBI- files. It is stored in the <*Intellect* installation directory>\Tools folder.

2.2.2 Connecting to Intellect

2.2.2.1 Connection Parameters

Intellect's core interacts with functional modules (third party information systems) according to the following connection parameters:

1. Port number.
    a. For the video subsystem: 900.
    b. For the **Interface IIDK** object: 1030.
    c. For **ATM** objects: 1009.

    > **Note.**
    >
    > 1030 (IIDK) port can be in use to connect ATMs (ATM) (not only 1009 port) - in this case the **ATM** object will be marked with red cross in the hardware tree. For this the **IIDK Interface object is to be created in the hardware tree**.

2. The IP address of the computer that is running Intellect's core.
3. ID (the connection object ID).

> **Attention!**
>
> To connect to video subsystem (port 900) id is to be more than 1 and must not be the same as id of **IIDK Interface objects created in the system**. To connect to **IIDK Interface object** (port 1030) id is to be the same as one of the object specified in the dialog box of *Intellect* settings.

> **Note.**
>
> If connection to the server (**IIDK Interface object**) from remote computer is required, then there is no need to install *Intellect* on the remote computer, but this computer is to be added to *Intellect* configuration on the server (in the **Hardware** tab of the **System settings** dialog box) and **IIDK Interface object** is to be created under the created **Computer** object. In this case the server address is to be specified in IP parameter of Connect function and ID of specified **IIDK Interface object** is to be specified in ID parameter. Take into account the fact that the **Computer** object corresponding to the remote computer is marked with a red cross in the object tree.

> **Note:**
>
> If an MDL file exists (see Section Creating MDL files), the connection to Intellect's core does not require creating the **IIDK Interface** object in the system. The connection ID passed is an empty string (in other words, the ID is "").

2.2.2.2 IIDK Interface Object

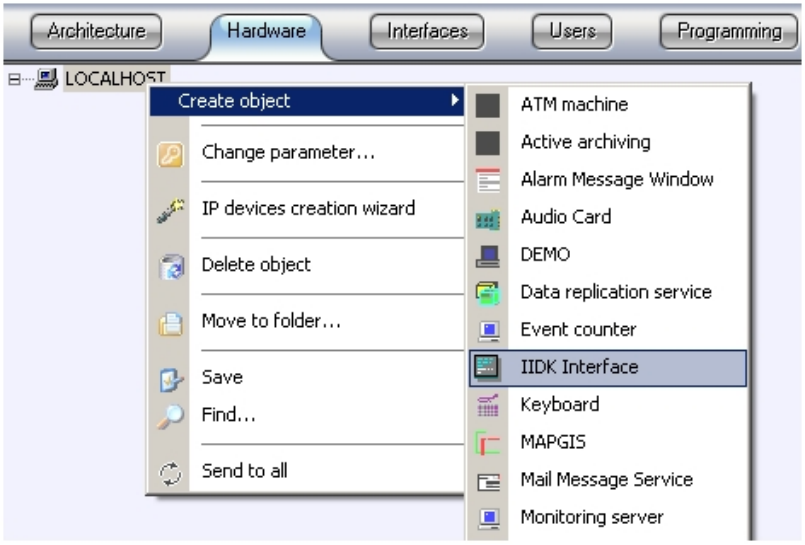
With the **IIDK Interface** object one can manage all the elements of the system. The **IIDK Interface** object is created under the **Computer** object in the *Intellect* object tree.

> **Note**
>
> To use the **IIDK Interface** object, allow the relevant functionality in the license key.

> **Note**
>
> If *Intellect* is started in the demo mode, the **IIDK Interface** object is activated after the functional module is connected to the system core (see Connect section)

Important!

The ID of the **IIDK Interface** object must not be the same as the IDs of the **Monitor** objects created in the system.



If the **IIDK Interface** object is used, the settings panels are not created for integrated functional modules (third party applications).

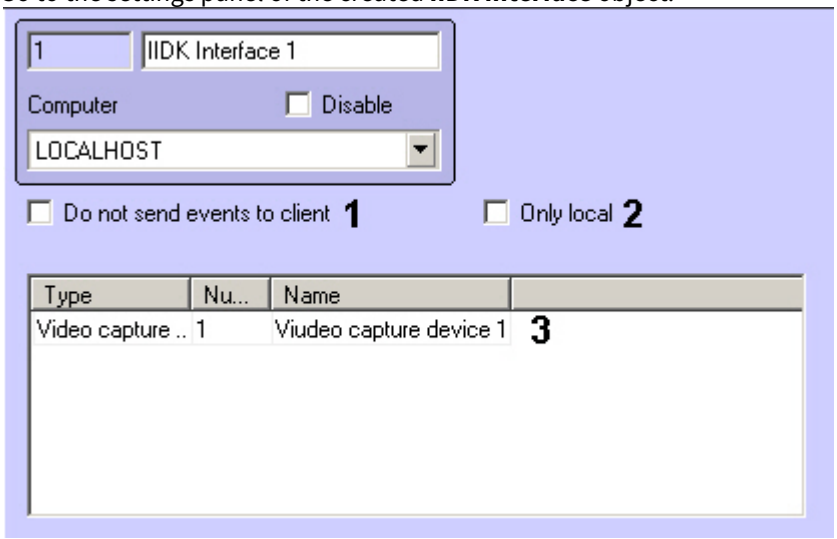
When the *Intellect* distributed architecture is used, the **IIDK Interface** object must be created on the computer that is running the software core (the core to which the connection is made). If the connection is made to a computer that has the *Operator Workstation* installed, the connection parameters must include the IP address of the *Server* or the *Administrator Workstation*.

2.2.2.3 Configuring passing events throung IIDK Interface object

IIDK Interface allows configuring of event filtering passed to connected client applications.

To configure filtering, do the following:

1. Go to the settings panel of the created **IIDK Interface** object.

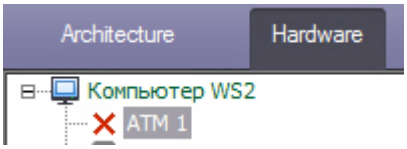


2. Set the **Do not send events to client** if it is not required to send any messages to client application not sending any messages to the core (1).
3. Set the **Only local** checkbox to send to the client applications only messages of those objects created under the same **Computer** object as the **IIDK Interface** object (2).
4. In the table (3) specify list of objects, events from which have to be sent to connected client applications. Enter CORE type to filter the core events.

Configuring of event filtering is completed.

2.2.2.4 Features of ATMs integration. ATM object

The **ATM** object can be used to send events from ATM software to *Intellect* core. This object is created under the **LOCALHOST** object in the **Hardware** tab of the **System settings** dialog box. It is created instead of the **IIDK Interface** object.



The **ATM** object shows ATM events (“Card inserted”, “Withdraw card”, etc.) in the event viewer. These events can be used for captioning, reactions configuration, etc.

> **Note.**
>
> For events regarding client card masked bank card number can be sent in the param0 parameter.

The list of available **ATM** events can be seen using the ddi.exe utility. Information on how to use this utility can be found in the The ddi.exe utility for editing database templates and external settings files section of Administrator's Guide.

Connection method and message syntax for the **ATM** object are the same as those for the **IIDK Interface object**, though 1009 port is in use for sending messages (see also Connection Parameters and Message Syntax (port 900)).

2.2.3 IIDK Functions

2.2.3.1 Connect

To establish communication between a functional module and Intellect, connect to the system core by using the following function:

```
BOOL Connect (LPCTSTR ip, LPCTSTR port, LPCTSTR id, void (_stdcall *func)(LPCTSTR msg))
```

Parameters of the connection function:

Parameter	Description	Example
LPCTSTR ip	The ID address of the computer that is running the system core	
LPCTSTR port	TCP/IP connection port	
LPCTSTR id	A connection ID, for video	
_stdcall *func) (LPCTSTR msg))	A callback function that accepts messages from Intellect	

```
CString port = "900";

CString ip = "127.0.0.1";

CString id = "2";

BOOL IsConnect = Connect(ip, port,
id, myfunc);

if (!IsConnect)

{

  // connection failed

  AfxMessageBox("Error");

}
```

The function returns TRUE if the connection is established, or FALSE if not.

All messages from the system core are accepted by a callback function.

A sample declaration of the callback function:

```
void _stdcall myfunc(LPCTSTR str)
{
 printf("\r\nReceived:%s\r\n\r\n",str);
}
```

> **Note:**
>
> **Void _stdcall myfunc** is called in a separate stream (not in the application's main stream).

The developer handles received messages as needed.

2.2.3.2 SendMsg

To send messages to the system core, use the following function:

```
BOOL SendMsg (LPCTSTR id, LPCTSTR msg)
```

Parameters of the SendMsg function:

Parameter	Description	Example
LPCTSTR id	The connection ID passed in the call to the **Connect** function	
LPCTSTR msg	Message text	

```
CString port = "900";

CString ip = "127.0.0.1";

CString id = "2";

BOOL IsConnect = Connect(ip, port, id,
myfunc);

if (!IsConnect)

{

// connection failed

AfxMessageBox("Error");

Return;

}


SendMsg(id,"CAM|1|REC"); // turn on
recording for camera 1


Disconnect (id);
```

The function returns TRUE if the message was sent, otherwise FALSE

2.2.3.3 Disconnect

To terminate a connection, use the **Disconnect** function:

```
void Disconnect (LPCTSTR id)
```

, where **LPCTSTR id** is the connection ID passed in the call to the **Connect** function.

If the connection is terminated by Intellect, **DISCONNECTED** is passed to the callback function.

> **Note:**
>
> An example of using the **Disconnect** function is given in Section SendMsg.

2.2.3.4 Other functions

On the page:

The iidk.h header file contains extra functions that are listed below. The Connect4, SendData4, SendFile and GetMsg functions should not be used. They are created for internal use. The Connect2 function is not used.

2.2.3.4.1 **Connect3**

```
BOOL Connect3(LPCTSTR ip, LPCTSTR port, LPCTSTR id, iidk_callback_func* lpfunc,
              DWORD user_param,int async_connect,DWORD connect_attempts)
```

Parameter	Description
ip	IP address of *Intellect* Server
port	TCP/IP port over which the connection is established
id	Slave connection ID, for video
lpfunc	Callback function receiving messages from *Intellect*
user_param	Extra parameter that comes to Callback function in order to split slaves if there is only one function.
async_connect	0 - synchronous connection mode, the function returns TRUE if the connection is established. -1 - asynchronous connection mode, the function always returns FALSE if the connection is established, then the CONNECTED event is created. Any other value – at first the synchronous mode is used, in case of fault - asynchronous mode.
connect_attempts	Number of connection attempts.

2.2.3.4.2 **SendReactToCore**

The function is used to send a reaction to the specific core.

```
BOOL SendReactToCore(LPCTSTR id, LPCTSTR msg)
```

Parameter	Description
id	Core connection ID

msg	Messages sent. Message format is similar to SendMsg.

2.2.3.4.3 IsConnected

IsConnected returns TRUE if the client is connected to server.

```
BOOL IsConnected();
```

2.2.3.4.4 Connect4

```
BOOL Connect4(LPCTSTR ip, LPCTSTR port, LPCTSTR id,  iidk_callback_func* lpfunc,
               iidk_frame_callback_func* lpframe_func, iidk_user_data_func*
iidk_user_data_func,
               DWORD user_param,int async_connect,DWORD connect_attempts);
```

Parameter	Description
ip	IP address of *Intellect* Server
port	TCP/IP port over which the connection is *established*
id	Core connection ID, for video
lpfunc	Callback function receiving messages from *Intellect*
lpframe_func	Callback function receiving video frames
iidk_user_data_func	Callback function for data sent using the SendData4 function
user_param	Extra parameter that comes to the Callback function in order to split slaves if there is only one Callback function for all cores.
async_connect	0 - synchronous connection mode, the function returns TRUE if the connection is established -1 - asynchronous connection mode, the function always returns FALSE. If the connection is established, then the CONNECTED event is created Any other value – at first the synchronous mode is used, in case of fault - asynchronous mode.
connect_attempts	Number of connection attempts

2.2.3.4.5 SendData4

This function is used to send CUserNetObject. Its purpose is to send raw data.

```
BOOL SendData4(LPCTSTR id, int nIdent,BYTE *pBuffer,DWORD dwSize);
```

Parameter	Description
id	Core connection ID

nIdent	Data UID
pBuffer	Transmitted data
dwSize	The size of data array

2.2.3.4.6 **SendFile**

The function is used to send a file.

```
BOOL SendFile(LPCTSTR id, LPCTSTR file_from, LPCTSTR file_to)
```

Parameter	Description
id	Core connection ID
file_from	Address to send file from.
file_to	Address to send file to.

2.2.3.4.7 **GetMsg**

The function is used to retrieve incoming messages that are queued if the Callback function is not specified.

```
BOOL GetMsg(LPTSTR msg, DWORD& cb)
```

Parameter	Description
msg	Incoming message
cb	Message length

2.2.4 Sent Message Syntax

2.2.4.1 Message Syntax

Messages sent to the core have the following syntax:

CORE||DO_REACT|source_type<OBJECT TYPE>,source_id<OBJECT ID>,action<ACTION> [,params<NO. OF PARAMETERS>,param0_name<PARAMETER NAME_0>,param0_val<PARAMETER VALUE_0>]

Below is the syntax of messages that contain two parameters.

CORE||DO_REACT|source_type<OBJECT TYPE>,source_id<OBJECT ID>,action<ACTION>,params<2>,param0_name<PARAMETER NAME_0>,param0_val< PARAMETER VALUE_0>,param1_name<PARAMETER NAME_1>,param1_val<PARAMETER VALUE_1>

The message parameters are described in the table below.

Parameter	Description
source_type<obj>	Object type (see the DDI file ([OBJTYPE] section))
source_id<id>	The object ID set when creating the object in Intellect (see Intellect's settings tree)
action<react>	Action (see the DDI file (the [REACT] section))
params<number>	The number of parameters passed, in decimal format
param0_name<str1>	Parameter name
param0_val<str2>	Parameter value

> **Note:**
>
> For working with DDI files, we recommend using the ddi.exe utility (see Section Using the ddi.exe Tool to Work with DDI files).

Example. Sending a message to switch the telemetry to preset mode 4.

CString msg=

"CORE||DO_REACT|
source_type<TELEMETRY>,source_id<1.1>,action<GO_PRESET>,params<2>,param0_name<preset>,param0_val<4>,param1_name<*tel_prior*>,param1_val<2>";

SendMsg(id,msg);

2.2.4.2 Message Syntax (port 900)

Messages sent to port 900 are passed to the video subsystem directly; for this reason, such messages have a different syntax.

Messages sent to the video subsystem have the following syntax:

OBJECT TYPE|OBJECT ID|ACTION [|PARAMETER<VALUE>]

Below is the syntax of messages that contain n parameters.

OBJECT TYPE|OBJECT ID|ACTION [|PARAMETER 1<VALUE>,PARAMETER 2<VALUE>,...,PARAMETER N<VALUE>]

> **Attention!**
>
> Port 900 may only be used to manage objects of the GRABBER, CAM, or MONITOR types.

The message parameters are described in the table below.

Parameter	Description
Object type	Object type (GRABBER, CAM, or MONITOR)
Object ID	The object ID set during creation of the object in Intellect
Action	Action (command)
Parameter <Value>	Parameter name. The value is enclosed by angle brackets.

Example 1. Setting camera 1 to recording mode.

CString msg = “CAM|1|REC”;

SendMsg (id,msg);

Example 2. Saving video from all cameras to local disk C.

CString msg = “GRABBER|1|SET_DRIVES|drives<C:\>” ;

SendMsg(id,msg);

> **Note.**
>
> The **SET_DRIVES** command includes the ID of any of the video capture cards created in the system.

> **Note.**
>
> The **SET_DRIVES** command does not change the video archiving settings set in the system.

2.2.4.3 Using the Event and React classes

For working with messages, you may use the classes provided: *Event* and *React,* declared in the msg.h file.

Example of using the react class:

A message composed without using the classes	**A message composed using the React class**
CString msg = “CORE||DO_REACT|source_type<TELEMETRY>,source_id<1.1>, action<GO_PRESET>,params<2>,param0_name<preset>,param0_val<4>, **param1_name<*tel_prior*>,param1_val<2>”;** **SendMsg(id,msg);**	**React react(“TELEMETRY”,”1.1”,”GO_PRESET”);** **react.SetParamInt(“preset”,4);** **react.SetParamInt(“*tel_prior*”,2);** **SendMsg(id,react.MsgToString().c_str());**

> **Note:**
>
> The msg.h and msg.cpp files are located in the Misc folder which is in the archive on page Intellect Software Integration Guide (HTTP API, IIDK, ActiveX).

2.2.5 Examples of Managing System Objects

2.2.5.1 Adding, Updating, and Deleting System Objects

On the page:

System objects are added, updated, and deleted by the following commands:

1. **CORE||CREATE_OBJECT** – creates a new object.
2. **CORE||UPDATE_OBJECT** – updates an existing object or creates a new one.
3. **CORE||DELETE_OBJECT** – deletes an object.

2.2.5.1.1 Adding a User to a Department

Below is a message that adds the specified user to the specified department, with the specified parameters:

CORE||CREATE_OBJECT|
objtype<PERSON>,objid<12341>,parent_id<1>,surname<Tim>,name<Kovac>,card<12362>,facility_code<0>

IIDK will return the following message in response to this command:

CORE||CREATE_OBJECT|card<1234>,objtype<PERSON>,guid_pk<{281A172C-62D2-EA11-A54B-B06EBF811A34}
>,facility_code<122>,surname<Tim>,module<iidk_client_test_x64.exe>,time<16:42:53>,parent_id<1>,fraction<797>,date<30-07-
20>,name<Kovac>,owner<QA-T49>,slave_id<QA-T49.11>,objid<12341>

This allows receiving the ID of the created object in the objid<> parameter.

2.2.5.1.2 Adding and Deleting a Video Capture Card

If an object is not present in the system, add that object with the **UPDATE_OBJECT** command (the system must not have an object with a type and ID equal to objtype and objid, respectively).

CORE||UPDATE_OBJECT|objtype<GRABBER>,objid<12>,core_global<0>,parent_id<SLAVAXP>,name<Frame **grabber**
1>,params<5>,param0_name<format>,param0_val<NTSC>,param1_name<mode>,param1_val<1>,param2_name<chan>,param
2_val<2>,param3_name<type>,param3_val<FX 4>,param4_name<resolution>,param4_val<0>

Having received the following message, the system changes the name of an existing object:

CORE||UPDATE_OBJECT|objtype<GRABBER>,objid<12>,core_global<0>,parent_id<SLAVAXP>,name<Card **2>**

To delete an object and all of its child objects, use the **DELETE_OBJECT** command:

CORE||DELETE_OBJECT|objtype<GRABBER>,objid<12>

2.2.5.2 Working with the System in the Multiuser Mode

The remote computer must install and be running Intellect (**Client** installation version) in order to exchange messages with the Server.

If users have been created and access rights have been configured in Intellect, any message that requires a response from the system core must contain the **receiver_id<ID>** parameter, where ID is the ID of the **IIDK Interface** in the system.

CORE||GET_CONFIG|objtype<CAM>,objid<1>,receiver_id<1>

// Returns the parameters of the Camera 1 object

To get the user ID and user's permissions DI by username and password, use the CHECK_USER function. Examples of using:
CORE||CHECK_USER|password<1>,login<1>
CORE||CHECK_USER|pass_key<1373503546>,login<1> (crc32 from DB)
CORE||CHECK_USER|md5<bf03b1605e3c83978514f2a6546eef50> (md5 from DB)
Response:
ACTIVEX|1|USER_RIGHTS|rights_id<1>,user_id<1>
If the password is incorrect, the response comes with a delay of 1 second.

