# People & Vehicle Counting Solution

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### 1 Introduction

#### 1.1 Overview

The application will establish a direct connection to the camera to retrieve AI analytics data, which will then generate G-Core actions in accordance with the associated metadata.



#### 1.2 Grafana Dashboard

Grafana is an open-source analytics and interactive visualization web application that allows users to ingest data from various sources, query this data, and display it on customizable charts for easy analysis.





### 2 Application Installation & Configuration

We recommend installing the application on the G-Core machine for automatic configuration. This setup will:

- Automatically populate the camera IP, user ID, and password.
- Use the G-Core database for data management.

If you choose not to use the G-Core machine, you will need to:

- Manually enter the camera IP, user ID, and password.
- Install SQL Express on your machine to handle the database requirements.

#### 2.1 Installation

The application needs a database to store information on people or vehicle counting in order to provide statistical data through Grafana. You can use an existing Gcore database or install SQL Express on your machine.

In this case, we will use the G-Core database. If you prefer to use SQL Express, download and install the software, and then refer to the 'Troubleshooting Guide' at the end.

SQL Server 2022 Express is a free edition of SQL server and can be downloaded from the link below.

https://www.microsoft.com/en-au/sql-server/sql-server-downloads

#### 2.1.1 G-Core Database as a data source

We need to know which port is being used by the G-Core database so that we can configure it for the application.

1) Click Start > Programs > "SQL Server XXXX Configuration" > SQL Configuration Manager.



- 2) In SQL Server Configuration Manager, expand SQL Server Network Configuration and then select Protocols for GCORESQL on the left panel. To identify the TCP/IP Port used by the SQL Server Instance, right click on TCP/IP and select Properties from the drop down as shown below.
- 3) In TCP/IP Properties window click on the IP Addresses tab and you will see the Port used by the instance of SQL Server in either TCP Dynamic Ports for a dynamic port or TCP Port for a static port as highlighted in the snippet below.



#### 2.1.2 G-Core Setting & License Key Setting

Click the application installation file to start the installation. While you can change the input information after installation, it's recommended to provide accurate details during setup, especially for the database configuration.

- 1) G-Core IP Address
- 2) G-Core user name
- 3) G-Core user password
- 4) License key

etup - G-Core MetaConnect		-	
Core Settings			
Please enter following information and click Next.			
G-Core IP Address:			
127.0.0.1			
Username:			
sysadmin			
Password:			
•••••			
Show password			
License Key:			
DEDLACE WITH ADD LICENCE KEY			

#### 2.1.3 Application Login Setting

- 1) Application port
- 2) Application user name
- 3) Application user password
- 4) You need to tick "Database Configuration".

Setup - G-Core MetaConnect -	×
App Settings	Ĵ
Please enter following information and click Next.	
Management Port:	
10923	
Login User:	
sysadmin	
Login Password:	
Show password	
Database Configuration	
Back Next Cance	ł

Back Next Cancel

#### 2.1.4 Database Setting

- 1) Please use the information you got in the previous chapter (i.e : IP-ADDRESS\GCORESQL,46915)
- 2) Do not change this unless you plan to use custom database
- 3) Specify the database user ID you want to use, unless you already have one.
- 4) Specify the database user password you want to use, unless you already have one.
- 5) If you are connecting to a data source provider that supports Windows authentication or are using a local machine (without a domain account), configure the options as follows

"Trusted\_Connection=yes; MultipleActiveResultSets=True; Encrypt=False".

However, if you are using domain login credentials or a remote database, you will need to update them as follows.

"Trusted\_Connection=No;MultipleActiveResultSets=True;Encrypt=False".

- 6) N/A
- 7) Please tick the box *if you want to connect to a local database without domain login credentials*. Leave the box unticked if you want to connect to a remote database or domain login credentials.

