

Application Note:

How to integrate OPTEX RLS3060SH Lasers & PIE-1 Sensors in Bosch DIP3000/7000

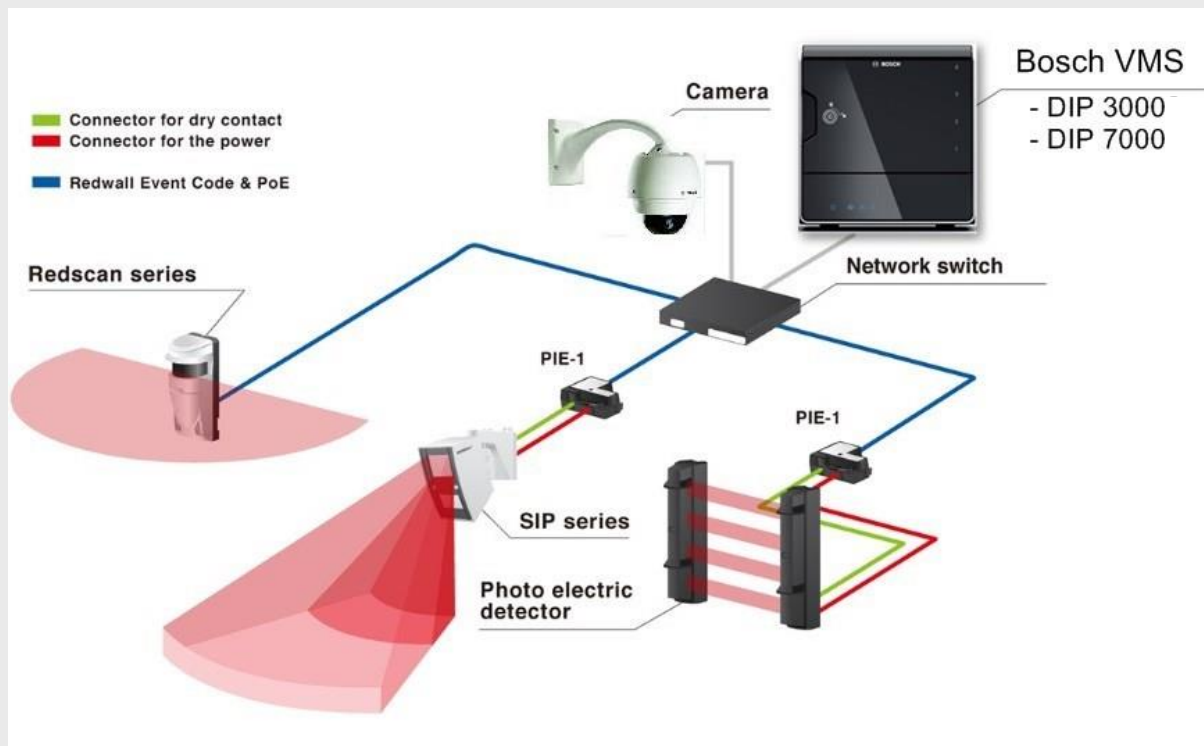
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Versionnummer 1.0

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1. Overview of the Integration

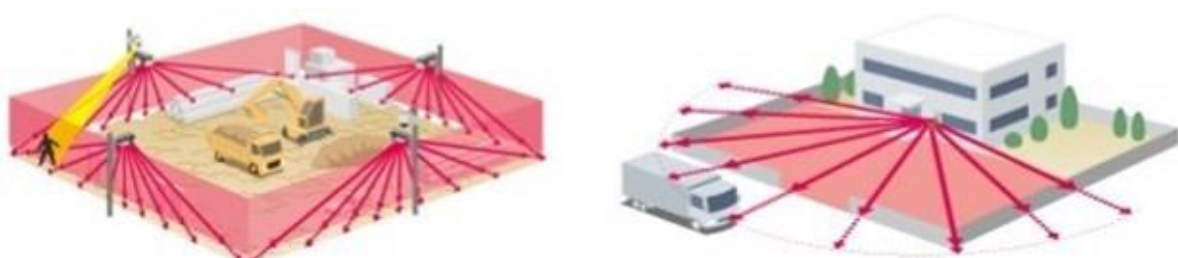
This integration Application Note outlines the feature set, connectivity, interfacing and settings to be done in order to use the OPTEX product line in BVMS or BVMS managed products like DiVAR IP 3000 and 7000 Series.

This Application Note also assumes that the reader is knowledgeable on both Bosch BVMS as well as OPTEX products.

1.1 Benefits of the integration

This integration solution with the OPTEX sensors and Bosch BVMS products provides security solutions for a wide range of application sectors like Remote Video Monitoring, Petrol/Gas, Government & Military, Transportation, Retail & Logistics, Industrial Sites, Banking, Museums & Art Galleries, Leisure, Residential & VIP.

The OPTEX detectors provide accurate detection information that is passed on to BVMS allowing the security manager to set up any desirable video follow up scenario like automated Goto Preset of IP cameras and/or start recording scenarios. Furthermore the OPTEX detector information will be stored in BVMS and can be used as forensic search data to easily find corresponding incidents as recorded video evidence. This OPTEX-BOSCH integration provides a tailor made solution for almost any intrusion scenario imaginable.



1.2 Principle of the integration

OPTEX lasers detect, analyze and track objects and can be programmed to scan areas, horizontally and vertically. At any alarm, the OPTEX device will create a ASCII string or so called REDWALL Basic Event Code that is passed on to the Bosch interface embedded with the DIP 3000/7000. This interface is called ATM/POS_Service. This interface will capture the Basic Event Code, filters and processes the data and passes this on to the BVMS standard ATM/POS socket. The ATM/POS_service is capable to process up to 16 OPTEX devices at the time allowing 16 OPTEX devices to send their detector information to BVMS at any time. The OPTEX device will send the OPTEX Basic Event Code format the describes the detected infringement.

This Basic Event Code format and syntax looks like an ASCII string of the following format and content (Fig1):

List of basic event codes (Redscan codes shown)

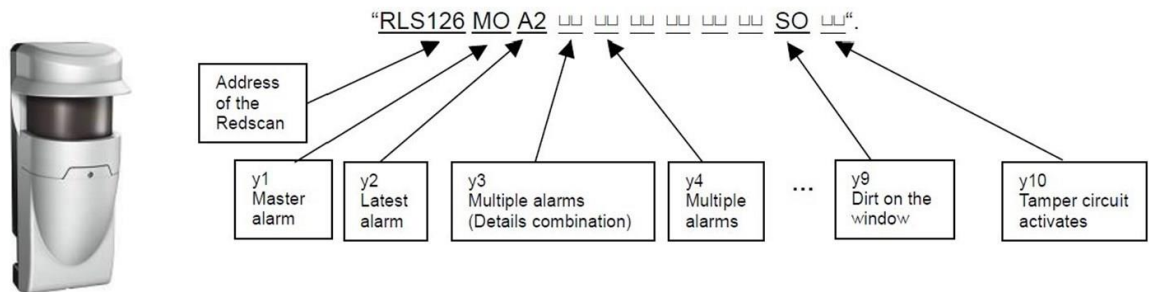


Fig. 1

OPTEX Event Codes are product type dependent. Please consult OPTEX support for the latest updated list of codes (*R.E.C. Event codes with combi codes.xlsx*)

Inside the BVMS configuration, the Basic Event Code data is regarded as Text Data and can internally be stored and processed as Event Data. This allows the user to do dedicated event search to quickly find all events of certain types but also allow the installer to pre-program dedicated tailored scripts in the BVMS Config Client to activate a live alarm follow up scenario for Operator Workstations and/or cameras on the site.

1.3 OPTEX products used for this integration

The OPTEX products involved in this integration document are:

- a. REDSCAN RLS-3060SH (Fig2.) Intrusion Detector Laser Unit
Find details here: http://www.optex-europe.com/cms/documents/PDS-REDSCAN-3060SH_%20v7.0.pdf
- b. REDWALL PIE-1 Encoder(Fig3) 5 input detector
Find details here: <http://www.optex-europe.com/cms/documents/PDS-OPTEX-PIE.pdf>



Fig. 2 REDSCAN RLS-3060SH



Fig. 3 PIE-1 Encoder

- c. REDSCAN Manager Advanced (ver 6.0.2.3) Software

This software can be downloaded or obtained via Optex.

Please contact www.optex-europe.com

1.4 Bosch products used for this integration

The Bosch products involved are:

- a. DIP 3000 or DIP 7000 with Version 7.0 OR BVMS Professional Edition 7.0



Fig. 4 DIP 3000



Fig.5 DIP 7000

- b. ATMPOS_Service_1.00.00.09_Package.

