

SIMPLIFYING COMPLEXITY

SEOUL ROBOTICS INTEGRATION USER GUIDE V1.1





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Introduction

LIDAR, or light detection and ranging is a popular technology that is used in a wide range of applications such as Land Management, Hazard assessment, and most importantly, security application.

6SS plugin is a software fully integrated with SEOUL ROBOTICS Sensr tracking software that uses Lidar technology and computer vision to build a 3d perception engine (3D object Detection). Our solution provides a live view map of Sensr in Milestone XProtect VMS. In addition, all events that are triggered in Sensr tracking software such as: Entering, Exiting, loitering and PTZ tracking events will be directly fired as an alarm in XProtect Smart Client.

Additionally, our software provides the user with many statistical reports, charts, and graphs based on the data gathered from Sensr.

6SS Robotics combines the power of Milestone and the LIDAR technology to ensure a fully secure environment.

Seoul Robotics Main Features

- Integrated with Milestone XProtect Corporate, Expert, Professional+, Express+ & Essential+
- Accessed from the Smart Client interface
- Data received from sensor using Protobuf
- Ability to view a live Map of sensor tracking software
- Ability to add and configure a floor plan
- Ability to view to translate, zoom in and out on the Map
- Ability to add, edit and delete a zone through XProtect Management Client
- Event Alarms and triggers generated by the sensor are shown in Smart Client
- Two-way communication with Sensor system using API
- Charts and Statistical report based on live data gathered from sensor
- Ability to filter reports by date and time
- Ability to export a report in PDF or Excel format

Main Benefits

- Cost-effective
- Time effective
- Easy to use and configure
- Very fast processing speed
- Very High refresh rate
- Seamless integration
- Enhanced security
- Centralized control through the Smart client
- Multiple applications and use cases

• Development team is always available to add Customer-tailored features

Getting Started

System Components

- Windows OS 8.1 or above
- Microsoft .NET framework 4.5 or newer (for .NET components usage)
- Microsoft SQL Server Express, Standard or Enterprise edition
- Milestone XProtect Corporate, XProtect Expert, Professional+, Express+, or Essential+
- Nodejs 14 or above
- 6SS Robotics client plugin
- 6SS Robotics server

Quick Start

- Microsoft SQL Server Management Studio installed.
- Named pipes and TCP/IP protocols must be enabled first
- XProtect Management Client must be installed on the Windows server machine
- Node.js must be downloaded on the Windows server machine
- Seoul Robotics 6SS Plugin must be downloaded and configured first on the server machine
- Seoul Robotics 6SS Server must be downloaded on the Windows server machine
- Seoul Robotics 6SS Plugin must be downloaded on the machines where XProtect Smart Client is installed

System Introduction

The Server part of the system consists of two main components: Management, Sensr system. Each 6SSRobotics system will contains one Management server and one Sensr system, where each Sensr system can contain one or more Lidar Sensors. Sensr system should be installed on an Ubuntu system and Management should be installed on a windows machine.

 Image: Control of the series of the serie

Below is a figure describing the architecture of the system.

- 1. Camera Streams sent to Recording Server
- Seoul Robotics 6SS Server will be receiving all the data sent from Seoul Robotics Server using Protobuf
- 3. Seoul Robotics 6SS Server will store all the data in SQL Server and alarm triggered if any
- 4. Display results in Smart Client
- 5. Management client will exchange data with Seoul Robotics Server using Rest API

Seoul Robotics – 6SS Installation & Configuration

Seoul Robotics - 6SS Ubuntu Server-Side

Browse to <u>http://SensorIPAddress/</u> and specify Ubuntu server IP address in Host (Destination) panel and Sensor IP address in Network (Sensor) panel. Click Set buttons and then Save Configuration button.

