# Alsmart®

# Master your
# HVAC **symphony**

Alsmart® is the latest generation of programmable controller platforms for the HVAC market. Think of it as the intelligent, compact and powerful brain of your application.

Packed with state-of-the-art technology, Alsmart® empowers you to take your thermodynamic knowledge to the next level — reducing time to market with module-based design and simulations.
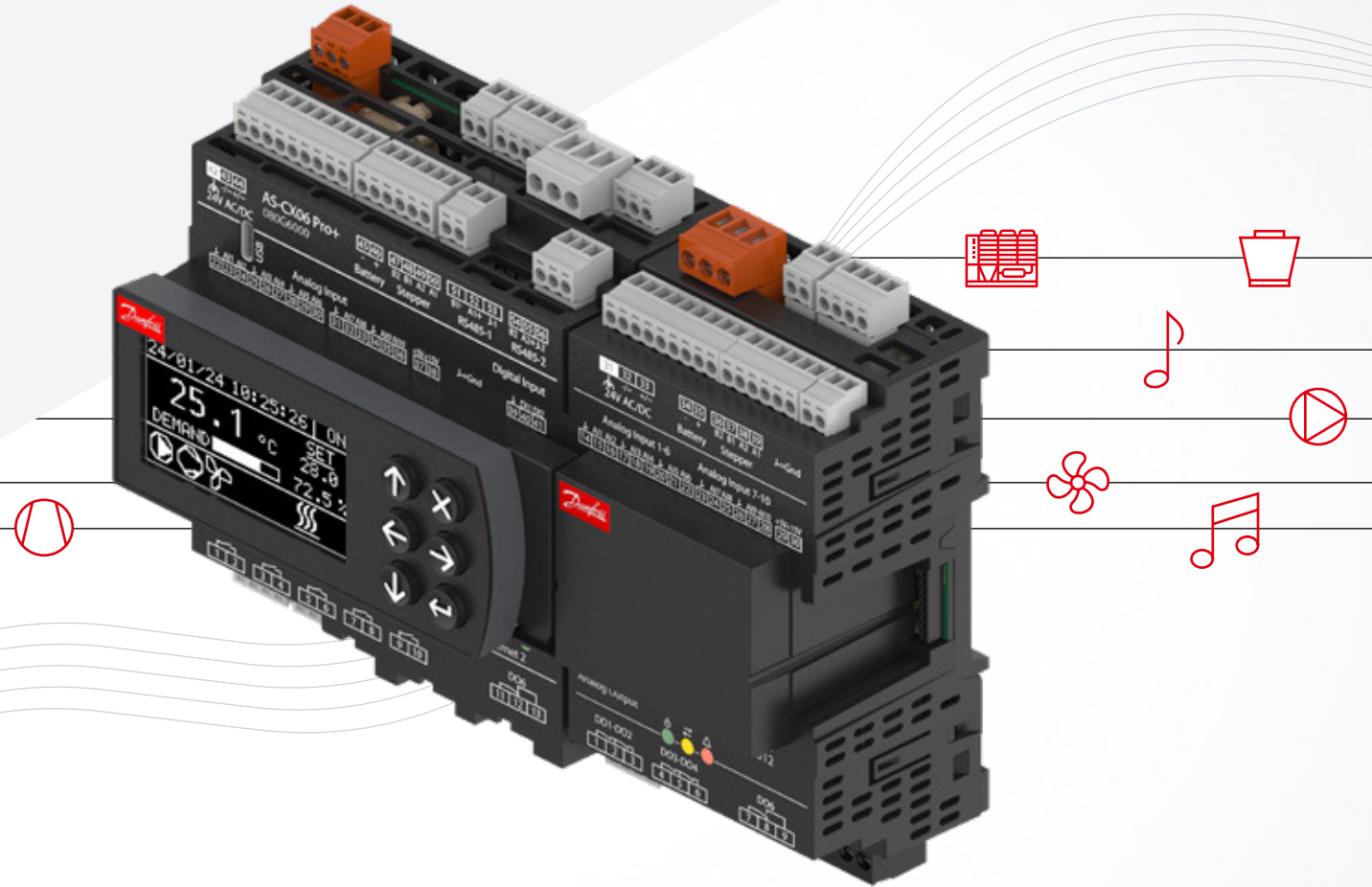
# Alsmart® universal programmable controller
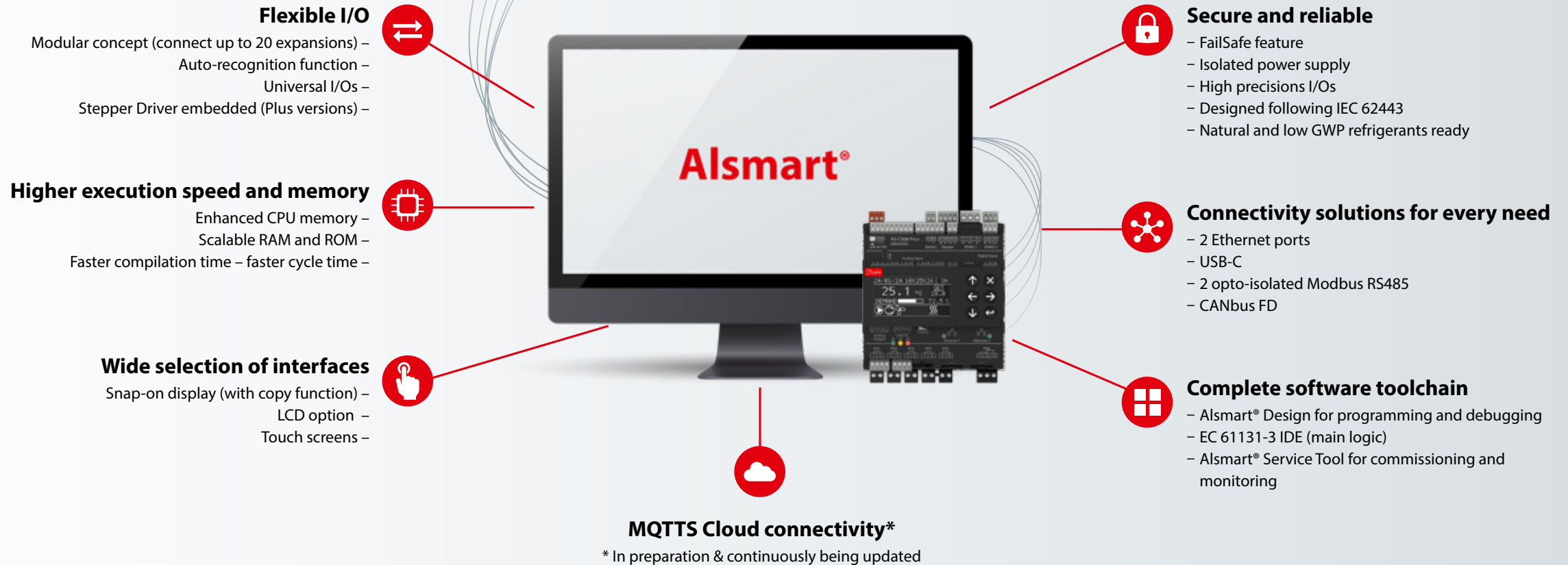## — Elevate your HVAC solution with Alsmart®

