



CONTROL AND AUTOMATION

Smart Solutions

HARDWARE
SOFTWARE

ENGLISH EDITION

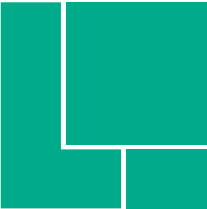
CONTROL AND AUTOMATION

Flexible and economic automation solutions allow maximum use of technological developments in wide areas of application.

ODE SOLUTION

With **ODE's** automation solution, you have the chance to be part of this change.

Our **complete concept** from the control level through to the valve technology offers standards, connectivity, communication and total flexibility thanks to the full openness of the solution. Because intelligence is not only predicting the future, but reacting to it in advance. This is supported by realtime designed control and Ethernet-based synchronous fieldbus systems in conjunction with our engineering.

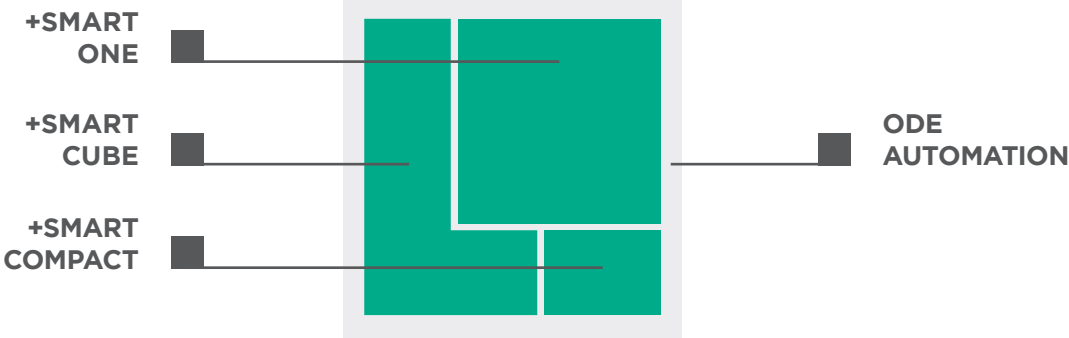


AUTOMATION FROM ODE

VISUALISATION, PLC AND REMOTE MAINTENANCE

The ODE range offers **extensive hardware solutions** in combination with excellent software functionalities.

PRODUCT	+SMART <small>ONE</small>	+SMART <small>CUBE</small>	+SMART <small>COMPACT</small>
VISUALIZATION	High resolution display, HMI, Webvisu		
PROTOCOL	CANOpen, Ethercat, Profinet, Modbus TCP-IP, Ethernet/IP, RS232, RS485		
CONNECTIVITY	WiFi	WiFi, 4G, NBIoT, Bluetooth	WiFi, Bluetooth
CLOUD	ODE Cloud, API	ODE Cloud, Microsoft Azure, AWS, Third party services (MQTT)	ODE Cloud, Microsoft Azure, AWS, Third party services (MQTT)
SENSOR	4-20mA, 0-10V	4-20mA, 0-10V, I ² C, CAN	0-5V, I ² C
ACTUATOR	Solenoid valves, General devices (24VDC)	Solenoid valves, stepper motors, drivers, relays, custom outputs	GPIO
SOFTWARE	Codesys	Codesys/C++	C++



MAKING THE FUTURE POSSIBLE

+SMART ONE is a completely new product in the market of the solenoid valves. This **system** allows development of any application in a simple and intuitive way, as well as control, monitoring and wireless operation of the solenoid valves applied.

The main features include the integration of a **PLC** with the **Wi-Fi** system through which it is possible to manage a control terminal block for digital inputs/outputs: **no.3 digital I / O, no.4 analog inputs** to process any measuring device, **n.1 PWM output** to command the solenoid coil.

The device is dedicated to the solenoid valve control and to the machine control, thus allowing data collection on Cloud platform, remote assistance and preventive maintenance.