Velodyne [®] LiDAR
Sensor Model: VLP-16 S/N: AH08522718 MAC: 60-76-88-10-58-be Factory MAC: 60-76-88-10-58-be
GPS Qualifier Require GPS Receiver Valid: On Off
Phase Lock O On Off Offset: 0 + - Set Host (Destination) IP Address: 192.168.15.5 Data Port: 2372 Telemetry Port: 8308 Set
Network (Sensor) DHCP: On 0ff IP Address: 192,168,15,100 Mask: 255,255,255,0 Gateway: 192,168,15,1
MAC Address: 60-76-88-10-58-be
GPS Position: PPS: Absent Motor State: On RPM: 600 Lock: Off Laser State: On
Velodyne [,] LiDAR

Host (Destination)	
IP Address: 192.168.15.5 Data Port: 2372 Telemetry Port: 8308 Set	
Network (Sensor)	
DHCP: O On 🖲 Off	
IP Address: 192.168.15.100 Mask: 255.255.255.0 Gateway: 192.168.15.1]
MAC Address: 60-76-88-10-58-be Set	
Download Snapshot	Save Configuration
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Seoul Robotics - 6SS Windows Server-Side

Start first by installing <u>Node.js</u> on the Windows server machine by choosing Windows x64.msi installer.

Seoul Robotics – 6SS Plugin must be then installed & configured on the same Windows server machine using XProtect Management Client. Then run Seoul Robotics – 6SS Server installer on the same server machine.

After installing Seoul Robotics plugin and server installers, login to Milestone XProtect Management Client and navigate to Tools > Options.



Under Seoul Robotics Options, follow the below steps:

- Specify SQL Server address to establish a connection to the SQL Server where the database must be installed.
- Specify Seoul robotics IP which is the Ubuntu server address on which Seoul Sensor is configured.
- Set the time between firing the same alarm.

Choose Windows Authentication option and test the connection, if test succeeded you will be notified with a notification text "Test Succeeded!".

In other cases, when you encounter an error, SQL Server Authentication is needed in this case as windows authentication is not allowed and trusted in the current environment. Follow <u>FAQ</u> on how to enable SQL Server and Windows Authentication Mode. After making sure that the connection is successfully established, go to Windows Start- Services and find 6SS Robotics from the list of services. Right-click and choose Start to run the service.

Navigate back to the Management client and go to MIP Plug-ins, Seoul Robotics. Apply zone configurations by adding a new zone (event, static, or exclusion), editing an existing zone, or deleting it.



By clicking on Add button, the user can choose to add a zone with the type he needs.



If create static zone is chosen, the user will specify the minimum and maximum Z, then he can draw the zone. Upon clicking on Add, the zone will be added automatically in Sensr software.



When clicking on the Edit button, a dropdown list will show all the available zones where the user can click on a zone to edit it or on the small x at the side to delete it.



Upon clicking on a zone to edit it, the user will see the zone on the map, once he clicks on the map a new point is added, and when clicking on the word done the user can change the position of existing points. After clicking on Update, the given zone will be updated directly in the Sensr system.

Milestone XProtect Management Client 2020 R2		— D ×	
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Site Navigation • 4 ×			
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Speakers	estone AProtect		1
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do Input			
- 🖓 Output	Seoul Robotics		
D 🖳 Client			
Smart Wall			*
View Groups		Event Zone	
Management Client Profile		Event zone	
C Matrix	Sneed Limit	Click when done assigning points	
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Notification Profiles	Loitering Threshold		
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Analytics Events	0		
Generic Events	· · · · · · · · · · · · · · · · · · ·		
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2 Basic Users			
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Current Tasks			
- System Monitor	Maz-Z		
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B Seoul Robotics			
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Site Navigation Federated Site Hierarchy			+

Seoul Robotics - 6SS Client-Side

Before connecting to XProtect Smart Client, go to the machine where IIS is configured for XProtect Management server, choose Application Pools -> DefaultAppPool -> rightclick and choose 'Advanced Settings'. Find 'Identity' property and change it to LocalSystem.