This can be retrieved via IPP or via the following link:

http://tutorials.ipp.boschsecurity.com/downloads/ipp-nam/ATM%20POS%20Service/1.00.00.09/ATMPOS_Service_1.00.00.09_Package.zip

The Package should also include 2 manuals for further reference:

- ATM POS Service Installation Manual.pdf
- ATM POS Service User Guide.pdf

2. Technical details and Setup of the integration

2.1 OPTEX RLS3060SH device preparation

To setup the REDSCAN Laser detection areas, masks, I/O settings and Network specs you can use the OPTEX REDSCAN Manager software as supplied via OPTEX.

Make sure that the Laser Network Settings are programmed correctly (The Laser default IP number is 192.168.0.126) . In the illustrations following, the Laser IP has been reconfigured to IP number 192.168.10.126

In order to connect the Laser to the DIP 3000 or DIP 70000 you must also program the DIP socket destination here where the Laser Basic Code Events have to be reported to. This is done via the I/O button in the top menu line of the REDSCAN Manager Software.

See figure 6.

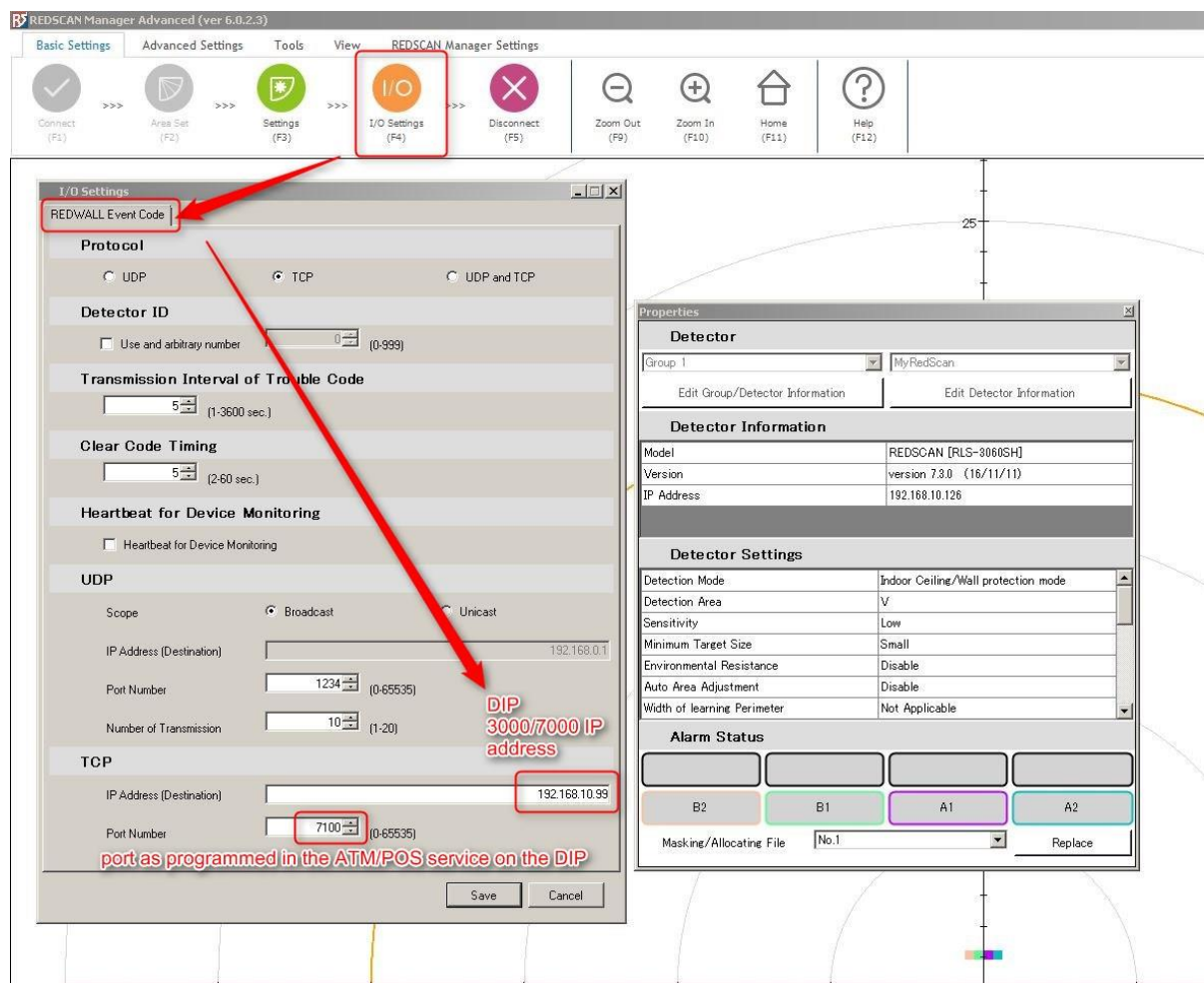


Fig. 6

Since the ATM/POS service, which has to receive the Event code, is running on the DIP 3000 unit, you have to insert the DIP IP number and the ATM/POS service port (in this case 7100) that corresponds to the Terminal-ID in the ATM/POS service configuration receiving this event.

2.2 OPTEX PIE-1 device preparation

In order to alter the PIE-1 Network IP number (in this document to 192.168.10.127) and to define the destination for Event Code to the ATM/POS Service in the DIP or BVMS you have to open the Webpage of the PIE-1 via <http://<ip>>

Go to the tab Configuration. See fig 7

OPTEX
Sensing Innovation

PIE-1 Configuration Page version 1.1.3

Overview
Configuration
Authorization

Save Config

PIE-1 Configuration

IP Address: 192.168.10.127
Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0

Event Code Configuration

☐ Use an arbitrary number

ID of Detector: 127 (000-999)

Transmission Mode: TCP

UDP (Destination)

IP Address: 192.168.10.99
Port Number: 7100 (0-65535)
Number of transmission: 10 (1-20)

TCP (Destination)

IP Address: 192.168.10.99
Port Number: 7110 (0-65535)
Time out setting: 10 sec.(1-30000)

☐ Set continuous alarm of TA/TR available

Transmission interval: 1 sec.(1-3600)

Delay time of event code stop transmission: 2 sec.(2-60)

I/O Configuration

Detector: SIP-100
Number of Output Selector: 3(UP)
Detection Range Selector: Far+Near(DOWN)

Color of the I/O paired input wires

Orange
Yellow
Green
Blue
Purple

Event type of the alarm generated

Alarm(Far)
Alarm(Near)
Alarm(Creep zone)
Tamper
Trouble

Save Config

Fig. 7

Type in the Event Code Configuration box the DIP address and port that the PIE-1 must use for Event reporting to the DIP. The port should be unique and is the same as the port defined in the ATM/POS configuration used in the ATM/POS configurator of the ATM/POS Service. See later in this document.

You can set the I/O functionality of the PIE-1 to any type of hardware in the I/O Configuration at the bottom of that page. The 5 sets of wires (delivered as accessory cable) are Normally closed inputs. In the overview tab of the Webpage you will see the status of the I/O inputs. These alarms are transferred and Event Code and send to the DIP as Event information.

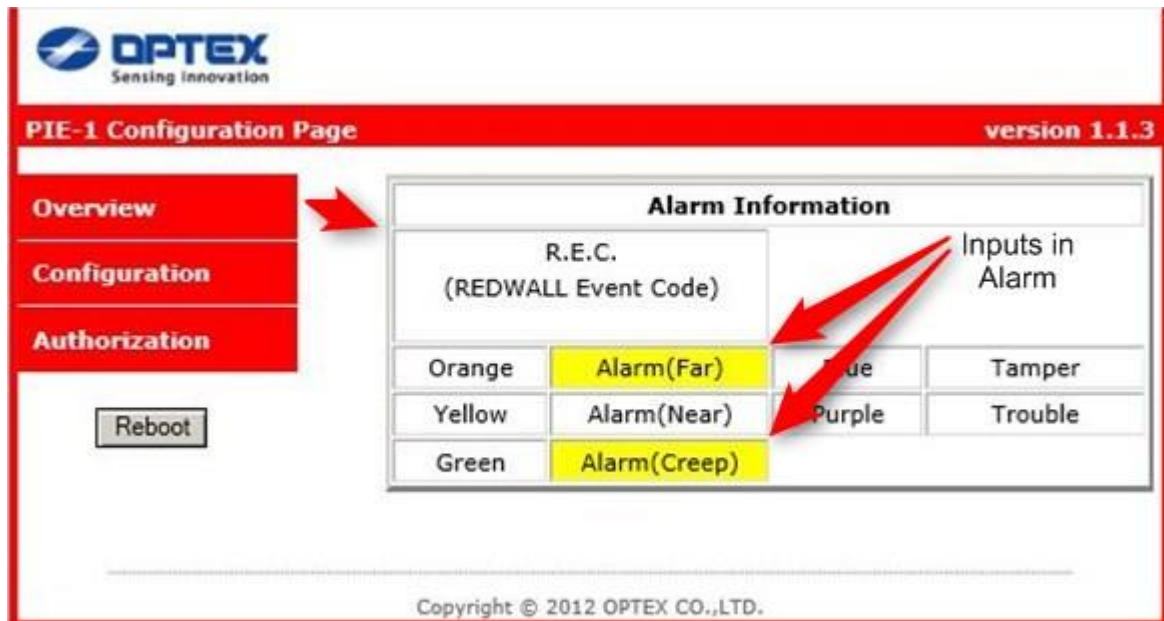


Fig. 8

2.3 Bosch Divar IP 3000/7000 preparation

2.3.1 Define the ATM/POS interface service

The ATM/POS Service is a separate Windows service that runs in the background on a DIP. It provides a general data collection interface between an external application and BVMS. It therefore takes external ASCII Text data received on its IP socket and passes this on to the ATM/POS internal IP input of BVMS (127.0.0.1).