Thanks to **+SMART ONE**, ODE is more than a solenoid valves manufacturer: it is a service provider for the management of the systems in which the valves are applied.

The solution can be used with solenoid valves manufactured by ODE, helping users to turn their businesses into “**Smart Factories**”. With ODE you have the chance to be part of this change.



FLEXIBILITY

+SMART ONE allows use of the entire range of ODE solenoid valves. Users can program their applications exactly like they want thanks to **IEC 61131-3**, a standardized programming environment.

INTEGRATION

+SMART ONE is a device with an integrated PLC and WiFi system. This **embedded controller** combines flexibility and excellent performance.

FEATURES

As a PLC, **+SMART ONE** can take over the control of an entire system or serve as a lower-level controller. The device has digital inputs/outputs and analog inputs. Its rugged design is optimized for driving electromechanical devices with a PWM output.

CONTROL

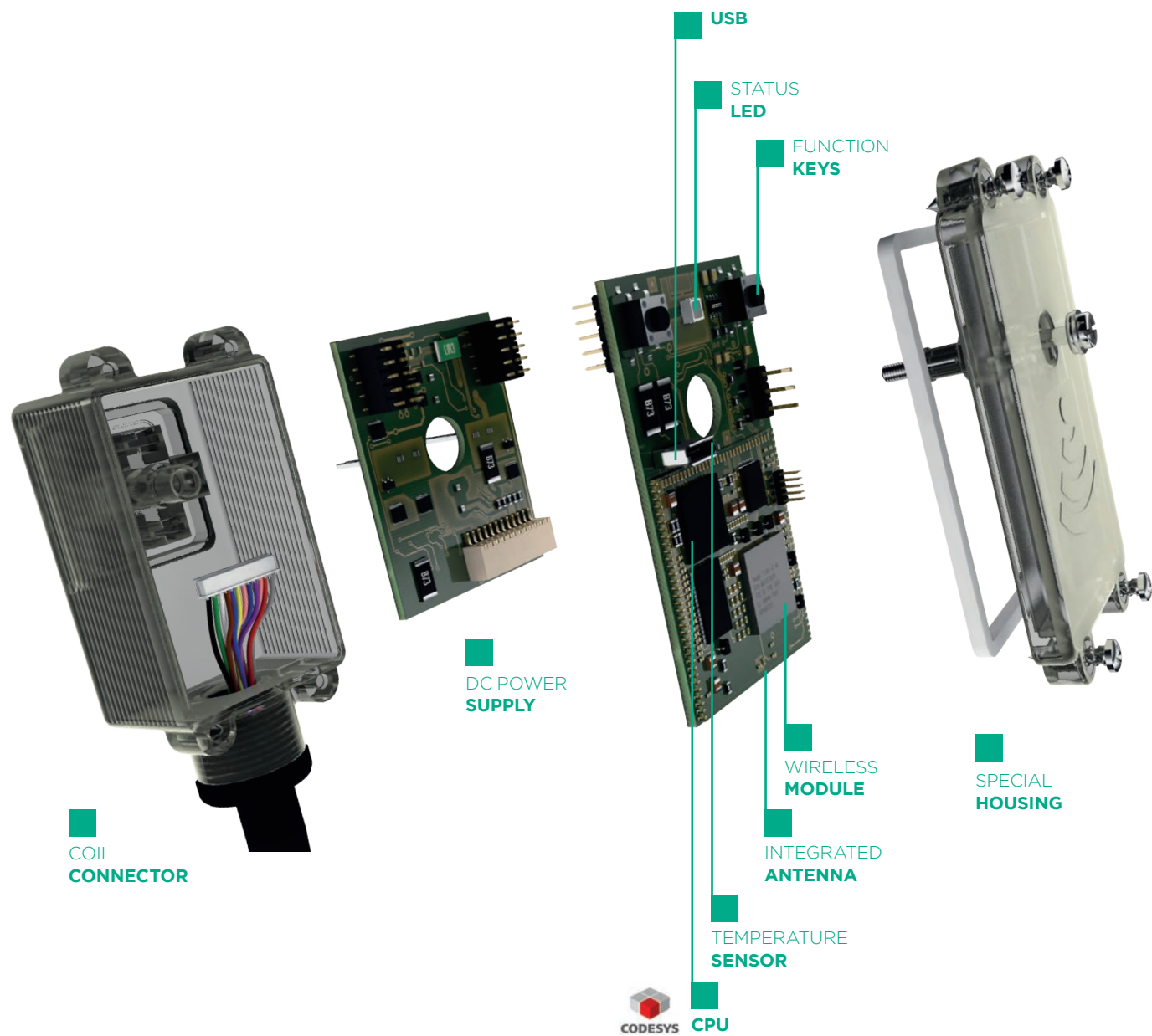
+SMART ONE provides LED signalling to give a better view of operating signals.