Alsmart® offers a complete and intuitive software platform that helps you take your HVAC application to the next level thanks to the programming tools Alsmart® Design and Alsmart® Service Tool.

**Alsmart® Design** is the programming tool that helps you optimize your HVAC application. It is the core of the toolchain, the programming tool used to program, compile, and debug your application to fully manage the universal controller and expansion modules connected to it.

**Alsmart® Service Tool** is web-server-based and its main purpose is to set up and monitor the application. The dashboard is customizable, allowing you to add new widgets with live diagrams and graphs, as well as monitor specific preferred parameters.

# The major Alsmart® pillars to achieve the best performance with your HVAC system



## Flexible I/O
Modular concept (connect up to 20 expansions) –
Auto-recognition function –
Universal I/Os –
Stepper Driver embedded (Plus versions) –

## Higher execution speed and memory
Enhanced CPU memory –
Scalable RAM and ROM –
Faster compilation time – faster cycle time –

## Wide selection of interfaces
Snap-on display (with copy function) –
LCD option –
Touch screens –

## Secure and reliable
– FailSafe feature
– Isolated power supply
– High precisions I/Os
– Designed following IEC 62443
– Natural and low GWP refrigerants ready

## Connectivity solutions for every need
– 2 Ethernet ports
– USB-C
– 2 opto-isolated Modbus RS485
– CANbus FD

## Complete software toolchain
– Alsmart® Design for programming and debugging
– EC 61131-3 IDE (main logic)
– Alsmart® Service Tool for commissioning and monitoring

## MQTTS Cloud connectivity*
* In preparation & continuously being updated

# Alsmart® – Connectivity highlights

**Stepper driver**

**USB-C**

**Display port / CAN FD**

Unipolar/Bipolar

Pen drive
PC connection

**Opto-isolated Modbus RS485**

To BMS

**RS485 fieldbus** (BACnet, Modbus)

Field bus

VZH & VZN
inverter
scroll
compressors

Turbocor®

AB-QM with
NovoCon®

3rd. Party
device
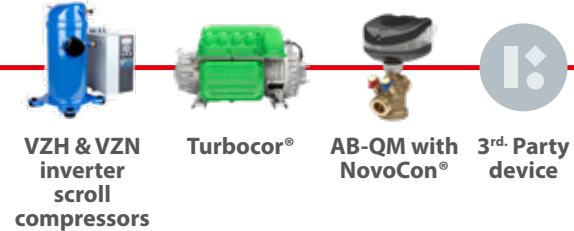
**Ethernet port 2**

2nd AS-CX
controller

3rd AS-CX
controller

**Ethernet port 1**

Cloud*

Alsmart Service tool

BMS

AS-CX06 Pro+
080G6000
24V AC/DC

Battery    Stepper    RS485-1    RS

Analog Input                 Digital Input

CIRCUIT    10.3 → 12.0 BAR
PRESSURES    FAN 42.5 %
27.4 BAR    52.5 %
10.3 BAR
REC. DEMAND
72.5 %    26:1 22.1    OK
25:1 → 28.0 °C

Analog
Output    CAN FD    Display    Ethernet 1    Ethernet 2

DO1    DO2    DO3    DO4    DO5    DO6
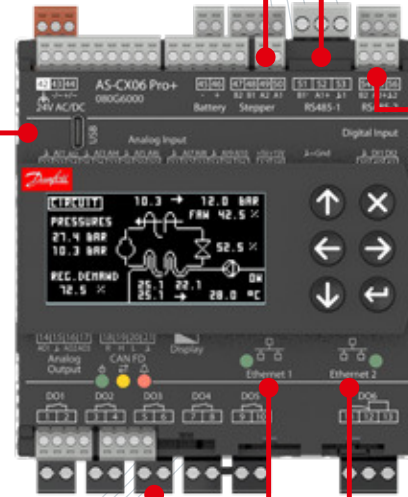
* In preparation & continuously being updated

# **Software** Toolchain

**Alsmart® Design** is the core of the toolchain, the programming tool used to program, compile, and debug your application to fully manage the universal controller and expansion modules connected to it. It supports five main standard programming languages, with an automated test function embedded, a simulation mode function, options to design and customize your user interface, and many other features that will make the difference in optimizing the performance of your HVAC application.