2.2.5.3 Determining Computers Where Intellect was Unloaded (via Port 1030)

If Intellect is unloaded, the callback function receives a message with an **action** parameter value of **DISCONNECTED**:

**ACTIVEX|12|EVENT|SOCKET<>,MMF<>,objaction<DISCONNECTED>,TRANSPORT_TYPE<MMF>,core_global<1>,
action<DISCONNECTED>, module<slave.exe>, objtype<SLAVE>,__slave_id<SLAVAXP.12>,
objid<SLAVAXP>,owner<SLAVAXP>,TRANSPORT_ID<1111>,time<12:41:16>,date<23-09-02>**

The message contains the name of the computer on which *Intellect* was unloaded and the date and time

2.2.5.4 Redirecting Video Cameras to the Monitor

After receiving the following message, the system deletes all cameras from the monitor and calls the specified video camera:

CORE||DO_REACT|
source_type<MONITOR>,source_id<1>,action<REPLACE>,params<4>,param0_name<slave_id>,param0_val<SLAVA>,param1_name<cam>,param1_val<1>,param2_name<control>,param2_val<1>,param3_name<name>,param3_val<>

If connected via port 900, the above action is performed by using the following message:

MONITOR|1|REPLACE|slave_id<SLAVA>,cam<1>,control<1>

2.2.5.5 Obtaining Object Parameters (via Port 1030) GET_CONFIG

An example of use of the **GET_CONFIG** command is given below:

CORE||GET_CONFIG|objtype<CAM>,objid<1>

The returned message contains all the parameters of the specified object:

ACTIVEX|12|OBJECT_CONFIG|
rec_priority<0>,mask0<>,decoder<0>,mask1<>,flags<>,mask2<>,compression<3>,sat_u<5>,mask3<>,proc_time<>,
hot_rec_period<>,mask4<>,telemetry_id<>,manual<1>,region_id<1.1>,contrast<5>,md_mode<0>,md_size<5>,audio_type<>,pre_rec_time<0>,config_id<>,
bright<7>,alarm_rec<0>,audio_id<>,rec_time<>,hot_rec_time<2>,activity<>,mux<0>,parent_id<1>,objtype<CAM>,type<>,__slave_id<SLAVAXP.12>,objid<1>,
name<Camera 1>,objname<Camera 1>,color<1>,priority<0>,md_contrast<5>

> **Note:**
>
> To obtain the configuration of all the objects of the specified type, remove the **objid** parameter.

Example. Get information about user by the identifier.

CORE||GET_CONFIG|objtype<PERSON>,objid<1>

The response is the message with parameters containing necessary information, including user name, card number etc.:

ACTIVEX|1|OBJECT_CONFIG|
pnet3_sound<0>,galaxy_dual_focus<0>,auto_pass_type<>,galaxy_pin_change<0>,external_id<>,card_date<26.05.2017 10:57:06>,galaxy_tag_link<0>,rubeg8_zone_id<>,levels_times<>,expired<>,hid_escort_id<>,objtype<PERSON>,level2_id<>,galaxy_group_choice<0>,
who_level<>,hid_use_extended_access<0>,visit_purpose<>,**card<1234>**,email<>,galaxy_timer_schedule<0>,galaxy_menu_option<0>,aiu_holiday<0>,
area_id<>,aiu_alarm<0>,objname<User 1>,surname<>,who_card<>,auto_brand<>,pnet3_alarm<0>,card_loss<0>,
facility_code<432>,galaxy_temp_code<0>,post<>,when_area_id_changed<>,drivers_licence<>,bolid_in_device<0>,pnet3_acs_counter<0>,
temp_levels_times<>,temp_card<>,pnet3_no_entry<0>,location<>,temp_level_id<>,patronymic<>,teleph_work<>,department<>,galaxy_keypad<0>,
_TRANSPORT_ID<>,finished_at<>,aiu_ksd_type<>,all_param<>,galaxy_template<0>,tabnum<>,parent_id<1>,pur<>,galaxy_duress<0>,pnet3_no_exit<0>,
galaxy_dual<0>,hid_pin_exempt<0>,pnet3_counter<0>,whence<>,schedule_id<>,hid_enable_pin_commands<0>,galaxy_dual_access<0>,
pnet3_block<0>,passport<>,person<>,galaxy_menu_choice<0>,flags<0>,auto_number<>,phone<>,pin<>,rubeg8_AccessToBCPTimeZoneNumber<>,
begin_temp_level<>,pnet3_master<0>,aiu_mark<0>,end_temp_level<>,visit_birthplace<>,galaxy_menu_level<>,visit_document<>,pnet3_guard<0>,
pnet3_black<0>,aiu_kso_type<>,is_apb<0>,**name<User 1>**,pnet3_temp<0>,started_at<>,level_id<>,_marker<>,
bolid_user_type<>,owner_person_id<>,card_type<>,is_active_temp_level<0>,begin<>,hid_line_tag<>,guid<{5B358685-E041-E711-BCC6-DA0AE28E0C17}>,
pnet3_guest<0>,is_locked<0>,objid<1>,marketing_info<>,comment<>,aiu_vpu_arm<0>,visit_reg<>,bolid_in_pku<0>,pnet3_2cards_mask<0>

> **Note.**
>
> User data can also be received via direct request to *Intellect* software database from the OBJ_PERSON table. In this case you can select a user by card number or other parameters. See more info on *Intellect* software database operation in Administrator's Guide, the Appendix 4. INTELLECT™ software database management.

2.2.5.6 Obtaining Information on Object States GET_STATE and GET_LIST

To obtain information on the state of an object, use the **GET_STATE** command:

CORE||GET_STATE|objtype<CAM>,objid<1>

The following string is returned:

ACTIVEX|12|OBJECT_STATE|objtype<CAM>,__slave_id<SLAVAXP.12>,objid<1>,state<DISARM_DETACHED>

The state of the specified object is represented by the **state** parameter, which takes values from the set of states that are specified in the object's DDI file.

If connected via port 900, requests for object states are performed through the **GET_LIST** command:

CAM||GET_LIST

> **Note:**
>
> Regardless of whether an object ID is specified, the command returns the states of all objects of the specified type.

The returned message has the following format:

CAM|1|SETUP|rec_priority<0>,is_armed<0>,is_recorded<0> , bt<0> , slave_id<SLAVAXP>, compression<3>,sat_u<5>, proc_time<0>, hot_rec_period<0> , manual<1>, telemetry_id<>, is_detached<1> , contrast<5>, md_size<5>,md_mode<0>, is_alarmed<0>, audio_type<>, pre_rec_time<0>, bright<7>, audio_id<>, rec_time<0>, alarm_rec<0>, hot_rec_time<2>, mux<0>, parent_id<1>, __slave_id<SLAVAXP>, priority<0>, mask<>, color<1>,md_contrast<5>, is_ring<1>, fs_error<0>

The message presents the states as follows: **is_state<val>,** where **state** is an object state (see the DDI file); and **val** equals 1 if the object is in this state, 0 otherwise.

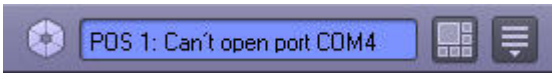
> **Note.**
>
> The **is_ring<>** parameter shows whether loop recording is performing or not. The **fs_error** parameter equals 1 when there was an archive recording error (e.g. failed to delete folder for loop recording).

2.2.5.7 Showing Information Messages. SET_STATE

To show an information message on the display of Intellect's main control panel, use the SET_STATE command:

CORE||SET_STATE|name<POS 1>,value<Can't open port COM4>

The figure below shows the result of handling the message by the system.



The message is removed from the display as follows:

CORE||SET_STATE|name<POS 1>,value<>

2.2.5.8 Live and archived video

To get live video from Camera 1 send **CAM|1|START_VIDEO|compress<1>** message to port 900.
Here compress<> is compression ratio, from 0 to 5. Video frames will be received as a response to this message. The example of

how to process incoming frames is given in demo kit available for download at the page of Intellect Software Integration Guide (HTTP API, IIDK, ActiveX).

To get archived video from Camera 1 send **CAM|1|ARCH_FRAME_TIME|time<dd-mm-yy HH:MM:SS.FFF> (to specify start time for viewing the archive)** or **CAM|1|PLAY|compress<> (to get archived video**. **Archived video is handled the same way as live video)** messages to port 900.

In order to get the full list of time intervals with video recordings for exact date, send **CAM|id|ARCH_GET_INTERVALSREC|date<>** message to port 900.

The date<> parameter can take the date<dd-mm-yy|> value or it can be left blank. In the first case time intervals for specified date will be requested, in the second – dates for which there is an archive.

As a result the **Event: CAM|id|SET_INTERVALSREC|intervals<>,date<>,timezone<>** message is received.

The value of intervals<> parameter looks like this: intervals<begin1 end1\nbegin2 end2…\nbeginN endN|date1\ndate2… \ndateN\n>

The time of beginning and ending are one blank separated (0x20 code), intervals are line break separated '\n'(0x0A code).

- begin1, begin2, ... beginN – time of interval beginnings in the HH:MM:SS format (returns if the exact date was requested).
- end1, end2, ... endN – time of interval endings in the HH:MM:SS format (returns if the exact date was requested).
- date1, date2, ... dateN – dates at which there are recordings in the archive (returns if the date field in the request is blank or there is no such field).

date<dd-mm-yy|> parameter represents date for which the intervals were requested or blank value (date<>) if dates for the entire period were requested.

timezone<> shows time shift on the client (IIDK) relative to Server time, in minutes. Examples:

- If Server is in -1 UTC time zone, the response to the CAM|1|ARCH_GET_INTERVALSREC| command will have parameter timezone<60>
- If Server is in +3 UTC time zone, the response to the CAM|1|ARCH_GET_INTERVALSREC| command will have parameter timezone<-180>

2.2.5.9 Telemetry control via IIDK

Telemetry is controlled via IIDK using simple reactions described in the TELEMETRY section of Programming guide, for instance:

CORE||DO_REACT| source_type<TELEMETRY>,source_id<1.1>,action<LEFT>,params<1>,param0_name<tel_prior>,param0_val<3> – message sent to port 1030 in order to rotate camera lens left with high priority.

TELEMETRY|1.1|LEFT|speed<2>,tel_prior<3> – reaction to port 1030 in order to rotate camera lens left with high priority at an average speed.

2.2.5.10 Map layer operations

The command for setting the parameter and position of **Camera 1** object icon is run in one of the following ways:

1. Sending a message to port 1030 **CORE||DO_REACT| source_type<MAPLAYER>,source_id<1>,action<CUSTOMIZE_OBJECT>,params<7>,param0_name<x>,param0_val<200>,param1_name<y>,param1_val<200>,param2_name<objtype>,param2_val<CAM>,param3_name<objid>,param3_val<1>,param4_name<a>,param4_val<90>,param5_name<w>,param5_val<70>,param6_name<h>,param6_val<80>**
   Where *x*, *y*, *w* and *h* are the coordinates and size of the object icon on the map.
   a is a tilt angle of icon.
2. Sending a reaction to port 1030 **MAPLAYER|1|CUSTOMIZE_OBJECT|x<200>,y<200>,objtype<CAM>,objid<1>,a<90>,w<70>,h<80>**

Layer 1 is shown in the interactive map window using one of the following ways:

1. Sending a message to port 1030: **CORE||DO_REACT|source_type<MAPLAYER>,source_id<1>,action<ACTIVATE>**
2. Sending a reaction to port 1030: **MAPLAYER|1|ACTIVATE**

2.2.5.11 Obtaining info on core queues with GET_QUEUE_INFO command

Use the GET_QUEUE_INFO command to request info about the queues in the Intellect core:

CORE||GET_QUEUE_INFO

> **Note.**
>
> The receiver_id parameter may be specified if there are several **IIDK Interface** objects in the system – see Working with the System in the Multiuser Mode.

The response is the string like this:

ACTIVEX|11|QUEUE_INFO|thread2<0>,thread1<0>,thread0<0>,posted_events<0>,_TRANSPORT_ID<>,server_reacts<0>, posted_reacts<0>,events_inwork<0>,coremanager_events<0>,thread3<0>

The response parameters correspond to the information displayed in the **Queue statistics** tool (shows on Alt+F2). Parameters description:

threadN<> – number of items in the queue of the thread N.

posted_events<> – number of incoming events.

posted_reacts<> – number of reactions currently being processed.

coremanager_events<> – number of events to send.

server_reacts<> – number of reactions to send.

events_inwork<> – number of events currently being processed.

3 CamMonitor.ocx ActiveX Control

3.1 General description of CamMonitor.ocx component of ActiveX

On the page:

3.1.1 General information

CamMonitor.ocx is the component of ActiveX that is similar in every way to the **Video monitor** interface object. It allows you to manage cameras, view the archive, etc.

CamMonitor.ocx component supports operation in the demo mode.

3.1.2 Requirements to developers

To use CamMonitor.ocx you will need:

1. The knowledge of any programming language that supports using the Component Object Model (COM);
2. Basic knowledge of Win32/Win64 programming;
3. Programming environment that supports OCX files.

Requirements for software which is used while integrating

3.2 How to install CamMonitor.ocx

Important!

It is not recommended to install *Intellect* and CamMonitor.ocx on the same computer. If it is required, then their versions are to be the same, otherwise CamMonitor.ocx operation is not guaranteed.

Use the CamMonitorInstaller.exe file (stored in the <*Intellect* installation directory>\Redist\CamMonitor folder) to install CamMonitor.ocx. Both 32-bit and 64-bit versions of this component are available. The installation files of components of different bit count are stored in the corresponding folders (x86 and x32 correspondingly).

If *Intellect* software is installed on the computer, then the CamMonitor.ocx file is stored in the <*Intellect* installation directory>\Modules\ folder when installing the 32-bit version and it is stored in the <*Intellect* installation directory>\Modules64\ folder when installing the 64-bit version.

If *Intellect* software is not installed, then the 32-bit component is installed in the c:\Program Files (x86)\ITV VideoPlayer\Modules\ folder and the 64-bit component is installed in the c:\Program Files\ITV VideoPlayer x64\Modules64\ folder.

There is standard registration of CamMonitor.ocx as ActiveX component at the stage of installation.

CamMonitorInstaller.exe installs the required files for all users.

Besides the library itself, CodecPack driver pack and ITV VideoPlayer utility are installed. ITV VideoPlayer utility uses the CamMonitor.ocx component and enables viewing the archive from the selected camera. By default this utility is installed in the C:\Program Files\ITV VideoPlayer\ folder. The utility interface looks like one of Converter.exe, but some features of Converter.exe (not dealing with viewing the archive) are not available. This utility can be used to check if CamMonitor.ocx is installed correctly.

3.3 CamMonitor.ocx parameters

On the page:

The parameters used for setting the CamMonitor component are presented in this chapter: elements to be shown as well as the overlay mode.

All parameters are *long* integers.

The values of parameters used for interface setup are enlisted in the tables and formed in a way that one integer only is represented in binary notation. To set the value of a parameter, combine the values of parameters using the XOR operation. You'll get the number the positions of which in binary notation represent the interface elements that are to be shown and those to be hidden. See How to use parameters section.

The OverlayMode parameter differs from others: it possesses values from 0 to 2 and its value sets the overlay mode.

3.3.1 CamMenuOptions

CamMenuOptions : long

Allows setting the feature menu of the camera.

One or more checkboxes can be set checked.

Available values:

Value	Information
#define MENU_ENABLE_OPTION 0x00000001	Deprecated. See BUTTON_MENU_ENABLE_OPTION
#define MENU_ARM_ENABLE_OPTION 0x00000002	Show the **Arm** option
#define MENU_REC_ENABLE_OPTION 0x00000004	Show the **Start recording** option
#define MENU_CAMS_ENABLE_OPTION 0x00000008	Show the **Camera** option
#define MENU_TITLES_ENABLE_OPTION 0x00000010	Show the **Show titles** option
#define MENU_PROCESSING_ENABLE_OPTION 0x00000020	Show the **Processing** option
#define MENU_EXPORT_ENABLE_OPTION 0x00000040	Show the **Export** option

3.3.2 CamMenuProcessingOptions

CamMenuProcessingOptions : long

Allows setting the **Processing** menu in the feature menu of the camera.

One or more checkboxes can be set checked:

Available values:

Value	Information
#define MENU_PROCESSING_DEINTERLACE_ENABLE_OPTION 0x00000001	Show the **Deinterlacing** option
#define MENU_PROCESSING_ZOOM_ENABLE_OPTION 0x00000002	Show the **Zoom-in** option *Note. If this option is disabled, the **Processing → Zoom** menu item is not shown, but zooming with mouse wheel is still available.*
#define MENU_PROCESSING_CONTRAST_ENABLE_OPTION 0x00000004	Show the **Contrast** option
#define MENU_PROCESSING_MASK_ENABLE_OPTION 0x00000008	Show the **Detector mask** option
#define MENU_PROCESSING_SHARP_ENABLE_OPTION 0x00000010	Show the **Sharpen** option

3.3.3 CamButtonsOptions

CamButtonsOptions : long

Set up displaying the buttons of the CamMonitor component.

One or more checkboxes can be set checked.

Available values:

Value	Information
#define BUTTON_MODE_ENABLE_OPTION 0x00000100	Show the Archive button
#define BUTTON_TIME_ENABLE_OPTION 0x00000002	Show time
#define BUTTON_NAME_ENABLE_OPTION 0x00000004	Show camera name
#define BUTTON_MENU_ENABLE_OPTION 0x00000008	Show the Menu button
#define BUTTON_RAYS_ENABLE_OPTION 0x00000010	Not used
#define BUTTON_MICS_ENABLE_OPTION 0x00000020	Not used

3.3.4 MainPanelOptions

MainPanelOptions : long

Set up displaying the CamMonitor panel.

One or more checkboxes can be set checked.

Available values:

Value	Information
#define MAIN_PANEL_ENABLE_OPTION 0x00000001	Show the panel

#define MAIN_PANEL_ENABLE_SCREENS_BUTTON 0x00000010	Show the **Screens** button (see Windows layout on the monitor).
#define MAIN_PANEL_ENABLE_BOOKMARK_BUTTON 0x00000020	Show the **Create a bookmark** button (see Create a bookmark).
#define MAIN_PANEL_ENABLE_BOOKMARK_REVIEW_BUTTON 0x00000040	Show the **List of bookmarks** button (see List of bookmarks).
#define MAIN_PANEL_ENABLE_AVIEXPORT_BUTTON 0x00000080	Show the **Background export** button (see The AviExport utility).

3.3.5 KeysOptions

KeysOptions : long

It allows setting control over the component using the keyboard and mouse.

One or more checkboxes can be set checked.

Available values:

Value	Description
#define KEYS_ENABLE_OPTION 0x00000001	Enables control over the CamMonitor component using the hotkeys available for Video Monitor (see Video Monitor).
#define TELEMETRY_DISABLE_OPTION 0x00000002	Disables Telemetry control using the CamMonitor component (see Telemetry control).
#define ARCH_DELETE_ENABLE_OPTION	Enables archive recordings deletion from the recordings list (see Deleting video recordings from the archive).
#define ARCH_PROTECT_ENABLE_OPTION	Enables rewrite protection of the archive recordings from the recordings list (see Protection of separate record and disable of protection).

3.3.6 OverlayMode

OverlayMode : long

Set the overlay mode.

Available values:

Value	Information
0	Overlay is not in use
1	Overlay 1
2	Overlay 2

3.3.7 How to use parameters

```
DWORD options = CamMonitor1->CamMenuOptions;
options = options^MENU_CAMS_ENABLE_OPTION^MENU_ARM_ENABLE_OPTION^MENU_REC_ENABLE_OPTION;
CamMonitor1->CamMenuOptions = options;
CamMonitor1->CamMenuProcessingOptions ^= MENU_PROCESSING_MASK_ENABLE_OPTION;
```

3.4 CamMonitor.ocx methods

On the page:

3.4.1 Connect

Connect(BSTR **ip**, BSTR **login**, BSTR **password**, BSTR **arch_password**, long **param**, long **port**) set up a connection to the Server/ Video Gate/Backup Archive.

