merchant CENTRAL

Print Service

Installation & User Guide

Version 3.4 · **Date** 2026-09-22 · Microsoft Dynamics 365 Business Central 28.x (Cloud/SaaS)

Print shipping labels, BC reports and any PDF/ZPL document from Business Central straight to local printers — no browser dialog — the print data never passes through ALTENBRAND infrastructure.

ALTENBRAND Datentechnik GmbH
Am Gelicht 5 · D-35279 Neustadt · +49 (0) 6692 202290
info@altenbrand.de · www.merchantcentral.de

© 2026 ALTENBRAND Datentechnik GmbH

Version: 3.4 · **Date:** 2026-09-22 · **Platform:** Microsoft Dynamics 365 Business Central 28.x (Cloud/SaaS)
Audience: Part 1 (Installation & Setup) is for administrators/partners, Part 2 (Operation) is for end users. ·
Deutsche Fassung: handbuch.de.md

This guide documents the **merchantCENTRAL Print Service** end to end — from installing the local print service, through connecting it to Business Central (in all three transport modes), to daily operation (printing, routing, automatic printing, dashboard, troubleshooting).

Table of contents

Fundamentals 1. Introduction & architecture

Part 1 — Installation & Setup (Administrator) 2. Prerequisites 3. Licensing & demo 4. Install the local print service (MC.PrintService) 5. Choosing the right transport mode 6. Mode A — Setting up Direct Push 7. Mode C — Setting up Relay 8. Mode D — Setting up Poll 9. Configuring Business Central

Part 2 — Operation (End user) 10. The dashboard 11. Printing 12. The print queue 13. Routing rules 14. Automatic printing (Print Subscriptions) 15. Troubleshooting

Appendix - A. Endpoint reference - B. Enum reference - C. Glossary

---

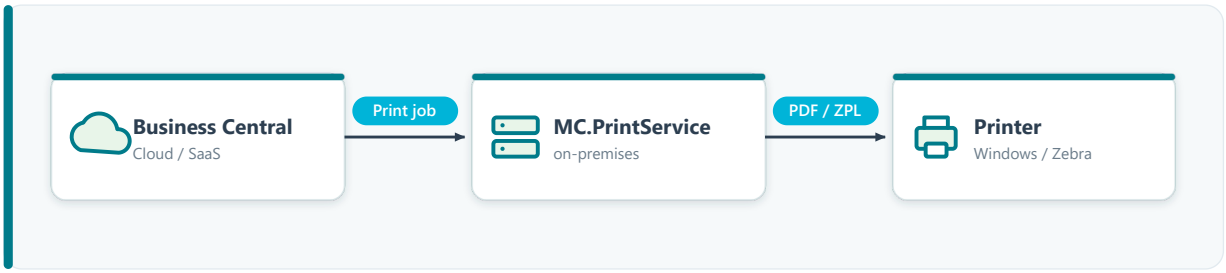
1. Introduction & architecture

What is the Print Service?

The Print Service sends **shipping labels**, **BC reports**, and arbitrary **PDF/ZPL documents** from Business Central to physical printers — without a browser print dialog. The print data never passes through ALTENBRAND infrastructure: with direct push it goes from Business Central straight to the print service, with relay and poll through the customer's own Azure. It offers multi-printer management, a print queue with retry logic, priority-based routing, automatic printing after posting events, and a central dashboard.

The core problem

Business Central runs in the **Microsoft cloud** and cannot address the customer's local printers **directly**. The bridge is the **MC.PrintService** — a small .NET application that runs on the customer's premises, receives print jobs, and forwards them to Windows or Zebra printers.



The three transport modes

For the path **from BC to MC.PrintService** there are three modes. They are chosen **per printer** (field *Transport Mode* on the printer card) and can be mixed freely.

© 2026 ALTENBRAND Datentechnik GmbH

	Direct Push (default)	**Relay** (Option C)	**Poll** (Option D)
How it works	BC calls the service directly via the fixed public IP	BC pushes the job to a queue in the customer's own Azure	The Azure Function **polls** BC; BC stays passive
Inbound port forwarding	required	**not required**	**not required**
Fixed public IP	required	not required	not required
HTTPS certificate	self-managed	not needed (Azure-managed)	not needed (Azure-managed)
BC makes outbound calls	yes	yes (job incl. label)	**no** (only an optional wake-ping)
Customer's Azure subscription	no	yes (a few €/month)	yes (a few €/month)

Which mode should I choose? Direct Push is the default and the best choice for most customers (free of charge, immediate status feedback). It requires a fixed public IP and the ability to open a port. **Relay** and **Poll** are for customers without a fixed IP / without inbound port forwarding. The difference: with **Relay**, BC actively pushes the job into Azure; with **Poll**, BC stays fully passive (the Function fetches the jobs) — ideal when BC must not make outbound web service calls. See the decision aid in Chapter 5.

Print methods

Method	Printer	Use case
PDF	Any Windows printer (laser, inkjet, thermal with a Windows driver)	Parcel labels, delivery notes, invoices, any report
ZPL	Zebra thermal printers (GK420, ZD421, ZT411 ...) via TCP/IP (port 9100)	High-speed label printing, highest quality

What can be printed?

Document type	Description
Shipping Label	Shipping labels from merchantCENTRAL (DHL, DPD, GLS, UPS ...)
Report	Any BC report (delivery note, invoice, picking list ...)
Raw Document	Pre-generated PDF/ZPL documents from external systems or the Print API

Graceful degradation: If the Print Service app is not installed, the hub keeps working fully — only without printing. No errors occur in other modules.

ALTENBRAND Datentechnik GmbH
Am Gelicht 5 · D-35279 Neustadt · +49 (0) 6692 202290
info@altenbrand.de · www.merchantcentral.de

© 2026 ALTENBRAND Datentechnik GmbH

Part 1 — Installation & Setup

2. Prerequisites

- [ ] **merchantCENTRAL Hub** — installed and active (the Print Service is a hub module).
- [ ] **Print Service app** — installed (AppSource or deployed by ALTENBRAND).
- [ ] **Module license** — at least a demo license for the `PRINTSERVICE` module (see Chapter 3).
- [ ] **Module switched on** — under *merchantCENTRAL Setup → Extensions → Print Service* the switch **Enabled** must be on (see Chapter 3). Switching it on requires the license and is a step of its own: while the module is off, automatic printing and print subscriptions stay quiet.
- [ ] **Windows PC or server** on the customer network for MC.PrintService that runs continuously and can reach the printers. Minimum 128 MB RAM. For the recommended MSIX install: Windows 10 version 1903 or later, Windows 11, or Windows Server 2022 and later. Windows Server 2016/2019: ZIP install only (option B).
- [ ] **Printer** — Windows printer driver (for PDF) **or** a Zebra printer reachable via TCP/IP (for ZPL, port 9100).
- [ ] **For Direct Push additionally:** a fixed public IP and access to the router/firewall.
- [ ] **For Relay/Poll additionally:** a customer Azure subscription with permission to create resources and role assignments (role **Owner**, or **Contributor** plus **User Access Administrator**), and for the access step C3 the Entra role **Privileged Role Administrator** or **Global Administrator**. Azure CLI and Functions Core Tools are not needed — Azure Cloud Shell in the browser is enough.

---

3. Licensing & demo

The Print Service is a licensed module (`PRINTSERVICE`). The license is always bound to **tenant + module code**.