**Alsmart® Service Tool** is web-server-based and its main target is to set up and monitor the application. The dashboard is customizable by adding new widgets with live diagrams and graphs but also to check preferred specific parameters. It's possible to set different users with different access and visibility to create different levels to monitor and manage all application parameters and set up the communication of the controller. From a service part point of view, it's possible to look, save, and download alarms, logs, and behavior history, in order to have a clear understanding of what is happening live in the system and, as a consequence, in order to easily define the best performance of the system and replicate it quickly once again. It also offers the best support for backing up and restoring controller settings for the ultimate maintenance experience.
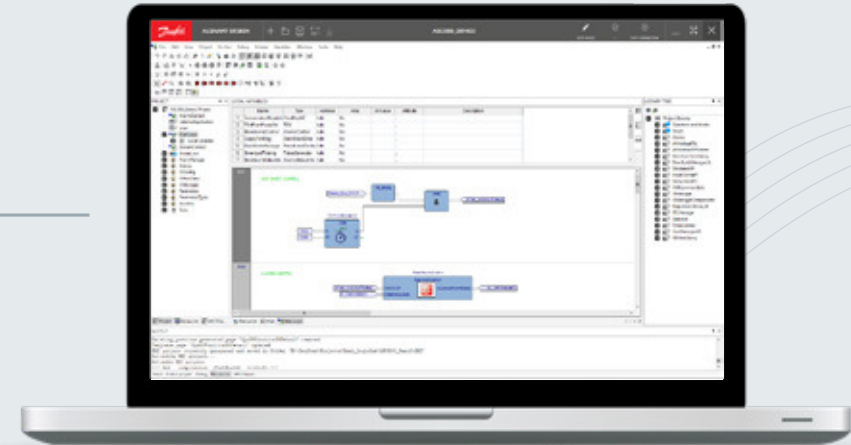
# A world of possibilities

With Alsmart®, you can configure your controller to manage virtually any application. To make things even easier, we are developing a library of pre-programmed blocks and software applications specifically designed for HVAC systems, providing a quick and efficient way to get started.

Our ADC laboratory is contributing greatly to the drafting and testing of the software applications to ensure maximum thermodynamic process optimization during the drafting of the application code.

We've leveraged our vast application know-how, broad portfolio and comprehensive support to create the best HVAC control experience with the highest level of performance and safety for you.

# Alsmart®
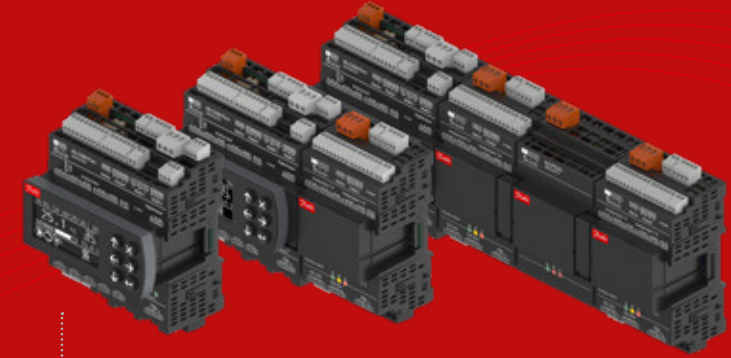
District heating

Data center

BESS
(Battery energy storage systems)