- BSTR **ip** – IP address of the Video server;
- BSTR **login** – login to connect to the Server (can be blank);
- BSTR **password** – password to set up a connection to the Video server (can be blank);
- BSTR **arch_password** – password to access the archive (i.e. admin password, can be blank);
- long **param** – Server role. The parameter is mandatory.
  - 0 – video server;
  - 1 – backup archive;
  - 2 – videogate;
- long **port** – port to connect Video server.
  - if 0, 1 or 2 are passed, the connection is established with port 900, 901 or 902 correspondingly;
  - if 100 is passed, the connection is with port 10504;
  - if any onter value passed, the connection is with port number "port + 20000". For example, if port=900, the connection is established with server port 20900.

The connection to Server is set up **asynchronously**.

> **Important!**
>
> If login and password are not specified at Connect() method call, all cameras are viewable in the control. It is to be considered when developing third-party application if access privileges are relevant.

3.4.2 ShowCam

ShowCam(long **cam_id**, long **compress**, long **show**) shows/hides camera on the monitor.

- long **cam_id** – camera ID
- long **compress** – level of video compression 0-5 (for local camera =0). If set to -1, video stream is displayed directly from the camera without compression.
- long **show** – checkbox: show/hide camera (1/0)

3.4.3 DoReactMonitor

DoReactMonitor(BSTR **react_string**) – control over the monitor/cameras

- BSTR **react_string** – reaction string view

How to create react_string:

```
react_string =   "MONITOR||ARCH_FRAME_TIME|cam<3>,date<dd-mm-yy>,time<hh:mm:ss>";
CamMonitor1->DoReactMonitor(react_string);
```

The result of calling the function with the parameter: camera 3 will be in the archive mode and the archive will be positioned to date «dd-mm-yy» and time «hh:mm:ss» (date and time are to be set in this format only).

The mode parameter takes the following values:

0 – video gate if it's specified (otherwise, video server).

1 – video server.

2 – long-time archive.

“MONITOR|**<id ignored>**|ARCH_FRAME_TIME|...”

> **Note:**
>
> Positioning accuracy can be specified in milliseconds, for instance:
>
> `DoReactMonitor(“MONITOR||ARCH_FRAME_TIME|cam<3>,date<02-10 05>,time<12:12:22.345>`

Example. Show 2nd stream from camera 14 on Monitor 1:

"MONITOR|1|ADD_CAM|cam<14>,cam_id<14>,compress<1>,stream_id<14.2>"

Exapmle. Set fps = 1 when viewing archive from Camera 11

"MONITOR||CAM_PARAMS|cam<11>;arch_fps<1>"

3.4.4 RemoveAllCams

RemoveAllCams() : long – remove all cameras from the monitor

3.4.5 IsConnected

IsConnected() : boolean – method shows if the Video server is connected or disconnected.

3.4.6 GetCurIp

GetCurIp() : BSTR – returns the IP address of Server specified when calling **Connect**.

3.4.7 SendRawMessage

SendRawMessage(BSTR **msg**) – sends the command to be executed to Video server.

- BSTR **msg** – command string view

How to call a function:

```
m_Cam.SendRawMessage("CAM|1|REC");
```

```
m_Cam.SendRawMessage("CAM|1|REC_STOP");
```

```
m_Cam.SendRawMessage("CAM|1|ARM");
```

```
m_Cam.SendRawMessage("CAM|1|DISARM");
```

3.4.8 Disconnect

Disconnect() – disconnect from the Video server.

3.4.9 SetCallBackOptions

SetCallBackOptions(int **cam_id**, int **options**) – sets parameters of getting video from camera.

- int **cam_id** – camera ID (number).
- int **options** – options. The possible values of the **options parameter are:**

- WithoutVideoFrame = 0x00 – do not send frames from the video module.
- WithVideoFrame = 0x01 – send frames from the video module.
- WithExtendedParams = 0x02 – get frames with extended parameters (time, fps, subtitles).
- WithInformationLayout = 0x04 – display video in the window with control elements (context menu).
- WithCompressedData = 0x08 – display video in the native format without decompression (if any).

- WithoutDecode = 0x10 – disable video decoding on the server.
- WithoutSubtitles=0x20 – disable subtitles.

> **Note**
>
> The options parameter is created the same as parameters of the CamMonitor.ocx component – see CamMonitor.ocx parameters.

3.4.10 SetParam

SetParam(BSTR **param_name**, BSTR **param_value**) - sets the number of camera windows in CamMonitor.

- BSTR **param_name** - a string representation of the length or width.
- BSTR **param_value** - the number of camera windows.

How to call a function:

```
m_cam.SetParam("monitor_ch", m_NH);
m_cam.SetParam("monitor_cw", m_NW);
```

3.5 CamMonitor.ocx events

OnCamListChange (long **cam_id**, long **action**) – occurs when there is connection with the Server or the number of cameras on the Server changes.

• long **cam_id** – camera ID.

• long **action** equals 1, if camera with **id** == **cam_id** exists, otherwise **action** == **0.**

This event occurs as many times as there are cameras on the Server. The negative value of the **cam_id** parameter (cam_id < 0) shows that **OnCamListChange** is not called.

If there are 3 cameras (1, 2, 3) on the Server, then the following events will occur one after another:

CamListChange(1,1)

CamListChange(2,1)

CamListChange(3,1)

CamListChange(-1,1)

Example:

Show the camera with cam_id =2 with **compress =1** compression level;

```
CamMonitor1CamListChange(long cam_id, long action)
{
    if(cam_id == -1)
    {
        CamMonitor1->ShowCam(2,1,1);
    }
}
```

4 Intellect HTTP API

4.1 General information on HTTP API

HTTP API is represented by web2 module (*Web-server 2.0*).

> **Note.**
>
> See Administrator's Guide, Configuring the server for the clients connection via the Web-server 2.0 module section.

HTTP API allows the following features:

1. Get information about interactive maps: map list, map name, map layer list, layer parameters, layer background image, information about the list of points and an individual point on the layer (see Map).
2. Get information about object classes created on the Server, a list of states for the object class and information about status, icons for a specific state (see Object classes).
3. Get a list of objects created on the server, information about the individual object, the state of the object, the list of available actions with the object (see Objects).
4. Receive events from the Server both separately and by blocks (see Getting events).
5. Send commands to the server (see Sending commands to server).
6. Run macros (see Macros).
7. Work with video: get frames, request configuration, receive live and archive video, manage recording, arm and disarm cameras, manage telemetry (see Video).
8. Use notification systems to subscribe an application to APNS messages (see Notification).
9. Get live and archive sound (see Sound).
10. Send events and reactions to the core of the Intellect software (see Sending reactions and events to Intellect using HTTP request).

The following notation is used in the examples shown in this section:

- Port stands for port number. The default **Web-server 2.0** module port is 8085. Specifying port in HTTP API commands is mandatory.
- /web2 – web context where the web2 app operates. This is the web-app context.

Further the description will be omitted when query action is clear in the context.

> **Important!**
>
> URL, id of objects and file extension are case-sensitive.

> **Note.**
>
> Date and time are specified in RFC 3339 format, see details at http://www.ietf.org/rfc/rfc3339.txt

4.1.1 Default response format

By default, the response is in the JSON format. The default response in XML format can be enabled on the settings panel of the **Web server 2.0** object (see Configuring default response type for HTTP API requests). Also, the response format can be explicitly specified in the **Accept** header, for example **application/json** or **application/xml**. The response format specified in the request has a higher priority than the default response format specified on the settings panel of the **Web server 2.0** object.

4.1.2 Cross domain requests (CORS)

To perform cross-domain requests or to access the necessary headers in the response (for example, due to CORS browser policy restrictions), it is necessary to specify **Origin** (the domain of the site from which the request is made) in the request header. In this case, the response will contain the **Access-Control-Allow-Origin** header, which indicates that

the resource can be accessed from the specified domain in a cross-site manner. The **Access-Control-Allow-Origin: *** header indicates that the resource can be accessed from any domain in a cross-site manner.

4.2 Product version

4.2.1 General request format:

http://IP-address:port/web2/product/version

4.2.2 Request example:

GET http://127.0.0.1:8085/web2/product/version

4.2.3 Response example:

The response is text/plain line like:

```
Intellect/4.11.2.2875
```

It means that the server supports the protocol described in this document. The line can change depending on the product version. This helps to distinguish 2 web servers with similar functionality but different protocols in different products.

4.3 Authorization using a token key

Authorization in *Intellect* using a token key provides the following capabilities:

- To specify a token in the "token" parameter in a url request instead of specifying the "login" and "password" parameters. Example of a video request with authorization in *Intellect* using a token key:

  ```
  http://127.0.0.1:80/video/action.do?normalize=true&version=4.10.0.0&video_in=CAM:1&token=EoHWC_zXFILImB0hL4QgjPc5624cJXMF
  ```

- To use the Bearer Token Authentication in the "Authorization" parameter in the request header.
  Example:

  ```
  Authorization: Bearer PJ_eHSwUsqjXX7PRZMB8hm_zKEnCg3hE"
  ```

4.3.1 General format of request:

GET/POST http://{login}:{password}@IP-address:port/token?expires_in={expires_in}

4.3.2 Request parameters:

Parameter	Is required	Description
login	No	User login in *Intellect*, if specified
password	No	User password in *Intellect*, if specified

Parameter	Is required	Description
expires_in	No	Token validity time in seconds. The maximum value is 1 day. The token expires after a specified period of time. The default value is **1800**. To log out, specify the value: "**0**" *Note. There can be only 1 token for each user.*

4.3.3 Request example:

```
GET/POST http://USER:PASSWORD@127.0.0.1:8085/token?expires_in=1800
```

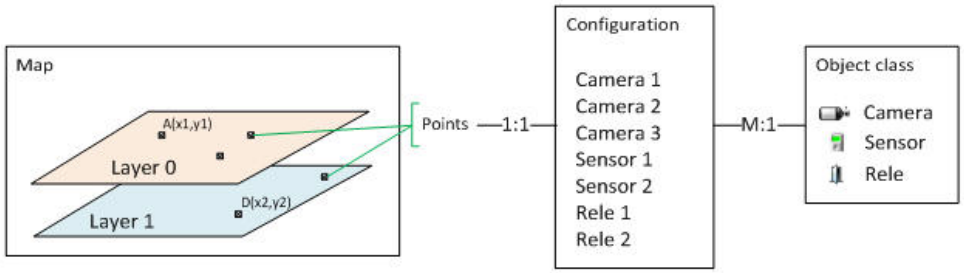
4.3.4 Response example:

```
{
"access_token":"PJ_eHSwUsqjXX7PRZMB8hm_zKEnCg3hE"
"token_type":"bearer"
"expires_in":"1800"
}
```

4.3.5 Response parameters:

Parameter	Description
access_token	Token
token_type	Token type
expires_in	Token validity time in seconds

4.4 Maps



Several maps can be created on the server. Each map can consists of one or more layers. There are points on each layer. Each point corresponds to one of the objects in configuration.

Configuration – objects in Intellect. Each object represents the object of specific class. Each object has one state and the list of actions to be performed.

The object class describes its icons, possible states and possible actions with the object in each state.

4.4.1 Getting the list of maps

4.4.1.1 General request format:

GET http://IP-address:port/web2/secure/kartas/

4.4.1.2 Request example:

GET http://127.0.0.1:8085/web2/secure/kartas/

4.4.1.3 **Response example:**

```
<kartas>
   <karta>
      <id>2</id>
      <layers>
         <layer>
            <geo_h>10.0</geo_h>
            <height>578</height>
            <id>2</id>
            <lat_bl>43.5905</lat_bl>
            <lat_br>43.6875</lat_br>
            <lat_c>43.6395</lat_c>
            <lat_tl>43.5914</lat_tl>
            <lat_tr>43.6885</lat_tr>
            <lon_bl>43.4584</lon_bl>
            <lon_br>43.4599</lon_br>
            <lon_c>43.4809</lon_c>
            <lon_tl>43.5018</lon_tl>
            <lon_tr>43.5033</lon_tr>
            <mapId>2</mapId>
            <name>Layer 2</name>
            <points>
               <point>
                  <id>CAM:1</id>
                  <layerId>2</layerId>
                  <mapId>2</mapId>
                  <angle>0.0</angle>
                  <geo_angle>0.0</geo_angle>
                  <latitude>43.47727</latitude>
                  <longitude>43.602381</longitude>
                  <x>95.0</x>
                  <y>329.0</y>
               </point>
            </points>
            <width>800</width>
            <zoomDef>1.0</zoomDef>
            <zoomMax>4.0</zoomMax>
            <zoomMin>0.25</zoomMin>
            <zoomStep>0.25</zoomStep>
         </layer>
      </layers>
      <name>Map 2</name>
   </karta>
</kartas>
```

4.4.1.4 Response parameters

Parameter	Description
<karta> group parameters	
id	Map ID
name	Map name
layers	Layer list
<layer> group parameters	
geo_h	Height mark (see Configuring map binding to coordinate grid)
height	Layer substrate height in pixels
width	Layer substrate width in pixels
id	Layer ID
lat_bl	Latitude: bottom left corner
lat_br	Latitude: bottom right corner
lat_c	Latitude: center
lat_tl	Latitude: top left corner
lat_tr	Latitude: top right corner
lon_bl	Longitude: bottom left corner
lon_br	Longitude: bottom right corner
lon_c	Longitude: center
lon_tl	Longitude: top left corner
lon_tr	Longitude: top right corner
mapId	Map ID
name	Layer name
points	List of points on the layer
zoomDef	Default scale

Parameter	Description
zoomMax	Minimum scale
zoomMin	Maximum scale
zoomStep	Scale
<point> group parameters	
id	Object type and ID in the format TYPE:ID
layerId	Layer ID
mapId	Map ID
angle	Object icon rotation angle
geo_angle	Viewing angle (for camera, see Configuring the camera viewing angle display on the Map)
latitude	Latitude
longitude	Longitude
x	The coordinate of the point relative to the substrate along the X axis
y	The coordinate of the point relative to the substrate along the Y axis

4.4.2 Information on one map

4.4.2.1 General request format:

http://IP-address:port/web2/secure/kartas/{plan}/

4.4.2.2 Request parameters:

Parameter	Is required	Description
plan	Yes	Map ID

4.4.2.3 Request example:

http://127.0.0.1:8085/web2/secure/kartas/2

4.4.2.4 **Response example:**

```
<karta>
  <id>2</id>
  <name>This is plan of a building</name>
</karta>
```

4.4.2.5 Response parameters:

Parameter	Description
id	Map ID
name	Map name

4.4.3 The list of layers for specific map

4.4.3.1 General request format:

GET http://IP-address:port/web2/secure/kartas/{plan}/layers

4.4.3.2 Request parameters:

Parameter	Is required	Description
plan	Yes	Map ID

4.4.3.3 Request example:

GET http://127.0.0.1:8085/web2/secure/kartas/2/layers

4.4.3.4 **Response example:**

```
<layers>
   <layer>
      <geo_h>10.0</geo_h>
      <height>578</height>
      <id>2</id>
      <lat_bl>43.5905</lat_bl>
      <lat_br>43.6875</lat_br>
      <lat_c>43.6395</lat_c>
      <lat_tl>43.5914</lat_tl>
      <lat_tr>43.6885</lat_tr>
      <lon_bl>43.4584</lon_bl>
      <lon_br>43.4599</lon_br>
      <lon_c>43.4809</lon_c>
      <lon_tl>43.5018</lon_tl>
      <lon_tr>43.5033</lon_tr>
      <mapId>2</mapId>
      <name>Layer 2</name>
      <points>
         <point>
            <id>CAM:1</id>
            <layerId>2</layerId>
            <mapId>2</mapId>
            <angle>0.0</angle>
            <geo_angle>0.0</geo_angle>
            <latitude>43.47727</latitude>
            <longitude>43.602381</longitude>
            <x>95.0</x>
            <y>329.0</y>
         </point>
      </points>
      <width>800</width>
      <zoomDef>1.0</zoomDef>
      <zoomMax>4.0</zoomMax>
      <zoomMin>0.25</zoomMin>
      <zoomStep>0.25</zoomStep>
   </layer>
</layers>
```

4.4.3.5 Response parameters

Parameter	Description
<layer> group parameters	
geo_h	Height mark (see Configuring map binding to coordinate grid)
height	Layer substrate height in pixels
width	Layer substrate width in pixels
id	Layer ID

Parameter	Description
lat_bl	Latitude: bottom left corner
lat_br	Latitude: bottom right corner
lat_c	Latitude: center
lat_tl	Latitude: top left corner
lat_tr	Latitude: top right corner
lon_bl	Longitude: bottom left corner
lon_br	Longitude: bottom right corner
lon_c	Longitude: center
lon_tl	Longitude: top left corner
lon_tr	Longitude: top right corner
mapId	Map ID
name	Layer name
points	List of points on the layer
zoomDef	Default scale
zoomMax	Minimum scale
zoomMin	Maximum scale
zoomStep	Scale
<point> group parameters	
id	Object type and ID in the format TYPE:ID
layerId	Layer ID
mapId	Map ID
angle	Object icon rotation angle
geo_angle	Viewing angle (for camera, see Configuring the camera viewing angle display on the Map)
latitude	Latitude (point coordinate)

Parameter	Description
longitude	Longitude (point coordinate)
x	The coordinate of the point relative to the substrate along the X axis
y	The coordinate of the point relative to the substrate along the Y axis

4.4.4 Information on a specific layer

4.4.4.1 General request format:

http://IP-address:port/web2/secure/kartas/{plan}/layers/{base}/

4.4.4.2 Request parameters:

Parameter	Is required	Description
plan	Yes	Map ID
base	Yes	Layer ID

4.4.4.3 Request example:

http://127.0.0.1:8085/web2/secure/kartas/2/layers/2/

4.4.4.4 **Response example:**

```
<layer>
    <height>1000</height>
    <id>2</id>
    <mapId>2</mapId>
    <name>Base layer for plan</name>
    <width>1000</width>
    <zoomDef>1.0</zoomDef>
    <zoomMax>4.0</zoomMax>
    <zoomMin>0.25</zoomMin>
    <zoomStep>0.25</zoomStep>
</layer>
```

4.4.4.5 Response parameters:

Parameter	Description
height	Layer substrate height in pixels
width	Layer substrate width in pixels
id	Layer ID

Parameter	Description
mapId	Map ID
name	Layer name
zoomDef	Default scale
zoomMax	Minimum scale
zoomMin	Maximum scale
zoomStep	Scale

4.4.5 Layer background

4.4.5.1 General request format:

GET http://IP-Address:port/web2/secure/kartas/{plan}/layers/{base}/image.{ext}

4.4.5.2 Request parameters:

Parameter	Is required	Description
plan	Yes	Map ID
base	Yes	Layer ID
ext	Yes	File extension. Allowed values: **png** or **jpg**

4.4.5.3 Response example:

Image in specified format comes in response.

4.4.5.4 Errors while request execution:

Error	Description
404	**JPEG** extension is specified in the request.