1. In BC, search for **merchantCENTRAL Setup** → part **Extensions** → row **Print Service** → action **Set Up** (a click on the name opens the dashboard instead). The hub card **Extension** opens; its **License** part (license FactBox of the merchantCENTRAL hub) shows the current status (`Unregistered` , `Demo` , `Active`). The Print Service is listed there right after its installation too: opening *merchantCENTRAL Setup* registers newly installed modules with the hub.
2. **Switch the module on:** switch **Enabled** on in the **General** group of the card. Switching it on makes the hub check the module license and, if there is no license yet, offer the demo registration. Without an active module, auto-print and print subscriptions stay quiet.
3. **Register a demo:** action **Register Demo** in the **License** part → the registration wizard collects company data (company, contact, e-mail, address, VAT ID) and unlocks a 30-day demo.
4. **Refresh the status:** action **Refresh License** in the **License** part re-checks the license server.

The Print Service settings themselves are on the same card, in the part **Print Service Settings** (see Chapter 9.1).

> **Note:** A demo consumed in a **production** environment cannot be restarted — only via release through the license manager. In **sandbox** environments the demo can be repeated freely.

---

4. Install the local print service (MC.PrintService)

The MC.PrintService is installed **once** on a machine in the customer network that runs continuously and can reach the printers. For **Relay/Poll** it additionally runs in **agent mode** (see Chapters 7/8) — the same installation, just

© 2026 ALTENBRAND Datentechnik GmbH

one extra configuration.

Option A — MSIX / App Installer (recommended, PDF + ZPL)

Signed installation via the download page — with automatic updates:

1. In Business Central open the **Print Service Settings** (merchantCENTRAL Setup → Extensions → Print Service → **Set Up**, see Chapter 9.1) or a **printer card** → action **Download Print Service** (in the Print Service Settings in the action group *Installation*). The page shows only the version compatible with your installation.
2. Choose **Install via App Installer** and open the `.appinstaller` file with the Windows App Installer. The service **merchantCENTRAL Print Service** (service name `MCPrintService`) is automatically registered as a per-machine Windows service (LocalSystem), started, and kept up to date via the `.appinstaller` protocol.
3. Copy the **API key** to the clipboard with **Copy** in the config UI (`http://localhost:5049/config`; it is never shown) — it is generated automatically on first start and required in Chapter 6 (Direct Push) in BC.

> The service creates the inbound firewall rule itself on first start. Its configuration lives in a writable copy under `%ProgramData%\merchantCENTRAL\PrintService\appsettings.json` (the MSIX install directory is read-only).

Option B — Windows service (ZIP, PDF + ZPL)

1. Extract the ZIP package.
2. Double-click `Install.bat` → confirm the UAC prompt.
3. The script installs the service, configures autostart and a firewall rule, and **automatically generates an API key**. It is not shown: the script puts it on the clipboard.
4. Paste the **API key** in Business Central in Chapter 6 (Direct Push). Later, **Copy** in the configuration UI (`http://localhost:5049/config`) copies it again at any time.

The service listens on port **5050** by default (print API for Business Central). The configuration UI has a port of its own, reachable only locally: `http://localhost:5049/config`.

Manual installation (alternative):

```
dotnet publish service/MC.PrintService -c Release -o "C:\Services\MC.PrintService"
New-Service -Name MC.PrintService -DisplayName "merchantCENTRAL Print Service" `
    -BinaryPathName "C:\Services\MC.PrintService\MC.PrintService.exe" -StartupType Automatic
Start-Service MC.PrintService
```

The configuration file `appsettings.json`

For the ZIP install it lives in the install directory. For the **MSIX install** that directory is read-only — the writable copy (including the auto-generated API key) lives under `%ProgramData%\merchantCENTRAL\PrintService\appsettings.json`.

Setting	Description
`Security:ApiKey`	API key for the print API (header `X-Api-Key`). The service creates it on first start; without a valid key it answers no request except `/health`, local ones included.
`Kestrel:Endpoints:Http:Url`	HTTP endpoint, default `http://0.0.0.0:5050`.
`Kestrel:Endpoints:Https`	Optional: HTTPS directly in the service with certificate path + password.
`Relay:*`	Agent-mode configuration for Relay/Poll (see Chapters 7/8).

> **Secure by default:** Without a configured API key the print API rejects **every** request except `/health` with `401` — from BC Online and from this machine alike. A reverse proxy on the same machine connects locally

© 2026 ALTENBRAND Datentechnik GmbH

> too, so "local" says nothing about who is really asking. The key is created on first start; if it is missing, **Regenerate** in the configuration UI creates a new one. Relay and Poll printers do not need it.

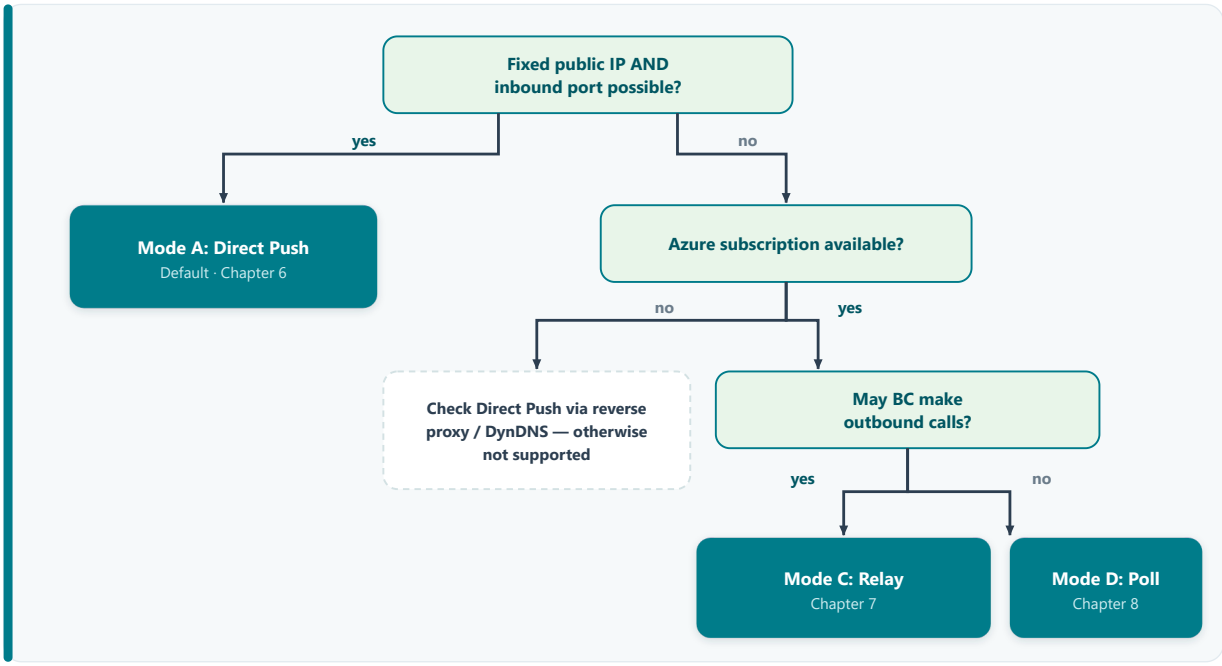
Quick check after installation

Check	Expectation
`services.msc` → "merchantCENTRAL Print Service" (service name `MCPrintService` for MSIX, `MC.PrintService` for ZIP)	Status **Running**
`http://localhost:5050/health` in the browser	Status page "The print service is running" (monitoring tools get JSON with `"status": "Healthy"` at the same address)
`http://localhost:5049/config`	Configuration UI with API key (**Copy** only, never shown), agent mode, printer list, ZPL test and setup hints

The actions **Open Local Configuration** and **Check Local Print Service** in BC open both pages too (Print Service Settings and printer card, group *Installation*). `localhost` is the computer you are sitting at: the actions work only on the computer with the service — the configuration page is reachable only there anyway. Both pages come in German and English (switch at the top right). | `…/config` | Configuration UI, API-key status, ZPL test field |

---

5. Choosing the right transport mode



---

6. Mode A — Setting up Direct Push

With Direct Push, Business Central reaches MC.PrintService via the customer's **fixed public IP**. Three layers secure the endpoint: **API key**, **HTTPS**, and a **firewall restriction** to Business Central.

