General Hardware Requirements

Server sizing

When installing an SAP Business One system together with Produmex solutions, both the hardware recommendations of SAP and of Produmex should be taken into account.
This document describes the additional hardware recommendations that should be considered on top of the SAP hardware recommendations.
Any deviation from these recommendations can lead to performance issues.

> Please note: all the recommendations in this document are **minimum** recommendations.

General recommendations

The general recommendations are independent from the product or components. Specific product-related recommendations are additions to the general recommendations.

Database server (MSSQL)

Memory
The amount of memory allocated to the MSSQL process should be at least equal to the total size of the production databases on the server. Only the size of the MDF files should be taken into account, the size of the log (LDF) files should be ignored.

The maximum server memory allocated to the MSSQL process should be set in such a way that a sufficient amount of memory is left free for the operating system. The amount of memory to be left free depends on the operating system. This setting can be set efficiently in an iterative way, by monitoring the amount of free memory.

> Note: it’s recommended to use archiving functionality whenever possible in order to decrease the size of the production databases, and thus also the amount of memory needed on the database server.

> Note: the database growth should be taken into account when calculating the size of the databases.

Example:

- 3 production databases of 65GB, 20GB and 5GB: total 90GB
- The operating system requires 8GB to operate.
- At least 98GB of memory should be present on the server, out of which 90GB should be allocated to the MSSQL process.

Database server (HANA)

Memory
A recommended minimum of 128GB of memory should be present on the server.
Certain installations and configurations are able to operate successfully with lower memory configurations. Partners are encouraged to test different values as each customer's needs are unique.
The amount of memory should be at least equal to the total size of the production databases on the HANA server.

Note: the database growth should be taken into account when calculating the size of the databases.

Example:

- 3 production databases of 65GB, 20GB and 5GB: total 90GB
- 90GB < 128GB → A minimum of 128GB is required

Produmex WMS

For an installation of Produmex WMS, the recommendations below should be taken into account in addition to the general recommendations.

In certain installations, lower values can be used and our partners are encouraged to test less demanding set-ups. However, in case of performance issues, our Support teams will validate that these requirements are being met.

Summary

Database	MSSQL	HANA
	Minimum 56GB memory Minimum memory size = DB size +30GB memory / 1000 delivery lines CPU cores = 4 + users x 0.25	Minimum 128GB memory Minimum memory size = DB size +50GB memory / 1000 transaction lines / day CPU cores = 8 + users x 0.5
License server	32MB memory 1 CPU core	
Mobile client	1GB memory / user CPU cores = 2 + users x 0.25	
Scale service	128MB memory 1 CPU core / 4 scales	
Other services	Requires specific analysis	
Add-on	Heavy user	Regular user
	4GB memory 2 high-end CPU cores	800MB memory

Scope

The recommendations below are valid for installations within the following boundaries:

- Database size < = 120GB
- Average delivery notes lines per day < = 2000
- Concurrent terminal users < = 30
- Concurrent add-on users < = 20

For installations that exceed one or more of these parameters, a more complete analysis is required to determine the hardware requirements.

Server split-up

The server roles should be split up as described below.

MSSQL

- Database server
- Produmex mobile client server
- Produmex server (all other Produmex services: license server, notification server, scale server, etc.)
- (if any) Presentation server (SAP Business One client through RDP/Citrix)

If the only Produmex server is the license server, then the Produmex server can be combined with either the Produmex mobile client server or the Database server on one single machine.

HANA

- Database server
- Produmex mobile client server

- Produmex server (all other Produmex services: license server, notification server, scale server, etc.)
- (if any) Presentation server (SAP Business One client through RDP/Citrix)

If the only Produmex server is the license server, then the Produmex server can be combined with the Produmex mobile client server on one single machine.

Database server

MSSQL

Memory
The recommendations below should be applied in addition to the general recommendations.
A minimum of 56GB of memory should be allocated to the MSSQL process.
An extra 30GB of memory should be added per 1000 delivery lines per working day (on average).