4.4.6 The list of point on the layer

4.4.6.1 General request format:

http://IP-address:port/web2/secure/kartas/{plan}/layers/{base}/points/

4.4.6.2 Request parameters:

Parameter	Is required	Description
plan	No	Map ID

Parameter	Is required	Description
base	No	Layer ID

4.4.6.3 Example request:

http://127.0.0.1:8085/web2/secure/kartas/2/layers/2/points/

4.4.6.4 Example response:

> **Note.**
>
> If the display type of the object on the map is different from **Image**, then an empty response is received. See also Attaching objects to the layers of interactive map

```
<points>
  <point>
    <id>CAM:1</id>
    <layerId>2</layerId>
    <mapId>2</mapId>
    <angle>0.0</angle>
    <geo_angle>0.0</geo_angle>
    <latitude>43.47727</latitude>
    <longitude>43.602381</longitude>
    <x>95.0</x>
    <y>329.0</y>
  </point>
</points>
```

4.4.6.5 Response parameters:

Parameter	Description
id	Object ID in the format "TYPE:ID", for example "CAM:1"
layerId	Layer ID
mapId	Map ID
angle	Object icon rotation angle
geo_angle	Viewing angle (for camera, see Configuring the camera viewing angle display on the Map)
latitude	Latitude (point coordinate)
longitude	Longitude (point coordinate)
x	X coordinate of the upper left corner of the object icon
y	Y coordinate of the upper left corner of the object icon

The coordinate plane is attached to the layer as follows:

I.e. x and y cannot be negative, but can be fractional.

4.4.7 Information on a specific point on the layer

4.4.7.1 General request format:

http://IP-address:port/web2/secure/kartas/{plan}/layers/{base}/points/{CAM:id}

4.4.7.2 Request parameters:

Parameter	Is required	Description
plan	No	Map ID
base	No	Layer ID
CAM:id	Yes	Object ID in the format "TYPE:ID", for example "CAM:1"

4.4.7.3 **Example request:**

http://127.0.0.1:8085/web2/secure/kartas/plan/layers/base/points/CAM:2

4.4.7.4 **Example response:**

```
<point>
    <id>CAM:2</id>
    <layerId>base</layerId>
    <mapId>plan</mapId>
    <x>200.0</x>
    <y>200.0</y>
</point>
```

4.4.7.5 Response parameters:

Parameter	Description
id	Object ID in the format "TYPE:ID", for example "CAM:1"
layerId	Layer ID

Parameter	Description
mapId	Map ID
x	X coordinate of the upper left corner of the object icon
y	Y coordinate of the upper left corner of the object icon

4.5 Object classes

4.5.1 The list of object classes on the server

4.5.1.1 General request format:

http://IP-address:port/web2/secure/objectClasses

4.5.1.2 **Example request:**

http://127.0.0.1:8085/web2/secure/objectClasses

4.5.1.3 **Example response:**

```
<objectClasses>
    <objectClass>
        <id>GRELE</id>
    </objectClass>
    <objectClass>
        <id>USERS</id>
    </objectClass>
    <objectClass>
        <id>CAM</id>
    </objectClass>
    <objectClass>
        <id>RIGHTS</id>
    </objectClass>
    <objectClass>
        <id>GRAY</id>
    </objectClass>
</objectClasses>
```

4.5.1.4 Response parameters:

Parameter	Description
id	Object class ID

4.5.2 Specific object class

4.5.2.1 General request format:

http://IP-address:port/web2/secure/objectClasses/{objectClass}/

4.5.2.2 Request parameters:

Parameter	Is required	Description
objectClass	Yes	Object class ID

4.5.2.3 **Example request:**

http://127.0.0.1:8085/web2/secure/objectClasses/GRELE/

4.5.2.4 **Example response:**

```
<objectClass>
    <id>GRELE</id>
</objectClass>
```

4.5.2.5 Response parameters:

Parameter	Description
id	Object class ID

4.5.3 The list of states for a specific object class

4.5.3.1 General request format:

http://IP-address:port/web2/secure/objectClasses/{objectClass}/states/

4.5.3.2 Request parameters:

Parameter	Is required	Description
objectClass	Yes	Object class ID

4.5.3.3 **Example request:**

http://127.0.0.1:8085/web2/secure/objectClasses/GRELE/states/

4.5.3.4 **Example response:**

```
<states>
    <state>
        <id>off</id>
    </state>
    <state>
        <id>on</id>
    </state>
    <state>
        <id>disabled</id>
    </state>
</states>
```

4.5.3.5 Response parameters:

Parameter	Description
id	The ID of all possible states of the object class

4.5.4 Information on a specific state

4.5.4.1 General request format:

http://IP-address:port/web2/secure/objectClasses/{ObjectClass}/states/{State}/

4.5.4.2 Request parameters:

Parameter	Is required	Description
ObjectClass	Yes	Object class ID
State	Yes	Object class state ID

4.5.4.3 **Example request:**

http://127.0.0.1:8085/web2/secure/objectClasses/GRELE/states/off/

4.5.4.4 **Example response:**

```
<state>
    <id>off</id>
</state>
```

4.5.4.5 Response parameters:

Parameter	Description
id	Object class state ID

4.5.5 Getting the icon for a specific state

4.5.5.1 General request format:

http://IP-address:port/web2/secure/objectClasses/{ObjectClass}/states/{State}/image.png

4.5.5.2 Request parameters:

Parameter	Is required	Description
objectClass	Yes	Object class ID
State	Yes	Object class state ID

4.5.5.3 **Example request:**

http://127.0.0.1:8085/web2/secure/objectClasses/GRELE/states/off/image.png

4.5.5.4 **Example response:**

The answer will be a png image.

4.5.6 The list of events for a specific object class

4.5.6.1 General request format:

GET http://IP-address:port/web2/secure/objectClasses/{ObjectClass}/events/

4.5.6.2 Request parameters:

Parameter	Is required	Description
ObjectClass	Yes	Object class ID

4.5.6.3 **Example request:**

GET http://127.0.0.1:8085/web2/secure/objectClasses/GRELE/events/

4.5.6.4 **Example response:**

```
<events>
    <event>
        <id>23</id>
        <sid>grele.disable</sid>
        <description>Disable rele</description>
    </event>
    <event>
        <id>24</id>
        <sid>grele.enable</sid>
        <description>Enable rele</description>
    </event>
</events>
```

4.5.6.5 Response parameters:

Parameter	Description
id	Object ID
sid	Event command
description	Event description

4.6 Objects

4.6.1 Getting list of all server objects

4.6.1.1 General request format:

GET http://IP-address:port/web2/secure/configuration?pageItems={pageItems}&page={page}

4.6.1.2 **Request parameters**:

Parameter	Is required	Description
pageItems	No	Sets the page number displayed as a result of the request. pageItems > 0. By default, pageItems=1.
page	No	Sets the number of objects displayed on the page. page > 0. By default, page=1000.

> **Attention!**
>
> If there are many objects in the system (>1000) they are to be displayed by pages.

Processing of all objects is performed page by pare until an empty array is received.

4.6.1.3 **Request example**:

GET http://127.0.0.1:8085/web2/secure/configuration

4.6.1.4 **Response example**:

The request returns the list of the following objects with states:

- cameras added to the Web-server with IDs of linked microphones, dynamics, PTZ devices, presets (see also Selecting and configuring cameras for the Web-server module).
- cameras added to maps selected for Web Server 2.0 are returned – see Selecting maps.
- sensors;
- relays;
- macros;
- RTSP servers with ports used, cameras added;
- list of zones and regions.

JSON:

```
[
    {
        "id": "1",
        "name": "Zone 1",
        "regions": [
            {
                "id": "1.1",
                "zoneId": "1",
                "name": "Region 1.1",
                "zoneDescription": "Zone description"
            }
        ]
    },
    {
        "id": "2",
        "name": "Zone 2",
        "regions": [
            {
                "id": "2.1",
                "zoneId": "2",
                "name": "Region 2.1",
                "zoneDescription": "Zone description"
            }
        ]
    }
]
```


XML:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<baseObjects>
    <CAM>
        <displayId>1</displayId>
        <displayName>Display 1</displayName>
        <extId>5</extId>
        <id>CAM:5</id>
        <monitorId>1</monitorId>
        <monitorName>Monitor 1</monitorName>
        <name>Camera 5</name>
        <regionDescription>Region description</regionDescription>
        <regionId>2.1</regionId>
        <regionName>Region 2.1</regionName>
        <state>
            <fullState>DISARMED</fullState>
            <id>connected</id>
            <type>NORMAL</type>
        </state>
        <type>CAM</type>
        <zoneId>2</zoneId>
        <zoneName>Zone 2</zoneName>
        <additionalInfo></additionalInfo>
        <micId></micId>
        <presets/>
        <speakerId></speakerId>
        <telemetryId></telemetryId>
    </CAM>
</baseObjects>
```

4.6.1.5 Response parameters:

Parameter	Description
General parameters	
extId	Object ID
id	Object type and ID in the format TYPE:ID
name	Object name
state	Object state. The <id> and <type> parameters show the state in the API terms, see State of a specific object fir details.
type	Object type
Specific parameters	
cams	List of cameras added to the RTSP Server with semicolon as a separator.
port	Port used by RTSP Server
regionDescription	Region description

Parameter	Description
regionId	ID of the region to which the object is added
regionName	Region name
zoneId	ID of the zone to which the object is added
zoneName	Zone name
latitide	Latitude (object coordinate if geo binding is configured).
longitude	Longitude (object coordinate if geo binding is configured).
monitorId	For camera: ID of the monitor to which the camera is added.
monitorName	For camera: name of the monitor to which the camera is added.
geo_angle	For camera: viewing angle (for camera, see Configuring the camera viewing angle display on the Map)
additionalInfo	For camera: the **Additional info** field value
micId	For camera: the ID of the associated microphone.
presets	For camera: preset list.
speakerId	For camera: the ID of the associated speaker.
telemetryId	For camera: the ID of the PTZ control panel.
displayId	For interface objects: display ID.
displayName	For interface objects: display name.

4.6.2 Information on a specific object

4.6.2.1 General request format:

http://IP-address:port/web2/secure/configuration/{objectClass}:{id}/

4.6.2.2 Request parameters:

Parameter	Is required	Description
ObjectClass	Yes	Object class ID
id	Yes	Object ID

4.6.2.3 **Example request:**

http://127.0.0.1:8085/web2/secure/configuration/GRAY:2/

4.6.2.4 **Example response:**

```
<GRAY>
    <id>GRAY:2</id>
    <name>Gray 2</name>
    <state>
        <id>alarmed</id>
    </state>
</GRAY>
```

4.6.2.5 Response parameters:

Parameter	Description
id	Object ID in the format "TYPE:ID", for example "CAM:1"
name	Object name in *Intellect*
state id	The current state of the object

4.6.3 State of a specific object

4.6.3.1 General request format:

http://IP-address:port/web2/secure/configuration/{objectClass}:{id}/state/

4.6.3.2 Request parameters:

Parameter	Is required	Description
objectClass	Yes	Object class ID
id	Yes	Object ID

4.6.3.3 **Example request:**

http://127.0.0.1:8085/web2/secure/configuration/GRAY:2/state/

4.6.3.4 **Example response:**

```
<GRAY>
    <id>GRAY:2</id>
    <name>Gray 2</name>
    <state>
        <id>alarmed</id>
    </state>
</GRAY>
```

4.6.3.5 Response parameters:

Parameter	Description
fullState	Full object state as stored in the database
id	Object state in terms of HTTP API
type	Object state in terms of HTTP API

Possible values of fullState parameter for a sensor are as follows:

Sensor state	**fullState in web request**	dbo.state
Armed + Closed	ON,ARMED	ON|ARMED
Armed + Closed+ Alarm	ON,ALARMED	ON|ALARMED
Armed + Closed+ Alarm confirmed	ON,CONFIRMED	ON|CONFIRMED
Armed + Closed+ Connection lost	ON,DETACHED_DISARM	ON|DETACHED_DISARM
Disarmed + Closed	ON,DISARMED	ON|DISARMED
Disarmed + Closed+ Alarm	ON,ALARMED	ON|ALARMED
Disarmed + Closed+ Alarm confirmed	ON,CONFIRMED	ON|CONFIRMED
Disarmed + Closed+ Connection lost	ON,DETACHED_DISARM	ON|DETACHED_DISARM
Armed + Opened	ARMED,OFF	ARMED|OFF
Armed + Opened+ Alarm	OFF,ALARMED	OFF|ALARMED
Armed + Opened+ Alarm confirmed	OFF,CONFIRMED	OFF|CONFIRMED
Armed + Opened+ Connection lost	DETACHED_DISARM,OFF	DETACHED_DISARM|OFF
Disarmed + Opened	DISARMED,OFF	DISARMED|OFF
Disarmed + Opened+ Alarm	OFF,ALARMED	OFF|ALARMED
Disarmed + Opened+ Alarm confirmed	OFF,CONFIRMED	OFF|CONFIRMED
Disarmed + Opened+ Connection lost	DETACHED_DISARM,OFF	DETACHED_DISARM|OFF

4.6.4 The list of available actions with the object in a specific state

The list of actions is requested not by the object class, but is taken in the context of a specific object as various user rights are possible for the objects of the same class. Information on how to use this list is given in Sending commands to server section.

4.6.4.1 General request format:

http://IP-address:port/web2/secure/configuration/{objectClass}:{id}/state/actions/

4.6.4.2 Request parameters:

Parameter	Is required	Description
ObjectClass	Yes	Object class ID
id	Yes	Object ID

Example request:

http://127.0.0.1:8085/web2/secure/configuration/GRAY:2/state/actions/

4.6.4.3 **Example response:**

```
<actions>
    <action>
        <description>Disarm ray</description>
        <id>ray.disarm</id>
    </action>
    <action>
        <description>Confirm alarm</description>
        <id>ray.confirm</id>
    </action>
</actions>
```

If the object state considers no actions, then xml is:

```
<actions/>
```

4.6.5 Getting list of all zones and regions

4.6.5.1 General request format:

GET http://IP-address:port/web2/secure/configuration/zones

4.6.5.2 **Request example**:

GET http://127.0.0.1:8085/web2/secure/configuration/zones

4.6.5.3 **Response example**:

JSON:

```
[
    {
        "id": "1",
        "name": "Zone 1",
        "regions": [
            {
                "id": "1.1",
                "zoneId": "1",
                "name":"Region 1.1",
                "zoneDescription": "Zone description"
            }
        ]
    },
    {
        "id": "2",
        "name": "Zone 2",
        "regions": [
            {
                "id": "2.1",
                "zoneId": "2",
                "name": "Region 2.1",
                "zoneDescription": "Zone description"
            }
        ]
    }
]
```

XML:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<zones>
    <zone>
        <id>1</id>
        <name>Zone 1</name>
        <regions>
            <id>1.1</id>
            <name>Region 1.1</name>
            <zoneDescription>Zone description</zoneDescription>
            <zoneId>1</zoneId>
        </regions>
    </zone>
    <zone>
        <id>2</id>
        <name>Zone 2</name>
        <regions>
            <id>2.1</id>
            <name>Region 2.1</name>
            <zoneDescription>Zone description</zoneDescription>
            <zoneId>2</zoneId>
        </regions>
    </zone>
</zones>
```

4.6.5.4 Response parameters:

Parameter	Description
id	ID of the zone/region
name	Name of the zone/region in *Intellect*
zoneDescription	Zone description

4.7 Getting events

Connection is not lost and events are always received.

4.7.1 General request format:

http://IP-address:port/web2/secure/feed/

4.7.2 **Example request:**

http://127.0.0.1:8085/web2/secure/feed/

4.7.3 **Example response:**

```
<message>
    <action>update</action>
    <objectId>CAM:1</objectId>
    <state>disconnected</state>
</message>

<message>
    <action>state</action>
    <objectId>CAM:1</objectId>
    <x>10.0</x>
    <y>123.9</y>
</message>

<message>
    <action>state</action>
    <objectId>CAM:1</objectId>
    <state>connected</state>
    <x>300.8</x>
    <y>670</y>
</message>

<message>
    <action>state</action>
    <objectId>CAM:1</objectId>
    <x>100</x>
    <y>100</y>
</message>

<message>
    <action>ping</action>
</message>
```

4.7.4 Response parameters:

Parameter	Description
action	Type of event. Possible values: create, delete, update.
objectId	id of object that is the source of event (always with update, delete, create).
state	id of a new object state (always with create. If the state has not changed, then there is no update state).
x, y	New coordinates (if changed).

4.7.5 Getting events of video subsystem in blocks

4.7.5.1 General request format:

http://IP-address:port/web2/secure/events/

4.7.5.2 **Example request:**

http://127.0.0.1:8085/web2/secure/events/

4.7.5.3 **Example response:**

XML:

```
<events>
    <event>
        <description>Recording off</description>
        <id>{E56B09A0-1A50-E211-840E-005056C00008}</id>
        <objectId>CAM:1</objectId>
        <ts>2012-12-27T15:43:27+04:00</ts>
    </event>
    <event>
        <description>Recording off</description>
        <id>{4482F63F-1A50-E211-840E-005056C00008}</id>
        <objectId>CAM:1</objectId>
        <ts>2012-12-27T15:40:50+04:00</ts>
    </event>
    <event>
        <description>Recording off</description>
        <id>{35D4BE3E-1750-E211-840E-005056C00008}</id>
        <objectId>CAM:1</objectId>
        <ts>2012-12-27T15:19:16+04:00</ts>
    </event>
</events>
```

JSON:

```
[ {
  "id" : "{E56B09A0-1A50-E211-840E-005056C00008}",
  "description" : "Recording off",
  "ts" : "2012-12-27T15:43:27.000+04:00",
  "objectId" : "CAM:1"
}, {
  "id" : "{4482F63F-1A50-E211-840E-005056C00008}",
  "description" : "Recording off",
  "ts" : "2012-12-27T15:40:50.000+04:00",
  "objectId" : "CAM:1"
}, {
  "id" : "{35D4BE3E-1750-E211-840E-005056C00008}",
  "description" : "Recording off",
  "ts" : "2012-12-27T15:19:16.000+04:00",
  "objectId" : "CAM:1"
} ]
```


4.7.5.4 Response parameters:

Parameter	Description
from	The oldest date of message search period. 2012-12-27T15%3A19%3A16.000%2B04%3A00
to	The latest date of message search period. 2012-12-27T15%3A19%3A16.000%2B04%3A00
count	Maximum number of messages in reply [1, 200]. On default – 20. Server can return more messages if there are few messages in the database.
objectId	Object id (CAM:1, GRAY:5 etc.). If parameter is not specified, events are returning for all.

Return codes:

200 - OK
400 - invalid parameter (e.g. date format)
500 - error
503 - error of core connection
504 - time-out (core failed to return data within 2000 milliseconds)

4.8 Sending commands to server

4.8.1 General request format:

PUT http://IP-address:port/web2/secure/configuration/{objectClass}:{id}/state/actions/{CMD}/execute

4.8.2 Request example:

Parameter	Is required	Description
objectClass	Yes	Object class ID
id	Yes	Object ID
CMD	Yes	Command *Attention! The command name must be in uppercase.*

4.8.3 Response example:

PUT http://127.0.0.1:8085/web2/secure/configuration/GRAY:2/state/actions/DISARM/execute

4.9 Macros

Macros - predefined sequence of responses to certain events. Macros are created on the server and have IDs and names. They are similar to actions with objects, but are not attached to the object.