A1 — Provide HTTPS

BC Online sends print jobs from the Azure data center and **validates the server certificate**. Self-signed certificates will **not** work.

© 2026 ALTENBRAND Datentechnik GmbH

Option	Description	Best suited for
Reverse Proxy (recommended)	Caddy, nginx, or IIS in front of the service, a subdomain per customer (e.g. `print.kunde.de` → fixed IP), Let's Encrypt certificate automatically	most customers with their own domain
Let's Encrypt IP certificate	Certificate issued directly for the IP (short-lived ~6 days, automatic renewal via ACME)	customers without a domain
Kestrel with PFX	HTTPS directly in the service: `Kestrel:Endpoints:Https` in `appsettings.json`	simple setups with an existing certificate

> **Reverse proxy with Caddy:** A minimal `Caddyfile` reads: `print.kunde.de { reverse_proxy localhost:5050 }`. Caddy obtains and renews the certificate fully automatically.

A2 — Configure port forwarding

In the router/firewall, forward the public HTTPS port (e.g. 443) to the machine running MC.PrintService (port 5050, or the reverse proxy's port).

A3 — Restrict the firewall to Business Central

So the forwarded port is not exposed to the entire internet, restrict inbound access to the IP addresses of BC Online. These are consolidated in the Azure service tag `Dynamics365BusinessCentral` (maintained automatically by Microsoft).

- Firewalls with service-tag support use the tag directly.
- Otherwise download the IP ranges as a JSON list and configure them as a rule.

A4 — Create a printer in Business Central

1. In BC, search for **Print Service Printers** → **New**.
2. Leave **Transport Mode** at **Direct Push**.
3. Fill in the fields:

Field	Value
Code	Unique identifier, e.g. `PDF-OFFICE` or `ZPL-WAREHOUSE1`
Description	Descriptive name
Service URL	Public **HTTPS** URL of the service, e.g. `https://print.kunde.de` (for local tests `http://localhost:5050`)
API Key	Click the DrillDown → enter the key generated in Chapter 4 (stored encrypted in the Credential Store)
Printer Name	For PDF: exact Windows printer name. For ZPL: IP address of the Zebra printer
Print Method	`PDF` (Windows printer) or `ZPL` (Zebra thermal printer)
ZPL Port	ZPL only: TCP port (default 9100)

> **HTTPS required for remote URLs:** The Service URL must use `https://`. `http://` is only allowed for `localhost` / `127.0.0.1`.

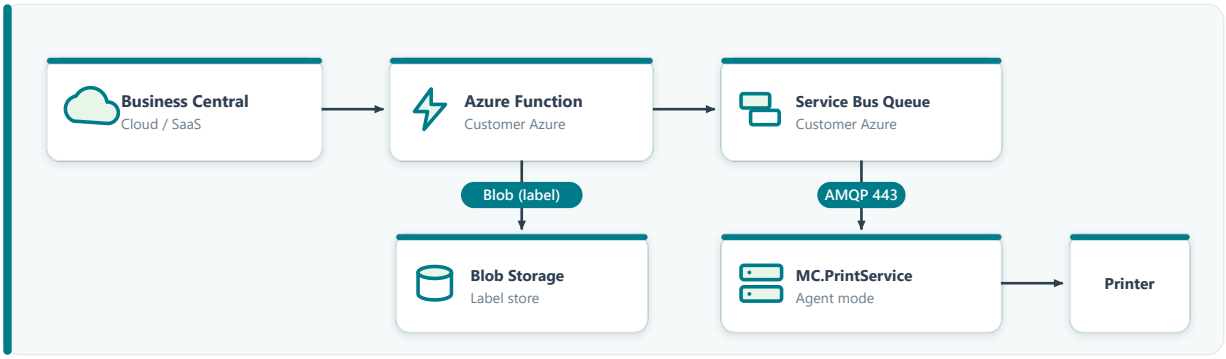
A5 — Test the connection

On the **Printer Card**, run the **Test Connection** action. On success, the status changes to **Online**. Then print a test label (see Chapter 11).

© 2026 ALTENBRAND Datentechnik GmbH

7. Mode C — Setting up Relay

In Relay mode the customer hosts the intermediary components in **their own Azure**. BC pushes the print job there; the MC.PrintService runs in **agent mode** and holds only an **outbound** connection — no inbound port forwarding, no fixed IP, no self-managed HTTPS certificate.



The status return path runs actively from the Function back to BC (Managed Identity, no polling) — so in Relay mode too a job moves from **Sending** to **Printed** or **Failed**.

C1 — Provision the Azure infrastructure

The included template creates, in a single step in the customer subscription: Service Bus (Basic) + queue `print-jobs`, a Storage Account + blob container `labels`, a Function App on the **Flex Consumption** plan (FC1, Linux, .NET 10 isolated) with a **system-assigned Managed Identity**, Application Insights + Log Analytics, plus the required role assignments. The **Function code comes along**: the template copies it once, at deployment time, into a dedicated deployment container.

Recommended — "Deploy to Azure" from Business Central: In the **Print Service Settings** (action group *Installation*, see Chapter 9.1) or in the setup wizard, run the action **Set up Relay/Poll in Azure**. It opens the Azure portal with the template from `https://downloads.merchantcentral.de/print-service/azure/azuredeploy.json` and shows the values to enter there. Select or create a resource group (e.g. `rg-mcps-relay`), fill in the parameters, **Review + create**.

Parameter	Meaning
`namePrefix`	Short prefix for the resource names (3–11 lowercase letters/digits), default `mcpsrelay`.
`bcEnvironmentUrl`	`https://api.businesscentral.dynamics.com/v2.0/<tenantId>/<environment>`
`bcCompanyId`	SystemId of the BC company that **Poll** serves; for Relay only the fallback (relay jobs carry their own company).
`enablePoll`	`false` (default) = Relay only. `true` additionally switches on the poll timer (Chapter 8). Relay printers work either way.
`labelTtlHours`	1–24, default **24**: how long a queued job can still print (lifetime of the queue message and of the link to the label).
`agentNames`	Only with several printing computers that have different printers, e.g. `["LAGER","BUERO"]`: a queue of its own per computer (C8). Default: empty.

