



Configuring a Xovis sensor for Xenometric Collection

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1 Introduction

Xovis was founded in Switzerland in 2008. They have a range of indoor and outdoor cameras. More detail can be found on their website <https://www.xovis.com/>. Xenometric can collect count data from all Xovis cameras using their Data Push mechanism.



The document doesn't cover the configuration of the sensor for accurate people counting. It covers how to configure the Xovis sensor's settings to identify the count lines, site details, localisation (time zone) and how the sensor will communicate with the Xenometric software on a private or public network. This includes Xenometric installations on private servers and the Xenometric

Cloud.

Xovis sensors can be linked together to form a single view of a wide entrance. Information about how Xovis achieves this can be found here <https://www.xovis.com/en/technology/detail/multisensor/>. The configuration necessary for Xenometric needs only be applied to the master counter. Xenometric's software sees the wide entrance of n sensors as a single counting device.

Each Xovis sensor can monitor multiple lines. Count lines are used to count pedestrians in two directions (In and Out) from one zone to another. A simple sensor would have one line that form the boundary between two zones, e.g., from the outside world zone to an internal zone within a retailer's property.

To configure to a Xovis sensor you can use a web browser to connect with the sensor's IP address or URL.

Xenometric collects data from many sources and aggregates this data in our SQL Server database. We then offer web reporting from your server or on our cloud. Email reports and direct data access is also available.



2 Principles of device and count-line naming

In order for Xenometric's software to understand the location of counters and the relationships between counters, it is necessary for identifiers to be applied in the Xovis Sensor's settings. There are 3 location identifiers that have to be set. These are, Site ID, Device ID and Device Name. There are strict rules for the Site ID and Device ID, but the Device Name can be any text you choose.

The two key identifiers, Site ID and Device ID, are used to uniquely identify which building (site) the counter belongs to and the counter's location within the building.

2.1 Site ID

The **Site ID** represents the building or wider location. For example, the building could be a shopping centre, transport hub, casino, town centre square or street within a city. It is important that the Site ID is unique. Site IDs are usually written in uppercase and contain no spaces. For example, a shopping centre in the Great Britain with counters managed by Acme Ltd. might have a unique Site ID of GBRACME0001. You can use your own naming scheme, so long as the Site ID is unique for the Xenometric software installation. If you are using the Xenometric Cloud, please ask Xenometric to assign you a unique Site ID.

Sensor group:

GBRACME0001

2.2 Device ID

The **Device ID** represents 3 different aspects of the counter's location wrapped into one code. The simplest codes are for counters with one count line, which usually represents the IN and OUT directions.

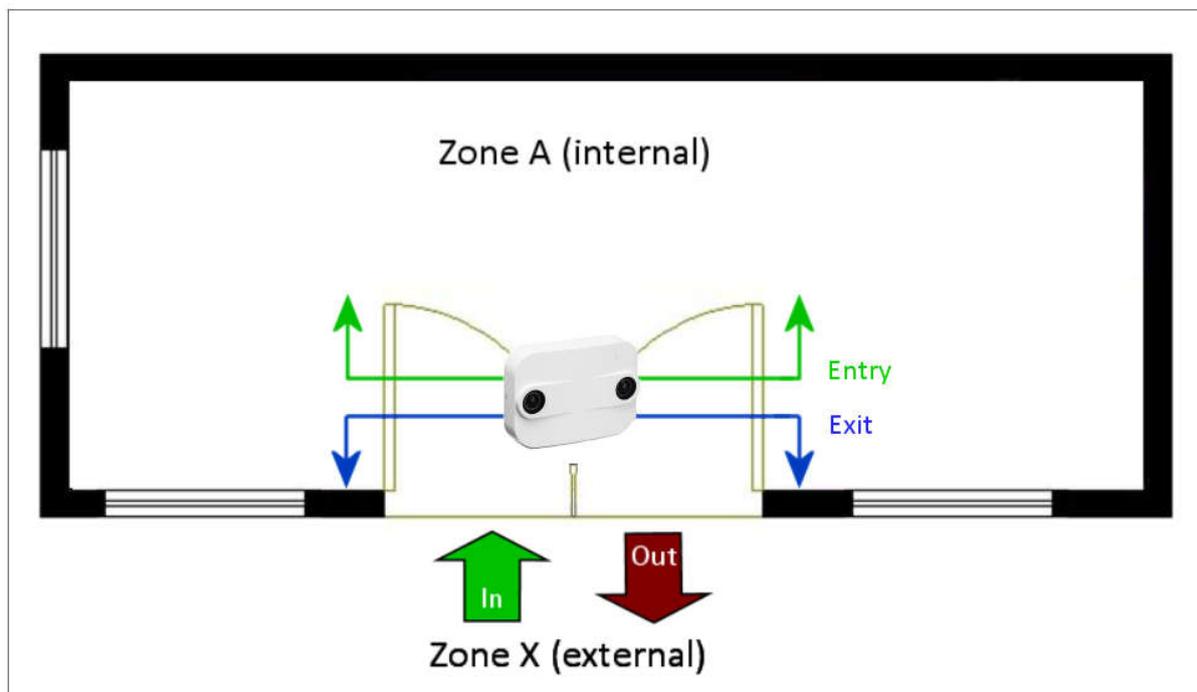
— AAAAAX



The Device ID scheme is complicated (due to historic compatibility issues), so please contact Xenometric if you are unsure of the Device IDs to apply to each counter. We are always happy to help provide Site ID and Device ID codes to ensure that the counters talk seamlessly with the Xenometric software.

2.2.1 Single-line example (IN and OUT)

The example below shows a simple retail store with one counter. The counter has been configured with one line. Pedestrians outside the store are labelled as being in Zone X, whilst pedestrians inside the store are labelled as being in Zone A.



In order to represent this scenario, we will need to program the sensor with the correct IDs for the line. To do this we will allocate a 2-character ID to the entrance.

The complete ID for each of the lines comprises of the entrance component (AA), a link ID (also AA) and a 2-character zone direction descriptor.

The link ID is usually the same as the entrance ID. E.g. if the entrance ID is AA the link ID will be AA. If you have multiple independent sensors covering a single entrance, you can change the link ID to inform the Xenometric software that the sensors share a single entrance. Please contact Xenometric for more information.

The zone direction descriptor for the IN direction is based on the direction of travel for a pedestrian entering the store. The pedestrian travels into Zone A from Zone X. The line's zone direction descriptor is AX.

