

Server-Side System Requirements for Using IngSoft InterWatt (Server Operation within the Licensee's Network)

(Version: 2026-06-01)

§ 1 Preliminary Note

This document describes the system requirements necessary to operate the server components of the software "IngSoft InterWatt."

This document only becomes contractually binding when explicitly incorporated into a contract.

The requirements outlined here reflect the current state as of the date of publication and apply to the then-current version of the software. Future versions may have different requirements to enhance system performance or security.

Details on client-side system requirements can be found in a separate document.

§ 2 General Information

IngSoft InterWatt consists of several server-side software components that can be distributed across one or multiple servers. This allows for installations that meet higher requirements for failover and high availability.

The actual hardware resource requirements depend on factors such as the number, type, resolution, and retention period of data points. Therefore, the following examples are based on typical scenarios.

§ 3 Required Software

Regardless of the installation scenario, the following software is required (licensing, installation, and maintenance are the responsibility of the customer):

Category	Supported Alternatives	Notes
Server Operating System	Microsoft Windows Server 2016 (support until end of 2026) Microsoft Windows Server 2019 Microsoft Windows Server 2022 Microsoft Windows Server 2025 (x64 architecture only)	It must be possible to use current versions of the Microsoft .NET Framework, .NET runtime components, and standard OS components such as Internet Information Server (IIS). TLS 1.2 or 1.3 must be enabled on the server.
Database Management	Microsoft SQL Server 2019 (support until March 2027, min. CU8) Microsoft SQL Server 2022 Microsoft SQL Server 2025	At least Standard Edition required.
Other		Antivirus, system management software, etc., at the customer's discretion

Exceptions: IngSoft InterWatt SoftLogger, IngSoft InterWatt Fieldservice, and IngSoft InterWatt Edge (small services for collecting and forwarding data, e.g., from building management systems) can also run on current Microsoft client operating systems.

Licensing notes:

- a) The Microsoft SQL Server can also be purchased through IngSoft, but this requires a corresponding agreement in the license contract.
- b) IngSoft InterWatt includes its own user management. Usually, Microsoft license agreements require a license per user set up in IngSoft InterWatt. IngSoft therefore recommends core-based licensing for Microsoft SQL Server; these licenses are available starting from 4 cores in increments of 2.
- c) IngSoft InterWatt is often operated in a way that it is accessible via the Internet; this must be covered by the license.
- d) If IngSoft InterWatt is made available to third parties for a fee, this generally requires Microsoft SPLA licensing.

§ 4 Example Hardware Sizing

IngSoft InterWatt can run on many different hardware configurations. Performance needs depend on many factors (including the number of meters, data collection frequency, data collection interfaces, and the number of years data is retained), so only example configurations are provided here:

	Minimal Stand-Alone	Data Center, Small Scenario	Data Center, Medium Scenario	Redundant Configuration, Large Scenario
Number of meters	500	1.000	5.000	25.000
...with data series finer than 1 day	100	500	2.500	12.500
Concurrent Users	5	10	25	50
Environment	Standalone machine	Virtualized data center	Virtualized data center	((Virtualized) data center
Existing resources in the data center		SQL server, space for database 50–150 GB	SQL server, space for database 200–600 GB	Storage solution with $\geq 10,000$ IOPS and 1.0–2.5 TB storage, load balancer
Server 1	32 GB RAM, 4 cores, 2x 256 GB SSDs (RAID 1)	64 GB RAM, 4 cores	Application Server: 32 GB RAM, 4 cores	Application Server A: 32 GB RAM, 4 cores
Server 2	-	-	Services: 32 GB RAM, 8 cores	Services A: 48 GB RAM, 8 cores
Server 3	-	-	-	Application Server B: 32 GB RAM, 4 cores
Server 4	-	-	-	Services B: 48 GB RAM, 8 cores
Server 5	-	-	-	2 servers each with 128 GB RAM, 8 cores as database cluster
Server 6	-	-	-	

Virtual machines require an additional 10 GB disk space for IngSoft InterWatt program files and temporary data (excluding OS and SQL server files).

§ 5 Data Backup

IngSoft InterWatt stores all data in a database. Therefore, backups of the server software and configuration are generally only necessary when updates are installed.