Alternatively via Azure CLI (e.g. in Azure Cloud Shell) with the Bicep template from `azure/deploy/`:

```
az group create -n rg-mcps-relay -l westeurope

az deployment group create -g rg-mcps-relay \
  --template-file azure/deploy/main.bicep \
  --parameters \
      namePrefix=mcpsrelay \
      bcEnvironmentUrl="https://api.businesscentral.dynamics.com/v2.0/<tenantId>/<environment>" \
      bcCompanyId="<company-systemid-guid>" \
      functionPackageUri="https://downloads.merchantcentral.de/print-service/azure/<version>/released-package.zip"
```


© 2026 ALTENBRAND Datentechnik GmbH
merchantCENTRAL – Multi-Channel-Plattform für Business Central

`functionPackageUri` is mandatory for a Bicep deployment (the published `azuredeploy.json` sets it itself); for Poll, add `enablePoll=true`.

Note from the **outputs** (resource group → *Deployments* → *Outputs*): `functionAppName`, `functionBaseUrl`, `statusUrl`, `serviceBusFqdn`. The deployment also returns `managedIdentityPrincipalId`, `queueName` and `listenAuthorizationRuleName`.

> **Finding the company SystemId:** `bcCompanyId` is the **SystemId** of the BC company (in BC under *Companies*, field **Id**, or via the API `…/api/v2.0/companies`).
>
> **Versions & updates:** Every release publishes, under `https://downloads.merchantcentral.de/print-service/azure/<version>/`, the package `released-package.zip` (+ `.sha256`) and an `azuredeploy.json` that pins exactly this version; the template behind the button is always the one of the newest release. The Function loads no code from the download channel at runtime and stays on the deployed version. **Updating the Function** = deploy the template again into the same resource group with the same parameters (run the button or action again).
>
> **Cost:** a low single-digit euro amount per month. Flex Consumption has a monthly free grant, Service Bus Basic has no base fee; on top come Application Insights + Log Analytics (daily cap 1 GB). Flex Consumption instead of the (Linux) Consumption plan because Linux Consumption does not support .NET 10 and will be retired on 30 September 2028.
>
> **Labels & storage:** The Storage Account has no account keys (access via Managed Identity only). A label is deleted as soon as the agent reports back; leftovers without a report are removed by a lifecycle rule after 1–2 days.

C2 — Publish the Function code (no longer needed)

No longer needed — the Function code comes with the template (see C1). A separate `func azure functionapp publish` is no longer required; Azure CLI and Functions Core Tools are not needed.

C3 — Register the Managed Identity as a BC Application User

So that the Function may report print status, its **Managed Identity** is registered as an application in BC — the agent itself needs **no** BC access.

Business Central only accepts service-to-service tokens that carry the app role `API.ReadWrite.All` of the application "Dynamics 365 Business Central". A Managed Identity has no *API permissions* page in the portal — so the script `grant-bc-access.ps1` makes this assignment (in the repository under `azure/deploy/`, published at `https://downloads.merchantcentral.de/print-service/azure/grant-bc-access.ps1`).

1. Run the script, e.g. in Azure Cloud Shell (PowerShell), signed in to the BC tenant with the Entra role **Privileged Role Administrator** or **Global Administrator**:

```
powershell Invoke-WebRequest https://downloads.merchantcentral.de/print-service/azure/grant-bc-access.ps1 -OutFile grant-bc-access.ps1 ./grant-bc-access.ps1 -ResourceGroup rg-mcps-relay
```

It assigns the app role (idempotent — running it again does no harm) and prints the **client ID** of the Managed Identity. 2. In BC, search for **Microsoft Entra Applications** → **New** → enter the client ID, **State = Enabled**. Do **not** run **Grant Consent**: a Managed Identity has no app registration, and Entra answers *AADSTS1003031*. `grant-bc-access.ps1` has granted the consent already. 3. Assign the permission set `ALN MCPS Relay API` (least privilege — status callback only); for Poll use `ALN MCPS Poll API` instead (it covers Relay as well). Do this in **every company** that has Relay or Poll printers. Further sets such as *D365 AUTOMATION* are not needed: both sets include Microsoft's *D365 Basic - Read* — execute permission on the Base Application objects that every

© 2026 ALTENBRAND Datentechnik GmbH
merchantCENTRAL – Multi-Channel-Plattform für Business Central
Updated 2026-09-22

change needs through the global triggers, and read-only data access. The Function may write print jobs and shipment labels only.

> **Note:** Microsoft documents app role assignments for Managed Identities in general, not specifically for Business Central — so verify the first setup end to end (C7). Tokens are cached: a role assigned later can take a while to take effect; the agent retries the status report until it gets through.

C4 — Retrieve the keys

Key	Used by	In the Azure portal
Function key	BC on the printer (C5) and the agent (C6)	Function App → *App keys* → `default`
Listen SAS	Agent `appsettings.json` (C6)	Service Bus → queue `print-jobs` → *Shared access policies* → `AgentListen` → *Primary Connection String*. With several computers (C8), the queue `print-jobs-<agent>` per computer

Or via Azure CLI (e.g. in Cloud Shell):

```
# Function key (for BC on the printer):
az functionapp keys list -g rg-mcps-relay -n <functionAppName> --query "functionKeys.default" -o tsv

# Service Bus listen SAS (for the agent appsettings.json):
az servicebus queue authorization-rule keys list -g rg-mcps-relay \
  --namespace-name <namespace = serviceBusFqdn without .servicebus.windows.net> \
  --queue-name print-jobs --name AgentListen \
  --query primaryConnectionString -o tsv
```

C5 — Create a printer in BC (transport Relay)

1. **Print Service Printers** → **New** → **Transport Mode = Relay (Azure Queue)**.
2. **Relay Function URL** = `functionBaseUrl` (output from C1).
3. **Relay Function Key** (DrillDown) = Function key from C4.
4. **Printer Name** / **Print Method** / **ZPL Port** as usual — the **agent** prints locally with them.

> **Function responses:** BC evaluates them as in Direct Push. A 4xx response (except 408 and 429) sets the job to *Failed* immediately — with 401 (wrong Function key) the printer also goes to *Error*; there are no pointless retries. If there is no response, the normal retry logic applies.

C6 — Start the agent (MC.PrintService) in agent mode

Fill in the `Relay` section in `appsettings.json` and restart the service:

```
"Relay": {
  "Enabled": true,
  "ServiceBusConnectionString": "<listen SAS from C4>",
  "QueueName": "print-jobs",
  "TransportType": "AmqpWebSockets",
  "MaxDeliveryCount": 5,
  "StatusCallbackUrl": "<statusUrl from C1>",
  "StatusCallbackKey": "<Function key from C4>"
}
```

The agent runs **alongside** the HTTP listener — one instance can serve Direct Push and Relay printers at the same time.

> **Firewall:** With `"TransportType": "AmqpWebSockets"` (default) the agent connects via AMQP over WebSockets on **port 443** (outbound only) to `*.servicebus.windows.net` . Classic AMQP on port 5671 —

© 2026 ALTENBRAND Datentechnik GmbH
merchantCENTRAL – Multi-Channel-Plattform für Business Central

> often blocked by corporate firewalls — only with `"TransportType": "AmqpTcp"`.

C7 — Test

Print a label to the relay printer. Flow: job → **Sending** → the agent pulls it from the queue, prints, and reports back → **Printed**.