Combining the Entrance ID, Link ID and Zone ID, we get AAAAAAX



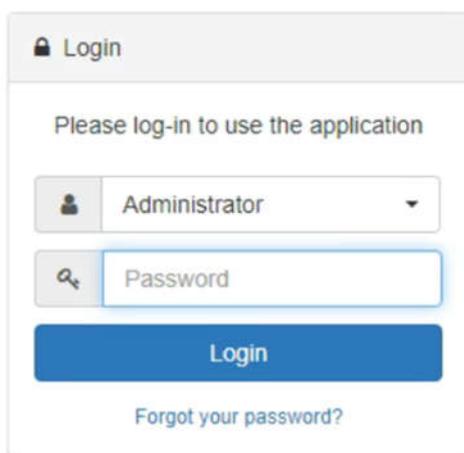
The two fields that must be completed correctly to unique identify each line are the Site ID and Device ID. The combination of these IDs unique identifies each entrance.

3 Site Details and Localisation

This chapter splits the procedure by Xovis firmware version. For firmware versions of 4.x and below, see section 3.1. For firmware version 5 and higher, see section 3.2.

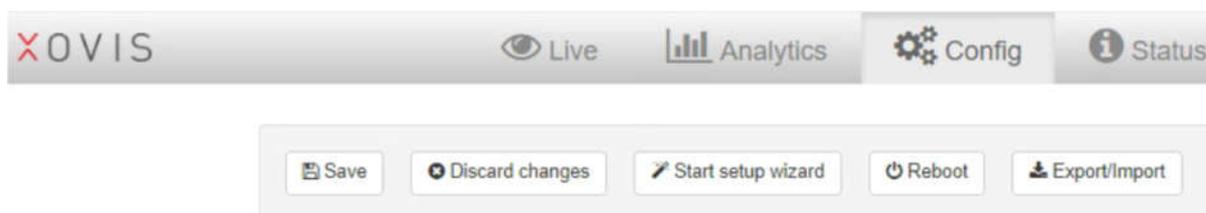
3.1 Firmware 4.x and below

Login to the Xovis sensor using a browser. The default password is pass.



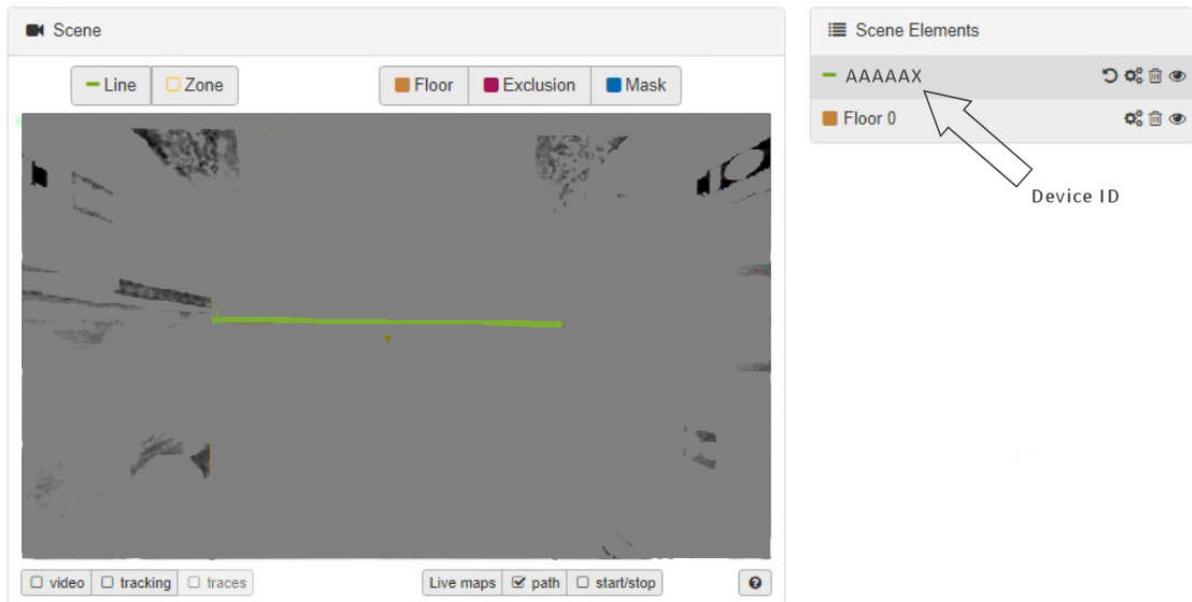
3.1.1 Site Details

Navigate to the Config page.

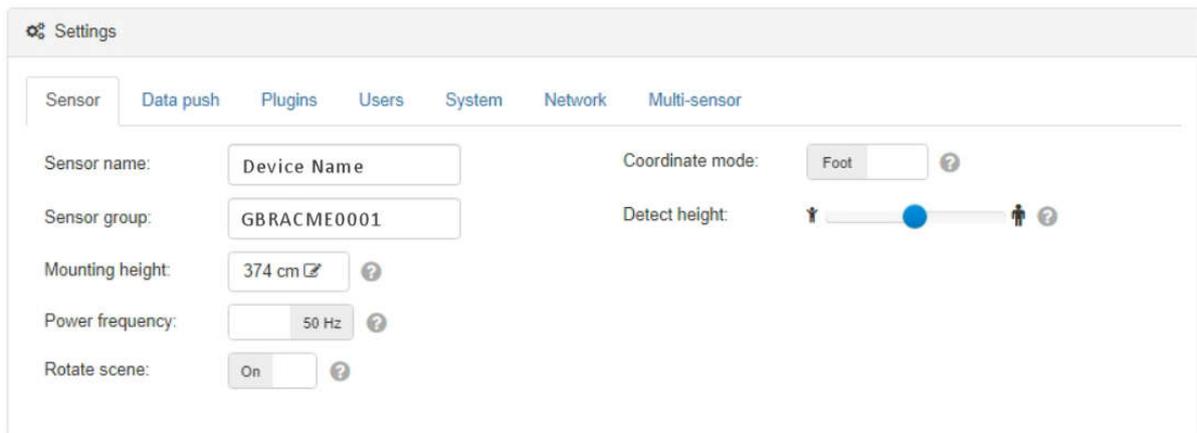


Based on the rules defined in section 2 of this document, you can apply the Site ID and Device ID that you or Xenometric has chosen. The Device Name (Sensor Name) field can be completed with any text of your choosing. The Device Name would be the name of the entrance into the building.