Setup - G-Core MetaConnect		-	
Database Settings(option)			(10)
Please enter following information and click Next.			0
Server:			
localhost\\GCORESQL,1433			
Database:			
META_CONNECT			
Username:			
gendered.			
Password:			
man-market			
Show password			
Option:			
Trusted_Connection=Yes;MultipleActiveResultSets=True	e;Encrypt=False		
Enable the database			
☐ DB Login with Windows authentication			
	Back	Next	Cancel

#### 2.2 Configuration

We need to add the camera channels that will be used for counting people or vehicles.

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#### 2.2.1 Add camera

Belos is the main screen of the user interface and you can add or delete the camera or update the many of configurations.

GCore MetaConnect				- 🗆 ×
Action User	Media Channels		- 🗆 X	
sysadmin	Device Setting			1
Password	1 Manufacture	~		
	2 Media Channel Carpark Entry Ramp	~		
	3 RTSP URL rtsp://THQ THULKU 2015	h264/stream_1		
Login	RTSP User     admin			
Logout	5 RTSP Password			
G-Core Connection Status	6 Bounding Box Yes	×.		
G-Core Setting	Minimum Likeliho 0.5			
Login Setting	7 LRP Direction No	× .		
Database Setting	No			
	Enter			
Licènse	Unknown			J
Version				

1) Camera manufacturers : It will automatically select the appropriate manufacturer when you choose the media channel. However, this may not occur if there is a communication timeout with the camera or if the application was not installed on the G-Core machine.

Note : **Please ensure that the correct manufacturer is selected, as this is crucial** for proper data parsing by the application. Choosing the wrong manufacturer may cause the application to stop working.

- 2) Media Channels : Once you select the media channels, No. 1, 3, 4, and 5 will be automatically populated if the application was installed on the G-Core machine. Otherwise, please provide this information manually.
- 3) LRP Direction : The application will use this information to store data on vehicle direction, even if multiple cameras supply the data. This is important to ensure accuracy and avoid potential errors.

#### 2.2.2 Axis - Multi head camera

Please add the camera number to the RTSP URL if the camera has multiple sensors.

rtsp://x.x.x.x:554/axis-media/media.amp?camera=2

			-	×
Device Setting ——				
_		_		
Manufacture	AXIS	×		
	TECT Avia D2715 (2)			
Media Channei	TEST - AXIS P3715 (2)			
RTSP URI	rtsp://IP-ADDRESS:554/axis-media/media	ampicamera=2		<u> </u>
	http://ii ADDRESS.SS4/axis media/media	a.amp.camera=4		

#### 2.2.3 Add camera result screen



### 3 Camera Configuration

#### 3.1 Axis Camera Configuration

As of firmware 11.3, it is possible to count objects that cross a virtual tripwire in a defined direction using the Crossline counting scenario. An event can be triggered whenever a set number of selected objects have crossed the line.

Since Axis crossline counting does not provide the direction of movement, we need to use two lines: one for inbound and the other for outbound. Additionally, the naming must include specific information such as the floor, camera location, and direction.

#### 3.1.1 Axis Object Detection

- 1) Open your web browser and go camera web page > App > Axis Object Analytics.
- 2) Create "Object in Area" as like following if you don't have it.



#### 3.1.2 G-Core – Person Detection event(optional)

Loin to G-Set and click on "Event/Alarm settings" in the selection menu, the settings dialog is opened on the left-hand edge and the registers on the right-hand side of the setting area.

 Clicking on Recording Task – Default Task opens the settings. > You can only assign a name for the recording tasks when you add one or more new recording tasks to the recording task of the event in the event list.