> **Duplicate-print protection:** The Function creates exactly one label blob per job (name = job ID) and records that it has been sent. If BC sends the same job again (e.g. after a timeout although the Function had already queued it), the Function answers 202 without queuing a second message. After the agent reports back, it deletes the blob — so a deliberate reprint goes out again. The agent remembers completed queue messages for up to 25 hours and does not print a redelivered message again. If it cannot report the result, it retries every minute (for up to 25 hours).
>
> **Multiple companies:** BC sends the company ID with every relay job; the status report goes to the right company. One deployment can therefore serve relay printers from several companies (permission set per company, see C3).

C8 — Several computers (agents)

One computer in agent mode is enough as long as it reaches every printer: the service addresses ZPL printers by their IP address on the network, PDF printers have to be installed on the computer as Windows printers. When several computers print on different printers — say one in the warehouse for the labels and one in the office for the delivery notes — **each computer gets a queue of its own**:

1. **Deployment (C1):** parameter `agentNames` with the names of the computers, e.g. `["LAGER","BUERO"]`, and deploy the template (again) into the same resource group. Every name gets the queue `print-jobs-<name>` in lower case with its own listen rule `AgentListen`; the output `agentQueueNames` lists them. Letters, digits and `- _ .` only, at most 20 characters.
2. **Each computer (C6):** `"QueueName": "print-jobs-lager"` and, as `ServiceBusConnectionString`, the listen SAS of **that** queue (C4 with `--queue-name print-jobs-lager`). The key opens that one queue only. `StatusCallbackUrl` and `StatusCallbackKey` are the same on all computers. The configuration UI shows the queue under *Relay / Poll*.
3. **Printer card:** field **Agent** = `LAGER` on every printer this computer prints for. Printers without an agent keep using the default queue `print-jobs`.

> **Why not all on one queue?** Several agents on the same queue share its jobs: each job goes to exactly one of them, whichever picks it up first. If that one lacks the printer, the job fails ("Printer … is not installed on the print service machine "). Nothing is printed twice, but a seemingly random part not at all. Identically set up computers on one queue — all of them have all printers — do work and share the load.
>
> **Agent without a queue:** if a printer names an agent the deployment has no queue for, the job fails at once: "No queue for print agent …". Once the agent is added to `agentNames` and the template deployed again, **Retry** prints it.

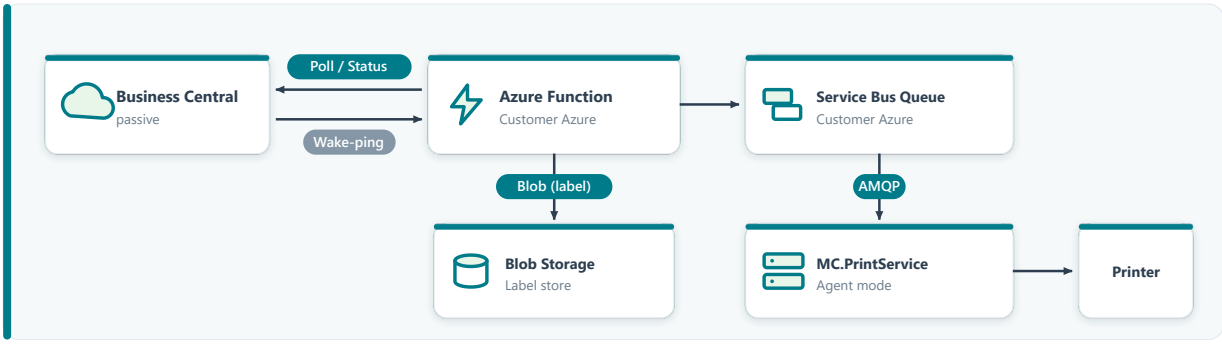
---

8. Mode D — Setting up Poll

The **Poll mode** uses the same Azure infrastructure and the same agent mode as Relay — but the **Function fetches the jobs from BC** instead of BC pushing them. Business Central makes **no** outbound web service calls

© 2026 ALTENBRAND Datentechnik GmbH

(except an optional tiny wake-ping). Ideal when BC must not be configured for outbound HTTP.



Setup follows **Chapter 7** (steps C4 and C6 identical, C2 not needed), with these differences:

Step	For Poll
Deployment (C1)	Set the parameter `enablePoll = true` — it switches on the poll timer (CRON in **UTC**, default every 5 minutes). Poll serves **exactly one company** per deployment: the one in `bcCompanyId`
Application User (C3)	Assign the permission set `ALN MCPS Poll API` (instead of `ALN MCPS Relay API` ; it covers Relay as well) — the Function also needs **read** access to the jobs
Printer in BC (C5)	Per printer, only **Transport Mode = Poll** + printer name. The Azure connection is configured **once globally** in the *Print Service Settings → Poll Connection (Azure)* (Function URL + Function key), **not per printer**
Several computers (C8)	Same as with Relay: `agentNames` in the deployment, each computer on its own queue, field **Agent** on the printer card. That way one Poll deployment serves several computers as well
Wake-ping (required in production)	With **Poll Function URL** and **Poll Function Key** set, BC tells the Function "there is work" as soon as a job is ready (waiting at most 10 seconds for the answer) — the page comes out a few seconds later. Without the wake-ping BC stays fully passive and the Function takes jobs only on its timer (default: every 5 minutes) — too slow for users. **Test Poll Connection** in the Print Service Settings checks URL and key and shows the Function's answer

> **Concurrency:** A wake-ping and the timer can poll at the same time. A blob lease ensures only one poll run works at a time; additionally the Function claims each job with optimistic concurrency (ETag), so no job is ever printed twice. If the Function cannot queue a claimed job, it hands it back in BC (*Sending* → *Queued*); the next run picks it up again.

Configure the global poll connection in the Print Service Settings: *merchantCENTRAL Setup* → *Extensions* → *Print Service* → *Set Up* → part **Print Service Settings** → group **Poll Connection (Azure)** → **Poll Function URL** (= `functionBaseUrl`) + **Poll Function Key** (DrillDown, Function key from C4).

Test: Print a label to the poll printer. Flow: job → **Sending** (claimed by the Function) → the agent prints → **Printed**. Without a wake-ping it may take until the next timer run.

> **Full Azure details** (all outputs, "Deploy to Azure" button, costs, troubleshooting): `azure/README.md` in the repository. Architecture in detail: `docs/relay-mode-architecture.md` and `docs/poll-mode-architecture.md` .

---

9. Configuring Business Central

9.1 The Print Service Settings (hub card Extension)

The module's central configuration. Like the other merchantCENTRAL modules, the Print Service has no setup page of its own in the search — it is set up on the hub card **Extension**.

© 2026 ALTENBRAND Datentechnik GmbH

Path: search for **merchantCENTRAL Setup** → part **Extensions** → row **Print Service** → action **Set Up** (a click on the name opens the dashboard instead) → the hub card **Extension** opens.

Layout of the card

Area	Content
General	The switch **Enabled** — this is how the module is switched on. Switching it on makes the hub check the license and, if there is none yet, offer the demo registration (see Chapter 3).
Extension Settings	The part **Print Service Settings** with all fields and actions of the Print Service (see below).
License	License status of the `PRINTSERVICE` module with the actions **Register Demo** and **Refresh License** (see Chapter 3).

The part **Print Service Settings** contains the following groups:

Group Local Print Service App — a note that printing requires the local MC.PrintService app on a Windows machine that can reach the printers. The installer is provided by the action **Download Print Service** (see Chapter 4).