Since this service is per default pre-installed in the **C:/Program Files(x86)/Bosch/ATM POS Service** directory of a DIP 3000/7000, you can use this service on the same PC right away. For BVMS Systems, the service can be installed separately on the BVMS Server or any other Windows PC in the Network.

Please consult the **ATM POS Service Installation Manual** of the **ATM/POS Service** to install the ATM/POS service step by step in case you use a BVMS system and not a DIP.

2.3.2 How to configure the ATM/POS Service for Optex devices

The next step is to set up the Optex channels as an Text Data supplier device.

A new Text Data source like OPTEX devices can be added using the configurator that can be found here: **C:/Program Files(x86)/Bosch/ATM POS Service BoschATMPOSConfigurator.exe** See Fig. 9.

This configuration tool can be used to add, to edit, to delete, and to save these configuration settings.

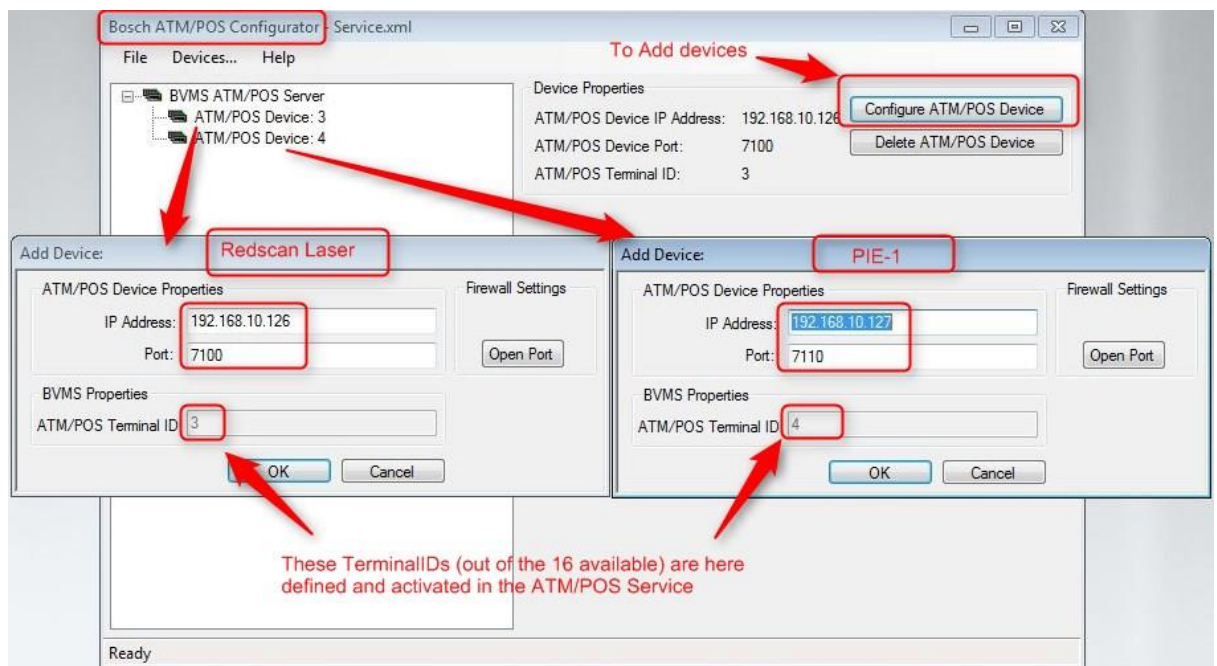


Fig. 9

Note:

The button “Open Port” automatically opens the defined port in your firewall to receive the Text Data.

Each ATM port must be unique for each Text Data device configured. In this case the OP The default configuration file **Service.xml** also should be located in the same folder. At launch, the BoschATMPOSConfigurator tool should load the configuration settings from the **Service.xml** file. The user can appropriately modify and save things like a Codepage to set the Text Data language to other than default English etc etc.

A finished setup looks like Fig. 9 and 10 for the REDSCAN Laser and the PIE-1.

The **Service.xml** shows then like Fig10:

```

- <Service>
  <DefaultAtm DeviceId="0" CodePage="US" TerminalId="1"/>
  <Atm DeviceId="0" CodePage="US" TerminalId="3" IpAddress="192.168.10.126"/>
  <Atm DeviceId="0" CodePage="US" TerminalId="4" IpAddress="192.168.10.127"/>
  - <Brd IpAddress="127.0.0.1" RecordingLanguage="GERMAN" TempFolder="C:\AtmPosDump"
    RecvTimeout="250" TxToBrdPort="4200" ConnectionPort="4201">
    <Terminal Name="POS Input 3" Id="3"/>
    <Terminal Name="POS Input 4" Id="4"/>
  </Brd>
  <AtmListener RecvTimeout="" AcceptsAny="0" MaxSizeData="" TcpPort="7100"/>
  <AtmListener RecvTimeout="" AcceptsAny="0" MaxSizeData="" TcpPort="7110"/>
</Service>

```

Fig.10 The file **Service.xml** with all initial settings

This is all it takes to setup the service.

In the same directory mentioned above you can find this service named as **AtmPosService.exe**. You can check if this service is running as a Windows background (consult services.msc). After a configuration change, either in Service.xml or via the tool, you must manually restart this ATM/POS service.

To do this, please run the file **RestartATMPOSService.bat** in the install directory.

(BVMS restarts this service automatically at every restart of the BVMS server).

Note: If the service does not start then there could be an error in your configuration like the same port used twice..

2.4 DIP 3000/7000 or BVMS preparation

In order to receive the OPTEX Event data and to store this data along with video footage also BVMS must be setup to receive the data that is routed from the OPTEX device via the ATM/POS service towards the BVMS server in the DIP (or on a PC)

To configure the DIP or BVMS for this integration, you can use the BVMS Config Client as installed in the Start menu of Windows.

The steps to do are:

- Define an ATM/POS device (representing the ATM/POS service)
- Define the Event reaction in BVMS resulting from this event and when.
- Define which camera should record the event data along its video footage
- Restart the BVMS server and Operator Clients.

The various figures below show these steps.

There are 16 inputs in the following picture on the right. Make sure that the input corresponds with the TerminalID of the defined ATM/POS device in Fig 9.

