



CONTROL AND AUTOMATION

Smart Solutions

HARDWARE
SOFTWARE

ENGLISH EDITION

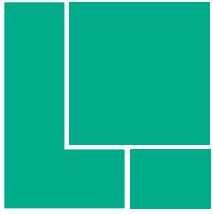
CONTROL AND AUTOMATION

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.

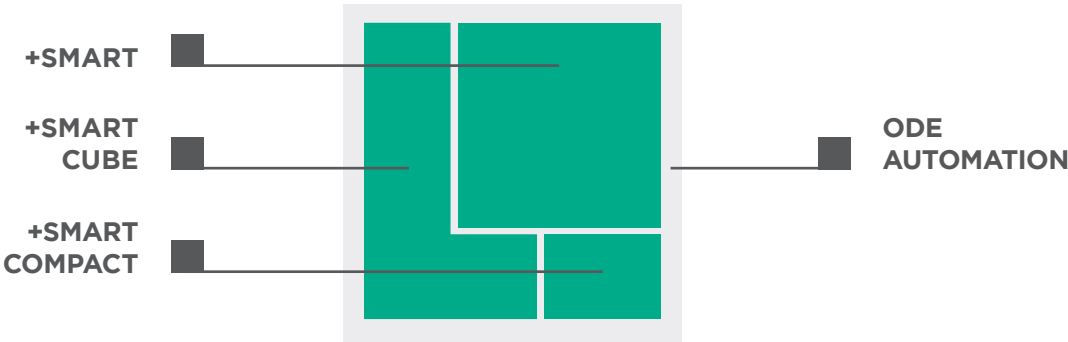


AUTOMATION FROM ODE

VISUALISATION, PLC AND REMOTE MAINTENANCE

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

| PRODUCT | +SMART | +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 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**, 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.





GENERAL FEATURES

FLEXIBILITY

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

FEATURES

As a PLC, **+SMART** 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

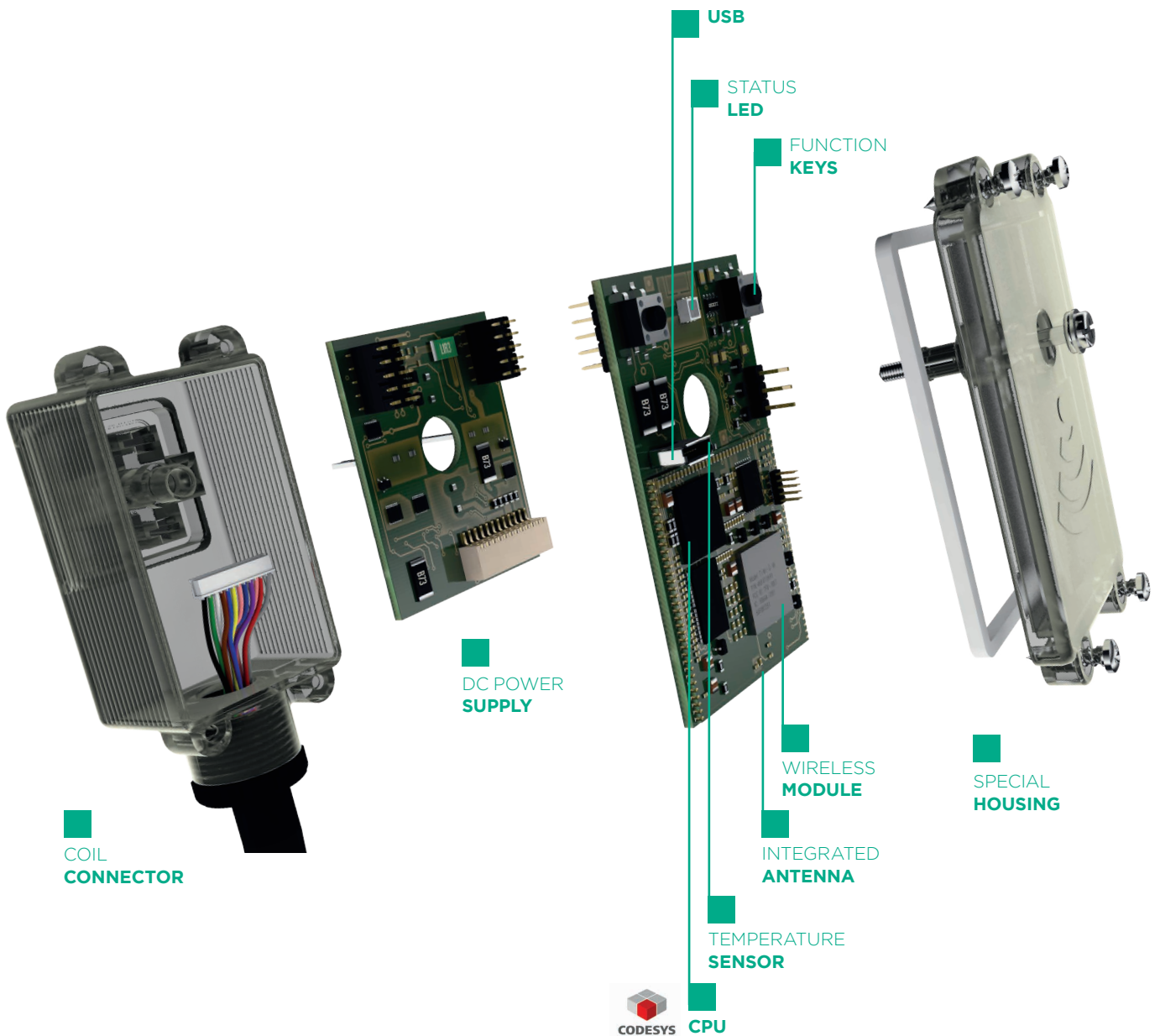
+SMART provides LED signalling to give a better view of operating signals.