Connections	Application Pc	ols			
Application Pools	This page lets you view and ma isolation among different appli	nage t ation	the list of application poo s.	ols on the s	erver. Applicatior
> 😌 Default Web Site	Filter: 👻	🖗 Go	🗸 👻 Show All 🛛 Grou	p by: No (Grouping
V 😜 RoboticsWeb	Name			Status	.NET CLR V
> Content	.NET v4.5 .NET v4.5 Classic			Started Started	v4.0 v4.0
> - 🚰 fonts > - 🚰 Images > - 🚰 Scripts	DefaultAppPool		Add Application Pool Set Application Pool D Start Stop Recycle Basic Settings Recycling Advanced Settings Rename Remove View Applications Help	efaults	0 0 1 Manag 0 0

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	Limit Action	NoAction
	Limit Interval (minutes)	5
	Processor Affinity Enabled	False
	Processor Affinity Mask	4294967295
	Processor Affinity Mask (64-bit c	4294967295
~	Process Model	
>	Generate Process Model Event L	
	Identity	LocalSystem
	Idle Time-out (minutes)	20
	Idle Time-out Action	Terminate
	Load User Profile	True
	Maximum Worker Processes	1
	Ping Enabled	True
	Ping Maximum Response Time	90
	Ping Period (seconds)	30
	Shutdown Time Limit (seconds)	90
	OC 1 TO 12 DO 1 D	00

XProtect Smart Client- Live Tab

After installing Seoul Robotics plugin, a new item will appear in the System Overview side panel.



By drag-drop the item to a new view, a live map of Sensr will be shown directly where the points displayed on the screen are the object detected by the LIDAR system, and the color of the points designate the classification of the object:

- Red: Car
- Green: Pedestrian
- Yellow: Cyclist
- Grey: MISC

6SS



Milestone XProtect Smart Cli	lient	- 0'	×
Live Playback	Search Alarm Manager 🕼 Seoul Robotics System Monitor	• 🛛 📍	~
> New View (1 x 1)	ד יישי פאר איז	tup	×
SEOUL ROBOTICS			
e PEDESTRIAN CYCLIST			
S MISC			
Eloor Plan Setup			
Copyright ©2021 All			

By clicking on the Add Floor Plan, the user can add the floor plan needed in JPEG, PNG, or JPG format. In addition, the user can rotate, translate, and zoom in or out the floor plan to fit in perfectly on the map.

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Live Playback Search Alarm Manager 🦻 Seoul Robotics System Monitor	* 9	9 9	
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Copyright ©2021 All rights reserved by 6ss.co After the floor plan is set up, the user will have a view on the live map, where all objects are shown with a refresh rate of 100ms, and all zone added or edited in Sensr system will be shown and updated directly on the map.



XProtect Smart Client- Alarm Manager Tab

In XProtect Smart Client Alarm Manager tab, all events, alarms and triggers that were fired in the Sensr system will directly appear. The alarm message will include the type of the event and the zone where the event happened.

In addition, an alarm will be fired in case a problem with the sensor or the software occurs.

Milestone XProtect Sma	rt Client									- 0	x
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										Setup	52
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n C ≥ 65° No map has b	een selected										
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T New (2720)	E Time	Priority Level	State Level	State Name	Message	Source	Owner	ID:			
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T in progress (U)	9:24:16 AM 10/1/2021		i.	New	Pedestrian exited zone: 1005	roboticsevent	Alarm	65074			
Y On hold (0)	9 24 16 AM 10/1/2021		1	New	Pedestrian exited zone: 1005	roboticsevent	Alarm	65073			
T Closed (0)	9.24:14 AM 10/1/2021			New	Pedestrian entered zone: 1005	roboticsevent	Alorm	65072			
	9:24:14 AM 10/1/2021	1		New	Pedestrian entered zone: 1005	roboticsevent	Alarm	65071			
	9:24:14 AM 10/1/2021			New	Pedestrian entered zone: 1005	roboticsevent	Alorm	65070			
	9:24:06 AM 10/1/2021	1	1	New	Pedestrian exited zone. 1005	roboticsevent	Alorm	65069			
Servers	9:24:06 AM 10/1/2021	1	1	New	Pedestrian exited zone: 1005	roboticsevent	Alorm	65068			
A WIN-DQP86JND55P	9.24:06 AM 10/1/2021			New	Pedestrian exited zone: 1005	roboticsevent	Alarm	65067			
	9:24.01 AM 10/1/2021			New	Pedestrian exited zone: 1005	roboticsevent.	Alorm	65064			
	9:24:01 AM 10/1/2021			New	Pedestrian exited zone: 1005	roboticsevent	Alorm	65065			
	9:24:01 AM 10/1/2021			New	Pedestrian exited zone: 1005	roboticsevent	Alorm	65066			
	9.23:59 AM 10/1/2021			New	Pedestrian entered zone: 1005	roboticsevent	Alarm	65063			
	9:23:59 AM 10/1/2021			New	Pedestrion entered zone: 1005	roboticsevent	Alarm	65061			
	9:23:59 AM 10/1/2021			New	Pedestrian entered zone: 1005	roboticsevent	Alarm	65062			
	9:23:52 AM 10/1/2021	1	1	New	Pedestrian entered zone: 1005	roboticsevent	Alarm	65060			