When you create a count line, the name of the line must be the Xenometric Device ID.



The Site ID is applied in the Sensor group field. The Device Name is applied in the Sensor name field.

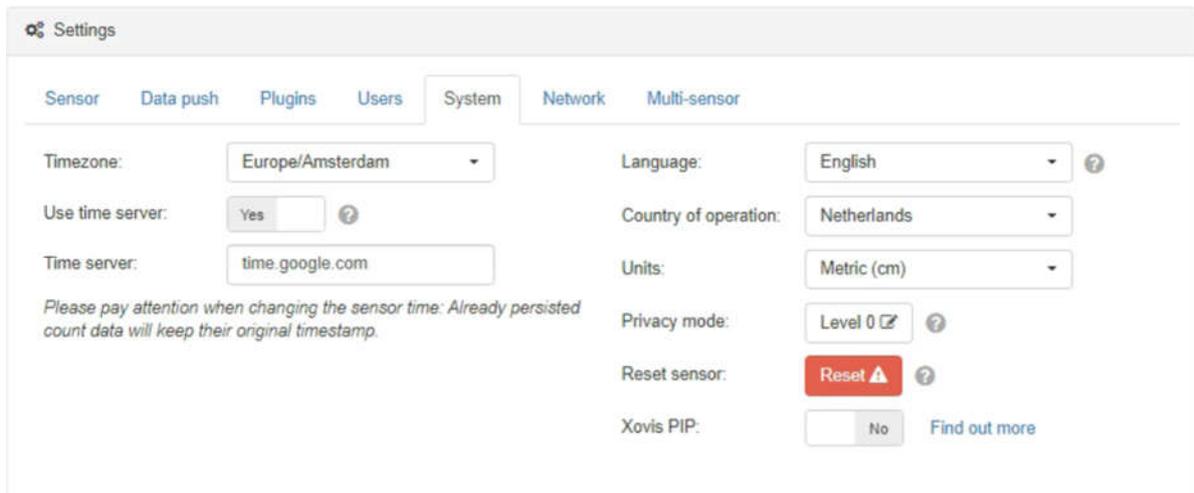


Remember to click the Save button after any changes have been applied.

3.1.2 Localisation

Localisation allows the sensor to tell Xenometric which time zone it is located within.

Select the correct time zone from the dropdown. You can also use a time server to ensure that the sensor's clock is regularly corrected.

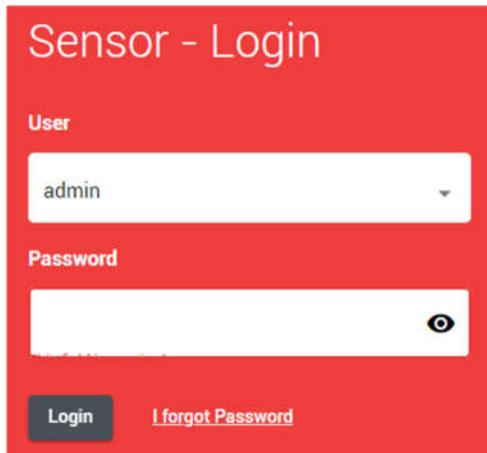


The screenshot shows the 'Settings' page with the 'System' tab selected. The settings are organized into two columns. The left column includes: 'Timezone:' with a dropdown menu set to 'Europe/Amsterdam'; 'Use time server:' with a 'Yes' button and a help icon; 'Time server:' with a text input field containing 'time.google.com'; and a warning note: 'Please pay attention when changing the sensor time: Already persisted count data will keep their original timestamp.' The right column includes: 'Language:' with a dropdown menu set to 'English' and a help icon; 'Country of operation:' with a dropdown menu set to 'Netherlands'; 'Units:' with a dropdown menu set to 'Metric (cm)'; 'Privacy mode:' with a dropdown menu set to 'Level 0' and a help icon; 'Reset sensor:' with a red 'Reset' button and a help icon; and 'Xovis PIP:' with a 'No' button and a 'Find out more' link.

Remember to click the Save button after any changes have been applied.

3.2 Firmware 5 and above

Login to the Xovis sensor using a browser. The default password is pass.

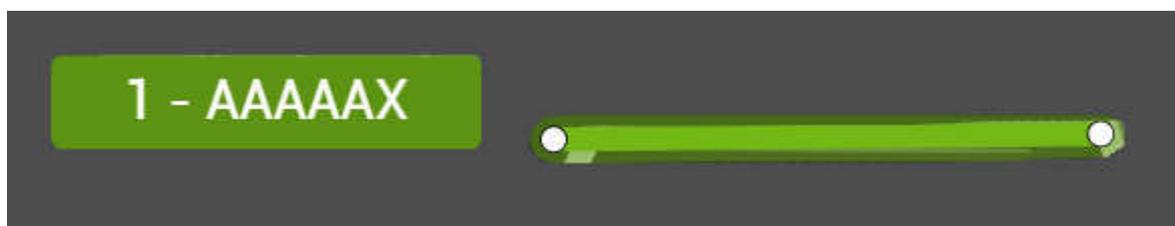


3.2.1 Scene Configuration

The Scene Configuration is where you configure the count lines and zones. The zones can be used as assistive geometries to help with the line counting. See Xovis' documentation for information on how to configure count lines and zones.

The scene can be configured to contain lines as zones as required. The count logic rules are now abstracted from the lines and zones, so we can create more than one count event per line. This might be useful to create one line with a logic to count children ($< 1.2\text{m}$) and another logic to count adults ($> 1.2\text{m}$). Alternatively, you could create a logic to count individuals and another logic to count groups.

It is necessary to name the count line according to Xenometric's Device ID naming scheme. For a single entrance building, the Device ID and line name will be AAAAAX



There are two types of logic available in the version 5+ firmware. There are legacy logics (count in/out and count late) and the newer logics introduced in version 5 (person count in/out, person count late, group count in/out and group count late).

The legacy logics can be manually added or they might be automatically made when you upgrade a camera from an earlier version to version 5+.