Event list	P Event 🛜 Alarm	🕐 Time ranges. 🗃 Recording task	
Person Detected - 604 A			1
✓	Recording task name		
Default task	Default task		
v Startby			
Convit notification message; channel: G04 A (48); topic: "Person"; data value: "	Media channels Ov	enide event nun time	1
> 🔁 StopBy			1
ConStart	G04 A		
ConStop			
> Person Detected - G04 B			~
> Person Detected - G04 C			
> Person Detected - G04 D			
> Person Detected - G05			
> Person Detected - 606	Default mode		
> Person Detected - G07			
> Person Detected - 608		MAX (Maximum) (Jpeg 3840 x 2160), 0426X 3840 x 2160)	
> Person Detected - G09	Aurfio perfile	Nos	
> Person Detected - G10			
> Person Detected - G11			
> Person Detected - G12		8.0000 C Pictures/s	
> Person Detected - G13 A			
> Person Detected - G13 B	Manuel setting		
> Person Detected - G14			
> Person Detected - G15 A			
> Person Detected - G15 8			
> Person Detected - G16			
> Person Detected - G17			
> Person Detected - G18	Leave chann	el in its current state	
> Person Detected - G19			
S Parson Datastaria (20)	intercontaining turn		

- 2) Right click the event list and then click 'Add' to create an event or click the **L** icon in the toolbar.
- 3) Update the event title to whatever you prefer.
- 4) Click 'StartBy' to add the action, then select the "Onvif notification message".



5) Update the 'channel' from which you wish to receive an event from the camera. Also, update the 'topic' and 'data value' as shown below.

	~	
🚍 Event list	Settings	
Y Person Detected - G04 A		
🗸 🚍 Recording tasks	Onvif notification message	e: channel: G04 A (48): tonic: "Person": data value: "1":
🔤 Default task	This action will featured the	
🗸 🏲 StartBy	This action will forward the	event notifications sent by a camera.
📑 Onvif notification message; channel: G04 A (48); topic: "Person"; data value: "		
🗸 🎮 StopBy		
Onvif notification message; channel: G04 A (48); topic: "Person"; data value: "Conversion of the second		
OnStart	🗶 channel	G04 A
- ConStop	time	2024/00/05 16:12:06 969 CNAT: 10:00
> Person Detected - G04 B		2004014011013:00,008 GWT+10:00
> Person Detected - G04 C	× topic	Person
> Person Detected - G04 D	source name	
> Person Detected - G05	Course value	
> Person Detected - G06	Source value	
> Person Detected - G07	data name	
> Person Detected - G08	X data value	1
> Person Detected - G09		
> Person Detected - G10	key name	
> Person Detected - G11	key value	
> Person Detected - G12	nroperty operation	
> Person Detected - G13 A		
> Person Detected - G13 B	source string	
> Person Detected - G14	data string	
> Person Detected - G15 A	key string	
> Person Detected - G15 B	Key stilling	
> Person Detected - G16	topic dialect	
> Person Detected - G17		

6) Crate 'StopBy' and update the 'channel' from which you wish to receive an event from the camera. Also, update the 'topic' and 'data value' as shown below.

Event list	Settings		
🗸 🟴 Person Detected - G04 A			
🗸 📑 Recording tasks	Onvif notification messa	nce: channel: G04 A (48): tonic: "Person": data value: "0":	
Default task	This action will forward th		
V StartBy	This action will forward th	e event notifications sent by a camera.	
🛛 🗮 Onvif notification message; channel: G04 A (48); topic: "Person"; data value: "			
🗸 🔁 StopBy			
🕂 🔁 Onvif notification message; channel: G04 A (48); topic: "Person"; data value: "(			
OnStart	🗶 channel	G04 A	
- OnStop	time	2024/09/05 16:13:35 833 GMT+ 10:00	
> Person Detected - G04 B		2024/05/05 10:15:55,055 00011 10:00	
> Person Detected - G04 C	× topic	Person	
> Person Detected - G04 D	Cource name		
> Person Detected - G05	source value		
> Person Detected - G06			
> Person Detected - G07	data name		
> Person Detected - G08	🗙 data value	0	
> Person Detected - G09		·	
> Person Detected - G10			
> Person Detected - G11	key value		
> Person Detected - G12	property operation		
> Person Detected - G13 A			
> Person Detected - G13 B	source string		
> Person Detected - G14	data string		
> Person Detected - G15 A	key string		
> Person Detected - G15 B	Key string		
> Person Detected - G16	topic dialect		
> Person Detected - G17			
Demos Detected C10			

#### 3.1.3 Axis Crossline counting

- 1) Open your web browser and go camera web page > App > Axis Object Analytics.
- 2) Add two 'Crossline Counting' configurations as follows. The names should be comma-separated values because the system supports direction-based counting, so we need two configurations to accurately track occupancy.



