# AAS (Asset Administration Shell) Introduction

## What is AAS (Asset Administration Shell)?

The Asset Administration Shell (AAS) is like a digital ID card or digital twin for a physical object (an "asset") in a smart factory — such as a machine, sensor, or even a software system.

In simple word: Think of AAS as a digital wrapper around a machine or device. It stores all important information about the asset in one place — including:

- What it is (type, manufacturer)
- What it can do (functions, features)
- How to use or control it (interfaces, settings)
- How it behaves (status, performance)
- How it should be maintained (manuals, lifecycle data)

This digital shell helps machines and systems understand each other, talk to each other, and work together more easily.

### Example:

Imagine you buy a robot arm. It comes with:

- A physical arm (the asset)
- An AAS that has all its data — speed, range, error codes, manuals, etc.

Your factory system can read the AAS and instantly know how to use and monitor the robot.

## What is an AAS Submodel?

An AAS Submodel is like a section or chapter in the Asset Administration Shell (AAS) — each one focuses on a specific topic or aspect of the asset.

Imagine the AAS as a digital book about a machine.
Each submodel is a chapter in that book:

- One submodel might be about technical specifications.
- Another about operating conditions.
- Another about energy usage, or maintenance history, or certifications.

Each submodel is structured and machine-readable — so software systems can understand it easily.

## Common Examples of Submodels:

1. Identification – Serial number, manufacturer, model.
2. Documentation – Manuals, datasheets.
3. Status – Current state, health, error messages.
4. Maintenance – Service intervals, repair logs.
5. Energy Consumption – Power usage, efficiency.
6. Capabilities – What the asset can do (functions, APIs).

## Example:

You have a CNC machine. Its AAS might contain:

- A submodel for basic info (ID, vendor)
- A submodel for energy usage
- A submodel for available services (like “start job”, “stop job”)
- A submodel for predictive maintenance

Each one is a plug-in module of data, reusable and standardized.