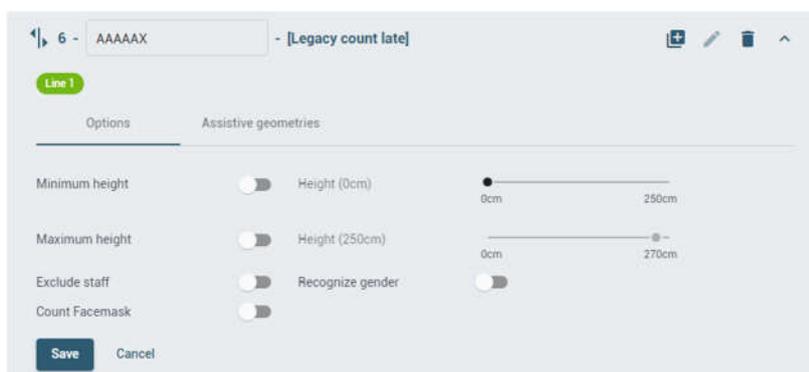
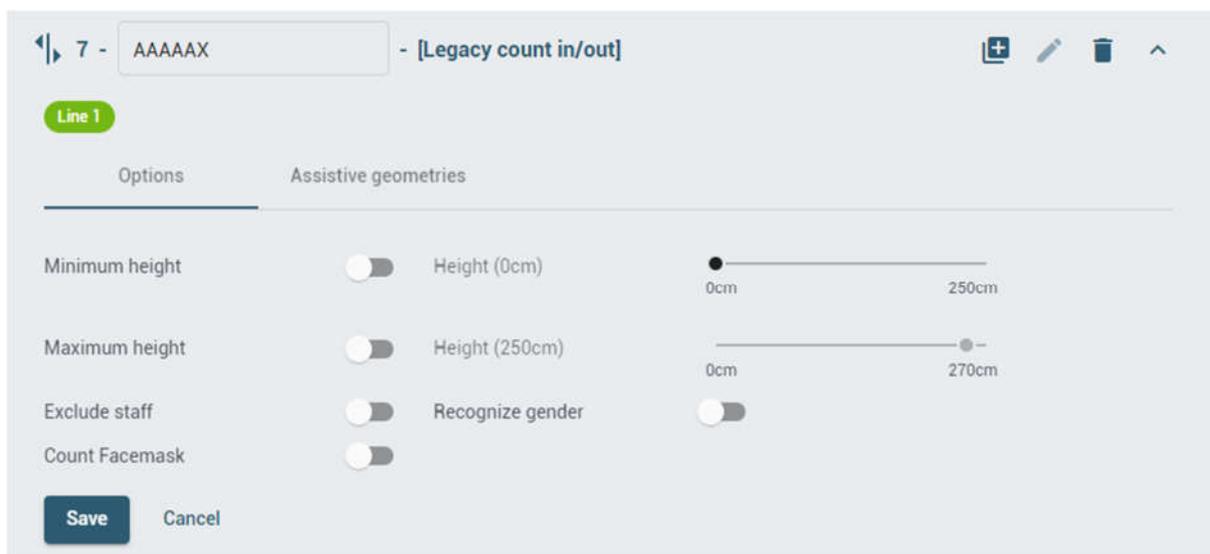
You can add new logics by selecting the line in the Scene Configuration and then clicking on the Add Logic + link.



3.2.2 Legacy Count Logics

The legacy in/out and legacy late differ only in when a person is counted. The 'late' logic only counts a person once they have left the scene, so it does not count people who linger in the counting area and perhaps cross the line more than once.

The name should be changed to a valid Xenometric Device ID. The examples below show a Device ID of AAAAAX. If you are unsure of the Device ID to use, please contact Xenometric.



The late version of the in/out logic has identical counting options.

Both logics can use assistive geometries (zones).

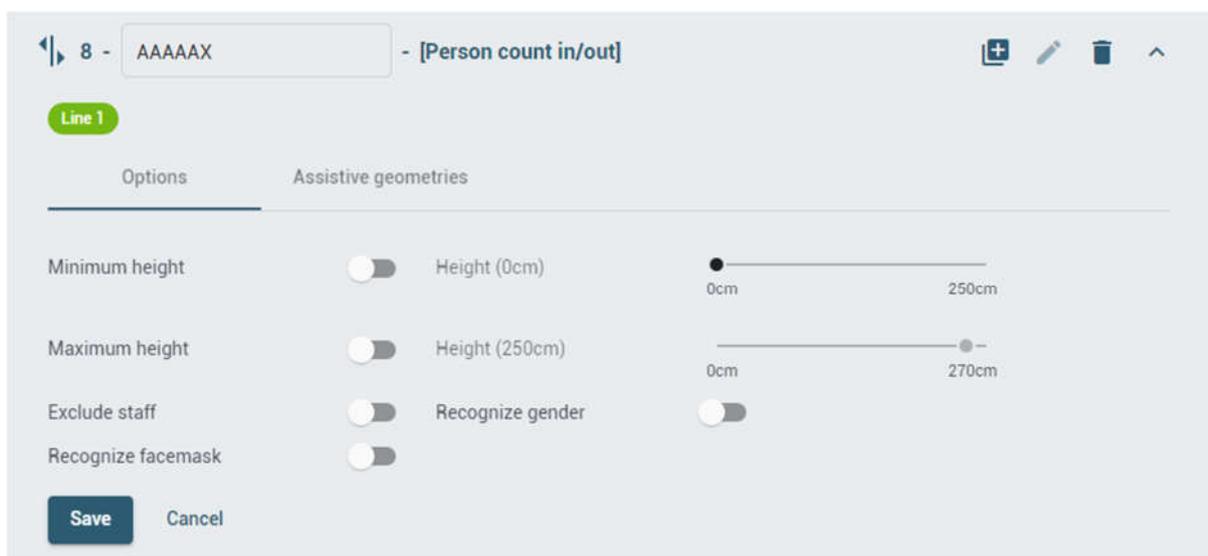
3.2.3 Count Logics (firmware version 5+)

The count logics in firmware version 5 onwards offers Person Count or Group Count. For both Person and Group you can choose late or in/out. The late count reduces the incidence of multiple counts from one person/group crossing the line multiple times.

The person counting (in/out and late) provides several options for filtering by height and staff/customer. You can also add assistive geometries. See Xovis' documentation for details on how to do this.