SAFETY

+SMART ONE complies with CE certification and with the requirements of two European Directives: EMC (concerning electromagnetic compatibility), RED (dedicated to radio devices).

PRODUCT
OVERVIEW

+SMART ONE the perception of a change, Industry 4.0. Starting from the control level through to the solenoid valve technology, this ODE solution offers standards, **connectivity**, **communication** and **total flexibility**. Because intelligence is not only anticipating the future but reacting to it in advance.



TECHNICAL
DATA

HARDWARE ARCHITECTURE	WI-FI	ARM® CORTEX™ - M4F PROCESSOR CODE
	VOLTAGE INPUT	IEEE 802.11 b/g/n -2.4 GHz SECURITY WPA/WPA2, ENCRYPTION WEP/TKIP/AESWEP, (uFL CONNECTOR AVAILABLE)
	DIGITAL OUTPUTS	24 VDC (+10% - 5%) (5A MAX)
	DIGITAL INPUTS	no.3 OPEN COLLECTORS (MAX 3A) no.1 PWM FOR COIL OPERATION
	ANALOG INPUTS	no.3 INPUTS (24 VDC)
	USB	no.4 INPUTS (no.2 - 0...10VDC)/ (no.2 - 4...20mA), 12 Bit
	HOUSING	no.1 USB 2.0
	HOUSING GASKET	NYLON PA66
	PROTECTION CLASS	SILICON
	CASE INSTALLATION	IP 67
	CABLE	EN 175301-803 (EX DIN 43650/A), 2P+E, IP67
	ENVIRONMENT	LINE LENGTH 1M (PVC) OTHER LENGTH AND MATERIAL AVAILABLE
	APPROVALS	OPERATING: -10...50°C (14...122°F) STORAGE: -25...70°C (13...158°F)
	WEIGHT	CE,EMC,RED
	DIMENSIONS	APPROX. 80g (WITHOUT CABLE)

The technical drawing shows the front and side views of the SMART ONE device. The front view dimensions are: 43 mm (width), 18 mm (height), and 95 mm (depth). The side view dimensions are: 40 mm (width) and M3 (thread size).

PROGRAMMING TOOL

CODESYS is the **+SMART ONE** programming tool. It is a software platform especially designed to fulfill the many different requirements of modern industrial automation projects.

The IEC 61131-3 programming tool is the heart of CODESYS. It offers integrated, user-friendly solutions to support users in developing their tasks.

The software includes the following elements:
editors for all IEC programming languages (AWL, ST, CFC/FUP, etc.);
extensive libraries with modules (counter, timer, controller, etc.);
tools for testing, simulation, error search and debugging.

Modbus is the serial communications protocol chosen for **+SMART ONE**. It is the standard communications protocol in industry, and the most commonly available means of connecting industrial electronic devices.

Ethernet is a ubiquitous solution that has established itself as the principal industrial network through its combination of high data rate and shelf infrastructure.

The **Modbus TCP-IP** module transmits data to the Cloud platform or to the machine's PLC via Ethernet over Wi-Fi.