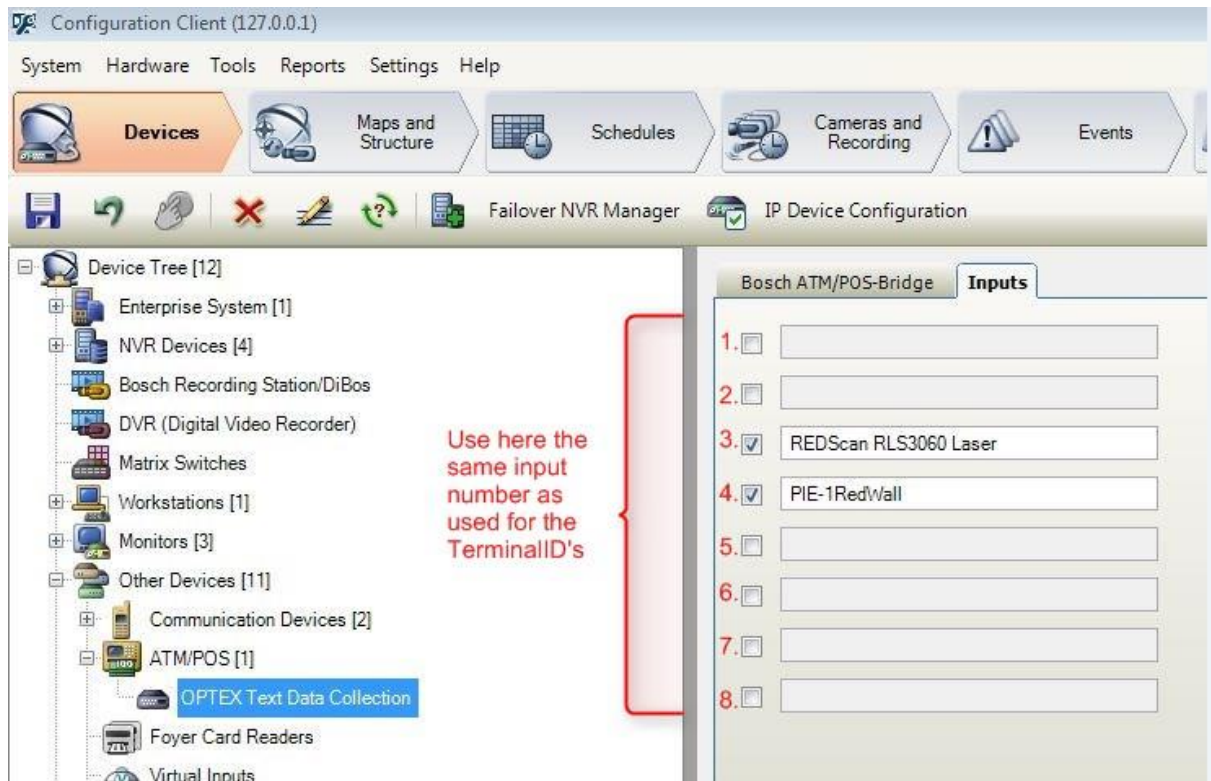


Fig. 11 Define an ATM/POS device (representing the ATM/POS service)

To define the OPTEx device event follow up in the Event TAB, see Fig 12 below.

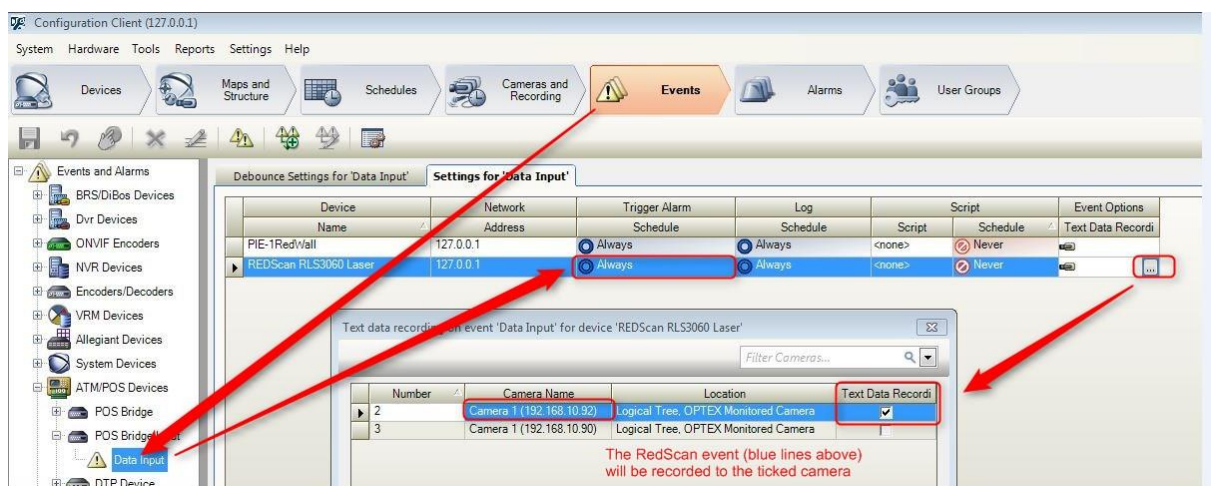


Fig. 12 Define the Event reaction in BVMS resulting from this event and when.

In the above setup you can see follow-up programmed that initiated an alarm (scheduled as “Always”) for that REDSCAN Data Input Event. On the far right you find the button to program to which camera(s) the Event Text data should be stored.

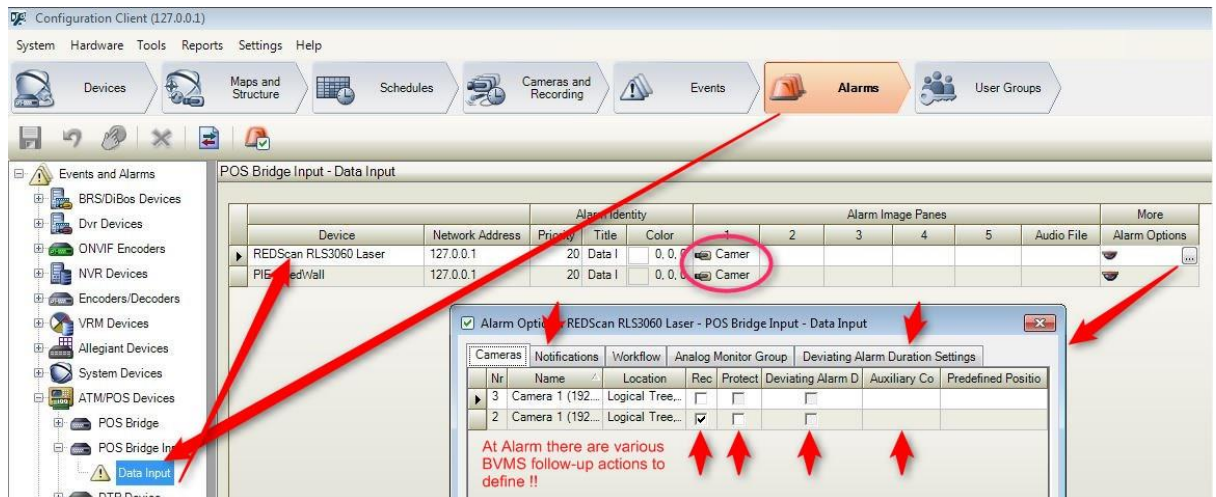


Fig. 13 Define the ALARM reaction in BVMS resulting from this event and when.

The above alarm settings and features addressed are activated as a result of an alarm acknowledge. Also notice in the red circle that both the REDSCAN Laser detector as well as the PIE-1 Alarm will automatically call-up the correct event involved Cameras.

When all BVMS settings are inserted you can re-activate the BVMS Server by pressing the Activation button in the left top screen of the Config Client. See Fig. 14



Fig. 14 Restart the BVMS server and Operator Clients.

Also at this point, the Operator Clients must restart with the new database content and will then show the altered settings in their GUI.

3. Test and see the integration at work !

Provided you have followed the above guideline and programmed the various elements correctly, you can now put the OPTEX – Bosch integration to the test.

3.1 Test Setup

For the DIP , the ATM/POS service Version 1.00.00.09 was used on a DIP 3000 with Version 7.0.0.223 and some cameras were added to the system.

To test the OPTEX device Event Code generation, as listed in Fig. 1 , both the REDSCAN Laser and the PIE-1 inputs were forced into Alarm Mode via an intrusion simulation.

This was done on the PIE-1 by randomly operating the 5 input contacts and for the RED-SCAN laser by setting up a scan environment with 4 Alarm zones (B2,B1,A1,A2) and penetrating the zones.

3.2 OPTEX detection of specific Alarms as shown in OPTEX GUIs

See both device alarms in below Fig15 and 16.