Group Printing

Field	Default	Description
Auto-Print Enabled	off	Labels are printed automatically after creation. Off = manual printing via the label list.
Default Printer Code	—	Default printer when no routing rule matches.
Routing Rules Enabled	off	Enables rule-based printer routing (see Chapter 13).
Fallback Enabled	on	Automatic switch to the fallback printer when the target printer is offline.

Group Retry Settings

Field	Default	Min/Max	Description
Max Retry Attempts	3	0–10	Retry attempts before a job is marked *Failed*.
Retry Delay (Seconds)	5	1–300	Wait time between attempts.

Group Maintenance

Field	Default	Min/Max	Description
Log Retention (Days)	30	1–365	Retention of completed/cancelled jobs before cleanup.

The **Maintenance** group also shows **Print Queue**: whether the job queue entry that renders and sends print jobs is scheduled. Without it, nothing from posting is printed.

Group Report Printing

Field	Default	Description
Print Subscriptions Enabled	off	Enables Print Subscriptions (auto-print on BC events, Chapter 14).

Group Poll Connection (Azure) — for Mode D only (see Chapter 8)

Field	Description
Poll Function URL	Base URL of the Azure Function App for poll printers. Empty = BC stays passive (timer only).
Poll Function Key	Function key (DrillDown, stored in the Credential Store).

Actions of the Print Service Settings — in the part's action menu, grouped:

© 2026 ALTENBRAND Datentechnik GmbH

Group	Action	Purpose
Installation	**Setup Wizard**	Assisted setup: local print service, first printer, automatic printing.
	Download Print Service	Opens the download page for the local MC.PrintService app with the versions compatible with your installation (Chapter 4).
	Open Local Configuration	Opens the configuration page of the service (`http://localhost:5049/config`). Only on the computer with the service.
	Check Local Print Service	Opens the status page of the service (`http://localhost:5050/health`). Only on the computer with the service.
	Set up Relay/Poll in Azure	Opens the Azure portal with the Relay/Poll template ("Deploy to Azure", Chapter 7 C1) and shows the parameters to enter.
	Test Poll Connection	Sends a wake-ping with the stored Poll Function URL and key and shows the Function's answer (Chapter 8).
	Clear Poll Function Key	Removes the stored poll Function key.
Process	**Test All Printers**	Tests all active direct-push printers and updates their status.
	Process Queue	Runs the print queue now: renders the documents from posting, returns hanging direct-push jobs to the queue and sends every due job — the same run the job queue entry makes every 5 minutes.
	Restart Print Queue	Schedules the print queue's job queue entry, also when it is on hold or in error.
	Cleanup Old Jobs	Deletes completed/cancelled jobs older than the retention period.
Navigate	**Printers / Print Jobs / Routing Rules / Print Subscriptions**	Navigation to the respective lists.

> **Print queue:** The app creates a job queue entry on installation (every 5 minutes, around the clock). It renders the documents from posting, settles hanging jobs and sends every due job; in Poll mode it also sends the wake-ping. A company created later gets the entry the first time the Print Service Settings are opened on the **Extension** card.

9.2 Managing printers

Search: **Print Service Printers**. Each printer has its own connection. The key fields:

Area	Field	Description
General	**Code**, **Description**, **Enabled**, **Is Default**	Identifier, name, active/inactive, default printer (display; change it with the *Set as Default Printer* action)
Connection	**Transport Mode**	Direct Push / Relay / Poll — controls the following fields; a change resets the status to *Not checked yet*
	Service URL + **API Key**	Direct Push only
	Relay Function URL + **Relay Function Key**	Relay only
	Agent	Relay/Poll with several printing computers only: the computer that prints for this printer (Chapter 7, C8)
	Printer Name	Windows printer name (PDF) or IP address (ZPL)
	Print Method, **ZPL Port**	PDF/ZPL, TCP port (ZPL)
Fallback	**Fallback Printer Code**	Replacement printer when offline
Status	**Status**, **Last Status Check**, **Last Error Message**	Connection status (read-only)
Statistics	**Total Jobs Printed**, **Pending Jobs**, **Failed Jobs**	Per-printer metrics

Actions: Test Connection (check the connection), **Clear API Key** / **Clear Relay Function Key** (remove keys).

> **Fallback printer:** It has to print the same format as the printer it stands in for — the field only offers such printers, and a printer cannot be its own fallback. Only one level is followed: if the fallback printer is offline as

© 2026 ALTENBRAND Datentechnik GmbH

> well, its own fallback is not asked; the Print Service looks for another online printer of the same format instead. A chain like A → B → A therefore cannot loop.

9.3 Routing rules and subscriptions

Optional — see Chapter 13 (routing) and Chapter 14 (automatic printing). Both are enabled in the Print Service Settings (*Routing Rules Enabled* and *Print Subscriptions Enabled*).

ALTENBRAND Datentechnik GmbH
Am Gelicht 5 · D-35279 Neustadt · +49 (0) 6692 202290
info@altenbrand.de · www.merchantcentral.de

© 2026 ALTENBRAND Datentechnik GmbH

Part 2 — Operation

10. The dashboard

Search: **Print Service Dashboard**. It shows the daily work at a glance; every number opens the records it counts.

Banner: When something keeps the service from printing everything on its own, a banner at the top names the first reason and what to do — in this order: module not switched on, no license, no active printer, no or invalid default printer, print queue not scheduled, auto-print and print subscriptions both off.

Tiles

Tile	Counts
Open print jobs	jobs in *Pending Render*, *Queued* or *Sending*
Sending > 10 min	jobs waiting for an answer for more than 10 minutes (direct push apart from relay/poll)
Failed	open failed jobs, with the last 7 days
Printed today	jobs printed since midnight, with a 7-day trend
Printers online	reachable out of all enabled printers

Cards: print queue by stage, outcome of the last 7 days, printers by status, and service state (module, print queue, default printer, auto-print, subscriptions, routing). The license FactBox is on the right.

Actions: Process Queue, **Test All Printers**, **Retry All Failed**, plus navigation to Print Jobs / Printers / Print Subscriptions.

---

11. Printing

11.1 Printing shipping labels

Shipping labels are created in merchantCENTRAL (Shipment). Depending on the configuration:

- **Automatically** (if *Auto-Print Enabled* is set): the label is printed right after creation — on the printer determined by routing/default.
- **Manually:** in the **Shipment Label List**, select the label → action **Print** (or **Reprint**). The **printer selection dialog** appears.