WIRELESS DEVICES, in the industrial world, are a fundamental aspect of the optimization process of the production. The secure transferring of data is an ideal base for several standard applications or a simple way to solve applications not supported from traditional technology. The main features of the platform are:

PROCESSING IN REAL TIME AND ARCHIVING:

The data is processed in real time to create structured information and generate events and alarms.

REMOTE ACCESS FROM PC OR SMARTPHONE/TABLET

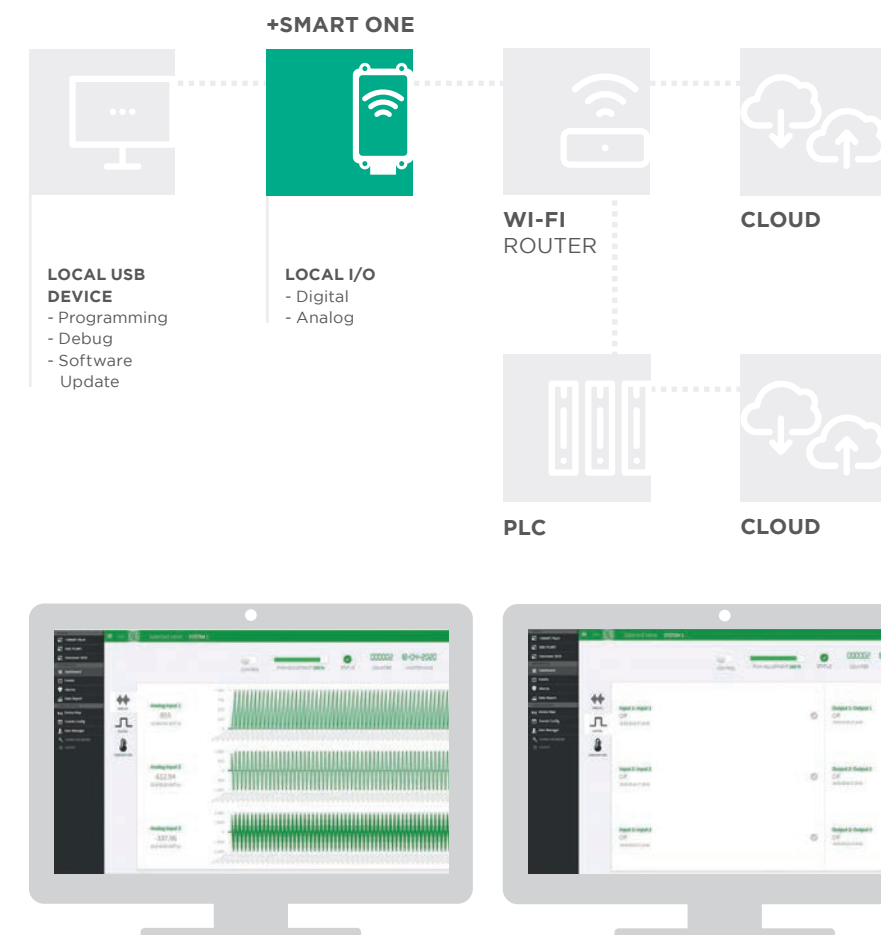
It is possible to manage the remote application maintenance through any kind of devices.

PLATFORM MANAGEMENT:

The platform allows to create custom views to check actual situations and historical data of modules.

NOTIFICATION OF EVENTS AND ALARMS:

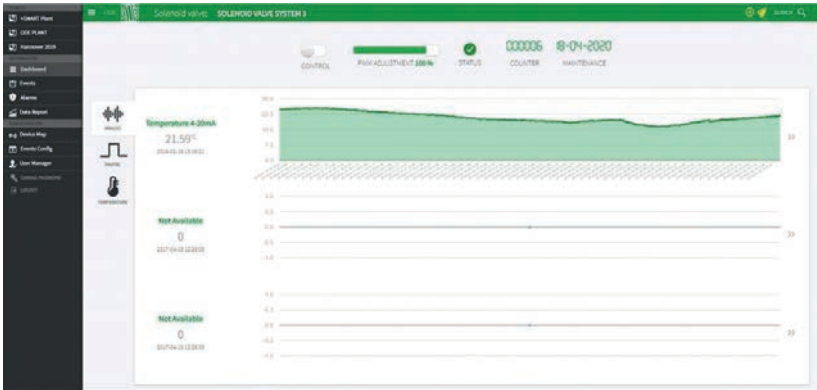
The platform is able to notify the user in several ways with events or alarms by e-mail, SMS or Push Notification.