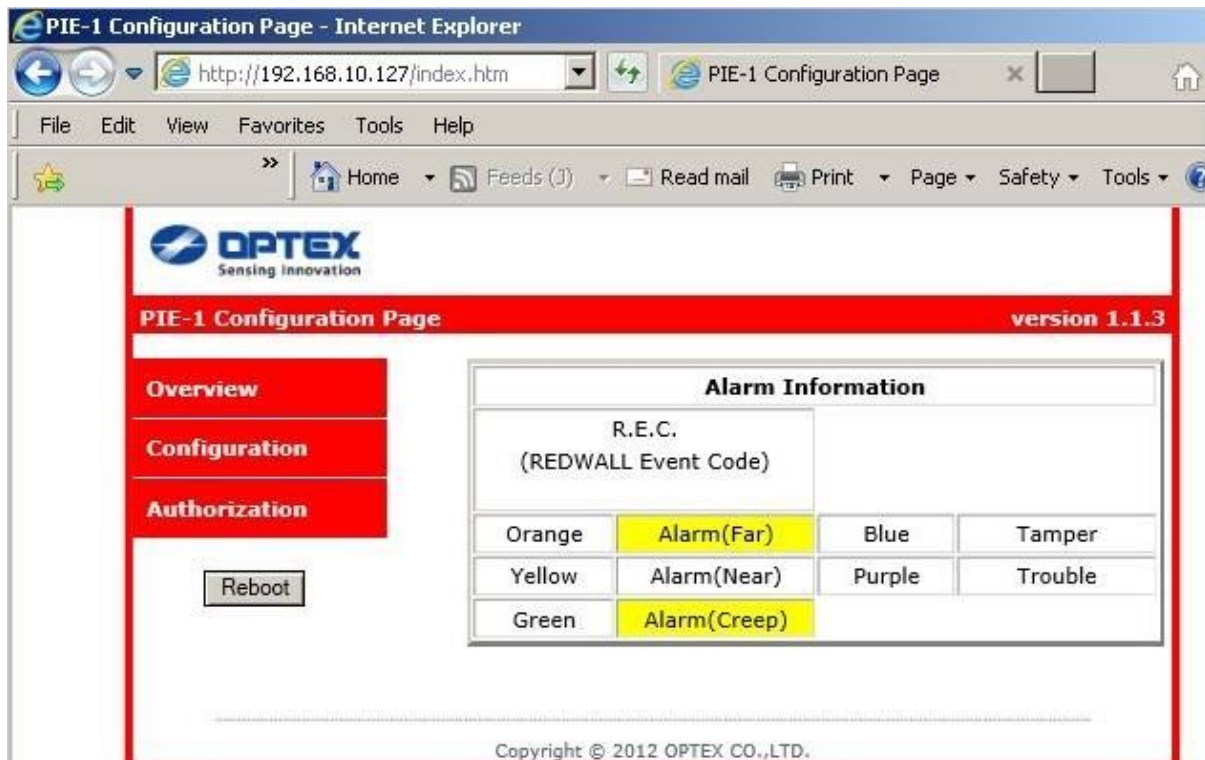


Fig. 15 a Far alarm as well as a Creep alarm reported in the PIE-1 browser page

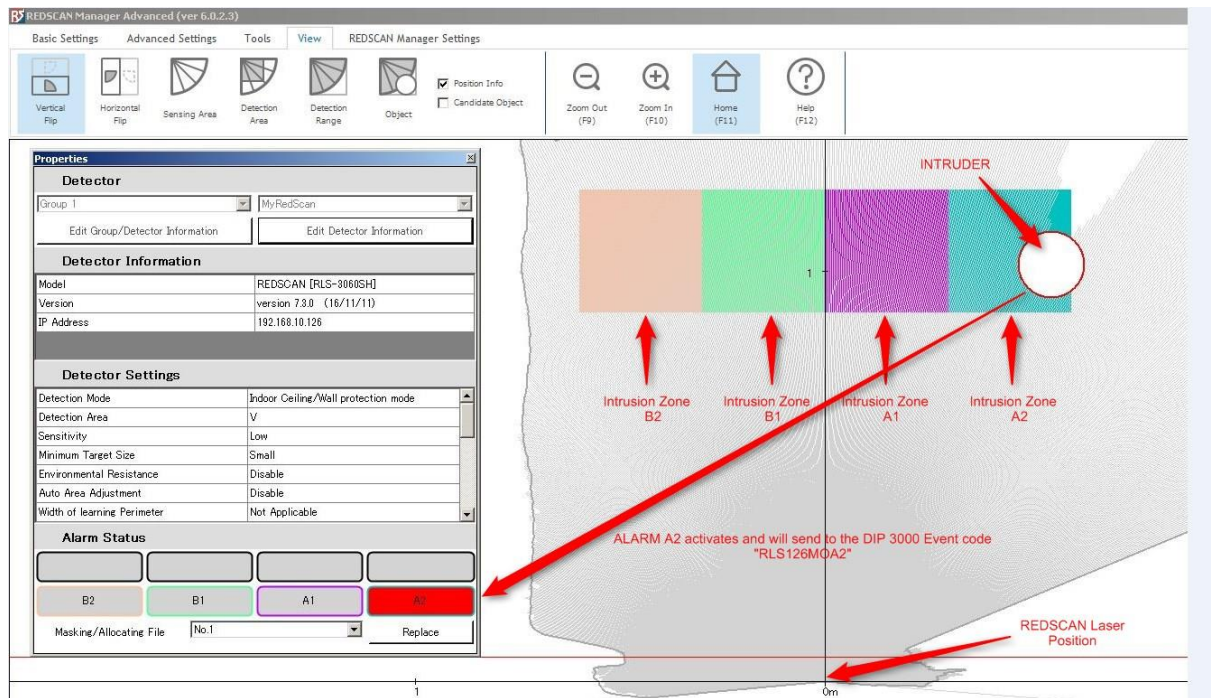


Fig. 16 A REDSCAN laser event triggers an alarm in Zone 2 in the REDSCAN Manager GUI

Both device's alarms will simultaneously be send along with their dedicated Event Codes to the DIP.

The default Event Code start characters , identifying the devices in the below screen shots are:

- REDSCAN Laser (192.168.10.126) = **RLS126.....**
- PIE-1 (192.168.10.127) = **PIE127....**

At an OPTEX alarm, the Event Code transmission to the DIP will trigger the DIP event settings.

As a result and according to the DIP settings, this event will be processed.

3.3 Event Code and alarm reporting as shown in BVMS Operator Client:

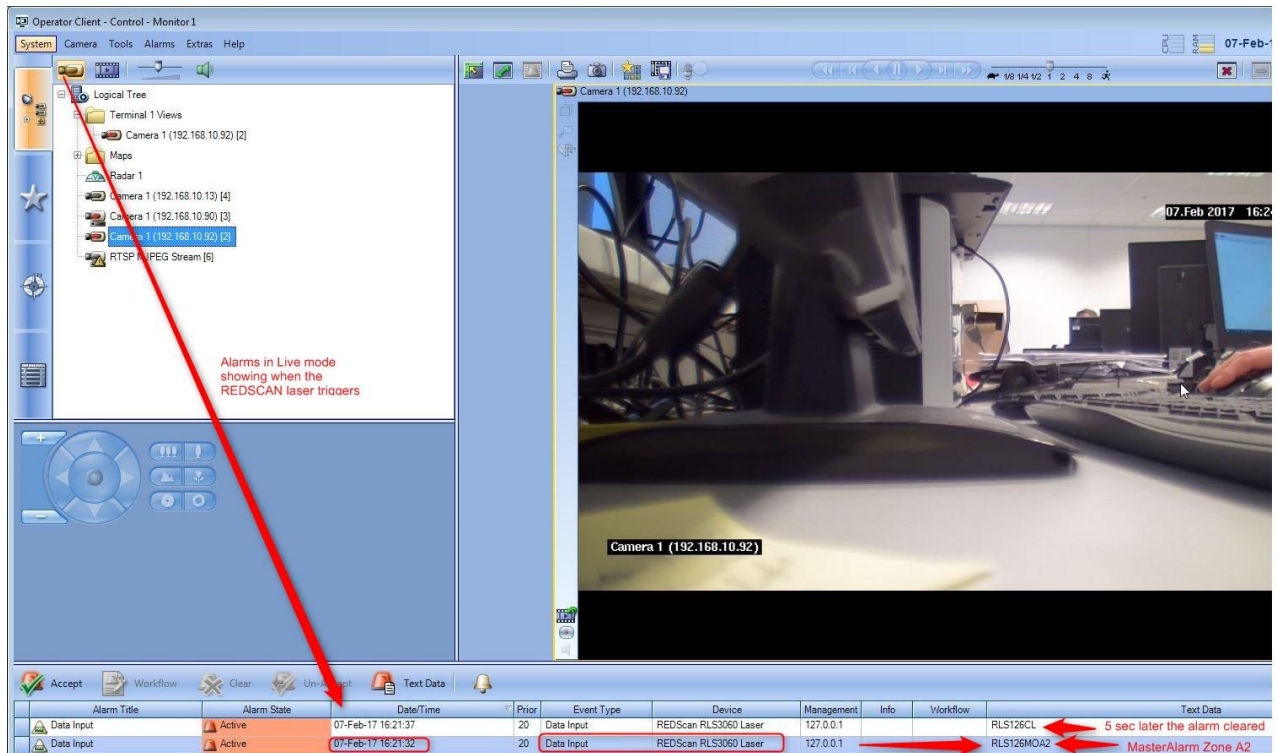


Fig.17 The DIP Operator Client receives the REDSCAN Laser Master Alarm for Zone A2

Now you can also simulate a PIE-1 Alarm or multiple simultaneous alarms by opening contacts.