SAFETY

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

PRODUCT OVERVIEW

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

PROGRAMMING TOOL

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

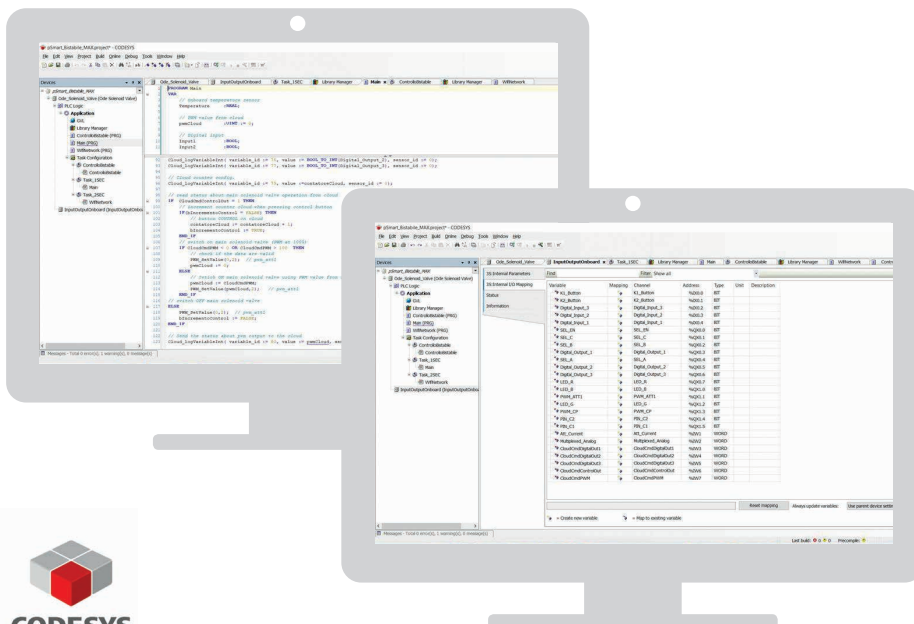
The IEC 61131-3 programming tool is the heart of CODESYS. It offers integrated, user-friendly solutions to support users in developing their tasks.

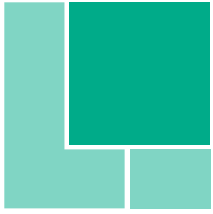
The software includes the following elements:
editors for all IEC programming languages (AWL, ST, CFC/FUP, etc.);
extensive libraries with modules (counter, timer, controller, etc.);
tools for testing, simulation, error search and debugging.

Modbus is the serial communications protocol chosen for **+SMART**. 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.





CLOUD PLATFORM

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

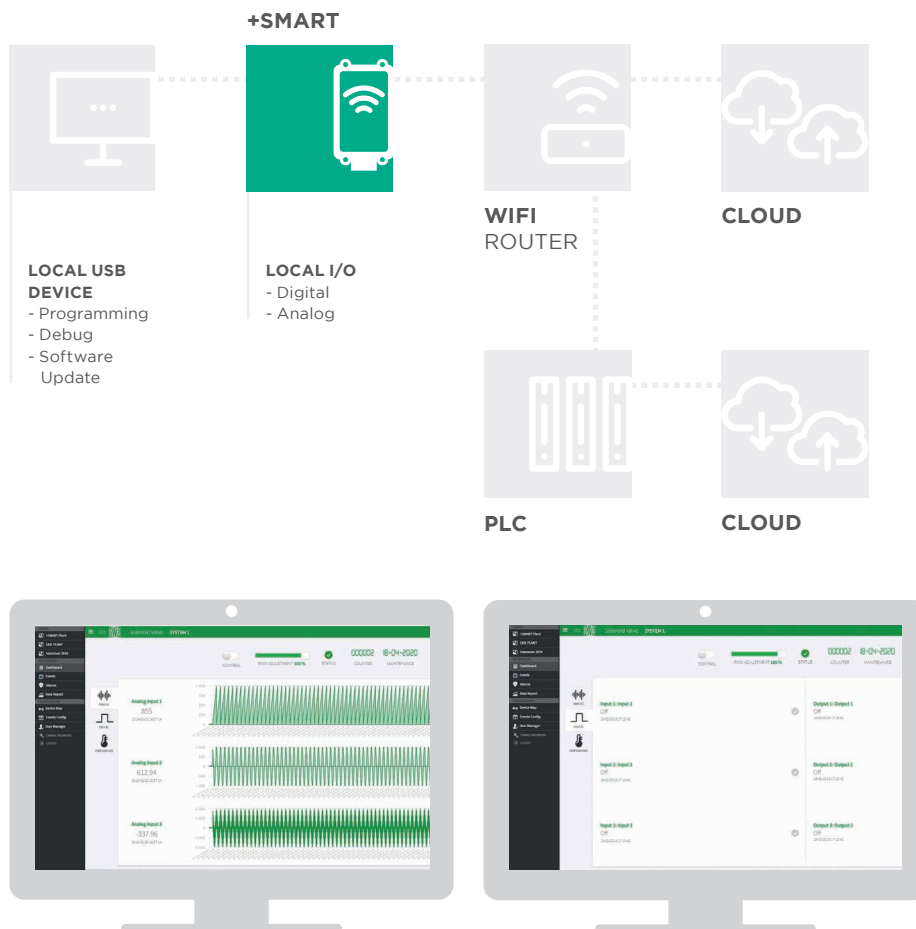
It is possible to manage the remote application maintenance through any kind of devices.