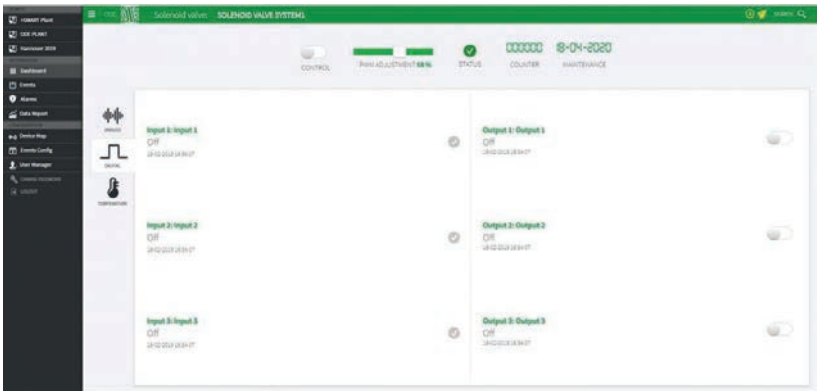
DASHBOARD
OVERVIEW

A **DASHBOARD** is a screen which allows you to track in **real time** the performance of the devices linked to the **+SMART ONE** product.

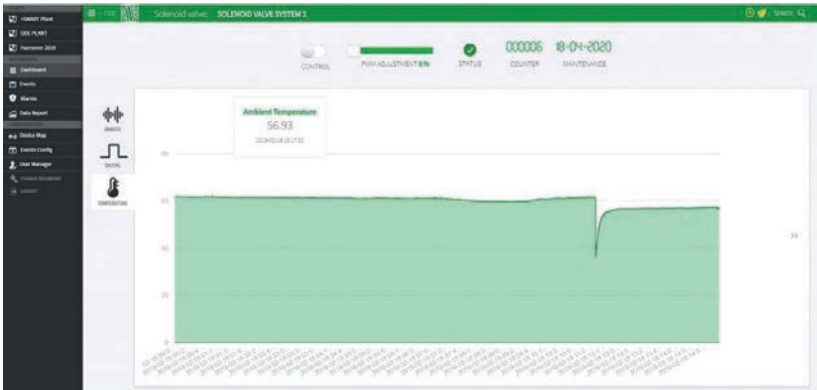
The dashboards allow technical departments, services, marketing and sales to always be aligned on the most important data.