XProtect Smart Client- Seoul Robotics Tab

In Seoul Robotics tab, the user will have access to many reports and statistics based on data gathered from Sensr Software. In addition, every chart or report can be exported to PDF or Excel format.



In the Reports drop-down menu, the user can check People, Bike and Cars count. Data will appear in a 3D chart that shows the number of people, bikes, or cars that are detected now.



In the Object Count per zone, the user can check the number of detected objects that entered each event zone (for example 200 objects entered the zone 1005).



Current Occupancy level will show the number of objects that are currently inside each event zone.



Total Count will show the total number of objects that have entered in all of the available event zones.

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Object Count Per Zone Current Occupancy Level	and the second s	
Total Count Dwell Times	09/11/58/09/12/00/09/12/02/09/12/04/09/12/08/09/12/08/09/12/10/09/12/14/09/12/16/09/12/18/09	
System Health		
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Dwell Times shows in a table the amount of time an object has spent inside a

zone.				
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Dwell Times 🔹	1005	26	7 Seconds	
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Time Of Entry	1005	41	9 Seconds	
Statistical Graphs 🗧	1005	20	T General	
System Health	1005	38	7 Seconas	
	1005	39	2 Seconds	
Copyright ©2021 All rights	1005	38	15 Seconds	
reserved by oss.co	1005	39	7 Seconds	
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ROBOTIC	5.	102138	1007	25	Entering	10/4/2021 1:07:29 PM	5.93	0.00 Km/hr	
		102139	1007	26	Entering	10/4/2021 1:07:29 PM	0.00	0.00 Km/hr	
Reports	•	102146	1007	28	Entering	10/4/2021 1:07:31 PM	6.11	0.00 Km/hr	
Zone	÷	102149	1005	26	Entering	10/4/2021 1:07:41 PM	5.06	3.63 Km/hr	
Dwell Times	÷	102152	1007	26	Entering	10/4/2021 1:07:46 PM	0.00	3.28 Km/hr	
Statistical Graphs		102153	1005	28	Entering	10/4/2021 1:07:47 PM	5.76	3.75 Km/hr	
System Health		102156	1005	25	Entering	10/4/2021 1:07:53 PM	6.11	3.90 Km/hr	
		102158	1007	28	Entering	10/4/2021 1:07:57 PM	5.41	3.32 Km/hr	
Copyright ©2021 All r	ights	102166	1007	25	Entering	10/4/2021 1:08:02 PM	5.24	2.94 Km/hr	
reserved by bss.co		102170	1005	26	Entering	10/4/2021 1:08:09 PM	5.93	2.26 Km/hr	
						5 6 7 8 9 10			

Total Occupancy report shows the current detected objects, and in case an object entered a zone, the chart shows the amount of time this object has stayed.

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		Setup 🔀
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ROBOTICS.		
Reports -	5 5	
Zone -	3	
Dwell Times 🔹	2	
Statistical Graphs	0	
Total Occupancy	1005	
Avg/Max Dwell Time		
System Health	● 73 ● 74 ● 76	
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Avg/Max Dwell Time shows the average and maximum dwell time for objects in each available zone.



System Health shows a report of all error messages that were received from the system. The report will include the type of error (Master, Sensor, or Algo node), the name, the Health Message, and the time when this error happened.