4.9.1 Getting parameters of macros

4.9.1.1 General request format:

GET http://IP-address:port/web2/secure/actions/

4.9.1.2 **Example request:**

GET http://127.0.0.1:8085/web2/secure/actions/

4.9.1.3 **Example response:**

```
<actions>
    <action>
        <description>Start recording for all cameras</description>
        <id>2</id>
    </action>
    <action>
        <description>Disarm all zones</description>
        <id>1</id>
    </action>
</actions>
```

4.9.1.4 Response parameters:

Parameter	Description
description	Macro name
id	Macro ID

4.9.2 Getting the list of macros

4.9.2.1 General request format:

GET http://IP-address:port/web2/secure/actions/{id}/

4.9.2.2 Request parameters:

Parameter	Is required	Description
id	Yes	Macro ID

4.9.2.3 **Example request:**

GET http://127.0.0.1:8085/web2/secure/actions/2/

4.9.2.4 **Example response:**

```
<action>
    <description>Start recording by all cameras</description>
    <id>2</id>
</action>
```

4.9.2.5 Response parameters:

Parameter	Description
description	Macro name
id	Macro ID

4.9.3 Macros execution on server request

4.9.3.1 General request format:

PUT http://IP-address:port/web2/secure/configuration/{id}/state/actions/RUN/execute

4.9.3.2 **Request parameters**:

Parameter	Is required	Description
id	Да	Macro type and ID in the format TYPE:ID (for example MACRO:1)

4.9.3.3 **Example request:**

PUT http://127.0.0.1:8085/web2/secure/configuration/MACRO:1/state/actions/RUN/execute

4.10 Video

4.10.1 Thumbnails request

4.10.1.1 General request format:

4.10.1.1.1 First way

http://IP-address:port/web2/secure/video/image.jpg?cam.id={cam.id}&width={width}&height={height}&version={version}
&login={login}&password={password}

4.10.1.2 Request parameters:

Parameter	Is required	Description
cam.id	Yes	Camera ID
width	No	Value can be in [64, 1600] range. Server automatically rounds width to larger value divisible by 4 Size of returned image is taken from video stream if width parameter are not set.
height	No	Value can be in [30, 1200] range. Size of returned image is taken from video stream if height parameter are not set.
version	No	See Product version
login	No	*Intellect* username, if set
password	No	*Intellect* user password, if set

4.10.1.2.1 Second way

http://IP-address:port/web2/secure/video/action.do?version={version}&command=frame.video&video_in={video_in}&imageWidth={imageWidth}&imageHeight={imageHeight}&login={login}&password={password}

4.10.1.3 Request parameters:

Parameter	Is required	Description
version	No	See Product version
video_in	Yes	Camera ID in the format "TYPE:ID", for example "CAM:1"
imageWidth	No	Value can be in [64, 1600] range. Server automatically rounds width to larger value divisible by 4 Size of returned image is taken from video stream if width parameter are not set.
imageHeight	No	Value can be in [30, 1200] range. Size of returned image is taken from video stream if height parameter are not set.
login	No	*Intellect* username, if set
password	No	*Intellect* user password, if set

4.10.1.4 **Example request:**

4.10.1.4.1 First way

http://127.0.0.1:8085/web2/secure/video/image.jpg?cam.id=5&width=85&version=4.7.8.0&login=USER&password=PASS

4.10.1.4.2 Second way

http://127.0.0.1:8085/web2/secure/video/action.do?version=4.9.0.0&command=frame.video&video_in=CAM:1&imageWidth=400

4.10.1.5 **Example response:**

Jpg image of approximately requested size or error code and zero length body (i.e. only headings) will be received in reply.

In case of error the http error code is returned:
404 – camera disabled or not in use (disabled);
403 – invalid password;
426 – old client version;
429 – too many requests;
444 – camera signal is lost or camera disabled (coaxial conductor disconnected from card);
503 – archive error.

4.10.2 Configuration request

4.10.2.1 General request format:

GET http://IP-address:port/web2/secure/video/config.properties?version={version}&login={login}&password={password}

4.10.2.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version
login	No	*Intellect* username, if set
password	No	*Intellect* user password, if set

4.10.2.3 **Example request:**

GET http://127.0.0.1:8085/web2/secure/video/config.properties?version=4.7.8.0&login=USER&password=PASS

4.10.2.4 **Example response:**

Config.properties text file.

If a password is set but not specified in the request:

```
password.enabled=true
login.enabled=true
password.invalid=true#
```

If the password is correct or access is allowed without the password, then the server sends the following configuration:

```
password.enabled=true
login.enabled=true
password.invalid=false
cam.0.id=2
cam.0.name=Face
cam.0.rights=11
cam.1.id=3
cam.1.name=Camera 3
cam.1.rights=11
cam.2.id=5
cam.2.name=Camera 5
cam.2.rights=11
cam.2.telemetry_id=1.1
cam.count=3#
```

4.10.2.5 **Response** parameters:

Parameter	Description
password.enabled	false - no password required true - password required
login.enabled	false - no login required true - login required
password.invalid	false - specified password is correct true - specified password is not correct
cam.count	Total count of cameras in the configuration (id starts at 0).
cam.N.id	Camera ID
cam.N.name	Camera name

cam.N.rights	Rights (they are checked on the server; available on the client in order not to show the user odd options). The parameter is represented by flags. If the flag is set, then the interface element is to be shown; if not – hidden.
	static final int RIGHT_VIEW = 0x1; // live video is available (always 1)
	static final int RIGHT_CONTROL = 0x2; // control (telemetry, arming and disarming)
	static final int RIGHT_CONFIG = 0x4; // reserved
	static final int RIGHT_HISTORY = 0x8; // access to archive

cam.N.telemetry_id	Telemetry ID (there can be no value if there is no telemetry – then hide telemetry control elements).

4.10.3 Video query

4.10.3.1 General request format:

http://IP-address:port/web2/secure/video/action.do?version={version}&sessionid={sessionid}&video_in={video_in}&imageWidth={imageWidth}&fps={fps}&login={login}&password={password}

4.10.3.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version. If version 4.10.0.0 is specified in request, then the *stream obtained* is in *MJPEG* format without XML inserts – it can be displayed on a web page using the IMG tag in Chrome and FireFox browsers. This feature is implemented for both live and archive video. *Note. Not more than 6 video streams can be received simultaneously.*
video_in	Yes	Camera ID in the format "TYPE:ID", for example "CAM:1"
sessionid	No	Session ID
imageWidth	No	Value can be in [64, 1600] range. Server automatically rounds width to larger value divisible by 4
fps	No	Video frame rate

Parameter	Is required	Description
login	No	*Intellect* username, if set
password	No	*Intellect* user password, if set

4.10.3.3 Example request:

http://127.0.0.1:8085/web2/secure/video/action.do?version=4.10.0.0&sessionid=1234567890&video_in=CAM:1&imageWidth=200&fps=1&login=USER&password=PASS

4.10.3.4 Example response:

```
<html>
 <head/>
 <body>
  <img src="path to mjpeg"/>
 </body>
</html>
```

4.10.4 Format of main stream

4.10.4.1 **Example request:**

```
HTTP/1.0 200 OK
Connection: close
Server: ITV-Intellect-Webserver/4.9.0.0
Cache-Control: no-store,no-cache,must-revalidate,max-age=0
Pragma: no-cache
Date: Mon, 13 Jan 2013 10:44:27 GMT
Content-Type: multipart/mixed;boundary=videoframe

--videoframe
Content-Type: text/xml
Content-Length: 138

<video_in>
  <sessionid>FC126734</sessionid>
  <video_in>CAM:5</video_in>
  <newstate>started</newstate>
  <errcode>100</errcode>
</video_in>
 --videoframe
Content-Type: image/jpeg
Content-Length: 23978
X-Width: 320
X-Height: 240
X-Time: 2013-03-15T10:51:44.314+04:00
X-Timestamp: 0.000

 <jpeg image>
--videoframe
Content-Type: image/jpeg
Content-Length: 23651
X-Width: 320
X-Height: 240
X-Time: 2013-03-15T10:51:44.314+04:00
X-Timestamp: 0.152

 <jpeg image>
```

4.10.4.2 **Response** parameters:

Parameter	Description
X-Width	Image width
X-Height	Image height
X-Time	Absolute time of frame forming
X-Timestamp	Relative frame time in seconds (relatively stream head)

4.10.4.3 **Example response:**

In case of stream end due to the fault of server, the end packet can be received:

```
--videoframe
Content-Type: text/xml
Content-Length: 106
<video_in>
  <sessionid>FC126734</sessionid>
  <video_in>CAM:5</video_in>
  <newstate>closed</newstate>
  <errcode>103</errcode>
</video_in>
```

4.10.4.4 **Response** parameters:

Parameter	Description
sessionid	Session ID (the same as at start).
video_in	Camera ID
errcode	Error code: • 100 – error absence. • 101 – too many connected users. • 102 – invalid password (theoretically, it's possible to change password at any moment). • 103 – unavailable video. • 104 – old client version. Update version.

4.10.5 Camera managing

4.10.5.1 General request format:

GET http://IP-address:port/web2/secure/video/action.do?version={version}&sessionid={sessionid}&cam.id={cam.id}
&target=CAM&targetid={targetid}&command={command}&login={login}&password={password}

4.10.5.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version
cam.id	Yes	Camera ID
sessionid	No	Session ID
targetid	Yes	Matches cam.id
login	No	*Intellect* username, if set
password	No	*Intellect* user password, if set

Parameter	Is required	Description
command	Yes	Camera control commands: • Start recording: REC • Stop recording: REC_STOP • Arming: ARM • Disarming: DISARM

4.10.5.3 **Example response:**

GET http://127.0.0.1:8085/web2/secure/video/action.do?
version=4.7.8.0&sessionid=29101F1&cam.id=1&target=CAM&targetid=1&command=REC&login=USER&password=PASS

GET http://127.0.0.1:8085/web2/secure/video/action.do?
version=4.7.8.0&sessionid=29101F1&cam.id=1&target=CAM&targetid=1&command=REC_STOP&login=USER&password=PASS

GET http://127.0.0.1:8085/web2/secure/video/action.do?
version=4.7.8.0&sessionid=29101F1&cam.id=1&target=CAM&targetid=1&command=ARM&login=USER&password=PASS

GET http://127.0.0.1:8085/web2/secure/video/action.do?
version=4.7.8.0&sessionid=29101F1&cam.id=1&target=CAM&targetid=1&command=DISARM&login=USER&password=PASS

4.10.6 Authorization by token

To receive a pre-authorized link to the camera (to receive both live or archived video), you must:

- Execute a request to get a token;
- Execute a request for the received token.

4.10.6.1 General request format to get a token:

GET http://IP-address:port/web2/secure/video/action.do?version={version}&sessionid={sessionid}&video_in={video_in}
&enable_token_auth={enable_token_auth}&valid_token_hours={valid_token_hours}&login={login}&password={password}

4.10.6.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version
video_in	Yes	Camera ID in the format "TYPE:ID", for example "CAM:1"
sessionid	No	Session ID
targetid	Yes	Matches cam.id
login	No	*Intellect* username, if set
password	No	*Intellect user password, if set*
enable_token_auth	Yes	Enable authorization by token **=1**.
valid_token_hours	No	Signature validation time (in hours). The maximum value is a week. The default value is 12 hours.

4.10.6.3 **Example request:**

```
GET http://127.0.0.1:8085/web2/secure/video/action.do?
version=4.10.0.0&sessionid=FC126734&video_in=CAM:
1&enable_token_auth=1&valid_token_hours=1&login=USER&password=PASS
```

4.10.6.4 **Example response:**

```
{
"path" : "action.do?hmac=GAqUa429sjY2E9jCTpuYeaMqReW3Y7HI"
}
```

4.10.6.5 General request format for the received token:

GET http://IP-address:{port}/action.do?hmac={hmac}

4.10.6.6 Request parameters:

Parameter	Is required	Description
port	Yes	Port number specified for HTTP Server connection on the **Web server** object settings panel (see Setting the parameters of connecting Clients to the Web-server).
hmac	Yes	Token

4.10.6.7 **Example request:**

```
GET http://127.0.0.1:8085/action.do?hmac=GAqUa429sjY2E9jCTpuYeaMqReW3Y7HI
```

4.11 PTZ control

4.11.1 General request format:

GET http://{login}:{password}@IP-address:[port]/web2/secure/video/action.do?version={version}&sessionid={session_id}
&cam.id={cam_id}&target=PTZ&targetid={PTZ_device_id}&command={command}&login={login}&password={password}
&speed={speed}&preset={preset}

> **Important!**
>
> Login and password must be specified twice in the request: before the IP address and in parameters. In both cases, this is the same login and password of the *Intellect* user.

4.11.2 **Request parameters**:

Parameter	Is required	Description
version	Yes	See Product version
session_id	Yes	Session ID
cam_id	Yes	Camera ID

Parameter	Is required	Description
PTZ_device_id	Yes	ID of the PTZ control panel related to the camera (can be obtained in configuration request – see Getting list of all server objects)
command	Yes	The command to be executed. It can take one of the following values: • RIGHT – pan right. • UP – tilt up. • LEFT – pan left. • DOWN – tilt down. • ZOOM_IN – zoom in. • ZOOM_OUT – zoom out. • GO_PRESET – go to the specified preset. • POINTMOVE – zooming of selected point on the image (x,y). • AREAZOOM – zooming of selected area on the image (x,y,w,h).
login	Yes	*Intellect* username, if set
password	Yes	*Intellect* user password, if set
speed	Yes	Command-processing speed (from 0 to 10). It is recommended to use low values due to delays while controlling by network
preset	No	Number of preset. Required parameter only for the command=GO_PRESET. Otherwise its value is ignored. **x** – x coordinate relatively the image size. It takes values from 0.0 to 1.0. Required parameter only for the command=POINTMOVE or command=AREAZOOM. Otherwise its value is ignored. **y** – y coordinate relatively the image size. It takes values from 0.0 to 1.0. Required parameter only for the command=POINTMOVE or command=AREAZOOM. Otherwise its value is ignored. **w** – width of zooming area relatively the image size. It takes values from 0.0 to 1.0. Required parameter only for the command=AREAZOOM. Otherwise its value is ignored. **h** – height of zooming area relatively the image size. It takes values from 0.0 to 1.0. Required parameter only for the command=AREAZOOM. Otherwise its value is ignored.

4.11.3 Request example:

GET http://user:pass@127.0.0.1:8085/web2/secure/video/action.do?
version=4.10.0.0&cam.id=5cam.id=1&target=PTZ&targetid=1.1&command=RIGHT&login=user&password=pass&speed=2

4.12 Using the archive

Video archive stream is sent on the same format as live video.

4.12.1 Getting list of records (1st way)

4.12.1.1 General request format:

GET http://IP-address:port/web2/secure/video/action.do?version={version}&sessionid={sessionid}&video_in={video_in}
&command=arc.intervals&time_from={time_from}&time_to={time_to}&max_count={max_count}
&split_threshold={split_threshold}&login={login}&password={password}

4.12.1.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version
sessionid	No	Session ID
video_in	Yes	Camera ID in the format "TYPE:ID", for example "CAM:1"
command	Yes	Command to receive list of records: arc.intervals
time_from	Yes	Start of interested time range
time_to	No	End of interested time range
max_count	No	Maximal number of records in reply
split_threshold	No	Time for combining several intervals (in seconds). Intervals, distance between which will be less than specified value, will be combined in one.
login	No	*Intellect* username, if set
password	No	*Intellect* user password, if set
format	No	Sets the response format (see General information on HTTP API)

4.12.1.3 **Example request:**

GET http://127.0.0.1:8085/web2/secure/video/action.do?version=4.9.0.0&sessionid=29101F1&video_in=CAM:5&command=arc.intervals&time_from=2013-03-20T00:00:00.000+04:00&time_to=2013-03-22T23:59:59.999+04:00&max_count=100&split_threshold=10399&login=USER&password=PASS

4.12.1.4 **Example response:**

XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<records count="1" complete="YES" sort="INCREASE">
    <record>
        <from>2011-09-01T00:00:00-05:00</from>
        <to>2011-09-01T00:00:35-05:00</to>
    </record>
    <record>
        <from>2011-09-01T00:00:35-05:00</from>
        <to>2011-09-01T00:01:10-05:00</to>
    </record>
</records>
```

JSON:

```
{ 'count' : 1,
  'complete' : 'YES',
  'sort' : 'INCREASE',
  'cam' : '1',
  'records' : [ {
     'from' : '2019-01-22T12:41:10.144+03:00',
    'to' : '2019-01-23T08:28:47.346+03:00'
  }]
}
```

4.12.2 Getting list of records (2nd way)

4.12.2.1 General request format:

GET http://IP-address:port/web2/secure/archive/{CAM:id}/{DATE}/?[splitThreshold={splitThreshold}]&[days={days}]

4.12.2.2 Request parameters:

Parameter	Is required	Description
CAM:id	Yes	Camera ID in the format "TYPE:ID", for example "CAM:1"
DATE	Yes	Date of the start of receiving the archive. All time is interpreted as local time for server.
splitThreshold	Yes	If difference between end of previous record and start of next record less than specified value (in milliseconds), than records will be combined in one. Specify splitTreshold=0. [default: 50] not to combine records.
days	Yes	Number of days from the current, for which archive is required. [default: 1]

4.12.2.3 **Example request:**

GET http://127.0.0.1:8085/web2/secure/archive/CAM:2/2011-12-30/?[splitThreshold=50]&[days=1]

GET http://127.0.0.1:8085/web2/secure/archive/CAM:1/2013-10-18/?splitTreshold=2000 – Get records for 18 November 2013 and combine all records, interval between which less than 2000 milliseconds.

GET http://127.0.0.1:8085/web2/secure/archive/CAM:1/2013-10-18/?days=10 – Get records for 10 days from 18 November 2013.

4.12.2.4 **Example response:**

XML:

```
<?xml version="1.0" encoding="UTF-16"?>
<days>
    <day>
        <id>2013-11-10T00:00:00-02:00</id>
        <records>
            <from>2013-11-10T18:44:01.579-02:00</from>
            <to>2013-11-10T18:44:09.717-02:00</to>
        </records>
    </day>
    <day>
        <id>2013-11-18T00:00:00-02:00</id>
        <records>
            <from>2013-11-18T18:38:30.252-02:00</from>
            <to>2013-11-18T18:38:56.942-02:00</to>
        </records>
        <records>
            <from>2013-11-18T18:39:08.321-02:00</from>
            <to>2013-11-18T18:39:10.080-02:00</to>
        </records>
    </day>
</days>
```

JSON:

```
[ {
  "id" : "2013-11-10T00:00:00.000-02:00",
  "records" : [ {
    "from" : "2013-11-10T18:44:01.579-02:00",
    "to" : "2013-11-10T18:44:09.717-02:00"
  } ]
}, {
  "id" : "2013-11-18T00:00:00.000-02:00",
  "records" : [ {
    "from" : "2013-11-18T18:38:30.252-02:00",
    "to" : "2013-11-18T18:38:56.942-02:00"
  }, {
    "from" : "2013-11-18T18:39:08.321-02:00",
    "to" : "2013-11-18T18:39:10.080-02:00"
  } ]
} ]
```

Getting records for a month (shows days of September at which there are records):

GET http://127.0.0.1:8085/web2/secure/archive/CAM:2/2011-12/

XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<days>
    <day>
        <id>2011-09-02T00:00:00-05:00</id>
    </day>
    <day>
        <id>2011-09-03T00:00:00-05:00</id>
    </day>
    <day>
        <id>2011-09-05T00:00:00-05:00</id>
    </day>
</days>
```

JSON:

```
[ {
  "id" : "2011-09-01T00:00:00-0500",
  "records" : [ ]
}, {
  "id" : "2011-09-03T00:00:00-0500",
  "records" : [ ]
}, {
  "id" : "2011-09-01T00:00:00-0500",
  "records" : [ ]
} ]
```

If there are no records, the following will be received:

XML:

```
[<days/>
JSON:
[]
```

4.12.3 Getting video from archive - "arc.play"

4.12.3.1 General request format:

GET http://IP-address:port/web2/secure/video/action.do?version={version}&sessionid={sessionid}&video_in={video_in}&command=arc.play&time_from={time_from}&time_to={time_to}&login={login}&password={password}

4.12.3.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version
sessionid	No	Session ID
video_in	Yes	Camera ID in the format "TYPE:ID", for example "CAM:1"
command	Yes	Command to get video from archive: arc.play

Parameter	Is required	Description
time_from	Yes	Start time of archive playing back
time_to	No	Completion time of archive playing back (if parameter is not specified, all archive will play back)
imageWidth	No	Width in pixels (is counted automatically with saving proportions if it isn't specified or equal 0)
imageHeight	No	Height in pixels (is counted automatically with saving proportions if it isn't specified or equal 0)
fps	No	Maximal frame per second (if it isn't specified or equal 0, frame frequency won't be limited if)
login	No	*Intellect* username, if set
password	No	*Intellect* user password, if set
format	No	Sets the response format (see General information on HTTP API)

4.12.3.3 **Example request:**

GET http://127.0.0.1:8085/web2/secure/video/action.do?version=4.9.0.0&sessionid=29101F1&video_in=CAM:5&command=arc.play&time_from=2013-03-22T13:04:52.312+04:00&time_to=2013-03-22T13:16:31.873+04:00&login=USER&password=PASS

4.12.3.4 **Example response:**

End packet with newstate=closed and errcode=100 will be received when stream completion.