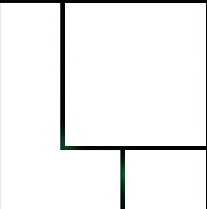
ANALOG
INPUT



DIGITAL
INPUT



INTERNAL
TEMPERATURE



+SMART **CUBE**
+SMART **COMPACT**



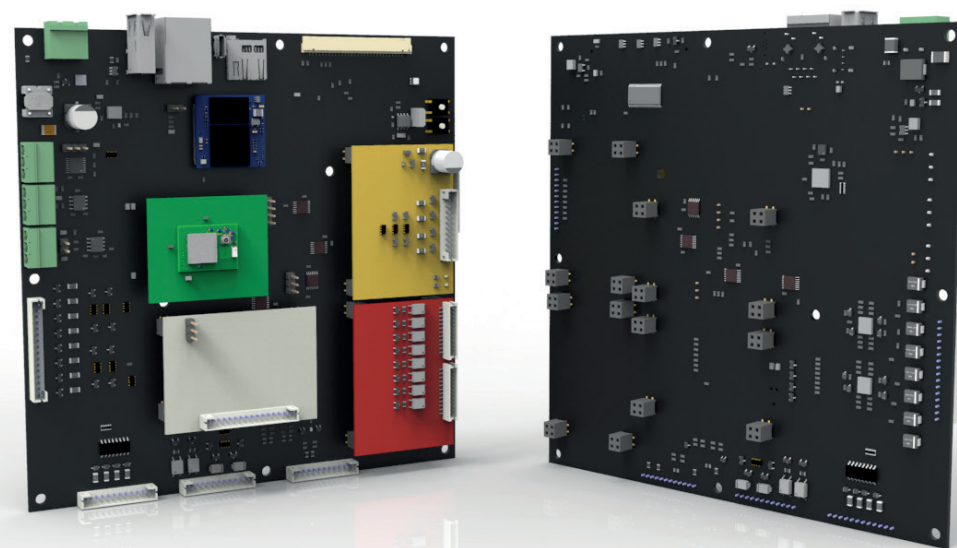
+SMART CUBE ARCHITECTURE

The compact **+SMART CUBE** unit with the various I/O modules to form a space-saving industrial controller in the control cabinet. Every user can find a suitable **device tailored** to budget, performance class and the complexity of the control task.

Apart from the CPU, the individual devices from the **+SMART** series differ in the available system interfaces and can be plugged together as a modular control system according to the respective task. This way, different applications can be realised on the same hardware.

INDUSTRIAL MOTHERBOARD

The scalable **CPU** allows to **upgrade/downgrade** performances and can be adapted precisely to the respective application. High-quality electronic components are selected in according to guaranteed availability.



- MODULAR ARCHITECTURE (UP TO 8 ADDITIONAL MODULES)
- HIGH PERFORMANCE CPU
- HIGH RESOLUTION GRAPHICS AND MULTIDISPLAY
- SOLENOID VALVE ENERGY AND PID MANAGEMENT
- SENSOR'S PORTS
- ACTUATOR'S PORTS
- CUSTOMER'S PROGRAMMABILITY
- INDUSTRIAL MULTIPROTOCOL ETHERNET BASED
- CAN, I2C
- INTERNAL SPI BUS FOR MODULES COMMUNICATION

CARRIER BOARD CHARACTERISTICS

- | | |
|---|---------------------------------------|
| 1 x 10/100 Ethernet interface | 24 Vdc single power supply |
| 1 x microSD | 8 x Solenoid Valve PWM Drivers |
| 1 x USB Host (Type A connector) | 8 x Digital Opto-isolated Input (PNP) |
| 1 x USB Device (Type micro B connector) | 4 x Open collectors Digital Output |
| 1 x CANopen (Master mode - CiA 301) | 4 x Digital Opto-isolated Output |
| 1 x Real Time Clock | 4 x 0-10V Analog Input |
| LCD connector for 7" and 10" | 2 x 4-20mA Analog Input |
| High resolution Screen and Capacitive Touch | |



IOT FOR CLOUD COMMUNICATION

OPTIONAL MODULES

Additional Option Available (Up to 7 modules) thanks to dedicated sockets:

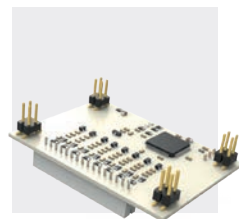
8 x Digital Opto-isolated Inputs and Outputs

4 x Solenoid Valve PWM Drivers (with Power Optimization and Current Control)

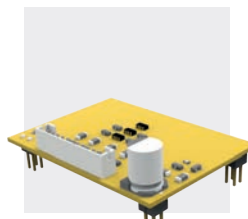
4 x 0-10V, 4 x 4-20mA Analog Inputs 12 bit