#### 3) Select the 'Human' option to count the people.



- 4) Axis allow 16 characters for the naming, and please use comma separate value to use it for Grafana statistics dashboard.
  - Ground, In : The 'First value (Ground)' indicates the floor level, while selecting 'In' will count the people entering.
  - Ground,**Out** : The 'First value (Ground)' indicates the floor level, while selecting 'Out' will count the people leaving.
  - Please enable the 'Reset counts at midnight', and 'Passthrough threshold'.

Create new scenario		×
	Configure Cround.In"	Virtual line Adjust and move the line to the part of the scene window want to count blets. Objects have to cross the line in the direction of the arrows to be cross the line in the direction of the arrows to be cross the line in the direction of the arrows to be cross the line in the direction of the arrows to be cross the line in the direction of the arrows to be Change trigger direction Reset line Counting settings Event interval Sond events with counting data at one-minute intervals. Number of counts between events 1
		Cancel Back Finish

5) Please create a rule for 'Ground, Out.' Below, you'll find the expected screen layout for reference.



### 3.2 Hanwha Camera Configuration

The number of people entering and exiting is calculated by setting the people count line and direction. Thus it is possible to manage the appropriate number of people inside.

#### 3.2.1 People counting

1) Open your web browser and go camera web page > Analytics > WiseAI

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<b>WISE</b> NET	
I≣ Basic	<
↔ PTZ	<
🔄 Video & Audio	<
📅 Network	<
. Event	<
☐ Analytics	~
Shock detection	
Motion detection	
Tampering detection	
Defocus detection	
WiseAl	
Audio detection	
Sound classification	
System	<
Open platform	<

2) Go to Statistics > People counting.

Since Hanwha does not allow the use of commas or any other specific characters as delimiters, the rule name needs to be 'floor level.'



Counting Exclude area

st		
No.	Name	
1	Rule2	បា

Direction	Total
IN	0
OUT	0

### 4 Grafana Installation & Configuration

#### 4.1 SQL Server Configuration

#### 4.1.1 Create Database Login

The database was created by the application, and you need to create a login in SQL Server.

1) Click Start > Programs > "SQL Server Management Studio"



2) Ensure the administrator has selected server Properties with Securities authentication before creating New Login Account.



3) Right-click on Security in Object Explorer and choose New Login

Object Explorer			<b>-</b> ‡ ×
Connect 👻 🌹 🏋	≡ ▼ 🖒 ≁		
<ul> <li>➡ ALBERT-LAPT</li> <li>➡ ■ Databases</li> <li>➡ ■ Security</li> </ul>	OP\SQLEXPRESS (SO	QL Server 15.0.200	00 - GEUTEB
	New Login Filter	ogin##	- 1
🔒 a	Start PowerShell		
🔓 a	Reports	•	
₽ g	Refresh		

4) In the General option of the Login-New window: Provide the New User Login account Name and login authentication. Click OK (If the window is closed, select your new account name in the Security option of your Object explorer and double-click on it).

Login Properties - geutebruck	:	-		
Select a page General Server Roles User Mapping Securables Status	∬ Script ▼ 😮 Help			
	Login name: Windows authentication SQL Server authentication	geutebruck		
	Password:	•••••		
	Confirm password: Specify old password Old password: Enforce password policy			

- 5) In Server Roles Option: Server-wide security privileges. Select the lists of all possible schemas that the new database user can own.By default, the login will be assigned to the public role. It means the object is available to all users.
- 6) In User Mapping Option: In this, specify databases that the user account can access if the login needs more access in one or other databases. In the Membership, select the lists of all possible database membership roles the new database user can own.