Fig.18 PIE-1 Far Alarm detected

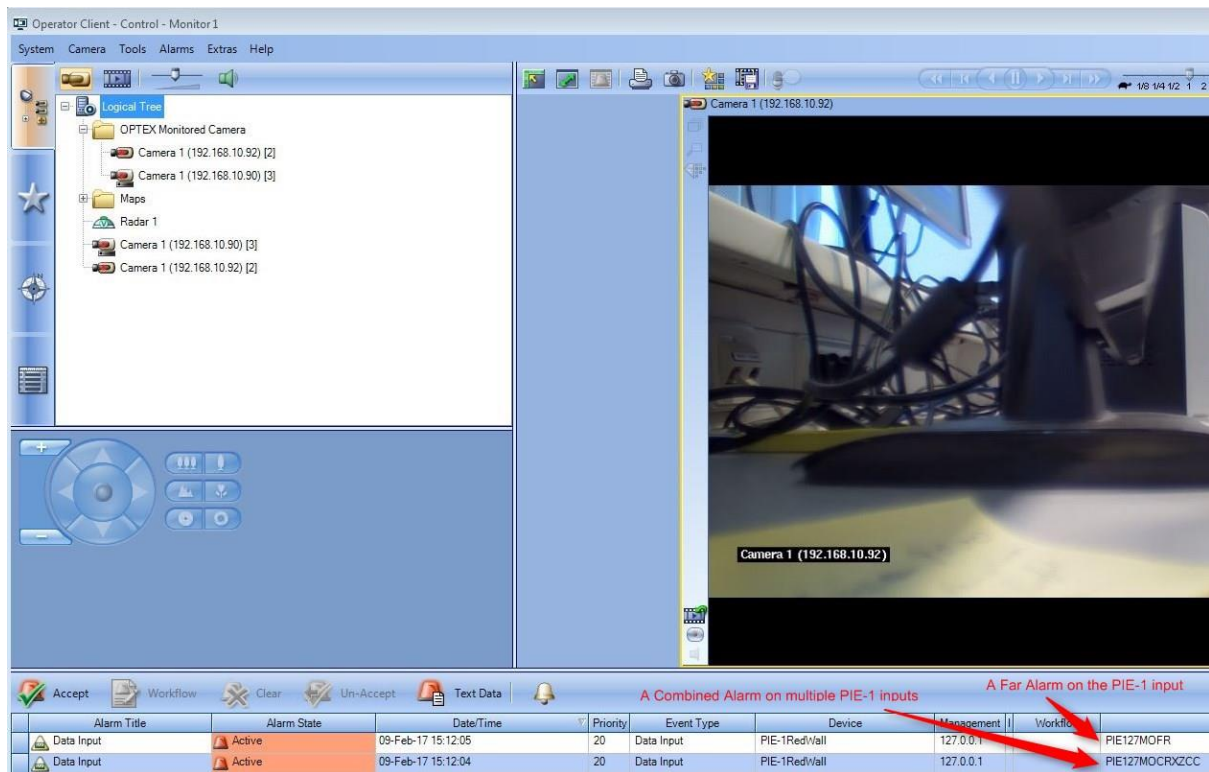


Fig.19 The DIP Operator Client receives the PIE-1 Master Alarm for Far alarm and Combined alarms

The Event Code received along with the Alarm will also be stored to the recordings of the camera(s) that you nominated in Fig.12 in the tickboxes for the column called Text Data Recording. We will use this for further tests below.

3.4 Search for video of an OPTEx Event in the DIP Recorded Data Base

For finding video Evidence you can either use the “Find Video By Event” button in BVMS or use the “Text Data Search” button (as shown in Fig 20).

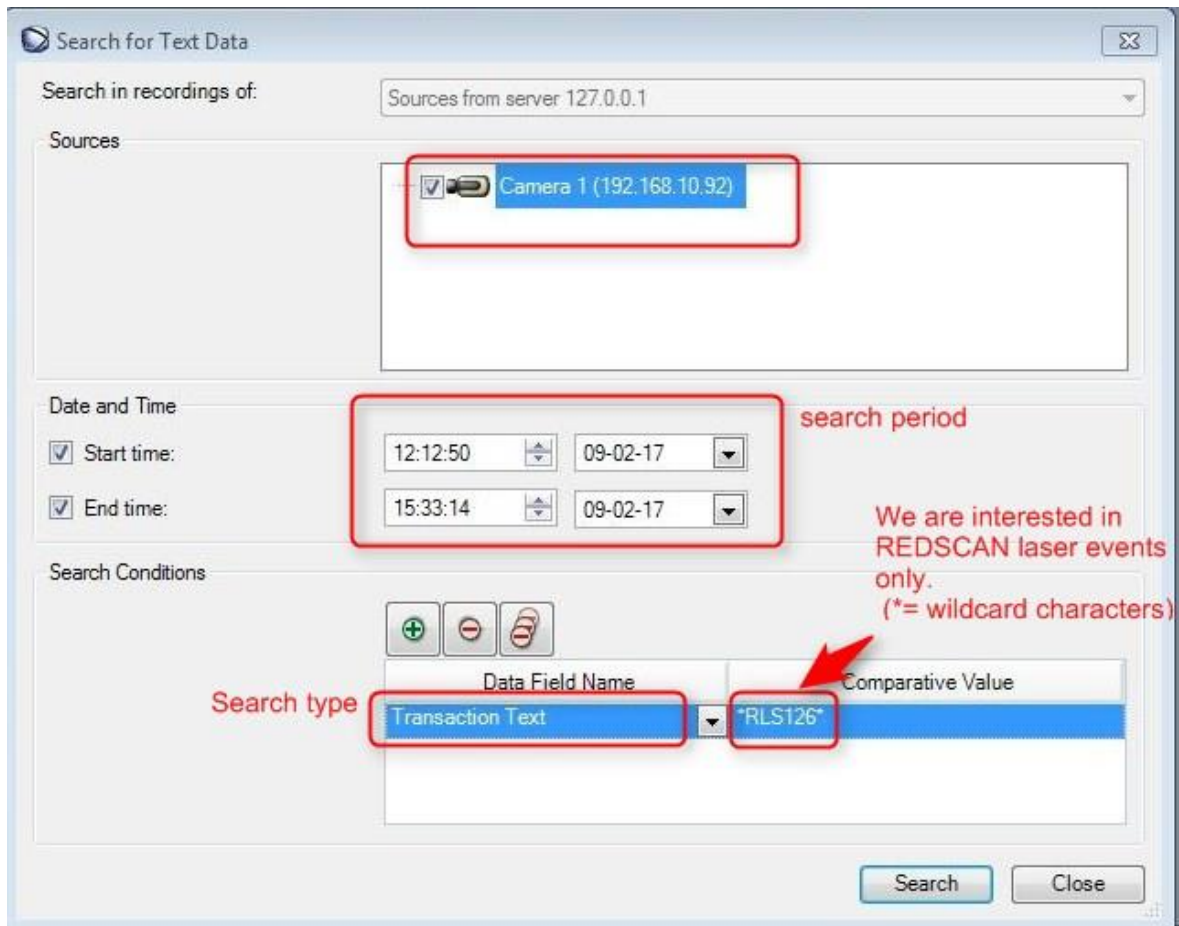


Fig. 20 Find any OPTEx event over a certain time period for a particular device.

3.5 OPTEx events found with Event Code as shown in the Operator Client GUI

After the search has finished, the result shows in the Operator Client with all evidence on one screen. The recorded event data that can be consulted here is:

1. all Alarm details like time / date , source device etc (also logged in log files).
2. The involved camera details closest to the event location.
3. The reported OPTEx Event Code synchronously reproduced from the live occurrence

The Operator can instantly use all playback options and also click any other search result lines for further consultation. See Fig. 21