For the database, hourly log backups and daily full backups are recommended. If no centralized company backup system is used, IngSoft InterWatt can be configured to perform its own backups. Adequate and appropriately sized backup targets must be provided.

§ 6 Server Network Integration

The following describes the individual connections required by the IngSoft InterWatt server(s). It is at the licensee's discretion through which network connection these connections are ensured.

No.	Description	Protocol Counterpart	Connection Setup Communication Direction	Remark
1	Communication between servers	various involved servers only	bidirectional bidirectional	not required if all components are installed on a single machine
2	Data backup	as chosen by the licensee	as chosen by the licensee	mandatory
3	Access for internal users (Web-Client)	http/https + WebSockets internal clients	incoming bidirectional	mandatory
4	Access for external users (Web client)	https + WebSockets public internet	incoming bidirectional	mandatory
5	Email sending	e.g., SMTP outgoing	outgoing outgoing	mandatory
6	Access for users (mobile app)	https public internet	incoming bidirectional	required for using the app
8	License retrieval	https supervisor.interwatt.net	outgoing bidirectional	recommended, but mandatory for software rental
9	Maintenance access for IngSoft GmbH	as chosen by the client IngSoft GmbH network	as chosen by the client bidirectional	mandatory
10	Software updates from IngSoft	https update.interwatt.net and version.ingsoft.de	outgoing incoming	strongly recommended, min. TLS 1.2
11	Software updates from Microsoft	as chosen by the licensee	outgoing incoming	Mandatory
12	Remote monitoring of the server	https supervisor.interwatt.net	outgoing outgoing	strongly recommended, min. TLS 1.2
13	Weather data via IngSoft proxy	https kds.interwatt.net	outgoing incoming	strongly recommended, min. TLS 1.2
14	Alternative: Weather data directly from provider	various	various	only if "Weather data via IngSoft proxy" is not desired/possible
15	Connection to energy data sources	e.g., http, https, WebSockets, MQTT, POP3, IMAP, BACnet, OPC via DCOM, ODBC various	various various	required if energy data is to be automatically collected
16	Determining geographic coordinates	https mapquestapi.com	outgoing bidirectional	optional, required for map display, sun position calculations
17	Registration of energy performance certificates	https energieausweis.dibt.de	outgoing outgoing	optional, required for online registration of energy certificates
18	Single Sign-On provider	Various	outgoing bidirectional	optional, e.g., Microsoft Entra

1. Communication between servers

If the IngSoft InterWatt server components are distributed across multiple servers, they must be able to communicate with each other. In particular, all components access the database or the database server. This connection must be as latency-free as possible.

In addition, all server components communicate with the IngSoft InterWatt WatchDog service, which is installed on each of the licensee's servers. This service can restart other components in case of failure.

2. Data backup

IngSoft's preferred backup concept involves the IngSoft InterWatt server independently writing a complete backup of the database into a *.bak file once a day. This file is either directly written to a provided network share (where it is secured) or stored in a special folder on the IngSoft InterWatt server, which is then backed up by the licensee's backup system. If transaction log backups are to be stored outside the IngSoft InterWatt server, a corresponding network share is required.

3. Access for internal users (web client)

The users utilize the web application "EnergieMonitor" to access the system. This application communicates with the server (or the Microsoft Internet Information Server installed on it as part of the operating system) via http/https or WebSockets; therefore, it must be possible for the users' computers to establish a corresponding connection to the IngSoft InterWatt server.

4. Access for external users (web client)

It is at the licensee's discretion whether external users (e.g., planners, customers, or citizens) can access the IngSoft InterWatt server via the internet. From the IngSoft InterWatt server's perspective, no additional requirements apply beyond those in point 3. However, it is strongly recommended to allow access only via encrypted protocols (HTTPS or WebSockets over HTTPS). The procurement and regular renewal of the necessary SSL certificate is the licensee's responsibility.

5. Email sending

The IngSoft InterWatt server regularly sends emails, some with attachments, to users registered in the software. It can either use the SMTP server available on the IngSoft InterWatt server OS (**only possible Windows Server 2022 or earlier**) or another **SMTP server provided by the licensee**. Receiving emails by the IngSoft InterWatt server is only necessary for specific remote data collection configurations.