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RUI	SUTIC	- 3.	76908	AlgoNode	algo_0000	Lost Connection	9/30/2021 5:03:57 PM	
			76907	AlgoNode	algo_0000	Lost Connection	9/30/2021 5:03:56 PM	
Reports		•	76906	AlgoNode	algo_0000	Lost Connection	9/30/2021 5:03:55 PM	
Zone		-	76905	AlgoNode	algo_0000	Lost Connection	9/30/2021 5:03:54 PM	
Dwell Ti	mes	-	76904	AlgoNode	algo_0000	Lost Connection	9/30/2021 5:03:53 PM	
Statistica	al Graphs	-	76903	AlgoNode	algo_0000	Lost Connection	9/30/2021 5:03:52 PM	
System I	Health		76902	AlgoNode	algo_0000	Lost Connection	9/30/2021 5:03:51 PM	
			76901	AlgoNode	algo_0000	Lost Connection	9/30/2021 5:03:50 PM	
Copyrig	ht ©2021 All	l rights	76900	AlgoNode	algo_0000	Lost Connection	9/30/2021 5:03:49 PM	
reserved	i by oss.co		76899	AlgoNode	algo_0000	Lost Connection	9/30/2021 5:03:48 PM	

FAQ Frequently Asked Questions

How to Allow SQL Server and Windows Authentication Mode?

• Open SQL Server Management Studio and connect to the server. Right click on the SQL server name and choose Properties.



• Select Security node and choose SQL Server and Windows Authentication mode option under Server authentication.



• SQL Server needs to be restarted in order to take effect. Right click again on SQL server name and choose Restart.

Bozhoust (SQL Sever 14.0.100) Database Sever Objects Sever Objects PolyBase PolyBase Management Avent Profiler	Connect Disconnect Register New Query Activity Monitor Start Stop Pause Resume
	Policies + Facets
	Start PowerShell Azure Data Studio 🔶
	Reports +
	Refresh Properties

• After restarting SQL server service, navigate to Security- Logins- New Login...



• Specify 6ss in Login name and choose SQL Server authentication with Password 6ss. Uncheck Enforce password policy tick.

Login - New			-		×
Select a page	🖵 Script 🔻 😯 Help				
 Server Notes User Mapping Securables Status 	Login name: Vindows authentication SQL Server authentication	6ss		Search	ı
	Password: Confirm password:	•••			
	Specify old password Old password: Enforce password policy Enforce password expira User must change passw Mapped to certificate	tion vord at next login	~		
Connection	O Mapped to asymmetric key				
Server:	Map to Credential		~	Add	
Connection: HALA-PC∖admin y₩ <u>View connection properties</u>	Mapped Credentials	Credential Provide	er		
Progress				Remo	ve
Ready	Default database: Default language:	master <default></default>	~		
			ОК	Cano	cel

• In Server Roles tab, enable sysadmin checkbox and click OK.

Login - New		_		×
Select a page	🖵 Script 🔻 😮 Help			
 Server Roles User Mapping Securables Status 	Server role is used to grant server-wide security privileges to a user. Server roles: bulkadmin dbcreator diskadmin processadmin public securityadmin serveradmin seturadmin seturadmin			
Connection				
Server: Connection: HALA-PC\admin <u>v</u> <u>View connection properties</u>				
Progress				
Ready				
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How to enable Named pipes and TCP/IP protocols?

Go to Windows Start screen and navigate to Microsoft SQL Server folder and click on SQL Server Configuration Manager.



Navigate to SQL Server Configuration Manager > SQL Server Network Configuration > Protocols for <machine instance>

Double-click Named Pipes. The Named Pipes Properties screen appears. From Enabled, select Yes. Then click OK.

LIIADIEU	No
Pipe Name	\\\pipe\sql\query

From SQL Server Management Studio, restart the server instance.



About 6SS

6SS was founded in Minneapolis Minnesota with a global team alongside Milestone to provide security solutions powered by XProtect.

Our services help governments and businesses across the world with video analytics, intelligent platforms, plug-ins and third-party integrations.

We ensure that XProtect & 6SS products runs reliably by tailored and certified trainings and professional services in Arabic, English, French and Russian.

Any Questions?

Please reach out to us if you have any question or inquiry Email us at info@6ss.co

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