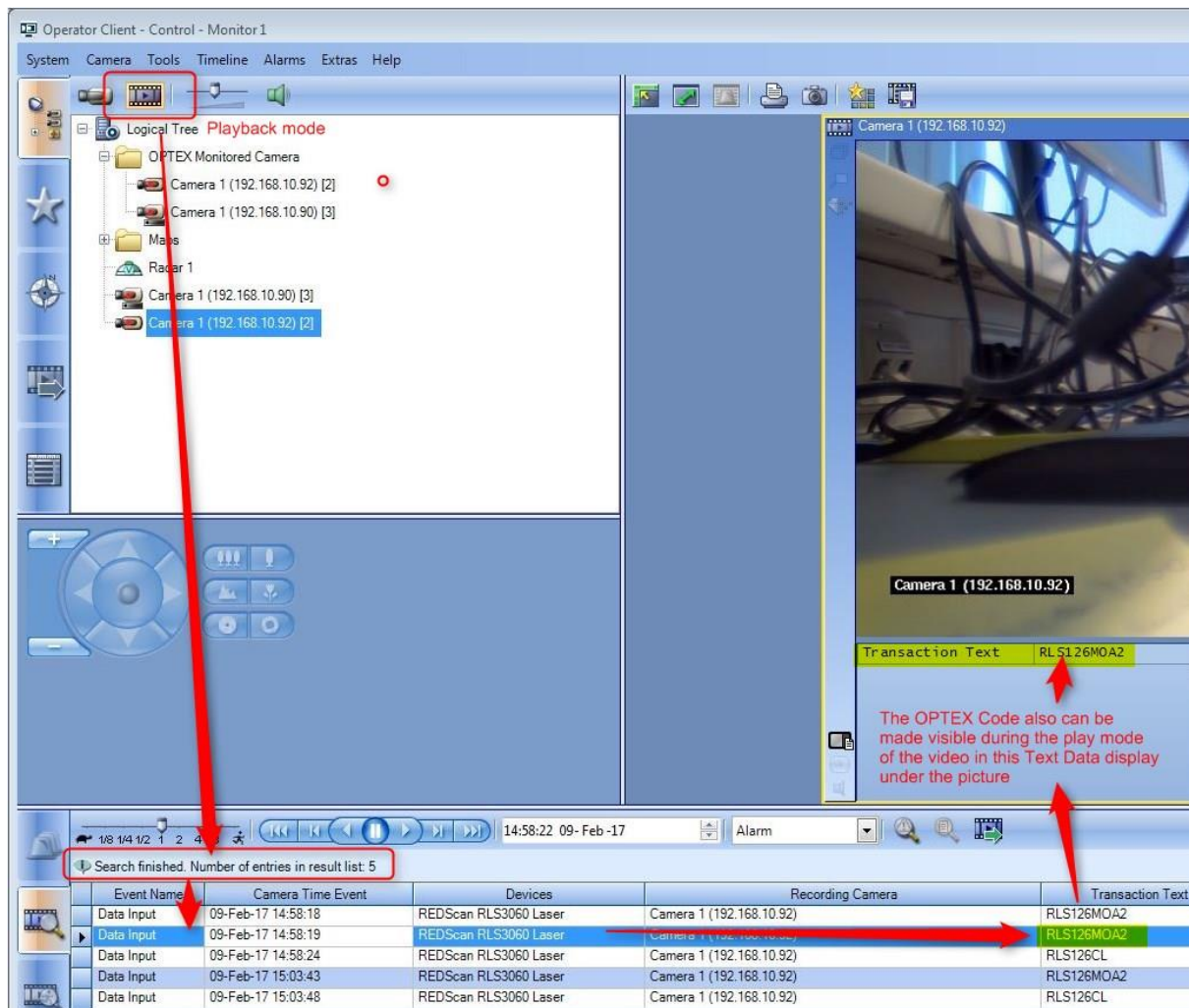


Fig. 21 List and show any OPTEX REDSCAN event over a certain time period for a particular device.

If this is all working fine, you can start to fine tune the integration to the application.

The options are that you activate functions and features in the Event and Alarm Screens in the Configuration Client as a result of OPTEX messages.

It is even possible to filter and invoke BVMS actions on OPTEX Event Code in BVMS not generally but very specifically according to the content of the OPTEX message.

For this reason the Integrator can extend the feature set for his end user and tailor the integration solution by using the BVMS-SDK via the onboard Script Editor and Compiler in the Config Client of BVMS.

This extra functionality allows Integrators to invoke adequate BVMS response on a very high level of automation and optional integration communication to on-site subsystems.

The details about how to compose, edit and compile C# or VB .NET scripts are part of the BVMS Advanced Integration Workshop in Eindhoven. This workshop teaches you how to design integration features, only limited by your own imagination, and are outside the scoop of the main BVMS Software feature set.

For further details, please contact Integrator Partner Program (IPP) in Eindhoven.

4. How to control BVMS via OPTEX Laser detection events

4.1 Where to start ?

In order to build tailored event follow-up for BVMS and BVMS controlled devices such as presets for PTZ cameras or populating Operator Client screens with involved cameras automatically, the above described Standard Integration should work OK first. It has no sense to continue building new features at this point when the Standard Integration lacks incoming event code generation or lacks communication between BVMS and OPTEX.

Following the guidelines above, a working Standard Integration will show the R.E.C event codes in the BVMS Operator Client as alarm overview line each time the OPTEX device detects an incident. See fig 17 above.

With the Standard Integration, any OPTEX event code sent to BVMS generates an alarm and the event code can be observed by the Operator. There is no distinct or dedicated follow-up inside BVMS for each alarm individually. For this to happen you must create a so called Server Script in BVMS.

4.2 The principle of controlling BVMS via external events

In principle, events are “triggers” which are provided to the BVMS server from inside the main BVMS Server or activated via external IP network devices such as OPTEX. In this integration, the OPTEX events propagate from the IP network via the ATM/POS service into the BVMS server. Such an event carries detailed event data which corresponds with the Laser detected event.

In the Configuration Client of BVMS (in the **EVENT TAB**) you can link each ATM/POS incoming Data Input, containing the OPTEX event (ASCII) code, to a Server Script.

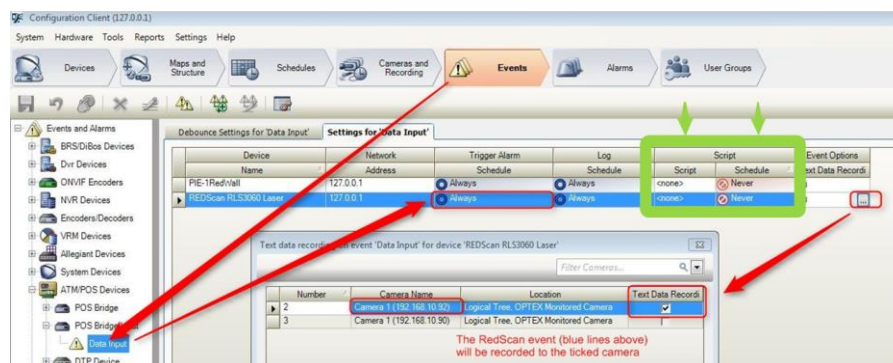


Fig. 22. Green box shows where Server Scripts show up and can be selected and scheduled for execution once being added and compiled (see chapter 4.3).

Compiled Script code can interpret this incoming Event data (OPTEX Event codes) and by that activate internal BVMS actions as well as external calls to devices and subsystems. This makes BVMS suitable for almost any integration project and required feature set.

4.3 A Server script to process incoming Event Data

Since BVMS contains all tools itself to design dedicated Scripts to follow-up reported incident events, no external development software is needed to edit, nor to compile your script C# source code. Scripts can be developed with the on board BVMS – SDK components and their methods.

You can add Scripts via the Config Client software of BVMS by selecting the Tools menu and then “Command Script Editor”



Fig. 23. Invoking the Command Script editor in BVMS Config Client Software

The Script tools window opens with 2 panels; on the left the Client and Server Script survey of existing scripts and on the right the Client and Server Editing Tabs.

For events, to invoke Script actions as a follow up to incoming BVMS events to the server, you need to add your script code as a SERVER script. On the contrary, Client Scripts are invoked by Operators and need to be added as Client Script.

4.4 Creating Scriptlets

To start editing, select in the left panel, the desired script type (ClientScript or ServerScript) and then right mouse to select “New Scriptlet” (inset A). This action will automatically open in the right panel the associated Script Tab and a new entry for your script code (inset B).

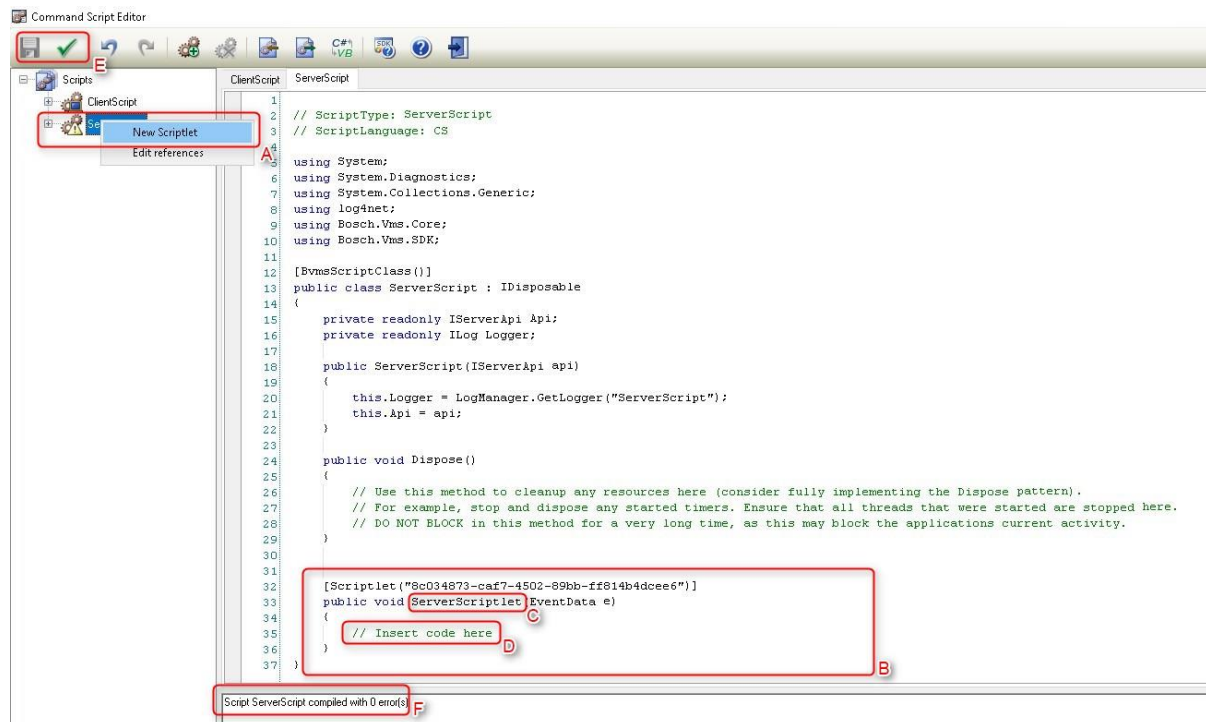


Fig. 24. Logical steps to create a Server Scriptlet.