Login Properties - geutebruck	:			
Select a page	I Script ▼ 9 Help			
<ul> <li>General</li> <li>Server Roles</li> <li>User Mapping</li> </ul>	Users	mapped to this login:		
Securables	Мар	Database	User	
Status		GCORE_VISUALCORTEX		
		GSqIDB		
		master		
		META_CONNECT	geutebruck	
		model		
		msdb		
		SAFR_CMS		
		SAFR_LICENSE		
		SAFR_REPORT		
		tempdb		
Connection				
Server	Gue	est account enabled for: META	_CONNECT	
ALBERT-LAPTOP\SQLEXPRESS	Databa	ase role membership for: META	_CONNECT	
Connection:	db	accessadmin		
GEUTEBRUCK\albert	db	backupoperator		
View connection properties	db	datareader datawriter		
	db	ddladmin		
	db	denydatareader		
	db	denydatawriter		
Progress	db	securityadmin		
Atta Doady	🔽 out	blic		

#### 4.1.2 Restart SQL Server

You may need to restart SQL Server if you change the server authentication settings.

The following screen capture shows a view of the Windows Service Manager on a server with a single instance of SQL Server as the default instance (GCORESQL)



#### 4.2 Grafana Installation & Configuration

#### 4.2.1 Grafana Installation

1) Navigate to the Grafnana download page <a href="https://grafana.com/grafana/download">https://grafana.com/grafana/download</a>

- 2) Select the Grafana version you want to install.
- 3) Select 'Enterprise' edition.
- 4) Click Windows
- 5) To use the Windows installer, complete the following steps
  - a. Click Download the installer.
  - b. Open and run the installer.

#### 4.2.2 Sign in to Grafana

To sign in to Grafana for the first time, follow these steps:

- Open your web browser and go to root URL specified in Grafana configuration file. Unless you have configured Grafana differently, it is set to use http://localhost:3000 by default.
- 2) On the sign-in page, enter admin for username and password.
- 3) Click Sign in.
- 4) If successful, you will see a prompt to change the password.
- 5) Click OK on the prompt and change your password.

#### 4.2.3 Microsoft SQL Server data source

To configure basic settings for the data source, complete the following steps.

- 1) Click Connections in the left-side menu.
- 2) Under Your connections, click Data sources.
- 3) Enter Microsoft SQL Server in the search bar.
- 4) Select Microsoft SQL Server. The Settings tab of the data source is displayed.
- 5) Set the data source's basic configuration options.

Field	Value	Description
Name	META_CONNECT_DB	
Host	IP-ADDRESS\GCORESQL,46915	Port might be different
Database	META_CONNECT	

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Username	
Password	

### 4.3 Import Dashboard

To import a dashboard, follow these steps:

- 1) Click Dashboards in the primary menu.
- 2) Click New and select Import in the drop-down menu.

Ó					+~ 💿 🔉 🚷
Home > Dashboards					^
器 Dashboards	Dashboards				New ^
	Create and manage dasht Q. Search for dashboard	ooards to visualize your data s and folders			New dashboard New folder Import
Library panels Public dashboards	O Fine by log	No dael	boarde vot. Croato vo	ur firett	
		+	Create Dashboa	rd	

3) Upload a dashboard JSON file.