11.2 Printing BC reports

Any BC report can be rendered and printed without a print dialog — either automatically via **Print Subscriptions** (Chapter 14) or programmatically via the Print API (for other apps):

```
var
    ReportPrinter: Codeunit "ALN MCPS Report Printer";
    SalesShipmentHeader: Record "Sales Shipment Header";
begin
    ReportPrinter.PrintReport(Report::"Sales - Shipment", SalesShipmentHeader, 'PDF-OFFICE', 1);
end;
```

Method	Purpose
`PrintReport(ReportId, RecordVariant, PrinterCode, Copies)`	render and print a BC report
`PrintReportWithParameters(…, RequestPageXml, …)`	report with custom parameters
`PrintPdfDocument(DocumentName, TempBlob, PrinterCode, Copies)`	print a raw PDF document
`PrintZplDocument(DocumentName, ZplContent, PrinterCode, Copies)`	print a raw ZPL document

© 2026 ALTENBRAND Datentechnik GmbH
merchantCENTRAL – Multi-Channel-Plattform für Business Central
Updated 2026-09-22

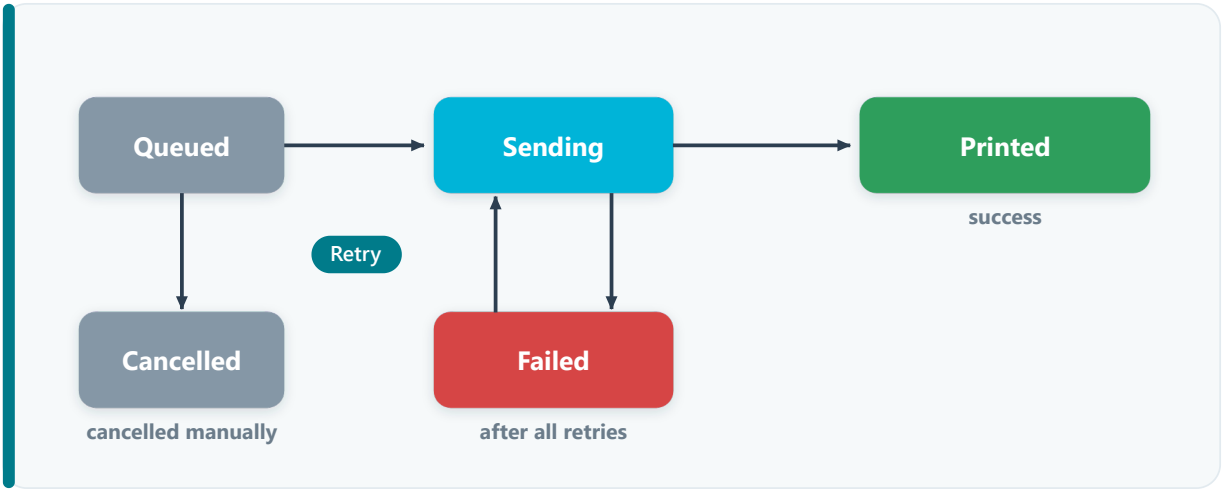
11.3 Batch printing

Several labels/documents at once: select multiple rows in the list → **Print**. A progress dialog shows the run; at the end a result message appears (processed / queued / errors).

---

12. The print queue

Search: **Print Service Print Jobs**. Every print job goes through a status lifecycle.



Status	Meaning
Pending Render	Queued from posting; an immediate print task renders the document seconds after the posting — outside it — and then sets the job to *Queued*.
Queued	Waiting for processing (default for new jobs).
Sending	Being transmitted, or (Relay/Poll) being handled by the Function/agent.
Printed	Printed successfully (final state).
Failed	Error after retries are exhausted (final until a manual retry).
Cancelled	Cancelled manually (final state).

Immediate printing: every new print job — from a posting, a new shipping label, printing by hand or a retry — starts a one-off background task that runs the print queue right after the commit: render, send or wake-ping. From posting to paper takes seconds instead of minutes. The task is created with the transaction and dropped with it when the posting fails; nothing is rendered or sent inside the posting itself. The recurring job queue entry stays as the safety net for anything a task does not reach. When several runs meet, each claims a job under a lock — no document is rendered or printed twice.

Key columns: *Document Name*, *Document Type* (Shipping Label / Report / Raw Document), *Printer Code*, *Print Method*, *Status*, *Tracking No.*, *Provider Code*, *Created At*, *Completed At*, *Retry Count*, *Error Message*, *HTTP Status Code*.

Actions

© 2026 ALTENBRAND Datentechnik GmbH

Action	Effect
Retry	Resets a *Failed* job to *Queued* (Retry Count → 0, Completed At cleared).
Retry All Failed	Resets all *Failed* jobs.
Cancel	Cancels the selected jobs in *Pending Render*, *Queued*, *Failed* or – after a confirmation – *Sending*. Select several lines to cancel them in one go: a confirmation names the number (and how many of them have been sent already), printed and cancelled jobs are skipped, and a summary shows the result.
Process Queue	Runs the print queue now — the same run as in the Print Service Settings and on the dashboard: first the documents from posting are rendered, then every due job is sent.

Retry logic: If a send fails, *Retry Count* is incremented. As long as `Retry Count ≤ Max Retries`, the job stays *Queued* with *Next Retry At* set (now + *Retry Delay*). Once the limit is reached it becomes *Failed*. A manual **Retry** resets the counter and schedule.

> **Relay/Poll note:** In Relay/Poll mode a job stays **Sending** after being handed to the queue, until the agent reports the print result. If a job is stuck in *Sending* (agent offline), check the agent service; once the delivery limit is reached the job becomes *Failed*. A job without any report is set to *Failed* after **25 hours**.

---

13. Routing rules

Routing rules automatically assign print jobs to the right printer — e.g. "DHL labels from warehouse A always to the Zebra in warehouse A". Enable via the Print Service Settings → *Routing Rules Enabled*.

Fields of a rule (search: **Print Routing Rules**, or Print Service Settings → *Routing Rules*)

Field	Description
Priority	Evaluation order — **lowest number wins**. Recommendation: steps of 10.
Description	Optional description.
Provider Code Filter	Shipping provider (DHL, DPD …). Empty = all.
Location Code Filter	BC location. Empty = all.
Has Print Method Filter / **Print Method Filter**	Rule only for labels in PDF or ZPL format. Unchecked = both.
Target Printer Code	Target printer when the rule matches (required).
Enabled	Rule active/inactive.

Evaluation order (rule engine):

1. Rules are checked by *Priority* ascending.
2. A rule matches when all configured filters fit the label (empty filters = "any").
3. **The target printer must qualify:** enabled, **same format as the label** (a PDF label never goes to a ZPL printer) and *Online/Not checked yet*. If it is *Offline/Error* and **Fallback Enabled**, its fallback printer is used if that one is online and prints the same format — otherwise another online printer of that format.
4. If the printer of a matching rule does not qualify, the **next matching rule** is checked.
5. If no rule applies, the **Default Printer** (Print Service Settings) is used — with the same checks.
6. If no printer qualifies at all, a **failed print job** records the reason.

Reports from print subscriptions without a fixed printer (or with *Use Routing Rules*) go through the same rules when the print queue renders them. A report has no shipping agent: rules with a *Provider Code Filter* do not apply to it, the *Location Code Filter* is compared with the document's location, and only PDF printers qualify. The document's location is the one on its header; when the header has none, the one location all lines with a location share counts. With lines of different locations the document has none, and the default printer takes it.

Example

© 2026 ALTENBRAND Datentechnik GmbH
merchantCENTRAL – Multi-Channel-Plattform für Business Central
Updated 2026-09-22

Priority	Provider	Location	Target printer	Result
10	DHL	WAREHOUSE-A	ZEBRA-01	DHL labels from warehouse A → Zebra in warehouse A
20	DHL	*	PDF-OFFICE	All other DHL labels → office printer
30	*	*	ZEBRA-02	Everything else → Zebra 02

14. Automatic printing (Print Subscriptions)

Print Subscriptions print any BC report **automatically after posting events** — without manual intervention. Enable via the Print Service Settings → *Print Subscriptions Enabled*.