The next step is to change the Scriptlet Name to a dedicated name corresponding the content action of the scriptlet (inset C).

Note:

- For Server Scripts, this new name will later also automatically appear in the Event Tab, at your device event row where you can select the “Scripts” for that event to follow-up the event.
- For Client Scripts, this new name will be used for adding Scriptlets to the Operators Logical Tree.

Next step is to add your dedicated source code (in this document C#) to the scriptlet where it says “Insert code here” by overriding the green **comment line** with your code. (inset D)
Your script can be written in the editor area on the right using the onboard BVMS SDK (API). To do so and to get help please open the API Help button on the top indicating “SDK /?”.

It is outside the scope of this Application Note to go into SDK details. (Please contact MKI/IPP Eindhoven for further BVMS SDK details if required)

When your code has been added, you can compile by pressing the green tick in the left top corner or the Floppy Icon which will compile and save your code (provided no errors are detected) (inset E) . Please check and correct your code until there are no errors reported. (inset F)
Leave the code screens when done. (your code must be error free and saved, before you can leave this page !!).

4.5 Bringing your Server Script into action.

A server scriptlet can be associated to any incoming BVMS event, once a new server scriptlet has been successfully added. To do this, go to the Event TAB and select your invoking event on the left. On the right, all event invocation actions can be programmed (to show alarms, to log and to activate a scriptlet)

Important to know is that Server Scriptlets also follow the BVMS programmed Time schedules. (do not forget to select a time schedule , See Fig 22 Green box).

To test your script, save your settings with the Save Changes floppy icon (left top) followed by Configuration Activation via the green light button.

Now fire the event and check the outcome.

Note:

Dealing with Client Scriptlets is not part of this document.

4.6 An OPTEX RS3060 Laser guided solution for Bosch PTZ camera presets.

To express the above described flexibility of Server Scripts, following integration between Bosch and OPTEX as automated security solution can serve as an example and be utilized:

1. Whenever the Laser detects an Area 1 (A1) access violation, the Bosch PTZ camera should immediately respond to this and go to Preset 1.
2. Whenever the Laser detects an Area 2 (A2) access violation, the Bosch PTZ camera should immediately respond to this and go to Preset 2.

Note: Optex Event code like RLS126 is automatically composed. I.E 126 is the last IP number Octet of your Laser Device.

To make this work we will use a Server script and the BVMS – SDK component **DomeCamera-Manager** with the Method **MoveToPredifinedPosition** as follows:

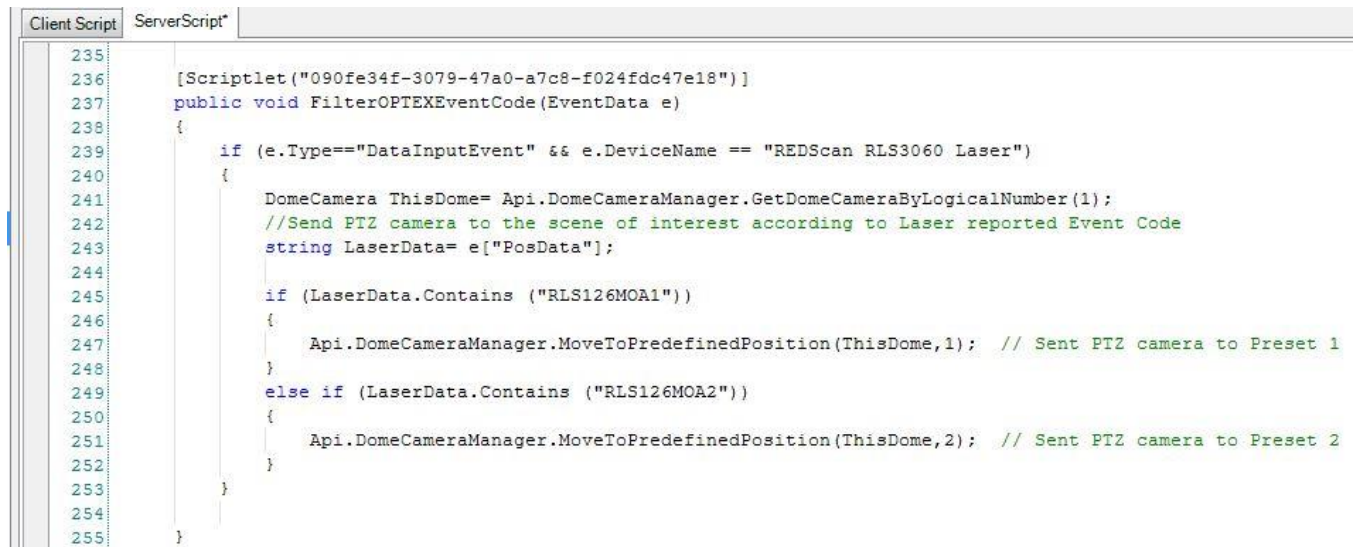


Fig. 25. A screenshot of a practical Server Script to control a Bosch PTZ camera from an OPTEX Laser Device.

4.6.1 Important Side Notes to this Script:

1. The PTZ Presets must be programmed in the PTZ camera in advance and correspond to the desired Laser area.
2. (line 236) This is the uniquely given script GUID by your BVMS server when you added a "New Scriptlet". DO NOT ALTER this given GUID !
3. (line 237) The Script name "FilterOPTeXEventCode" is a given name. You can take any name.
4. (line 239) This line filters on only ATM/POS data AND only data from Device called "RLS Laser Data" (which is the named ATM/POS data input)
5. (line 241) The Logical Number must correspond with the given Logical Number in the Camera TAB of that PTZ camera. (Column called "Number")
6. Make sure there is no compilation error before leaving this script. If there are errors reported then find the error line indication in the error message. Consult the SDK/? Button if needed.
7. This script is an example showing the operational basics of scripts. The integrator is however responsible to implement a smooth and save functionality taking operational and security aspects in account.

8. Also be informed that the OPTEX Event code can be a combination of multiple events and also there are codes that indicate clearance of Alarms. (See Fig 1.) You can anticipate as programmer to these possible events in your C# code and make your script rugged and sabotage/fool proof. See Appendix B and Event Code publications for details.
9. Bosch will not accept any liability of implemented script impact.

5. Appendix A

Example Server Script

Here is the (red) script Text to COPY/PASTE into your script area at location “// insert code here”

```
public void FilterOPTEXEventCode(EventData e)
{
    if (e.Type=="DataInputEvent" && e.DeviceName == "REDScan RLS3060 Laser")
    {
        DomeCamera ThisDome= Api.DomeCameraManager.GetDomeCameraByLogicalNumber(1);
        //Send PTZ camera to the scene of interest according to Laser reported Event Code
        string LaserData= e["PosData"];

        if (LaserData.Contains ("RLS126MOA1"))
        {
            // Sent PTZ camera to Preset 1
            Api.DomeCameraManager.MoveToPredefinedPosition(ThisDome,1);
        }
        else if (LaserData.Contains ("RLS126MOA2"))
        {
            // Sent PTZ camera to Preset 2
            Api.DomeCameraManager.MoveToPredefinedPosition(ThisDome,2);
        }
    }
}
```

6. Appendix B

Reference Sites for further info:

For OPTEX Product information: www.optex-europe.com

For Bosch Integration Partner Program (IPP) : <http://ipp.boschsecurity.com/en/>

For Bosch DIP 3000/7000 and BVMS:

https://emea.boschsecurity.com/en/products_3/videosystems_17/recording_17/iprecording_17/divarip3000_18/divarip3000_18_21177

https://emea.boschsecurity.com/en/products_3/videosystems_17/recording_17/iprecording_17/divarip70002u_32/divarip70002u_32_34825

https://emea.boschsecurity.com/en/products_3/videosystems_17/videosoftware_17/videomanagementsystems_17/boschvideomanagementsyste_144/boschvideomanagementsyste_144_36910