Stepper Motor Driver

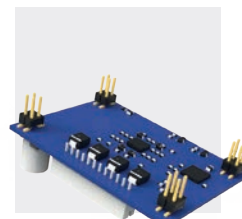
Communication module (Wifi; 4G; NBloT; Bluetooth;)



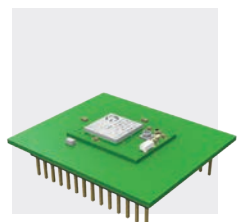
ANALOG INPUTS



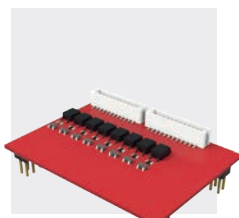
SOLENOID VALVE PWM



STEPPER MOTOR DRIVER



COMMUNICATION

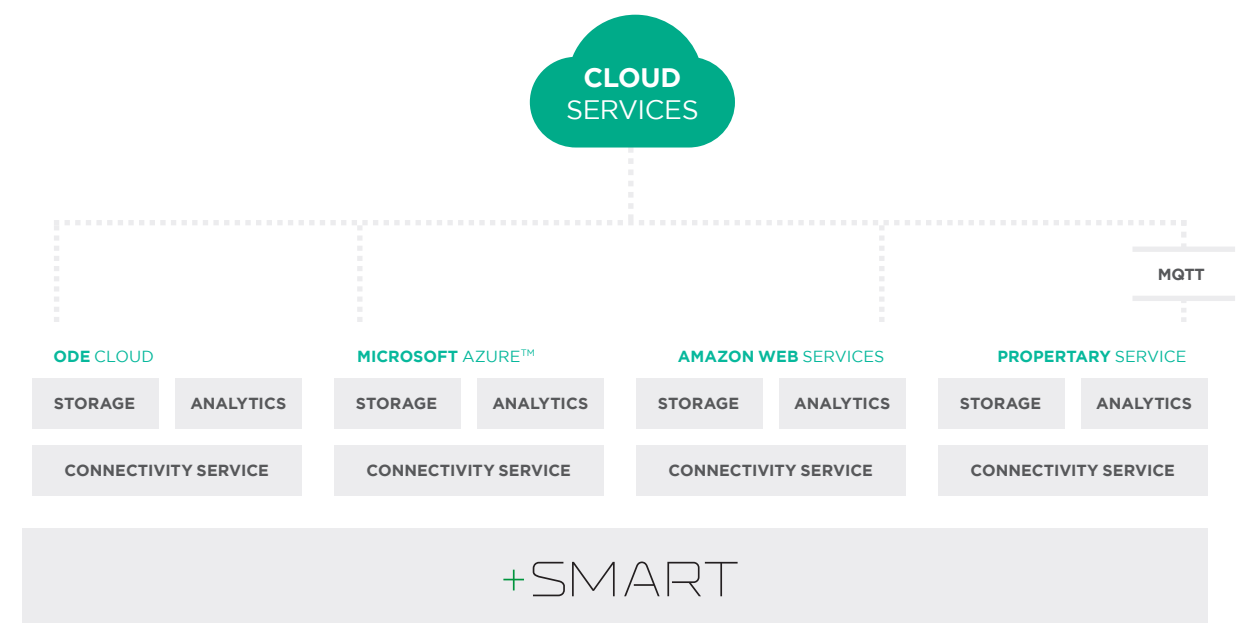


DIGITALS I/O



ODE has developed the software library for system-integrated communication between machine controllers and cloud-based services.

It supports the standardised protocol **MQTT** for communication with common cloud systems, such as **Microsoft Azure™**, **Amazon Web Services** and **ODE Cloud Platform**. Built-in security mechanisms prevent the misuse of data through unauthorised access, further protecting the company's intellectual property.



FLEXIBLE COMMUNICATION OPTIONS

+SMART ONE +SMART CUBE +SMART COMPACT

+SMART products were **designed to be flexible**. EtherCAT, Profinet, Ethernet/IP, and MODBUS TCP-IP are just a few of the communication protocols supported by the **+SMART** interface. The communication board of CUBE version is modular, the customer can choose which protocols are best for their installation and add or subtract as needed.