4.12.4 Getting one frame from archive - "arc.frame"

4.12.4.1 General request format (1st way):

GET http://IP-address:port/web2/secure/video/action.do?version={version}&sessionid={sessionid}&video_in={video_in}&command=arc.frame&time={time}&range={range}&login={login}&password={password}

4.12.4.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version
sessionid	No	Session ID
video_in	Yes	Camera ID in the format "TYPE:ID", for example "CAM:1"
command	Yes	Command to get video from archive: arc.frame
time	Yes	Frame time
range	No	Time in seconds to specify search range of the nearest frame relatively the time parameter (the nearest frame all over archive is searched if this parameter is not specified);
imageWidth	No	Width in pixels (is counted automatically with saving proportions if it isn't specified or equal 0)
imageHeight	No	Height in pixels (is counted automatically with saving proportions if it isn't specified or equal 0)
login	No	*Intellect* username, if set

Parameter	Is required	Description
password	No	*Intellect* user password, if set

4.12.4.3 **Example request:**

GET http://127.0.0.1:8085/web2/secure/video/action.do?version=4.9.0.0&sessionid=29101F1&video_in=CAM:5&command=arc.frame&time=2013-03-22T13:04:52.312+04:00&range=0.1&login=USER&password=PASS

4.12.4.4 General request format (2nd way):

GET http://IP-address:port/action.do?version={version}&video_in={video_in}&command=arc.frame&time={time}

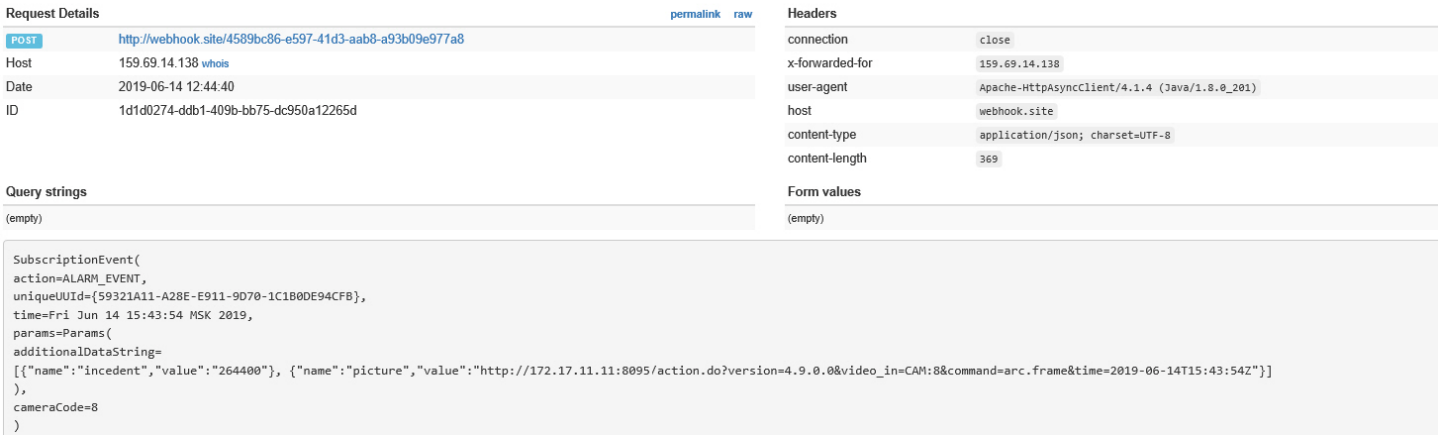
4.12.4.5 Request parameters:

Parameter	Is required	Parameter
version	Yes	See Product version
video_in	Yes	Camera ID in the format "TYPE:ID", for example "CAM:1"
command	Yes	Command to get video from archive: arc.frame
time	Yes	Frame time

4.12.4.6 **Example request:**

GET http://127.0.0.1:8085/action.do?version=4.9.0.0&video_in=CAM:1&command=arc.frame&time=2018-08-12T22:29:06Z

4.12.4.7 **Example response:**



In return http-headings and the nearest frame from the [time - range, time + range] range in the jpeg format will be received. The reply body will be empty if there is no frame in the range.

4.13 Notification

When the app connects to service, the APNS messages subscription is performed. So when the app is closed, device will receive events notifications.

APNS(iOS), C2DN (Android), etc. notification systems are in use.

4.13.1 APN message format

```
{
"aps" : {
                    "alert" : "Motion Detected",
                    "badge" : 2 //ordinal number of the message. Numbers are given one after
another after the latest subscribing.
            },
     "e" : {
                "srv" : "XXX",  //server id. Unique in one iOS device
                "stt" : 88,   //state id(see The list of states for a specific object class)
                "obj" : "6", //object id
                "ts" : "2010-08-02T23:30:00Z" //time of sending the event
            }
}
```

4.13.2 APNS messages subscribing

4.13.2.1 General request format:

POST http://IP-address:port/web2/secure/subscription/

The POST body should contain information about created subscribing. Only JSON format is received. It's required to specify the Content-Type title properly.

```
JSON
Content-Type  :  application/json
{
    "userparam" : "{userparam}",
    "deviceid" : "{deviceid}"
}
```

4.13.2.2 Request parameters:

Parameter	Is required	Description
deviceid	Yes	Device token (APNs), registration id (C2DN), etc.; DeviceId is not to be empty, it's length should be from 5 to 150 symbols and contain only digits and letter of English alphabet).
userparam	No	User login. The field can be blank.

4.13.2.3 **Example request:**

POST http://127.0.0.1:8085/web2/secure/subscription/

```
JSON
Content-Type  :  application/json
{
    "userparam" : "John doe",
    "deviceid" : "FC126734454FGD5"
}
```

4.13.2.4 **Example response:**

Reply with “201 Created” code means that subscribing is performed successfully.

Reply with “ 400" code means that specified parameters are invalid.

4.13.3 APNS messages subscription cancellation

Subscription is cancelled in the following cases:

- The user subscribed to events from other device;
- Device token or registration id is changed;
- Another user subscribed to events from this device;
- Subscription is cancelled manually.

4.13.3.1 General request format:

DELETE http://IP-address:port/web2/secure/subscription/[{deviceId}

4.13.3.2 Request parameters:

Parameter	Is required	Description
deviceid	Yes	device token (APNs), registration id (в случае C2DN) и т.д

4.13.3.3 **Example request:**

DELETE http://127.0.0.1:8085/web2/secure/subscription/[FC126734454FGD5]

4.13.3.4 **Example response:**

Reply with “204 No Content” code means that subscribing is performed successfully.

4.14 Sound

4.14.1 Getting live sound

4.14.1.1 General request format:

GET http://IP-address:port/web2/secure/video/action.do?version={version}&sessionid={sessionid}
&command=audio.play&audio_in={audio_in}&format={format}&login={login}&password={password}

4.14.1.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version
sessionid	No	Session ID
command	Yes	Command to getting live sound: **audio.play**
format	Yes	Format of audio data
audio_in	Yes	Microphone ID in the format "TYPE:ID", for example "MIC:1"
login	No	*Intellect* username, if set
password	No	*Intellect user password, if set*

4.14.1.3 **Example request:**

GET http://127.0.0.1:8085/web2/secure/video/action.do?
version=4.9.0.0&sessionid=FC126734&command=audio.play&audio_in=MIC:5&format=L16&login=USER&password=PASS

4.14.1.4 **Example response:**

Audio packets of the following view will be received:

```
HTTP/1.0 200 OK
Connection: close
Server: ITV-Intellect-Webserver/4.9.0.0
Cache-Control: no-store,no-cache,must-revalidate,max-age=0
Pragma: no-cache
Date: Mon, 13 Jan 2013 10:44:27 GMT
Content-Type: multipart/mixed;boundary=audioframe

--audioframe
Content-Type: text/xml
Content-Length: 138

<audio_in>
  <sessionid>FC126734</sessionid>
  <audio_in>MIC:5</audio_in>
  <newstate>started</newstate>
  <errcode>100</errcode>
</audio_in>
--audioframe
Content-Type: audio/L16;rate=8000;channels=1
Content-Length: 1024
X-Time: 2013-03-22T13:16:31.371+04:00

<audio packet PCM16>
--audioframe
Content-Type: audio/L16;rate=8000;channels=1
Content-Length: 1278
X-Time: 2013-03-22T13:16:31.873+04:00
<audio packet PCM16>
```

4.14.2 Stop streaming live sound

4.14.2.1 General request format:

GET http://IP-address:port/web2/secure/video/action.do?version={version}&sessionid={sessionid}
&command=audio.stop&audio_in={audio_in}&login={login}&password={password}

4.14.2.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version
sessionid	No	Session ID
command	Yes	Command to stop streaming live sound: **audio.stop**
audio_in	Yes	Microphone ID in the format "TYPE:ID", for example "MIC:1"
login	No	*Intellect* username, if set
password	No	*Intellect user password, if set*

4.14.2.3 **Example request:**

GET http://127.0.0.1:8085/web2/secure/video/action.do?
version=4.9.0.0&sessionid=29101F1&command=audio.stop&audio_in=MIC:5&login=USER&password=PASS

4.14.2.4 **Example response:**

The end xml packet will be received:

```
--audioframe
Content-Type: text/xml
Content-Length: 106
<audio_in>
  <sessionid>FC126734</sessionid>
  <audio_in>MIC:5</audio_in>
  <newstate>closed</newstate>
  <errcode>100</errcode>
 </audio_in>
```

4.14.3 Playing sound from archive

4.14.3.1 General request format:

GET http://IP-address:port/web2/secure/video/action.do?version={version}&sessionid={sessionid}
&command=arc.play&audio_in={audio_in}&format={format}&time_from={time_from}&time_to={time_to}&login={login}
&password={password}

4.14.3.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version
sessionid	No	Session ID
command	Yes	Command to playing sound from archive: **arc.play**
format	Yes	Format of audio data
audio_in	Yes	Microphone ID in the format "TYPE:ID", for example "MIC:1"
time_from	Yes	Start time of archive playing back
time_to	Yes	End time of archive playing back
login	No	*Intellect* username, if set
password	No	*Intellect user password, if set*

4.14.3.3 **Example request:**

GET http://127.0.0.1:8085/web2/secure/video/action.do?version=4.9.0.0&sessionid=29101F1&command=arc.play&audio_in=MIC:5&format=L16&time_from=2013-03-22T13:16:31.873+04:00&time_to=2013-03-22T13:04:52.312+04:00&login=USER&password=PASS

4.14.3.4 **Example response:**

The stream will be received in the same view as in case of live sound (see Getting live sound). The end xml packet will be received when data completion (as when getting live sound (see Stop streaming live sound).

4.14.4 Sending live sound

4.14.4.1 General request format:

POST http://IP-address:port/web2/secure/video/action.do?version={version}&sessionid={sessionid}
&command=audio.receive&audio_out={audio_out}&login={login}&password={password}

4.14.4.2 Request parameters:

Parameter	Is required	Description
version	Yes	See Product version
sessionid	No	Session ID
command	Yes	Command to sending live sound: **audio.receive**
audio_out	Yes	Speaker ID in the format "TYPE:ID", for example "SPEAKER:1"
login	No	*Intellect* username, if set
password	No	*Intellect user password, if set*

4.14.4.3 **Example request:**

POST http://127.0.0.1:8085/web2/secure/video/action.do?
version=4.9.0.0&sessionid=FC126734&command=audio.receive&audio_out=SPEAKER:3&login=USER&password=PASS

Sending of sound is performed by serial communication of packets using commands:

```
Content-type: audio/L16;rate=8000;channels=1
Connection: keep-alive
```

Then audio packet transmission will perform.

4.14.4.4 Response parameters:

Parameter	Description
L16	Format of sound – only L16
rate	Any rational value

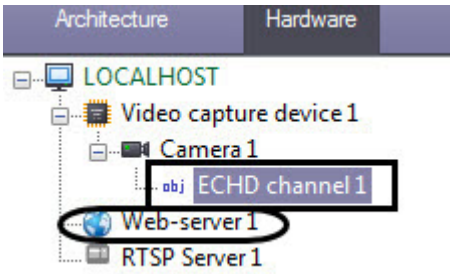
Parameter	Description
channels	Channel from 1 to 6

4.15 Commands used for ECHD integration

ECHD means 'Unified data center' state information system.

The description of http requests that are used for integration of *Intellect* with ECHD is given in this section. For requests operation they are to be enabled at the stage of system configuration – see Enabling the processing of ECHD requests and selecting rtsp server.

Requests are sent to **Web Server** and are performed only for cameras under which the **ECHD channel** object is created.



4.15.1 Archive downloading

4.15.1.1 General request format

GET

http://IP-address:port/downloadarchivefile?cameraid={cam_id}&fromdatetime={from_time}&todatetime={to_time}

4.15.1.2 Request parameters

Parameter	Is required	Description
cam_id	Yes	Camera ID
from_time	Yes	The start time of the archive fragment in the format YYYY-MM-DDTHH:MM:SS
to_time	Yes	The end time of the archive fragment in the format YYYY-MM-DDTHH:MM:SS

4.15.1.3 Request example

GET http://192.168.15.182:80/downloadarchivefile?
cameraid=1&fromdatetime=2014-10-01T00:00:00&todatetime=2014-10-01T01:20:05

4.15.1.4 Response example

```
HTTP/l.1 200 OK
Content-Type: application/octet-stream
```

Also, as a result of the command, a file with the .es extension will be received (for example, Camera [4] (2019-08-13T11_00_00 - 2019-08-13T12_10_00).es). Convert this file using the ffmpeg utility to play it. This utility is available for download on the official website https://ffmpeg.org/

Example command to convert H.264-coded file:

ffmpeg -i "C:\path to the .264 file\Camera[5].es" -c:v copy -bsf:v h264_mp4toannexb -c:a copy -f avi output.avi

Example command to convert H.265-coded file:

ffmpeg -i "C:\path to the .265 file\Camera[5].es" -c:v copy -bsf:v hevc_mp4toannexb -c:a copy -f avi output.avi

The .avi file (output.avi) is created after this command execution.

4.15.2 Archive export

In the section:

By default, the archive is exported in mp4 format. Change the format using the ExportContainerFormat registry key (see Registry keys reference guide). The export of the archive in H.264 or MPEG4 formats is supported.

4.15.2.1 Creating archive export request

Example:

POST http://192.168.15.182:80/createarchivetask
Content Type: application/json
Content:

```
{
 "CameraId": "1",
 "From": "2016-06-27T15:10:00.00Z",
 "To": "2016-06-27T15:20:00.00Z"
}
```

Response:

```
{
    "CameraId" : "1",
    "From" : "2016-06-27T15:10:00.00Z",
    "To" : "2016-06-27T15:20:00.00Z",
    "ArchiveTaskId" : "084b56a5-bd49-4327-82db-9bc911f7ff96",
    "ErrorMessage" : null,
    "State" : "Created"
}
```

The folder with the corresponding name (084b56a5-bd49-4327-82db-9bc911f7ff96) and mp4 file inside it is created in the export folder (by default C:\Users\User\Documents\Intellect\export).

4.15.2.2 Getting export status

Example:
GET http://192.168.15.182:80/getarchivetaskstatus?archivetaskid=104b38d4-07d7-4d2f-84da-49b3e255d2bf

Response:


```
{
    "Percents" : 100,
    "Url" : "http://192.168.15.182:80/download?
file=104b38d4-07d7-4d2f-84da-49b3e255d2bf",
    "CameraId" : "1",
    "From" : "2016-06-27T15:10:00.000+03:00",
    "To" : "2016-06-27T15:11:00.000+03:00",
    "ArchiveTaskId" : "104b38d4-07d7-4d2f-84da-49b3e255d2bf",
    "ErrorMessage" : "null",
    "State" : "ReadyForDownload"
}
```


The required mp4 file can be downloaded using the link in the URL bar.

4.15.2.3 Deleting archive

Example:
DELETE http://192.168.15.182:80/removearchive?archivetaskid=084b56a5-bd49-4327-82db-9bc911f7ff96

Response:


```
{
    "ArchiveTaskId" : "084b56a5-bd49-4327-82db-9bc911f7ff96",
    "ErrorMessage" : null,
    "Success" : true
}
```

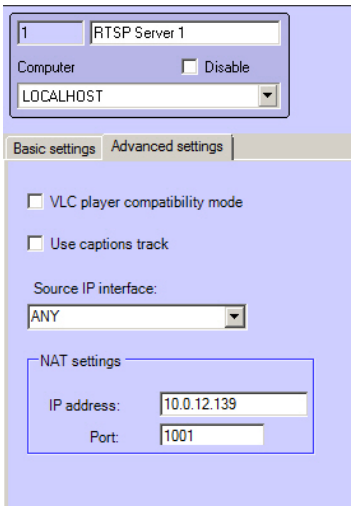

The corresponding folder with mp4 file will be deleted from the export folder.

4.15.3 Example ECHD commands with NAT

Go to the **RTSP Server** and **Web server** objects setting panels to enable and configure NAT (see Configuring RTSP Server module and Enabling the processing of ECHD requests and selecting the RTSP server).

Example:

Let us set the following parameters on the **RTSP Server** object setting panel:



10.0.12.139 – router IP address.

1001 – router port.

192.168.0.109 – Server address in local network.

559 – RTSP Server port.

80 – Web Server port.

Request:

```
http://10.0.12.139:80/getliveurl?cameraid=1
```

If the **Use NAT address** checkbox on the **Web server** object setting panel is UNchecked, then

Response:

```
{ "rtspurl": "rtsp://192.168.0.109:559/archive?id=1" }
```

If the **Use NAT address** checkbox on the **Web server** object setting panel is checked, then

Response:

```
{ "rtspurl": "rtsp://10.0.12.139:1001/archive?id=1" }
```

4.15.4 List of cameras and their parameters

In the section:

4.15.4.1 GetCameras

GET

http://example.com:[port]/getcameras

Returns the list of IDs of cameras registered on the video encoder/video server. Additionally, it can contain information on the status of the video surveillance device.

Example:

GET http://192.168.15.182:80/getcameras

Response:

```
{
"cameras": [
{
"id": 1,
"channe1": 1,
"status": "working"
},
{
"id": 2,
channel ": 2,
"status": "signallost"
}
]
}
```

4.15.4.2 GetDeviceInfo

GET http://example.com:[port]/getdeviceinfo

Returns information about the device (firmware version, manufacturer, model and serial number).

> **Note.**
>
> Any prefix can be added to the firmware version value returned by the AdditionalVersionString registry key – see Registry keys reference guide.

Example:

GET http://192.168.15.182:80/getdeviceinfo

Response

```
{
"firmware version": "1.2.3 Rev B.",
"vendor": "Vendor Title Ltd"
"model": "Device Model",
"serial_number": "12345ABCDEF",
"ptz-status": "not supported"
}
```

4.15.5 Ranges of available archive recordings

GET

http://example.com:[port]/getarchiveranges?cameraid=1

Returns time periods over which archive recordings from the specified video surveillance device are available.