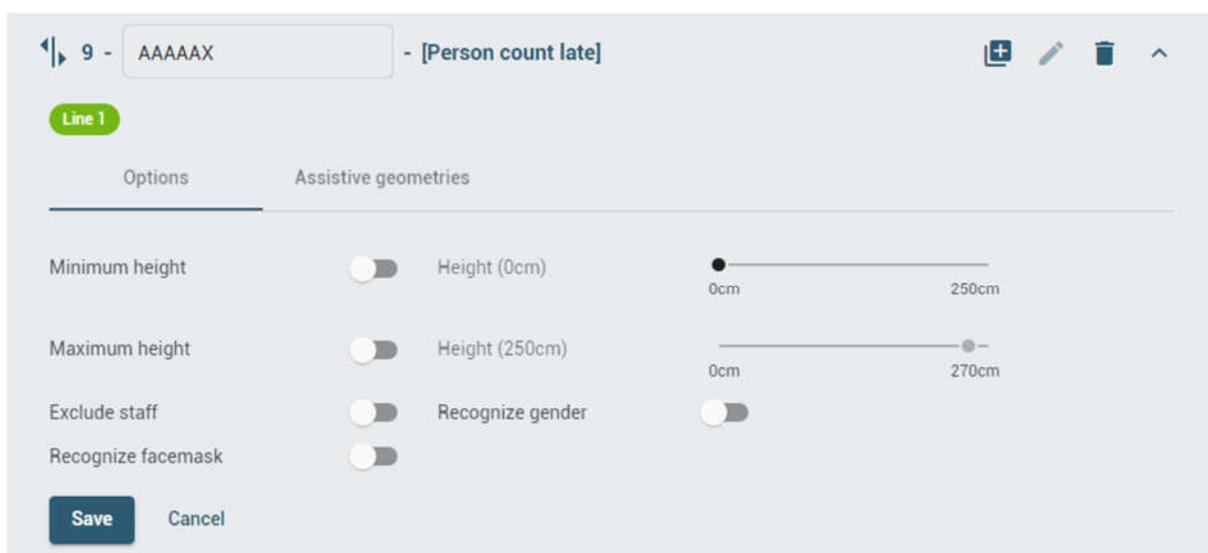
The name should be changed to a valid Xenometric Device ID. The examples below show a Device ID of AAAAAX. If you are unsure of the Device ID to use, please contact Xenometric.

The standard In/Out count page is shown below.



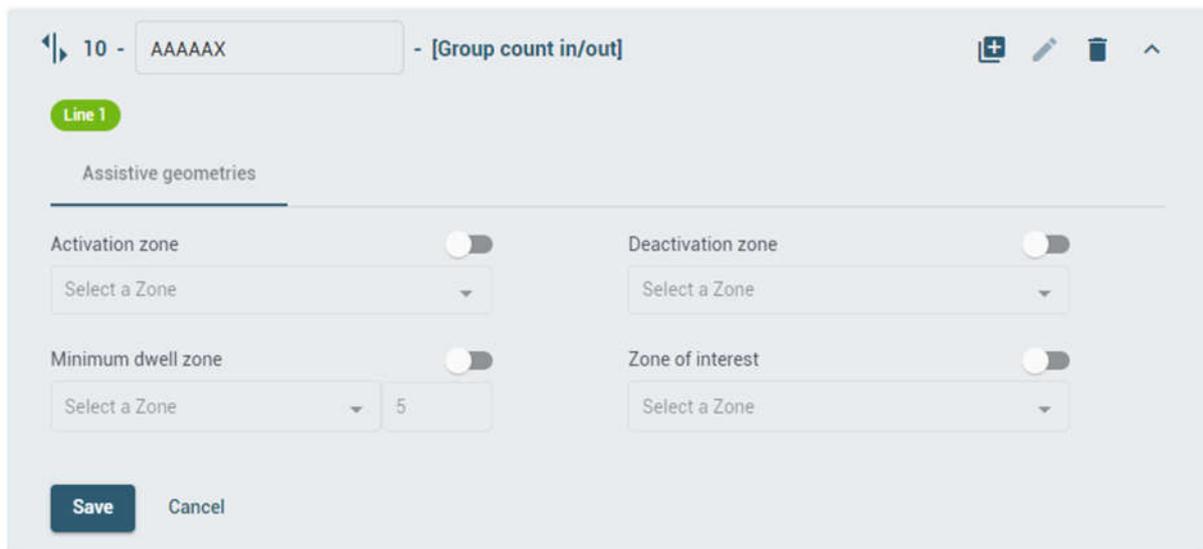
The screenshot shows the configuration interface for 'Line 1' with the title '8 - AAAAAX - [Person count in/out]'. The interface is divided into two tabs: 'Options' and 'Assistive geometries'. Under 'Options', there are four rows of settings, each with a toggle switch: 'Minimum height' (off), 'Maximum height' (off), 'Exclude staff' (off), and 'Recognize facemask' (off). Under 'Assistive geometries', there are two rows: 'Height (0cm)' with a slider from 0cm to 250cm, and 'Height (250cm)' with a slider from 0cm to 270cm. At the bottom, there are 'Save' and 'Cancel' buttons.

This is the 'person count late' page, which is counts similarly to in/out, but the count is only generated when the person has left the scene.



The screenshot shows the configuration interface for 'Line 1' with the title '9 - AAAAAX - [Person count late]'. The interface is divided into two tabs: 'Options' and 'Assistive geometries'. Under 'Options', there are four rows of settings, each with a toggle switch: 'Minimum height' (off), 'Maximum height' (off), 'Exclude staff' (off), and 'Recognize facemask' (off). Under 'Assistive geometries', there are two rows: 'Height (0cm)' with a slider from 0cm to 250cm, and 'Height (250cm)' with a slider from 0cm to 270cm. At the bottom, there are 'Save' and 'Cancel' buttons.