Fields of a subscription (search: **Print Service Subscriptions**)

Field	Description
Description	A free-text name (e.g. "Delivery note warehouse 1").
Trigger Event	The BC event that triggers printing (see table below).
Report ID / **Report Name**	The BC report to print.
Printer Code	Target printer. Only PDF printers can be chosen – reports are always printed as PDF. Empty = routing rules, then the default printer.
Use Routing Rules	The routing rules choose the printer instead of the printer code. For reports only rules without a *Provider Code Filter* apply; a rule's *Location Code Filter* is matched against the document's location. If no rule applies: default printer.
Copies	Number of copies (1–99).
Location Code Filter	Optional: only for documents of this location.
Enabled	Subscription active/inactive.

Available trigger events

Trigger	Fires after ...
After Post Sales Shipment	posting a sales shipment
After Post Sales Invoice	posting a sales invoice
After Post Sales Credit Memo	posting a credit memo
After Create Shipment Label	creating a shipping label
After Post Warehouse Shipment	posting a warehouse shipment
After Post Transfer Shipment	posting a transfer shipment
After Post Purchase Receipt	posting a purchase receipt

Example configuration

Trigger	Report	Printer	Copies
After Post Sales Shipment	Sales - Shipment (208)	PDF-OFFICE	2
After Post Sales Invoice	Sales - Invoice (206)	PDF-OFFICE	1
After Create Shipment Label	— (label directly)	ZPL-WAREHOUSE1	1

> **Notes:** Reports are rendered **without a request page** (silent) — the report must not require mandatory parameters. Multiple subscriptions can exist for the **same** event (all fire). To temporarily disable, set *Enabled* off instead of deleting.

© 2026 ALTENBRAND Datentechnik GmbH

15. Troubleshooting

15.1 Quick check (all modes)

1. **Is the service running?** → `services.msc` → "merchantCENTRAL Print Service" must be *Running*. The service name for `Get-Service` / `sc.exe` is `MCPrintService` (MSIX) or `MC.PrintService` (ZIP).
2. **Reachable?** → `http://localhost:5050/health` (or **Check Local Print Service** in BC) → must show the status page "The print service is running".
3. **Printers visible?** → `http://localhost:5049/config` lists the Windows printers.
4. **API key set?** → `…/config` shows the status at the top.

15.2 Common problems

Symptom	Cause	Resolution
Printer status stays **Offline**	Service not reachable	Check port forwarding, reverse proxy, and service status
401 Unauthorized	API key missing/wrong	Compare the key in BC (Printer Card → API Key) with `appsettings.json`
Certificate error	Invalid/self-signed certificate	Use a valid certificate (Let's Encrypt)
ZPL Connection Refused	Zebra not reachable via TCP	`ping <ip>`, check port 9100 on the printer, ZPL test in `…/config`
Job stuck in **Sending** (Relay/Poll)	Agent offline / wrong listen SAS	Check the agent service, `Relay:Enabled`, and the listen SAS; after `MaxDeliveryCount` → *Failed*
/enqueue → 401 (Relay)	Wrong/missing Function key	Check the Function key on the printer (the job goes to *Failed* immediately, the printer to *Error*)
Status does not reach BC (Relay/Poll)	App role / application user / permission missing	Run `grant-bc-access.ps1` (Chapter 7 C3); check the Entra application + permission set (`ALN MCPS Relay API` or `ALN MCPS Poll API`)
Agent: label link expired (403)	The job sat in the queue longer than `labelTtlHours` (default 24 h), e.g. agent PC switched off for a long time	Print the job again in BC (**Retry**)
Agent does not connect (Relay/Poll)	Firewall blocks the outbound connection	Allow outbound port **443** to `*.servicebus.windows.net`; `Relay:TransportType` = `AmqpWebSockets`
"Deploy to Azure": template cannot be loaded	Download channel / CORS	Report to ALTENBRAND

© 2026 ALTENBRAND Datentechnik GmbH

Appendix

A. Endpoint reference (MC.PrintService)

Endpoint	Method	Auth	Purpose
`/`	GET	required	Service info (name, status, version, API-key/relay status)
`/health`	GET	none	Health check (always open). JSON `{"status":"Healthy","timestamp":…}` ; a browser on the same machine gets the status page instead. Requests from outside and through a proxy (with `X-Forwarded-For`) always get JSON.
`/version`	GET	required	Version info + minimum BC app version
`/capabilities`	GET	required	Feature discovery (PDF/ZPL, MaxCopies …)
`/printers`	GET	required	List of installed Windows printers
`/print/pdf`	POST	required	PDF to a Windows printer
`/print/zpl`	POST	required	ZPL to a Zebra printer (TCP/IP)
`/print/zpl/test`	GET	required	ZPL connection test (`?ip=…&port=9100`)
`/config`	GET	none — port 5049 only, local only	Configuration UI

> All endpoints except `/health` require the `X-Api-Key` header, from localhost as well: a reverse proxy on the same machine connects from there too. The configuration UI has a port of its own (`127.0.0.1:5049`), answers only a browser on the same machine and must never be published through the proxy.

ZPL print targets: The service opens TCP connections only to printers in private networks (`10.0.0.0/8` , `172.16.0.0/12` , `192.168.0.0/16` , `fc00::/7`) on printer ports 9100–9103 and 6101. Loopback and link-local (including `169.254.169.254`) are always blocked. Other networks or ports: `Zpl:AllowedNetworks` / `Zpl:AllowedPorts` in `%ProgramData%\merchantCENTRAL\PrintService\appsettings.json` .

B. Enum reference

Transport Mode: Direct Push (0) · Relay (Azure Queue) (1) · Poll (Azure Queue) (2) **Print Method:** PDF (0) · ZPL (1) **Print Job Status:** Queued (0) · Sending (1) · Printed (2) · Failed (3) · Cancelled (4) **Printer Status:** Not checked yet (0) · Online (1) · Offline (2) · Error (3) **Document Type:** Shipping Label (0) · Report (1) · Raw Document (2) **Print Trigger:** Manual · After Post Sales Shipment/Invoice/Credit Memo · After Create Shipment Label · After Post Warehouse/Transfer Shipment · After Post Purchase Receipt

ALTENBRAND Datentechnik GmbH
Am Gelicht 5 · D-35279 Neustadt · +49 (0) 6692 202290
info@altenbrand.de · www.merchantcentral.de
© 2026 ALTENBRAND Datentechnik GmbH
merchantCENTRAL – Multi-Channel-Plattform für Business Central

C. Glossary

Term	Meaning
MC.PrintService	The local .NET print service on the customer's premises (also "agent" in Relay/Poll mode).
Transport mode	Path from BC to MC.PrintService: Direct Push, Relay, or Poll.
Agent mode	Operating mode of MC.PrintService for Relay/Poll: holds only an outbound connection to the Azure queue.
Claim-check	Pattern where the (large) label sits in blob storage and only a time-limited SAS reference (`labelTtlHours` , default 24 h) travels through the queue.
Managed Identity	Identity of the Azure Function that accesses BC/Azure without a stored secret.
Wake-ping	Tiny best-effort signal from BC to the poll Function ("there is work").
Routing rule	Priority-based assignment of job → printer.
Print Subscription	Automatic report printing after a BC posting event.

© ALTENBRAND Datentechnik GmbH — merchantCENTRAL Print Service. Technical architecture: `docs/relay-mode-architecture.md` , `docs/poll-mode-architecture.md` . Azure deployment: `azure/README.md` .