Super-market

Chillers

Heat pumps

Rooftops

AHU

CRAC

# Alsmart®
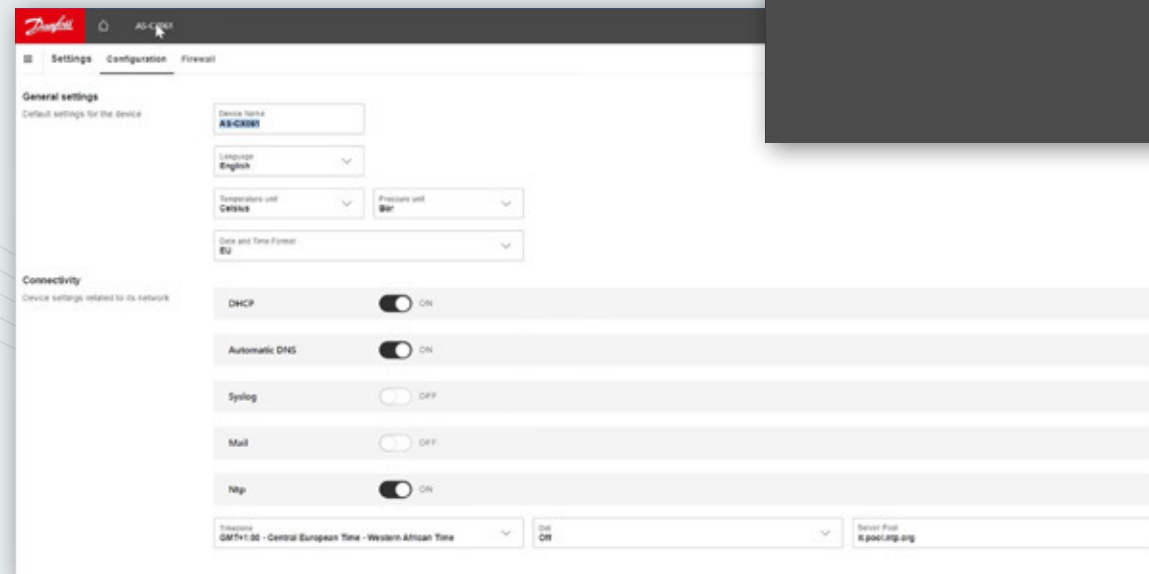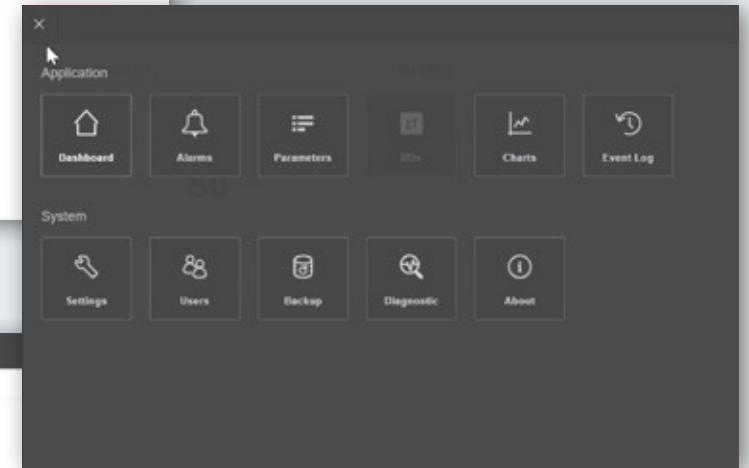# Design
## – Highlights

- IEC 61131-3 IDE (main logic)

- UI designer for low resolution displays
  (monochromatic LCD, 7-segment)

- UI designer for high resolution displays
  (color touchscreen, HTML browser)