Example 1:

- Total size of production databases: 90GB
- On average, 1500 delivery lines are created per working day
- Recommended memory: 90GB + 30GB * 1.5 = 135GB

Example 2:

- Total size of production databases: 20GB
- On average, 800 delivery lines are created per working day
- Recommended memory: 20GB + 30GB * 0.8 = 44GB → minimum of 56GB

CPU cores
The number of CPU cores should be calculated based on the number of concurrent users (mobile client and add-on combined).
The minimum amount of CPU cores is 4 + [concurrent users] x 0.25 (rounded up)

Example:
10 add-on users + 8 scanner users → 4 + (10 + 8) x 0.25 = 8.5 → minimum 9 CPU cores

HANA

Memory
The recommendations below should be applied in addition to the general recommendations.

An extra 50GB of memory should be added per 1000 delivery lines per working day (on average).

Example 1:

- Total size of production databases: 90GB
- On average, 1500 delivery lines are created per working day
- Recommended memory: 90GB + 50GB * 1.5 = 165GB

Example 2:

- Total size of production databases: 20GB
- On average, 800 delivery lines are created per working day
- Recommended memory: 20GB + 50GB * 0.8 = 60GB → minimum of 128GB

CPU cores
The number of CPU cores should be calculated based on the number of concurrent users (mobile client and add-on combined).
The minimum amount of CPU cores is 8 + [concurrent users] x 0.5 (rounded up)

Example:
10 add-on users + 8 scanner users → 8 + (10 + 8) x 0.5 = 17 → minimum 17 CPU cores

Mobile client server

Memory
1GB of memory should be counted for each concurrent mobile client running on the server.

CPU cores
The number of CPU cores should be calculated based on the number of concurrent users (mobile client and add-on combined).
The minimum amount of CPU cores is 2 + [concurrent users] x 0.25

Produmex license server

The Produmex license server requires 1 CPU core and 32MB of memory.

Produmex scale service

The Produmex scale service requires 1 CPU core per 4 connected scales, and 128MB of memory.

Other Produmex WMS services

The Produmex notification listener's requirements highly depend on the configuration. A more complete analysis is required to determine its hardware requirements.

Add-on

Heavy users
Users who use heavy functionality (= functions that require heavy computing) are considered heavy users, and they have higher requirements.

The following functions are considered heavy:

- Create pick list proposals
- Print pick lists
- Create sales deliveries
- Close production orders
- Process cycle count

For each heavy user, an extra 4GB of memory and 2 CPU cores should be counted. A high-end CPU is also highly recommended (e.g. core i7 instead of core i3).

Regular users
For users who don't use heavy functionality, an extra 800MB of memory should be counted for the add-on.

Produmex Manufacturing

Summary

Database	MSSQL	HANA
	Minimum memory size = DB size	Minimum 128GB memory Minimum memory size = DB size
Service Broker	16GB memory 4 CPU	
Add-on	Heavy user	Regular user
	4GB memory 2 high-end CPU	800MB memory

Server split-up

The server roles should be split up as described below (there's no difference between MSSQL and HANA).

- Database server
- Produmex service broker server

- (if any) Presentation server (SAP Business One client through RDP/Citrix)

Database server

The general recommendations are sufficient.

Produmex service broker server

Memory
16GB of memory should be counted for the service broker, independently from the amount of concurrent connections and the number of modules.

CPU cores
4 CPU cores should be counted for the service broker, independently from the amount of concurrent connections and the number of modules.

Add-on

Heavy users
Users who use heavy functionality (= functions that require heavy computing) are considered heavy users, and they have higher requirements. The following functions are considered heavy:

- MRP
- Cost calculation
- Job scheduling control panel
- Production management cockpit

For each heavy user, an extra 4GB of memory and 2 CPU cores should be counted. A high-end CPU is also highly recommended (e.g. core i7 instead of core i3).

Regular users
For users who don't use heavy functionality, an extra 800MB of memory should be counted for the add-on.

Produmex Scan, Operator

Summary

In certain installations, lower values can be used and our partners are encouraged to test less demanding set-ups. However, in case of performance issues, our Support teams will validate that these requirements are being met.

Database	MSSQL	HANA
	Minimum memory size = DB size	Minimum 128GB memory Minimum memory size = DB size

Service Broker	16GB memory 4 CPU
Add-on	256MB memory

Server split-up

The server roles should be split up as described below (there's no difference between MSSQL and HANA).

- Database server
- Produmex service broker server
- (if any) Presentation server (SAP Business One client through RDP/Citrix)

Database server

The general recommendations are sufficient.

Produmex service broker server

Memory
16GB of memory should be counted for the service broker, independently from the amount of concurrent connections and the number of modules.