Note.

By default fragments are merged if the interval between them is less than 5 seconds. This time period can be changed using the SplitArchiveIntervals registry key (see Registry keys reference guide).

Example:

GET http://192.168.15.182:80/getarchiveranges?cameraid=1

Response**:**

```
{
"cameraid": 1,
"ranges": [
{
"from": 1412121600, //unixtime
"to": 1412172000
},
{
"from": 1412186400,
"to": 1412188200
}]
}
```

4.15.6 Video surveillance device features management

Important!

Disable the **Use device settings** checkbox in order to change the manage parameters by the below commands – see The Settings panel of the Video Capture Device object.

A camera must support the same commands for features management as the given ECHD commands (both when connected via ONVIF and via the corresponding driver).

4.15.6.1 General request format

GET https://IP-address:port/?cameraID={1}&ip={2}&loqin={3}&pass={4}&action={5}&x={6}&y={7}&z={8}&modelName={9}

4.15.6.2 Request parameters

Parameter	Is required	Description
1	Yes	ID of video surveillance device.
2	No	IP address of video surveillance device.
3	No	account of video surveillance device.
4	No	access password to video surveillance device.

Parameter	Is required	Description
5	Yes	Command name: **degreesmove** – discrete motion. Atomic shift of video surveillance device in the specified direction. **degreesmove2** – relative motion. Rotation of video surveillance device compared with current position. Viewing area of video surveillance device is divided by a grid where central point's coordinates are (x:0, y:0), top left (x:-7, y:7), bottom right (x:7, y:-7). Video surveillance device must be rotated in a way that object appears in the center of the grid. 'Optical' error caused by the distance to the visible object is allowed. Error caused by sphere-to-plane projection must be compensated. Depending on camera, registry keys may have to be set for correct operation: 1. The camera does not support Point&Click but supports absolute PTZ. Set the ReplacePointAndClick registry key to 1 (see Registry keys reference guide). 2. The camera supports Point&Click. Set the ReplacePointAndClick registry key to 0 and TelemetryCommandMoveTimeout to delay in milliseconds between panning/tilting and zooming (see Registry keys reference guide). **setposition** – setting position of video surveillance device in degrees compared with '0' position. **getposition** – getting position of video surveillance device in pAN and TILt in degrees as well as current zoom values. **focus** – video surveillance device's focus control command where z parameter controls over focus: 1: Focus in -1 : Focus out 0: Auto **iris** – video surveillance device's iris control command where z parameter controls over iris: 1: Open iris -1: Close iris 0: Auto **switch_day_night** – switch day/night mode where z parameter enables one of the following modes: 1: Day mode -1 : Night mode **backlight** – switch backlight on/off where z parameter controls over the mode: 1: Enable -1: Disable **switch_color** – the following operation modes of video surveillance device are set by z parameter: 1: Enable -1: Disable
6	No	In **degreesmove, setposition** commands: PAN rotation [-180 ..0.. 180]. In **degreesmove2**: PAN rotation [-7..0..7]. In **getposition:** not in use. In commands **focus, iris, switch_day_night, backlight, switch_color:** set value 0 to the parameter.
7	No	In **degreesmove, setposition** commands: TILT rotation [-180 ..0.. 180]. In **degreesmove2**: TILT rotation [-7..0..7]. In **getposition:** not in use. In commands **focus, iris, switch_day_night, backlight, switch_color:** set value 0 to the parameter.

Parameter	Is required	Description
8	No	In **degreesmove, degreesmove2, setposition** commands: zoom in/out [0.. 100]. In **getposition:** not in use. In commands **focus, iris, switch_day_night, backlight, switch_color:** set device mode, see description of the corresponding command above.
9	No	Model of video surveillance device.

4.15.6.3 Request example:

http://172.17.111.72:8095/execute?cameraID=7&action=getposition

4.15.6.4 Response example:

Response comes on getposition command only. Example in JSON format:

{"y":56, "x":105, "z":0}

Response parameters:

Parameter	Description
x	PAN coordinate
y	TILT coordinate
z	Zoom value

4.15.7 Working with video streams

In the section:

- GetLiveUrl(CameraId)
- GetArclliveURL(CameraId, FromDatetime, toDatetime)

4.15.7.1 GetLiveUrl(CameraId)

GET

http://example.com:[port]/getliveurl?cameraid=1

Returns rtsp URL of “live” video stream for the specified camera.

Example:

GET http://192.168.15.182:80/getliveurl?cameraid=1

Response

{

"rtspurl": "rtsp://device-address/somelivemediastream0"

}

4.15.7.2 GetArclliveURL(CameraId, FromDatetime, toDatetime)

GET

http://example.com:[port]/getarchiveurl?cameraid=1&fromdatetime=2014-10-01T00:00:00&todatetime=2014-10-01t01:20:05

Returns rtsp URL of archive video stream received from video encoder for the specified camera starting from FromDateTime (and, optionally, ending at endDatetime).

Example:

GEt http://192.168.15.182:80/getarchiveurl?cameraid=1&fromdatetime=2014-10-01T00:00:00&todatetime=2014-10-01t01:20:05

Response

{

"rtspurl": "rtsp://deviceladdress/somearchivemediastream?somedatetimetoken"

}

4.16 Sending reactions, events or XML data to Intellect with HTTP API

4.16.1 Request for archive frame

4.16.1.1 General request format

`http://{IP}:{port}/video/GetImage/{CamNo}/{UTC_Time}`

here:

IP is an Intellect Server IP

port is a HTTPS Server or HTTPS Server port set when configuring the Web server object – see Setting the parameters of connecting Clients to the Web-server

CamNo is a camera ID

UTC_Time is a time in UTC format

4.16.1.2 Request example

Request archive frame (screenshot) from camera 1 on date 07.11.2018 and time 13:20:56.212

`http://localhost:8080/video/GetImage/1/20181107T132056.212`

4.16.1.3 Response example

The response is a jpeg image or HTTP ERROR 404

4.16.2 Sending HTTP API commands using curl tool

To test HTTP API one can send HTTP API commands using curl tool. This tool is available at https://curl.haxx.se/.

To use the tool start the Windows command line and go to <curl installation directory>\curl-7.46.0-win64\bin folder.

Find the example of the command to create the archive export task below (see Archive export):

curl -H "Content-Type: application/json" -X POST -d "{ \"CameraId\": \"1\", \"From\": \"2017-12-26T10:58:00.00Z\", \"To\": \"2017-12-26T11:00:00.00Z\" } " http://127.0.0.1:80/createarchivetask

Response example:

{ "CameraId" : "1", "From" : "2017-12-26T10:58:00.00Z", "To" : "2017-12-26T11:00:00.00Z", "ArchiveTaskId" : "084b56a5-bd49-4327-82db-9bc911f7ff96", "ErrorMessage" : null, "State" : "Created" }

4.16.3 Sending reactions and events to Intellect using HTTP request.

4.16.3.1 General request format

> **Note.**
>
> Create and configure the Web server object in order to use these requests – see Creating the Web-server object

```
http://[Intellect Server IP]:10112/intellect_core/React?command="[Intellect format
command]"
http://[ Intellect Server IP]:10112/intellect_core/Event?command="[ Intellect format
command]"
```

```
GET
http://{IP}:{port}/intellect_core/React?command="{react}"
http://{IP}:{port}/intellect_core/Event?command="{event}"

or (with the same result)

POST
/intellect_core/React HTTP/1.1
{
    "command" : "{react}"
}

/intellect_core/Event HTTP/1.1
{
    "command" : "{event}"
}
```

where

IP is an Intellect Server IP

port is a HTTPS Server or HTTPS Server port set when configuring the Web server object – see Setting the parameters of connecting Clients to the Web-server

4.16.3.2 Request parameters

Parameter	Is required	Description
command	Yes	For React – a reaction in the *Intellect* format For Event – an event in the *Intellect* format

4.16.3.3 Examples:

Add captions to video from camera 2 via HTTP request:

```
http://localhost:10112/intellect_core/React?command="CAM|2|ADD_SUBTITLES|command<Some
text\n!>"
```

Generate alarm on camera 2 via HTTP request:

```
http://localhost:10112/intellect_core/Event?command="CAM|2|MD_START"
```

Run Macro 1 via HTTP request:

```
http://localhost:10112/intellect_core/React?command="MACRO|1|RUN"
```

When getting such commands, standard events and reactions will be generated in *Intellect* – they can be used in scripts and macros (see Creating and using macros section of Administrator's Guide as well as Programming Guide (JScript)).

4.16.4 Sending reactions to Intellect via HttpListener

In order to send reactions to the Intellect software via HttpListener, create **Video Capture Device** object under the **Computer** object on the **Hardware** tab of the **System Settings** dialog box, then select **HttpListener** as its **Type** and set connection port in the **Port** field. Also, create no more than 4 **Sensor** objects under this **Video Capture Device** object.

HttpListeners only allows sending reactions to close/open a normally opened/closed Sensor. In 2 seconds after the command execution, the sensor goes back to its normal state. Macros or scripts can be configured in *Intellect* to handle sensor triggering.

The command for HttpListener:

```
POST http:/IP-address:port/device/di/0
```

with the body of {"state": "closed"} or {"state": "opened"}

where

- **port** is the HttpListener's port.
- 0/1/2/3 – Sensor ID.
- **state** – **opened** or **closed**.

Example:

```
http://127.0.0.1:8080/device/di/0
{"state": "closed"}
```

4.16.5 Sending XML file

The HTTP API allows receiving data in xml format for further processing in scripts. To send a file, perform a POST request as follows:

https://127.0.0.1:8081/intellect_core/Any

```
<tag1>
  <tag2>some_data</tag2>
  <tag3>another_data</tag3>
</tag1>
```

> **Note.**
>
> Any set of valid characters can be specified instead of "Any" at the end of the command, except for "Event" and "React", for example:
>
> https://127.0.0.1:8081/intellect_core
>
> https://127.0.0.1:8081/intellect_core/Any
>
> https://127.0.0.1:8081/intellect_core/Custom

After receiving the data in xml format in *Intellect*, the following event is generated:

```
HTTP|1|CUSTOM_EVENT|url</intellect_core/Any>,owner<SLAVE-ID>,data<PG5..90ZT4=>
```

The event has the parameters:

- data – request body (i.e. the above xml) base64-encoded.
- url – part of the posted url.

4.17 Configuring the Technoserv integration

Create and configure the following objects and files in order to configure the Technoserv integration:

1. **Web-server** – see Configuring the videoserver to connect Clients via the Web-server module.
2. **Web-server 2.0** – see Configuring the server for the clients connection via the Web-server 2.0 module.
3. At least one **User** object added to **User permissions**. The Technoserv connection with *Intellect* will be established under this user's credentials. See Rights administration.
4. Enable filter for camera and detection tool events on the **Web-server 2.0** object settings panel – see Configuring the Events filter for the Web-server 2.0 module.
5. Add all cameras to get events from to the Web-server configuration – see Selecting and configuring cameras for the Web-server module.
6. Fill in the ApiBgConfig.xml configuration file, then put it to "<*Intellect* installation path>\Modules\Jetty\". See Filling in the ApiBgConfig.xml configuration file.

See also Examples of commands to work with the Technoserv integration.

4.17.1 Filling in the ApiBgConfig.xml configuration file

The ApiBgConfig.xml file is used to configure the login and password for connecting the Technoserv system to *Intellect*, as well as for associating *Intellect* events with the Technoserv event codes (see the table below).

The file has the following format:

```
<ApiBgEventsConfiguration>
    <PingTimeout>120000</PingTimeout>
    <MainHost>127.0.0.1</MainHost>
    <Login></Login>
    <Password></Password>
    <ApiBgEventMatch>
        <ProductObjectName>CAM</ProductObjectName>
        <ProductEventName>DETACHED</ProductEventName>
        <ApiBgEventCode>not_available</ApiBgEventCode>
    </ApiBgEventMatch>
    <ApiBgEventMatch>
        <ProductObjectName>CAM</ProductObjectName>
        <ProductEventName>ATTACH</ProductEventName>
        <ApiBgEventCode>available</ApiBgEventCode>
        <Picture>1</Picture>
    </ApiBgEventMatch>
    <ApiBgEventMatch>
        <ProductObjectName>CAM</ProductObjectName>
        <ProductEventName>ALARM</ProductEventName>
        <ApiBgEventCode>264400</ApiBgEventCode>
        <Shapes>1</Shapes>
        <Picture>1</Picture>
    </ApiBgEventMatch>
        <ApiBgEventMatch>
        <ProductObjectName>CAM</ProductObjectName>
        <ProductEventName>REC</ProductEventName>
        <ApiBgEventCode>264409</ApiBgEventCode>
        <Shapes>1</Shapes>
        <Picture>1</Picture>
    </ApiBgEventMatch>
</ApiBgEventsConfiguration>
```

1. The time in milliseconds between sending PING events
   <PingTimeout>120000</PingTimeout>
2. The IP-address to be returned on requests of Technoserv.
   <MainHost>192.168.0.171</MainHost>
3. Username and password to connect to the Technoserv server and send events (if any)
   <Login></Login> <Password></Password>
4. Correspondence of the *Intellect* event to the event code:

```
<ApiBgEventMatch>
    <ProductObjectName>CAM_VMDA_DETECTOR</ProductObjectName>
    <ProductEventName>ALARM</ProductEventName>
    <ApiBgEventCode>264400</ApiBgEventCode>
    <ProductObjectIds>
      <id>2</id>
      <id>1</id>
    </ProductObjectIds>
    <ParamMatch>
        <ProductEventParamName>num</ProductEventParamName>
       <ApiBgEventParamCode>NUMBER_OF_DETECTED_PEOPLE</ApiBgEventParamCode>
    </ParamMatch>
```

```
    <Shapes>1</Shapes>
    <Picture>1</Picture>
</ApiBgEventMatch>
```

a. ProductObjectName, ProductEventName – Intellect object and event, for example, CAM|MD_START.
b. ProductObjectIds – Intellect object id, if you need to specify specific detectors. May be absent, then events will be transmitted to all detectors.
c. ApiBgEventCode – event code, see below.
d. Shapes – whether to transfer the Shapes field.
e. Picture – whether to send a link to the freeze frame.
f. ParamMatch – correspondence of the Intellect event parameter name to the event parameter. May be absent.

Event codes:

Code	**Event name**
1799	Crowd Detection (detect crowds, including in unauthorized places)
264393	Abandoned object detection
264383	People counter
264385	Estimated people traffic density in significant city sites
264388	Detection of moving against crowd flow
264387	Person stopped in the controlled area (with the preset stop time)
264386	Sharp acceleration of human movement
264389	Chaotic human movement (idleness)
264391	Indexing events in traffic conditions (traffic jams)
264392	Indexing of events in traffic conditions (massive accumulation of vehicles)
264390	Indexing events in traffic conditions (traffic density)
264394	Detection of crossing the forbidden zone (by human or vehicle)
264395	Disappeared object detection
264396	Responding to the passage of people in a given direction (entrance)
264397	Responding to the passage of people in a given direction (exit)
264399	Responding to the passage of people in a given direction (corridor etc.)
264398	Responding to the passage of people in a given direction (crosswalk)
264400	Appearance of a person or car in the observation zone (streets, squares, intersections, parks)

Code	Event name
1795	Focus loss detection
1797	Dirty camera lens
264403	Background change
264402	Camera shift
1796	Blind/cover detection
264401	Bare flame
287069	Target detected
siren	Siren or car alarm detected
shout	Human cry detected
klaxon	The sound of the car horn detected
voice	Human speech detected
brake	The sound of a vehicle brake detected
shockwave	A shock wave detected
shock	A bang/shot/blast detected
PING	It is used for a regular event periodicity sent to control the communication channel between the IS and the "Safe City" software and hardware complex. Value is filled as cameraCode=-1.
not_available	The camera is unavailable (there is no video stream or no connection with the camera, etc.)
available	The camera is available

4.17.2 Examples of commands to work with the Technoserv integration

Use the following command to work with the Technoserv integration:

http://<IP address>:<Port>/web2/secure/api/bg[/request]

The 127.0.0.1 IP address and default 8085 port of the Web server 2.0 are given in the examples below**.** This data is subject to change.

4.17.2.1 **Getting a list of cameras**

GET http://127.0.0.1:8085/web2/secure/api/bg

Note.

If in the **Additional information** field on the camera settings panel is filled in the format coords:[longitude]:[latitude]:[angle]:[azimuth]:[radius], then this data will be returned in response to the request in the corresponding parameters. See also Additional information on camera.

Example response


```
0:
    cid:            "8"
    name:           "Камера 8"
    longitude:      "50.0825508"
    latitude:       "14.4410435"
    angle:          "56"
    azimuth:        "223"
    radius:         "23"
    webviewurl:     "http://172.17.11.11:8095/"
    streamHost:     "172.17.11.11"
    streamHttpPort: "8095"
    available:      false
```


4.17.2.2 Get a list of subscriptions

GET http://127.0.0.1:8085/web2/secure/api/bg/events/subscriptions

Example response:

when the list is empty:

{"data": [], "status":"success"}


```
data:    []
status:  "success"
```


when the list has subscriptions:

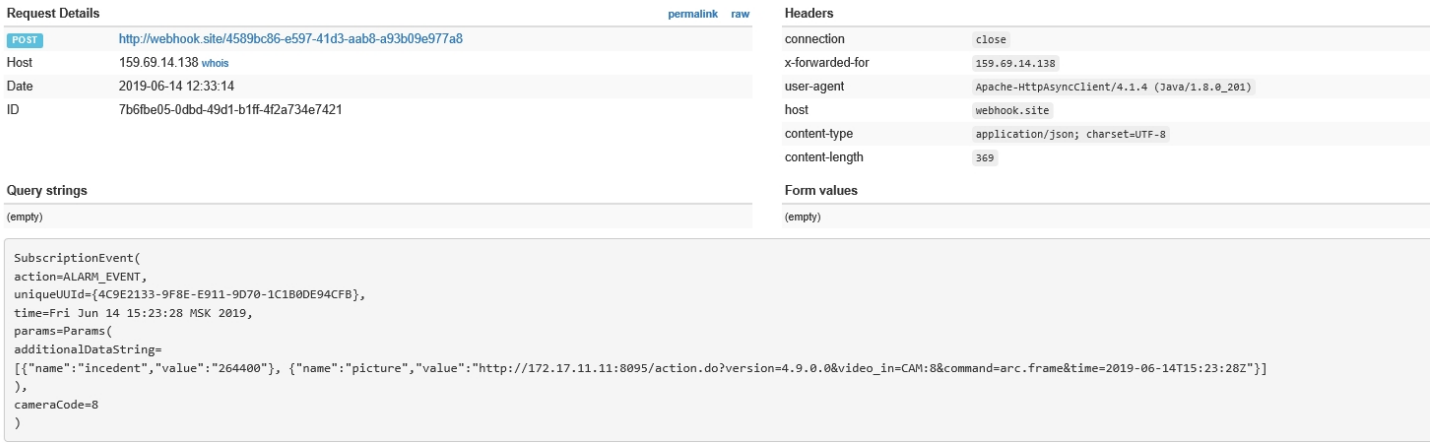

```
data:
  0:
    callback:   "https://webhook.site/4589bc86-e597-41d3-aab8-a93b09e977a8"
    filter:
        action: "RUN"
        type:   "MACRO"
        id:     "8"
      id:       "63eb2852-9780-4085-bf5e-f3e5be875357"
status:         "success"
```


4.17.2.3 Create subscription

POST http://127.0.0.1:8085/web2/secure/api/bg/events/subscriptions


```
{"callback":"https://webhook.site/26d15078-c405-4918-8f03-4f2a01b7580f","filter":
{"action":"RUN","type":"MACRO"},"id":"5"}
```


Example response:



Request Details permalink raw

POST	http://webhook.site/4589bc86-e597-41d3-aab8-a93b09e977a8
Host	159.69.14.138 whois
Date	2019-06-14 12:33:14
ID	7b6fbe05-0dbd-49d1-b1ff-4f2a734e7421

Headers

connection	close
x-forwarded-for	159.69.14.138
user-agent	Apache-HttpAsyncClient/4.1.4 (Java/1.8.0_201)
host	webhook.site
content-type	application/json; charset=UTF-8
content-length	369

Query strings

(empty)

Form values

(empty)


```
SubscriptionEvent(
action=ALARM_EVENT,
uniqueUUId={4C9E2133-9F8E-E911-9D70-1C1B0DE94CFB},
time=Fri Jun 14 15:23:28 MSK 2019,
params=Params(
additionalDataString=
[{"name":"incedent","value":"264400"}, {"name":"picture","value":"http://172.17.11.11:8095/action.do?version=4.9.0.0&video_in=CAM:8&command=arc.frame&time=2019-06-14T15:23:28Z"}]
),
cameraCode=8
)
```


4.17.2.4 Delete subscription

DELETE http://127.0.0.1:8085/web2/secure/api/bg/events/subscriptions/071e0159-5b2c-4bab-8ed7-42397f1b99b8

4.17.2.5 Delete all subscriptions

DELETE http://127.0.0.1:8085/web2/secure/api/bg/events/subscriptions/all

5 Intellect HTTP-Server

5.1 General information on HTTP-Server

HTTP-Server allows you to transfer the events from *Intellect* to the third-party systems, i.e. to notify the clients about the events.