When using the SMTP server on the IngSoft InterWatt server, the licensee must ensure that the SMTP server functions properly (e.g., opening ports, setting up DNS reverse lookup for the public IP, etc.).

If an external SMTP server is provided, its accessibility to the IngSoft InterWatt server must be ensured.

6. Access for users (mobile app)

The IngSoft InterWatt apps for Android and iOS communicate with the IngSoft InterWatt server via the same protocols as other client programs. If the users' mobile devices access the IngSoft InterWatt server only through an internal network or VPN, the instructions in point 3 apply; otherwise, point 4 also applies. App distribution and updates occur via the Google or Apple app stores, so the server must allow this access.

7. License retrieval

A license key is required to use IngSoft InterWatt, tied to the hardware and the URL used for client access. This key can be retrieved automatically during initial installation or when extending the license, provided <https://supervisor.interwatt.net> is reachable. During retrieval, license-related information (e.g., number of meters used, URL, and a hardware hash) is transmitted to IngSoft.

If IngSoft InterWatt is operated with a perpetual license, the license installation can also be done by downloading a request file via the web interface, sending it to IngSoft by email, receiving a license file by email, and uploading it via the web interface.

8. Maintenance access for IngSoft GmbH

Ideally, IngSoft is provided with a VPN connection to the server, enabling system management via Microsoft Remote Desktop. This access can and should be restricted to a fixed public IP address from the IngSoft network and secured using IPSEC or equivalent.

If personalized accounts are issued, several accounts may need to be set up depending on the desired SLA level:

Desired SLA: Mon–Fri 8:00 am to 5:00 pm	Required personalised access
80%	2
90%	3
95%	4
98%	5

9. Software updates from IngSoft

Updates for the IngSoft InterWatt server components can be downloaded from <https://update.interwatt.net>. The licensee may choose whether to allow automatic installation or to carry out the installation manually each time.

10. Software updates from Microsoft

For (automatic) patch downloads, the IngSoft InterWatt server must be able to establish an https connection to the respective Microsoft servers unless alternative mechanisms are used within the corporate network.

11. Remote monitoring of the server by IngSoft

As part of the software maintenance contract, IngSoft offers remote monitoring of the server. For this, the server regularly sends https requests to an IngSoft-operated website (<https://supervisor.interwatt.net>). These requests include system status information (e.g., available disk space and number of logged-in users). IngSoft InterWatt can operate without this remote monitoring; however, IngSoft support cannot proactively respond to potential issues (e.g., failed daily backups, low storage capacity, etc.).

12. Weather data access

IngSoft InterWatt requires current climate information. It downloads weather data daily from <https://kds.interwatt.net>.

13. Alternative: weather data directly from provider

Alternatively, data can be retrieved directly from weather data providers (e.g., DWD at dwd.de) via various methods (http/ftp, etc.).

14. Connection to data loggers or building management systems

The required connections vary depending on the capture system used. In some cases, modem or ISDN cards are needed. For some older systems, the included remote query software must be used, which may require additional components (e.g., modems) as specified by that software. It may be necessary or beneficial to run this software on a separate computer, which the IngSoft InterWatt server can access via file sharing.

Very often, data loggers send data via email. In this case, IngSoft InterWatt requires access to a mail server z.B. via IMAP or POP3. Increasingly, MQTT or REST-APIs are used.

15. Geolocation

IngSoft InterWatt includes functions requiring the determination of GPS coordinates of an entered address (e.g., for map display or sunset calculations). For this, IngSoft InterWatt uses the MapQuest service and transmits only the recorded addresses to <https://mapquestapi.com>. This communication can be completely disabled if desired by the licensee.

16. Registration of energy certificates

In IngSoft InterWatt, energy performance certificates can be generated in accordance with various standards. 'Energy performance certificates' under German law must be registered electronically with the German Institute for Building Technology (DiBT). To do this, it is necessary to create an account there and purchase so-called registration numbers for a fee. Upon the user's request, IngSoft InterWatt sends the data to <https://energieausweis.dibt.de>.

17. Single Sign-On Integration

IngSoft InterWatt can be connected to a single sign-on provider such as Microsoft Entra (cloud) or Active Directory (on-premises). The provision/licensing of the corresponding service, as well as its configuration, is the responsibility of the licensee. The relevant interfaces must be accessible to the IngSoft InterWatt Server.

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