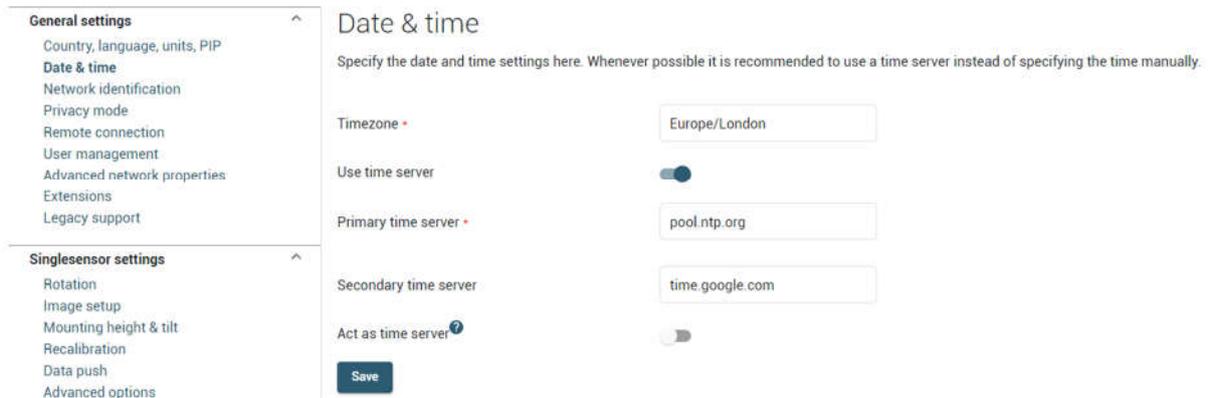
You can also great a logic for group counting. Please see Xovis' documentation for details on groups.



3.2.4 Date and Time

It is important for any Xovis camera to have the correct time zone, data and time. Ideally, a time server should be supplied to keep the clock accurate.

Settings



3.2.5 Network Identification / Sensor Name and Site ID

The Xenometric Site ID and Entrance/Device Name are hidden in the Network Identification page.

The Site ID is applied to the Xovis field called Sensor Group.

The Entrance or Device Name is applied in the Xovis field called Sensor Name.

Settings

General settings Country, language, units, PIP Date & time Network identification Privacy mode Remote connection	<h4>Network identification</h4> <p>Specify your network settings and, if desired, sensor naming and group here.</p> <table><tr><td>Sensor name Entrance Name</td><td>Sensor group SITE_ID</td><td>Hostname XOVIS-PC</td></tr></table>	Sensor name Entrance Name	Sensor group SITE_ID	Hostname XOVIS-PC
Sensor name Entrance Name	Sensor group SITE_ID	Hostname XOVIS-PC		

4 Data Delivery / Data Push

The mechanisms for data delivery from firmware versions 4.x and 5+ are very different. The Xenometric server can handle both, but the configuration in the camera is dependent on the firmware version.

4.1 Firmware 4.x and below

Data can be delivered to Xenometric's software using Xovis' Data Push mechanism.

The Data type should be 'Line count data'. This is the In and Out footfall data.

The Interval should be 15 minutes. This is how often the sensor will communicate with Xenometric.

The Granularity should be 15 minutes (unless lower is needed). This is the period of count aggregation.

The Protocol must be HTTP(S) and the Ignore proxy checkbox can be unticked.

The Data push format should be 'Xovis XML v2'.

The URL is the IP address or machine name, prefixed by http:// and suffixed by the port to be used.



If you are using the Xenometric Cloud, the same mechanism applies, but the URL will be `http://www.xenometric.com:6000`

A screenshot of the Xenometric web interface showing the 'Settings' page with the 'Data push' tab selected. The page has a header with a gear icon and the word 'Settings'. Below the header are several tabs: 'Sensor', 'Data push', 'Plugins', 'Users', 'System', and 'Network'. The 'Data push' tab is active. Underneath, there is a section titled 'Add new data push agent:'. This section contains several form fields: 'Data type' (dropdown menu with 'Line count data' selected), 'Interval' (dropdown menu with '15 minutes' selected), 'Granularity' (dropdown menu with '15 minutes' selected), 'Protocol' (dropdown menu with 'HTTP(S)' selected), and 'Data push format' (dropdown menu with 'Xovis XML v2' selected). To the right of the 'Protocol' field is an unchecked checkbox labeled 'Ignore proxy'. Below these fields is a text input field for 'URL' containing the placeholder text 'http://ip-address:port'. At the bottom of the form are two buttons: a blue 'Add' button and an orange 'Discard' button.

The connection can be tested by clicking on the Test button.

Settings

Sensor Data push Plugins Users System Network Multi-sensor

Edit data push agent

Data type: Line count data

Interval: 15 minutes

Granularity: 15 minutes

Protocol: HTTP(S) Ignore proxy

Data push format: Xovis XML v2

URL: http://ip-address

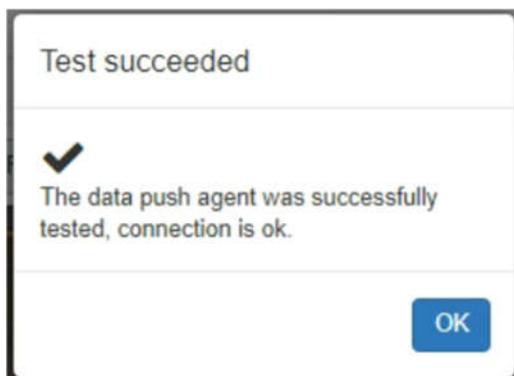
Change Discard changes

Configured data push agents:

Pushing Line count data (xml) with 15 minutes granularity every 15 minutes by HTTP to http://ip-address:port

Push Test

If the connection is successful, you will get a message like this.



If the connection fails, check the firewalls.

You can manually push data by clicking on the Push button.

Push count data

Please select the period of count data you'd like to push to http://10.0.30.197:3000 now.

From 12. Nov 2020 18:01 To 13. Nov 2020 18:01

Timezone: UTC+1

OK Cancel

4.2 Firmware 5 and above

In firmware 5 Xovis have split the data delivery into two components. Firstly, there are Connections, which describe how the camera will connect to a server. Secondly there are Agents, that describes which data is to be sent and the format of the data. Each Agent must have a Connection assigned to it. You can create multiple Agents that share the same Connection.

Singlesensor settings

Rotation

Image setup

Mounting height & tilt

Recalibration

Data push

Advanced options



This manual describes a Singlesensor Data Push, but a similar process is performed for a Multisensor Data Push.

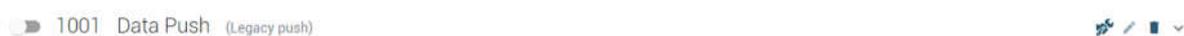
4.2.1 Upgraded cameras from version 4.x or below

If you have upgraded your camera from a 4.x or lower firmware version, you will find that the newer firmware has created connections and legacy agents automatically. It is important to note that Legacy Agents will only work with Legacy Logics

One the Scene Configuration, you may have a Legacy Logic, such as the one shown below.