The *HTTP-Server* module operation requires the web browser to support the Server-sent events (SSE) technology.

> **Note**
>
> Internet Explorer browser does not support the SSE technology.

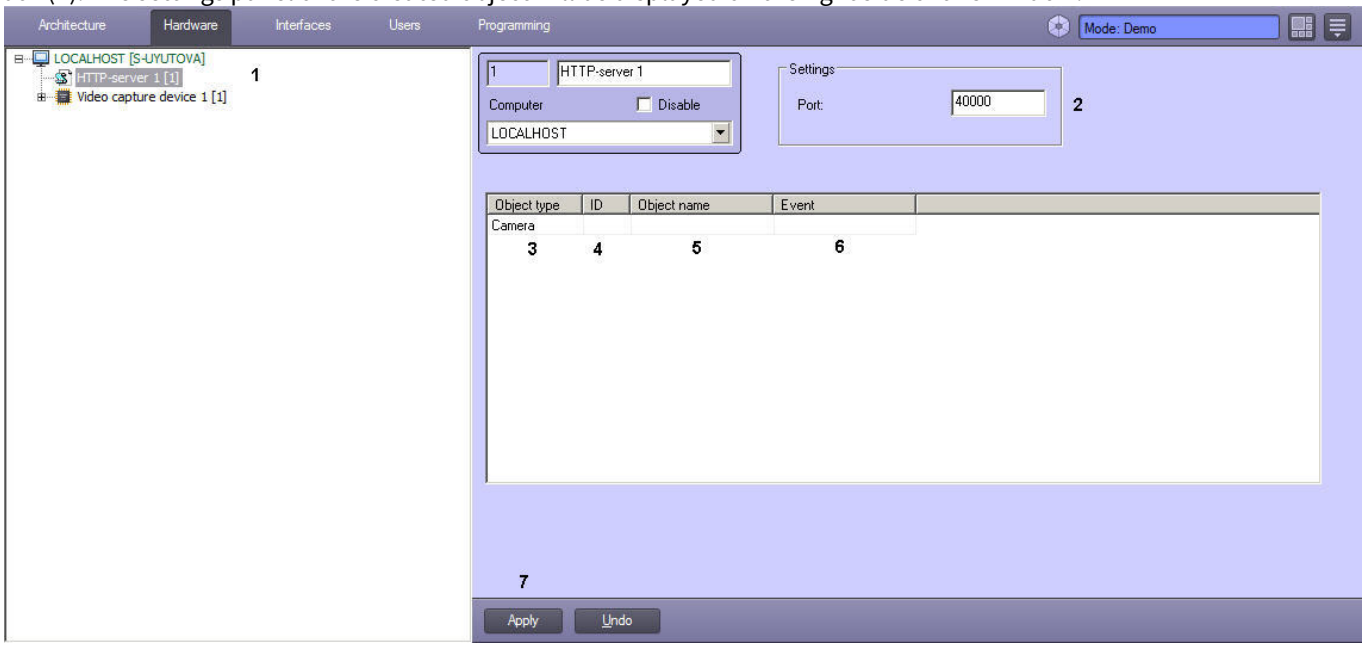
The *HTTP-Server* module is configured on the settings panel of the corresponding object — see Configuring the HTTP-Server object.

The requests sent from a web browser are used to work with the *HTTP-Server* module - see HTTP-Server requests.

5.2 Configuring the HTTP-Server object

The **HTTP-Server** object is configured as follows:

1. Create the **HTTP-Server** object on the basis of the **Computer** object on the **Hardware** tab of the **System Settings** dialog box (**1**). The settings panel of the created object will be displayed on the right side of this window.



2. In the **Port** field, specify the port number in the system where the client should send the *HTTP-Server* requests (**2**).
3. Configure the filter for the events which information should be sent by the *HTTP-Server*. If no events are added to the filter, then the *HTTP-Server* will return only the core events (the CORE object) for the client requests. The additional events are selected as follows:
   a. From the **Object type** drop-down list, select the required *Intellect* object type (**3**).
   b. From the **ID** drop-down list, select the identifier of the object of the selected type (**4**). If no ID is selected, then the *HTTP-Server* will send the events for all objects of the selected type.
   c. After selecting the type and object identifier, the **Object name** field will be automatically filled with the name of the corresponding object (**5**).
   d. From the **Event** drop-down list, select the type of event which should be sent via the *HTTP-Server* (**6**). If no event is selected, the *HTTP-Server* will send all events of the selected object (or all objects of the selected type).
   e. Repeat steps a-d for all required objects and events.
4. Click **Apply** (**7**).

Configuring the **HTTP-Server** object is complete.

5.3 HTTP-Server requests

The requests described below are used when working with the *HTTP-Server* module.

The last event ID request

```
http://<IP-address>:<Порт>/core/GetLastID
```

Request example

```
http://localhost:40000/core/GetLastID
```

Response example

```
{"lastId":"b686658c-764c-e911-8f42-001a7dda710e"}
```

The event request based on filter

The filter is configured on the settings panel of the HTTP-Server object — see Configuring the HTTP-Server object.

```
http://<IP-address>:<Port>/core/EventsTest
```

Request example

```
http://localhost:40000/core/EventsTest
```

Response example

```
{"module":"video.run","protocol_id":"2dc6dfcb-5351-e911-8832-534e57000000","slave_id":"S-
UYUTOVA","src_action":"MD_STOP","src_objid":"2","src_objtype":"CAM","time":"2019-03-28T12
:20:03.977"}
```

6 Configuring RabbitMQ

Intellect can act as receiver and transmitter of RabbitMQ events. Download and install the following components from the https://www.rabbitmq.com/install-windows.html website before using this functionality:

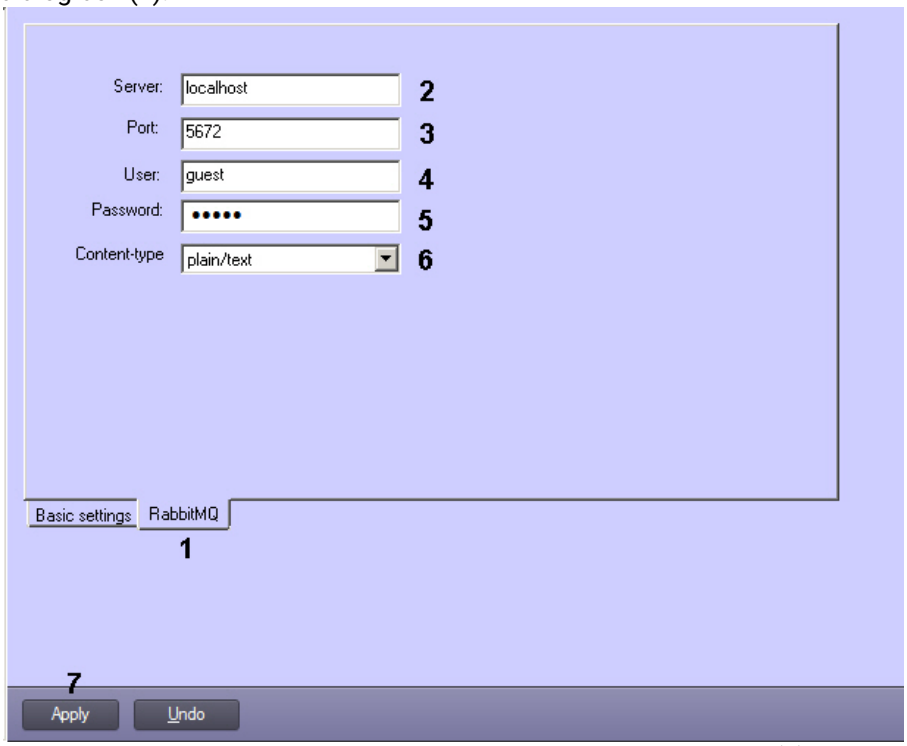
1. Rabbit service
2. Erlang

By default, RabbitMQ has a built-in **guest/guest** account that only works with **localhost**. Create a new account to use RabbitMQ remotely.

The examples below mention the amqp_sendstring.exe and amqp_listen.exe utilities. These utilities for processing and sending messages from the *Intellect* are to be implemented by programmer.

The connection to RabbitMQ is configured as follows:

1. Go to the **RabbitMQ** tab on the **Security zone** object settings panel on the **Programming** tab of the **System settings** dialog box (1).



2. In the **Host** field, enter the name or address of the RabbitMQ host (2).
3. In the **Port** field, enter the port to connect with the RabbitMQ host (3).
4. In the **User** field, enter the RabbitMQ user name (4).
5. In the **Password** field, enter the RabbitMQ user password (5).
6. From the Content-type drop-down list, select the data type to be sent and received by Intellect (6):
    a. **application/json** – a message is sent and received in JSON format. If *Intellect* cannot parse the message in JSON format, an attempt is made to recognize the message in plain/text format.
    b. **plain/text** – the *Intellect* event is sent and received in the format "TYPE|ID|EVENT"
7. Click **Apply** (7).

6.1 Intellect provider and third party receiver

Intellect provider operates in amq.topic mode, and the receiver operates in amq.direct mode.

amq.topic allows for subscriptions ranging. Each event sent from *Intellect* is signed with a special header, which is built according to the following scheme:

routingkey = "intellect.event." + msg.GetSourceType() +"." + msg.GetSourceId() + "." + msg.GetAction();

So the receiver can subscribe to any event(s).

Example.

Subscription to all events:

```
amqp_listen.exe localhost 5672 amq.topic intellect.event.#
```

Subscription to Action==”RUN” events

```
amqp_listen.exe localhost 5672 amq.topic intellect.event.*.*.RUN
```

> **Important!**
>
> Events enter the RabbitMQ queue from each *Intellect* core individually. For example, if there are two cores in the system, and the event occurred on a core that has incorrect settings or does not have a connection to RabbitMQ, the event will not get into the queue, despite the fact that the second core will receive it. Each core sends only its own messages.

6.2 Intellect core receiver

The receiver is implemented according to the amq.direct scheme. It is subscribed to all events with the "bindingkey" key. bindingkey should have the following format: "intellect." + ComputerName (case sensitive).

When sending, the bindingkey must be specified exactly as it is registered at the receiver, otherwise the message will not be delivered.

Example events that will be receiver by Intellect core:

text:

```
amqp_sendstring.exe localhost 5672 amq.direct intellect.ASUS "CAM|1|HELLO"
```

or JSON

```
amqp_sendstring.exe localhost 5672  amq.direct intellect.ASUS {\"Type\":\"MACRO\",\"Id\":
\"1\",\"Action\":\"RUN\",\"Params\":{\"test1\":\"+++\",\"test2\":\"000\"}}
```

7 Intellect software Integration Guide. Postscript

More detailed information on the Intellect 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 while operating the given software product you have faced difficulties and problems, 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 occurr and what had happened before it occurred?
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 how to improve our software and documentation.

Please forward your suggestions to the following e-mail addresses: documentation@axxonsoft.com

8 APPENDIX 1. DDI file structure

The table below contains a description of the fields of the table from the **Names** tab (the **<Objects>** section):

Field	Description
Name (<ObjectName>)	Object ID
Visible name (<VisibleName>)	Visible name
Group name (<GroupName >)	The name of a group of objects. Used for grouping objects in Intellect's settings tree

The table below contains a description of the fields of the table from the **Events** tab (the **<Events>** section):

Field	Description
Name (<EventName>)	Event ID
Description (<EventDescription>)	Event description recorded in the event log
Event handling (<EventType>)	Used to set the background color in the event log normal – no background color; alarm – red window; information – blue window
Sound support (<IsSoundEnabled>)	A sound file is played when a message arrives.
Do not send over network (<IsNetworkDisabled>)	Messages will not be sent over the network
Do not log (<IsProtocolDisabled>)	Events will not be recorded in the event log
Windows log (<IsWindowsLogEnabled>)	Record messages in the Windows log. *Note: Recording in the Windows log is impossible for an event, if* *the event is not logged*

The table below contains a description of the fields of the table from the **Reacts** tab (the **<Reacts>** section):

Field	Description
Name (<ReactName>)	Reaction name
Description (<ReactDescription>)	The reaction description shown in the context menu after a right-click on the object icon on the *Map*
Flags (<IsReactArm>)	Reaction scope flags: perform actions for a single object or for a group of objects from the same section

The table below contains a description of the fields of the table from the **Icons** tab (the **<Icons>** section):

Field	Description
Filename (<FileName>)	A BMP file name (the part that serves as an image ID). An image ID allows you to use multiple BMP files to show objects of the same type on the *Map*. (see Section Using the ddi.exe Tool to Work with DDI files)
Name (<IconName>)	A description of the BMP file of an object

The table below contains a description of the fields of the table from the **States** tab (the **<States>** section):

Field	Description
Name (<StateName>)	State name
Image (<ImgName>)	BMP file name (the part that serves as a state ID). (see Section Using the ddi.exe Tool to Work with DDI files). Note: The *Map* may show objects using lines (that is, without using BMP files). In this case, when an object changes its state, the line color changes. *For a state, the color (RGB) is set as follows:* **<State>$R:G:B**
Description (<StateDescription>)	State description
Flashing (<IsStateFlashing>)	Display on the *Map*: normal – the icon does not flash , alarm – the icon flashes

The table below contains a description of the fields of the table from the **Transition Rules** tab (the **<Rules>** section):

Field	Description
Event (<EventName>)	The event that triggers the transition
Transition From (<FromStateName>)	The start state (that is, the state that we transition from)
Transition To (<ToStateName>)	The end state (that is, the state that we transition to)

9 APPENDIX 2. NissObjectDLLExt and CoreInterface class declarations

On the page:

9.1 CoreInterface

```
class CoreInterface

{

public:

                virtual BOOL DoReact    (React&) = 0;

                virtual BOOL NotifyEvent(Event&) = 0;

                virtual void SetupACDevice(LPCTSTR objtype, LPCTSTR objid, LPCTSTR
 objtype_reader) = 0;



                virtual   BOOL    IsObjectExist(LPCTSTR objtype, LPCTSTR id) = 0;

                virtual   BOOL    IsObjectDisabled(LPCTSTR objtype, LPCTSTR id) = 0;

                virtual Msg FindPersonInfoByCard(LPCTSTR facility_code, LPCTSTR card) = 0;

                virtual Msg FindPersonInfoByExtID(LPCTSTR external_id) = 0;

                virtual   CString GetObjectName (LPCTSTR objtype, LPCTSTR id) = 0;

                virtual   CString GetObjectState(LPCTSTR objtype, LPCTSTR id) = 0;

                virtual   void       SetObjectState(LPCTSTR objtype, LPCTSTR id, LPCTSTR state)
= 0;

                virtual   BOOL    IsObjectState(LPCTSTR objtype, LPCTSTR id, CString state) =
0;



                virtual   CString GetObjectParam    (LPCTSTR objtype, LPCTSTR id, LPCTSTR
 param) = 0;

                virtual   int  GetObjectParamInt (LPCTSTR objtype, LPCTSTR id, LPCTSTR param) =
0;

                virtual   CMapStringToStringArray* GetObjectParamList(LPCTSTR objtype, LPCTSTR
 id, LPCTSTR param) = 0;

                virtual   CStringArray*   GetObjectParamList(LPCTSTR objtype, LPCTSTR id,
LPCTSTR param, LPCTSTR name) = 0;

                virtual   void       GetObjectParams   (LPCTSTR objtype, LPCTSTR id, Msg& msg)
= 0;

                virtual   void       SetObjectParamInt (LPCTSTR objtype, LPCTSTR id, LPCTSTR
 param, int val) = 0;
```

```
                virtual   CString GetObjectIdByParam(LPCTSTR type, LPCTSTR param, LPCTSTR val)
= 0;

                virtual   CString GetObjectIdByName(LPCTSTR type, LPCTSTR name) = 0;

                virtual   CString GetObjectParentId(LPCTSTR objtype, LPCTSTR id, LPCTSTR
 parent) = 0;

                virtual   int GetObjectIds(LPCTSTR objtype, CStringArray& list, LPCTSTR main_id
= NULL) = 0;

                virtual   int GetObjectChildIds(LPCTSTR objtype, LPCTSTR objid, LPCTSTR
 childtype, CStringArray& list) = 0;

};
```

9.2 NissObjectDLLExt

```
class NissObjectDLLExt

{

protected:

                CoreInterface* m_pCore;

public:

                NissObjectDLLExt(CoreInterface* core) { m_pCore = core; }


                virtual CString GetObjectType() = 0;

                virtual CString GetParentType() = 0;

                virtual int GetPos()  { return -1; }

                virtual CString GetPort() { return CString(); }

                virtual CString GetProcessName() { return CString(); }

                virtual CString GetDeviceType() { return CString(); }


                virtual BOOL HasChild() { return FALSE; }

                virtual UINT HasSetupPanel()  { return FALSE; }

                virtual void OnPanelInit(CWnd*) {}

                virtual void OnPanelLoad(CWnd*,Msg&) {}

                virtual void OnPanelSave(CWnd*,Msg&) {}

                virtual void OnPanelExit(CWnd*) {}

                virtual void OnPanelButtonPressed(CWnd*,UINT) {}

                virtual BOOL IsRegionObject()   { return FALSE; }

                virtual BOOL IsProcessObject()  { return FALSE; }

                virtual BOOL IsIncludeParentId()             { return 0; }

                virtual BOOL IsWantAllEvents()                                  { return 0; }

                virtual CString DescribeSubscribeObjectsList() { return CString(); }

                virtual CString GetIncludeIdParentType(){ return CString(); }
```

```
                virtual CString DescribeParamLists(){ return CString(); }


                virtual void OnCreate(Msg&) {}
                virtual void OnChange(Msg&,Msg&) {}
                virtual void OnDelete(Msg&) {}
                virtual void OnInit(Msg&)           {}
                virtual void OnEnable(Msg&)  {}
                virtual void OnDisable(Msg&) {}
                virtual BOOL OnEvent(Event&) { return FALSE; }
                virtual BOOL OnReact(React&) { return FALSE; }
};
```