- Debugger and simulator

- Parameter database and normalization

- Translation tool

- Automated test system

- Documentation generator (developer's
  documentation, user manual)
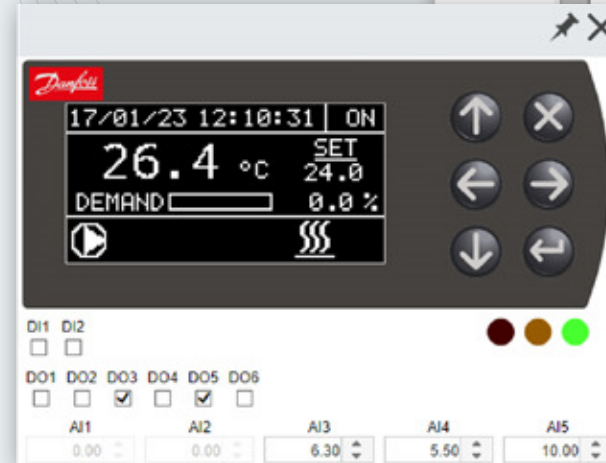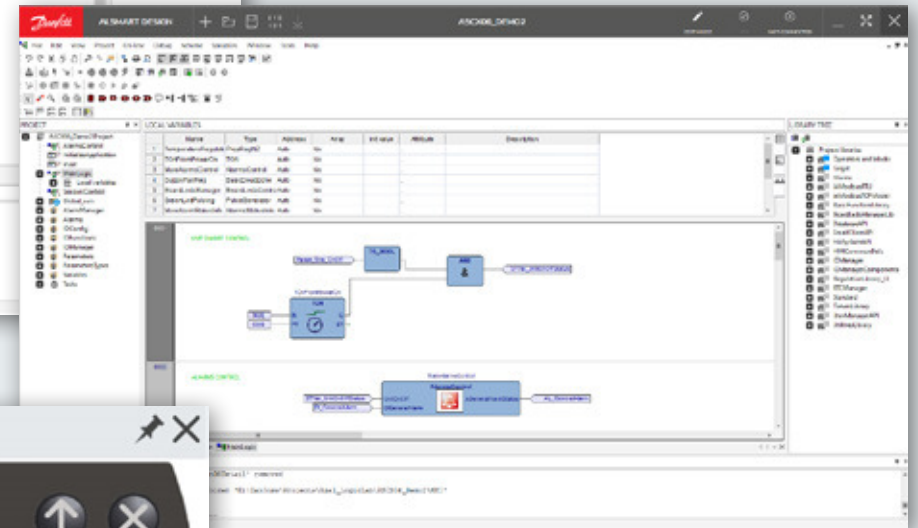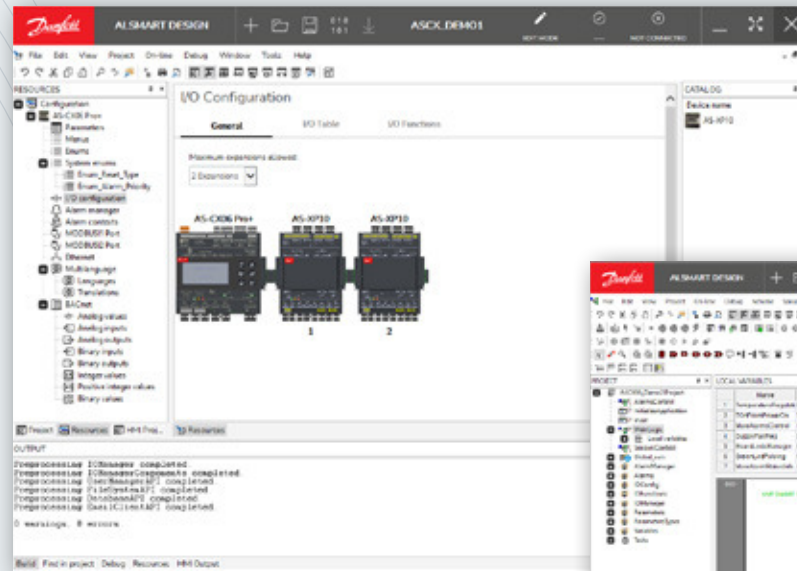
# Alsmart®
# Service Tool
## – Highlights