This Legacy Logic will work with a Legacy Agent, as shown below as a Legacy Push.



It is important that Legacy Logics are only paired with Legacy Agents, else no data will be sent.

4.2.2 Connections

This topic is relevant regardless of whether you are editing an auto-created Connection or if you are creating a new connection.

For a new connection, click on the 'Add new connection +' link. [Add new connection +](#)

Add new connection

Name

Protocol

Give the connection a name and then select the Protocol from the list as 'HTTP / HTTPS'.

Press Save to then specify the connection's properties.

To edit an existing connection, click on the pen icon next to the connection name. You can then directly edit the connection's properties.

1006 Xenometric Connection (HTTP, Port: 80)

HTTP

Server URI *
e.g. myServer.com

Port
between 1 and 65535

SSL/TLS enable

Authentication Advanced settings

Authentication mode

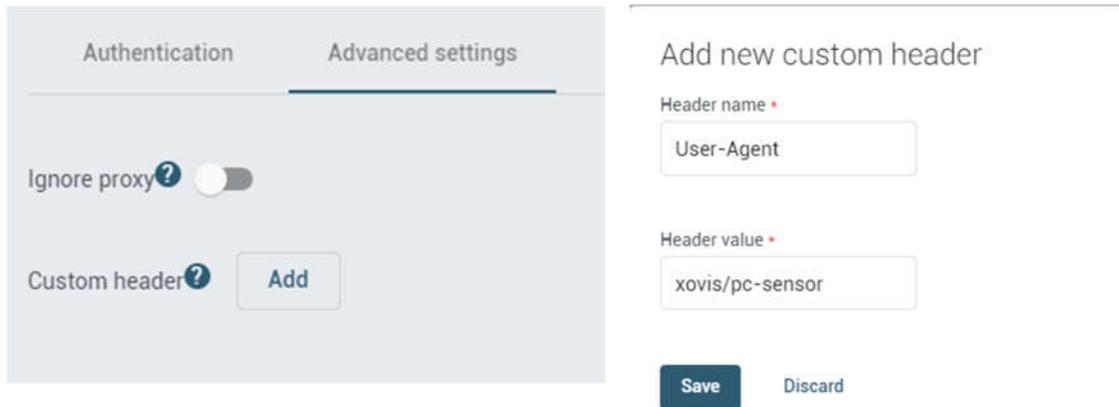


If you are using the Xenometric Cloud, the Server URL will be `http://www.xenometric.com` and the port will be 6000.

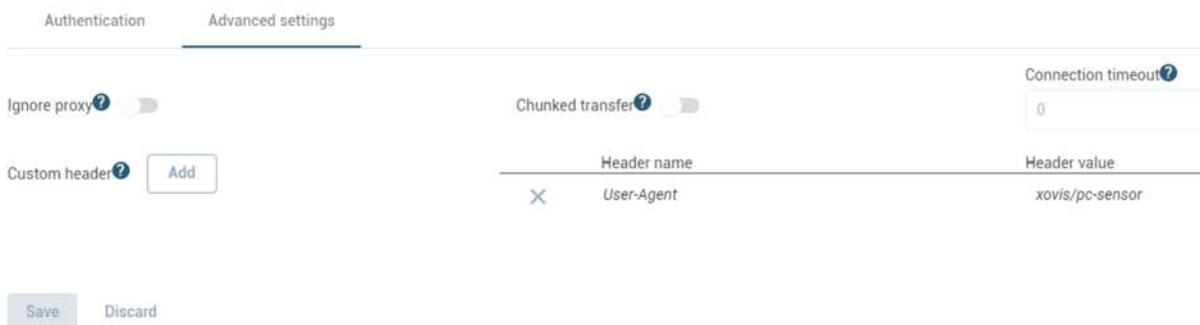
For local installation of Xenometric's software, the Server URL will be the IP address of the server and the port that X-Push has been configured to listen on.

There is no need for SSL or Authentication.

One the Advanced settings it is necessary to add a custom header. This lets the Xenometric server know that a Xovis sensor is connecting. Click on the Add button and then add the Header name as User-Agent and the Header value as xovis-pc-sensor. Be careful to use the right case.



You will see the custom header shown in the Advanced settings.



Save your connection and then we can test that it works. Click on the Connection Test button 

Connection test

Status: OK

Server code: 250

Server info:

Last successful test: 01/03/2022 - 20:08:24

Retry

Close

If the connection fails, it is likely that the Xenometric software is not listening at that address on that port or a firewall is blocking the connection.

4.2.3 Agents

Agents use a connection to deliver data to Xenometric's software. The Xenometric server (Xenometric Cloud or a local installation) will be listening on a specific port. The Agent will open a connection to the Xenometric software and deliver data in a format and at a frequency that is configured in the Agent.

If you have upgraded a Xovis camera from version 4.x or below, you will find that the upgrade has created legacy agents to match your old Data Push settings. It is important to note that a Legacy Agent will only work with Legacy Count Lines (Logics).

4.2.3.1 Legacy Push

If you need to add a legacy push agent, you can click on the Add new agent + link.

Add new agent +

The Add new agent form will allow you to choose 'Still use Legacy Data push type' to send the line count data to Xenometric.

Xenometric supports the Legacy data push as well as the newer Logics push.

You can edit the legacy push to send data aggregated (granularity) to 15-minutes at a frequency (interval) of 15-minutes.

Add new agent

Name

Data push type

Still use Legacy Data push

Please note that legacy data push types will not be enriched with future data features. Legacy Data Pushes can only be created and deleted, not edited.

Legacy Data push type

Save

Close

1006 Legacy Push (Legacy push)

Data push type: Legacy push

Connection: Xenometric HTTP 6002

Data type: Line count

Interval: 15 minutes

Granularity: 15 minutes

Format: XML

Save Discard



Remember to turn on the Agent, else data will not be sent.

4.2.3.2 Logics Push

To add a new Logics Agent, which is now Xovis' preferred way of pushing data, click on the Add new agent + link.

[Add new agent +](#)

Add new agent

Name

Xenometric Logics Push

Apply a name for this agent and then choose Logics Push from the dropdown options.

Click Save to then edit the parameters for this agent.

Data push type

Logics push

Still use Legacy Data push

Save

Close

Firstly, choose a connection for this agent. The connection must be one that you previously configured for sending to Xenometric's software.