CPU cores
4 CPU cores should be counted for the service broker, independently from the amount of concurrent connections and the number of modules.

Add-on

An extra 256MB of memory should be counted on work stations that use the add-on.

Other recommendations

MSSQL server configuration

Compatibility level

The compatibility level of all databases should be set to the same level as the MSSQL server.

Hard drive separation

If the server has 2 separate physical drives, then the MDF and the LDF files should be stored on separate drives.
If the server has only one physical drive, then the MDF and the LDF files should be stored on the same drive.

Virtualization

If the servers are virtualized, extra memory and CPU cores should be counted for overhead.

Hard disks speed

Depending on the type of hard disks, and the usage of virtualization, the hard disks speed should be optimized.
SSD drives provide the best raw speed; for hard drives, using a proper RAID configuration is necessary.
Especially in the case of virtualized servers, make sure that the hard disk settings are tuned properly for the best performance possible.

Server role separation

Critical services should run alone on their server, so they do not compete for hardware resources with other processes.
The database server, Produmex mobile client server and Produmex service broker servers are all critical services that should be separated.
All other applications and services (including file server, print server, exchange server, SharePoint, web servers, etc.) should run on other servers than the ones hosting the critical services.

Presentation server

If there is a presentation server (RDP/Citrix), where the SAP Business One client runs, then the “heavy users” of the add-on should be separated from the “regular users”. Heavy users typically execute complex computational functions that require a lot of hardware resources, and separating them will reduce the impact of these complex computational functions on regular users.

Network

The recommended connection between each server and the database server should be a link aggregation of 4 gigabit ethernet connections.

Device Requirements

Produmex WMS

- Wi-Fi
- Barcode reader
- Windows CE 5+, Windows Mobile 6+, Android 4.4.4, Android 6.0
- Screen resolution: 240×320 or 320×320

Produmex Scan

Hardware requirements:

- Wi-Fi
- Barcode reader (The suffix must be tab character, no new line needed.)
    - Screen resolution: 320×320, 240×320 or 640×480
    - Minimum memory: 256 MB RAM
    - Minimum CPU: 800 MHz

Software requirements:

- Windows CE 5+, Windows Mobile 6+ or Windows Mobile 7 (OS 7.2.2851.0 or higher)
    - Microsoft .NET Compact 3.5 framework
- OR Android 6.0 or higher

Produmex Operator

- Wi-Fi
- Android 6.0 or higher

Produmex PDC

- Wi-Fi
- Operating system: Windows 7/8/8.1/10 Professional or Windows Server 2012/2016
- Screen resolution: 1024×768 or higher
- CPU: Core i3 or better
- RAM: 1GB per concurrent user
- Device type: PC or tablet

Note: Bar code scanning for Produmex PDC on these devices can be achieved by using USB bar code scanners. These are not the same devices as the handheld devices used for Produmex WMS

or Produmex Scan.

Produmex Weigh

- USB or TCP/IP connection
- Capable to reply the actual weight on command
- character-based communication capability through serial or LAN-port connection

Device List

This section lists examples of devices on which Produmex products have been tested and successfully deployed by our partners.

NOTE: We are not recommending or suggesting any manufacturer, the following is only a list of devices that have worked for our partners.

- Produmex WMS - Device List
- Produmex Scan - Device List

Keyboard selection matrix for PDA devices

Main PDA Type	Keyboard type	Example devices	Industry
Touchscreen only	Virtual touch keyboard	Honeywell Dolphin CT60, Zebra M60, Zebra TC20	Retail (all scan)
Physical keyboard	Numeric keyboard	Datalogic Skorpio X4 28-key, Zebra MC3300 29-key	Retail (all scan)
	Numeric / Function keyboard	Datalogic Skorpio X4 38-key, Zebra MC3300 38-key	Retail (all scan)
	Alphanumeric keyboard	Datalogic Skorpio X4 50-key, Zebra MC3300 47-key	Pharma, food

The keyboard type to be selected depends on the data to be entered and on the frequency when the data must be entered.

- If the keyboard is used for entering quantities, a numeric keyboard model is enough.
- If alphanumeric data like batch or serial numbers need to be entered manually, more keys are useful.
- If most of the data is scanned, a full touchscreen PDA with virtual keyboard can also work.

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