– Four level of access with
   different visibility

– Dashboard view customizable
   with widgets

– Alarm log and history accessible
   and downloadable

– Event log collect in one view all
   thesystem notifications and alarms

– Settings and users sections

– Backup to restore and copy
   parameters and settings

# Product range overview
## – Hardware



**Universal Controller AS-CX06**

**Expansion Modules AS-XP**

**Power Module**

| | | Lite | Mid | Mid SSR * | Mid+ | Mid+ SSR * | Pro | Pro+ | AS-XP05 | AS-XP05+ | AS-XP10 ** | AS-PS20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dimension** | | 6 DIN | | | | | | | 4 DIN | | 6 DIN | 4 DIN |
| **Digital Output** | N | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 10 | — |
| | Type | 5xSPST 1xSPDT | 5xSPST 1xSPDT | 4xSPST 1xSPDT 1xSSR | 5xSPST 1xSPDT | 4xSPST 1xSPDT 1xSSR | 5xSPST 1xSPDT | 5xSPST 1xSPDT | 4x SPST 1xSPDT | 4xSPST 1xSPDT | 8xSPST 2xSPDT | — |
| **Digital Input** | N | 2 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | 4 | — |
| | Type | Voltage free | | | | | | | — | — | 24Vac or 230Vac | — |
| **Analog Output** | N | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | — |
| | Type | 0/10V or PWM | | | | | | | 0/10V or PWM | | | — |
| **Universal Input** | N | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | — |
| | Type | NTC, PTC1000, 4-20mA, DI, 0/5V ratio, 0-1V / 0-5V / 0-10V | | | | | | | NTC, PTC1000, 4-20mA, DI, 0/5V ratio, 0-1V / 0-5V / 0-10V | | | — |
| **Stepper Motor** | | — | — | — | 1 | 1 | — | 1 | — | 1 | — | — |
| **CAN FD** | | YES | YES | YES | YES | YES | YES | YES | — | — | — | — |
| **Ethernet / Web Server** | | — | — | — | — | — | 2 | 2 | — | — | — | — |
| **Modbus RS485 (opto-isolated)** | | 1 | 2 | 2 | 2 | 2 | 2 | 2 | — | — | — | — |
| **USB** | | Yes, C type | | | | | | | — | — | — | — |
| **Power Supply** | | 24 Vac or 20…60 Vdc | | | | | | | From main control, except for stepper valve | | | — |

* Available from Q2-2025

** Available from Q4-2025

# Ready to **get started?**

To learn more about how Alsmart® can optimize your application, reach out to us.

**Contact us here** ➤
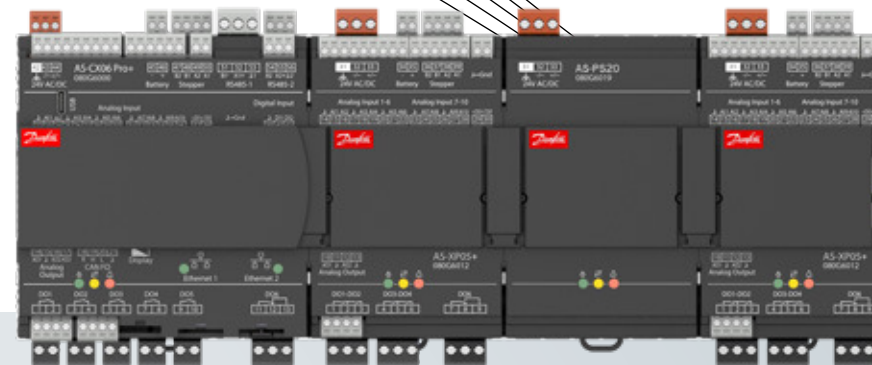
### Visit our Alsmart® website

To learn more about Alsmart® and the supporting software toolchain, please visit our dedicated Alsmart® website.

**Visit website** ❯

### Alsmart® software suite

To learn more about Alsmart® Design & Alsmart® service tool please visit the Partner portal web page, where you can find documentations, video, guides and further useful tools to quickly get familiar with the Alsmart® tool chain.

**Partner portal** ❯

### Alsmart® Training On-demand

For the Alsmart® portfolio Danfoss provide the option for Online Training or Face to Face. We offer standard courses or customize the training according to your needs. These courses are subject to a fee.
Fill out the form and you are on your way to in-depth Alsmart® training.

**Training** ❯