Ø	Q Search or jump to
Home > Dashboards > Impo	rt dashboard
器 Dashboards	Import dashboard Import dashboard from file or Grafana.com
Playlists	
Snapshots	ث
Library panels	Upload dashboard JSON file
Public dashboards	Drag and drop here or click to browse Accepted file types: .json, .txt
	Find and import dashboards for common applications at <u>grafana.com/dashboards</u> 면
	Grafana.com dashboard URL or ID Load
	Import via dashboard JSON model
	{     "title": "Example - Repeating Dictionary variables",     "uid": "_OHnEoN4z",     "panels": []  }
	Load Cancel

- 4) (Optional) Change the dashboard name, folder, or UID, and specify metric prefixes, if the dashboard uses any.
- 5) Select a data source, if required.

B Dashboards	Import dashboard	
	Import dashboard from file or Grafana.com	
laylists napshots	Options	
	Name	
ibrary panels	People Counting	
Public dashboards	Folder	
	Dashboards	
	Unique identifier (UID) The unique identifier (UID) of a dashboard can be used for uniquely identify a dashboard between multiple Grafana installs. The UID allows having consistent URLs for accessing dashboards oc changing the title of a dashboard will not break any bookmarked links to that dashboard.	
		Change uid
	META_CONNECT	
	META_CONNECT	

- 6) Click Import.
- 7) Save the dashboard.

### 5 Troubleshooting

#### 5.1 Error creating database and table

You might encounter a 'database and table creation error' when you start the application.

It might be related to the privileges of your Windows account or domain.

#### 5.1.1 Verify that the database and tables exists

- 1) Start "SQL Server Management Studio Management Studio XX" as an Administrator.
- 2) Connect to the database using Windows Authentication.



- 3) Database script files exist in "C:\Program Files\Geutebruck Pacific\G-Core MetaConnect\database"
- 4) Open a "INSTALLER-DRIVEN-CREATE-DATABASE.sql", and Open a query window, paste the query from the file into it, and execute the query.



- 5) Open a "INSTALLER-DRIVEN-CREATE-LOGIN-ROLL.sql", and Open a query window, paste the query from the file into it, and execute the query.
- 6) Open a "INSTALLER-DRIVEN-CREATE-TABLE.sql", and Open a query window, paste the query from the file into it, and execute the query.

#### 5.1.2 Verify the User mapping

- 1) Expand the "Security" and "Logins" sections in the Object Explorer panel, then right-click on the user and choose "Properties".
- Click the "User Mapping", select the "META\_CONNECT" database, and set the database role membership to "db\_owner", "db\_datareader", "db\_datawriter" and "db\_owner", and "public".



#### 5.1.3 Server Authentication mode

You can check to see which authentication method is configured in several ways.

ФТТ ГР	Server Properties - ALBERT-LA	PTOP\GCORESQL
Object Explorer	Select a page	∏ Script ▼      ੳ Help
Connect - + + + + + C + + © Databases © Security © Security © Server Objects © Replication © PolyBase © Management © XEvent Profiler	General     Memory     Memory     Security     Security     Constituent     Database Settings     Advance     Permissions	Server authentication mode          Windows Authentication mode         SQL Server and Windows Authentication mode         SQL Server and Windows Authentication mode         Login auditing         None         Failed logins only         Successful logins only         Both failed and successful logins         Server proxy account
	Connection	Enable server proxy account
	Sonior	Provu account:

Then, go to the Connections page and ensure that "Allow remote connections to this server" is checked, and click OK.

Server Properties - ALBERT-L/	APTOP\GCORESQL	_	$\times$
Select a page	🗊 Script 🔻 😮 Help		
General     Memory     Processors     Security     Connections     Database Settings     Advanced     Permissions	Connections Maximum number of concurrent connections (0 = unlimited): 0 • • Use query governor to prevent long-running queries 0 • • Default connection options:		
	cursor clase on commit ansi warnings		I
	ANSI NULLS		
Connection	arithmetic abort		
Server: albert-laptop\GCORESQL	Remote server connections		
Connection: GEUTEBRUCK\albert	Allow remote connections to this server		
View connection properties	600		
	Require distributed transactions for server-to-server communication		
Progress			 
Ready	Configured values         O Running values		