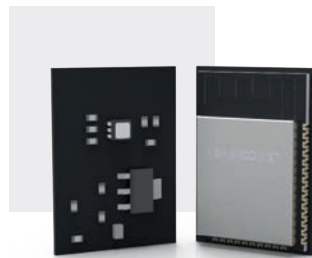




+SMART COMPACT ARCHITECTURE

+SMART COMPACT concentrates the concept of ODE regarding **+SMART** solution: from fluidic control to Cloud, Extremely compact and low-cost product, It can easily be housed in sensors or other small devices.

Thanks to a powerful CPU, it can process signals from external devices adding other information to the measurement (pressure, flow, temperature and so on). All the information processed on the device can be send by WiFi connectivity to the cloud platform as: ODE Cloud, Amazon AWS or Microsoft Azure. Other types of connectivity allow local network connection such as CAN 2.0 B and Bluetooth 4.2.

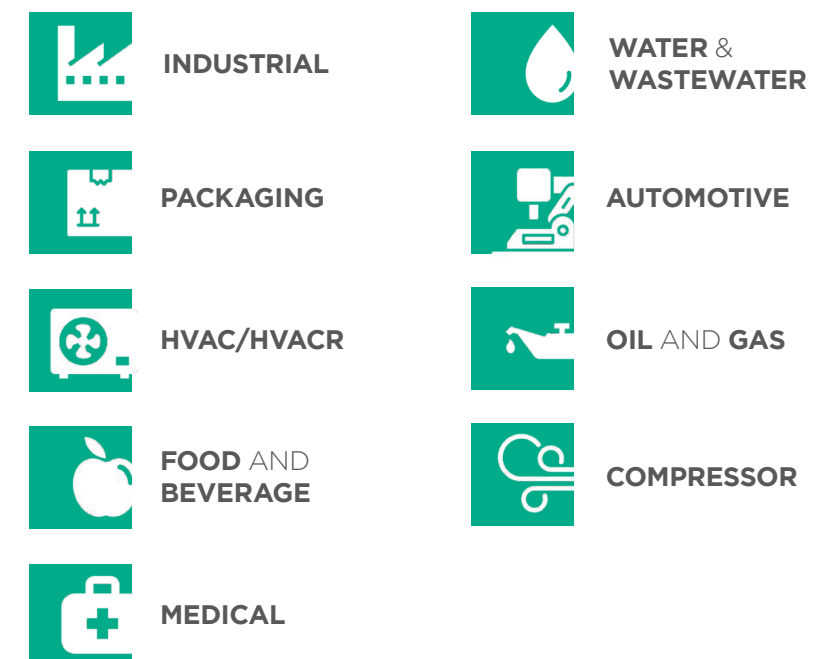


HIGHLIGHTS

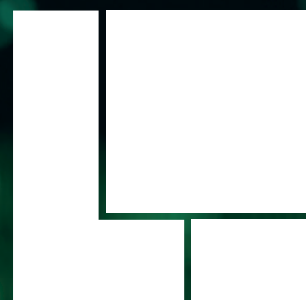
- **CPU:**
dual-core 32-bit microprocessor
240MHz up to 600 MIPS
- **KEY FEATURES:**
RGB LED
12-bit analog input for sensor reading
Extreme low power suitable for IoT battery operated devices
Very small dimensions
- **CONNECTIVITY:**
Wi-Fi 802.11 n (2.4 GHz), up to 150 Mbps
Bluetooth v4.2 BR/EDR and BLE specifications
I2C
CAN2.0B
UART



+SMART is a flexible automation solution that allows the maximum utilization of technological developments in wide fields of applications thanks to its user-friendliness, versatility and reliability.



AWARDED AT HOST MILANO 2017
40° international hospitality exhibition



+SMART ONE
+SMART CUBE
+SMART COMPACT

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