Set the Scheduler type to Periodic and the Interval to 15 minutes, unless you need a different delivery schedule. You can use cron to specify your own delivery schedule, but this is for advanced use only.

The screenshot shows the configuration page for a Xenometric Logics agent. At the top, there is a toggle switch for '1005', the agent name 'Xenometric Logics', and the data push type '(Logics push)'. Below this, the 'Data push type' is set to 'Logics push' and the 'Connection' is set to 'Xenometric HTTP 6002'. The 'Schedule' tab is active, showing 'Scheduler type' set to 'Periodic', 'Interval' set to '15 minutes', and 'Enter cron expression' set to '5 0/15 * ? * *'. At the bottom, there are 'Save' and 'Discard' buttons.

Note: the cron format is non-standard in that the first number represents seconds. The cron expression shown below (5 0/15 * ? * *) instructs the camera to send every 15 minutes at 5 seconds past the minute boundary for all hours, days, months and days of the week, e.g. 13:15:05, 13:30:05, 13:45:05 etc.

The Data format tab needs to be changed to match the image below.

1. The package resolution (granularity) should be set to 15-minutes, unless you need a different aggregation period.
2. The Time Format needs to be changed to RFC 3339.
3. The Full senso info needs to be ON.
4. The other options can be left as default or OFF.

The screenshot shows the configuration interface for Xenometric Logics. At the top, there is a toggle switch for '1005' and a button labeled 'Xenometric Logics' with '(Logics push)' next to it. Below this, the 'Data push type' is set to 'Logics push' and the 'Connection' is set to 'Xenometric HTTP 6002'. The interface is divided into four tabs: 'Schedule', 'Data format', 'Retry settings', and 'Data filtering'. The 'Data format' tab is currently selected. Under this tab, the 'Format' is set to 'JSON', 'Pretty format' is turned off, and 'Format version' is '5.0'. The 'Time Format' is set to 'RFC 3339', 'Package resolution' is '15 minutes', and 'Package size' is '1'. There are three toggle switches: 'Push empty frames' (off), 'Full package info' (off), and 'Full sensor info' (on). At the bottom left, there are 'Save' and 'Discard' buttons.

The Retry settings tab should have the Retry Mode changed to Exponential delay. All other settings can be left as default.

The screenshot shows the configuration interface for a logic named '1005 Xenometric Logics'. The 'Data push type' is set to 'Logics push' and the 'Connection' is 'Xenometric HTTP 6002'. The 'Retry settings' tab is active, showing the following configurations: 'Retry Mode' is set to 'Exponential delay', 'Max number of retries' is 10, 'Start delay (sec, 0-86400)' is 2, 'Delay increase' is 2, 'Min' is 2, 'Max' is 2, and 'Reset on next push' is enabled. 'Save' and 'Discard' buttons are at the bottom.

The Data filtering tab should be edited to choose Custom from the Logics dropdown. The relevant line can then be selected from the adjacent dropdown.

The screenshot shows the configuration interface for the same logic '1005 Xenometric Logics'. The 'Data push type' is 'Logics push' and the 'Connection' is 'Xenometric HTTP 6002'. The 'Data filtering' tab is active, showing the 'Logics' dropdown set to 'Custom' and the adjacent dropdown set to '1 Line-based logic 1'. 'Save' and 'Discard' buttons are at the bottom.

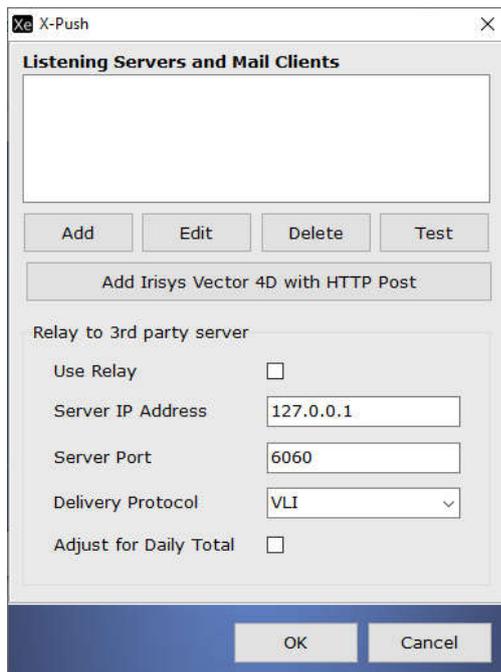
5 Configuring X-Server

This section is only necessary for local installations of X-Server. If you are using Xenometric's Cloud Server, there is no need to worry about configuring X-Server.

This mechanism requires the X-Server's X-Push service to listen on a specified port. All the Xovis counters will connect to the server on this port and deliver their data.

To configure the X-Server, you will need to open the X-Push form in the X-Control.

On this form you will need to add a port to listen on. If you already have a port specified, then you can skip adding a new port. In this example we use port 1973, but you can use any port.

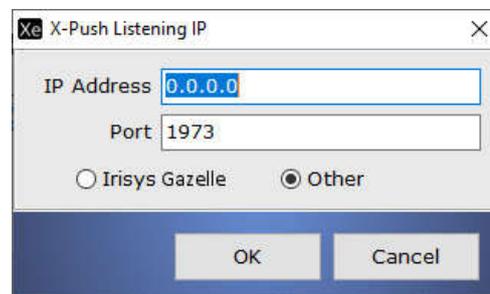


The screenshot shows the 'X-Push' configuration window. The main section is titled 'Listening Servers and Mail Clients' and contains a large empty list box. Below the list box are four buttons: 'Add', 'Edit', 'Delete', and 'Test'. Underneath these buttons is a button labeled 'Add Irisys Vector 4D with HTTP Post'. Below that is a section titled 'Relay to 3rd party server' with the following options:

- Use Relay
- Server IP Address:
- Server Port:
- Delivery Protocol:
- Adjust for Daily Total

At the bottom of the window are 'OK' and 'Cancel' buttons.

Click on the Add button to launch the X-Push Listening IP form.



The screenshot shows the 'X-Push Listening IP' configuration window. It has the following fields and options:

- IP Address:
- Port:
- Radio buttons: Irisys Gazelle, Other

At the bottom are 'OK' and 'Cancel' buttons.

If you specify the IP address as 0.0.0.0, the X-Server will listen on all local IP addresses. This is recommended.

Choose a port that is not currently in use on the server, i.e. avoid low number ports.