PLATFORM MANAGEMENT:

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

NOTIFICATION OF EVENTS AND ALARMS:

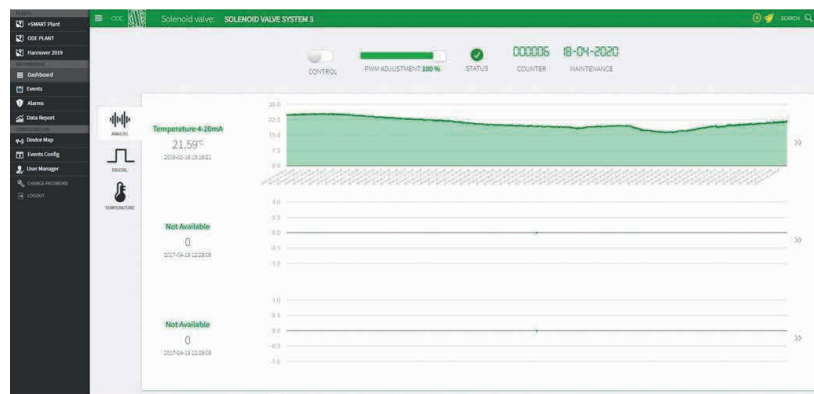
The platform is able to notify the user in several ways with events or alarms by e-mail, SMS or Push Notification.



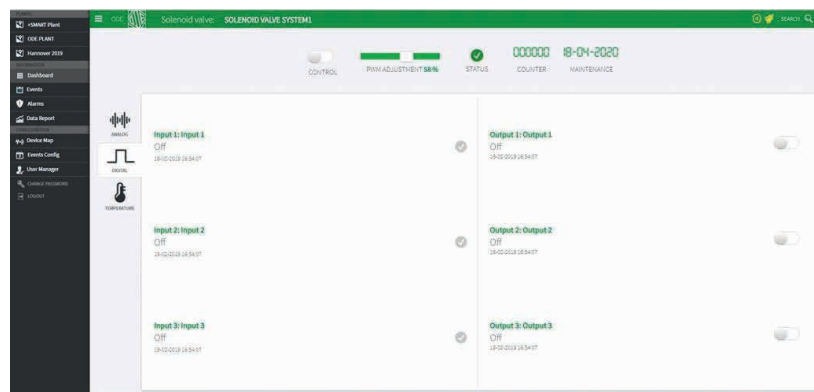
DASHBOARD OVERVIEW

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

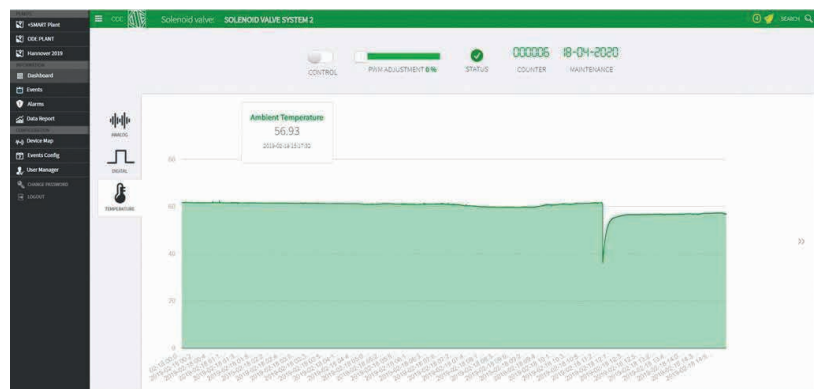
The dashboards allow technical departments, services, marketing and sales to always be aligned on the most important data.



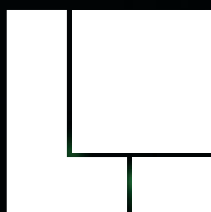
ANALOG
INPUT



DIGITAL
INPUT



INTERNAL
TEMPERATURE



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

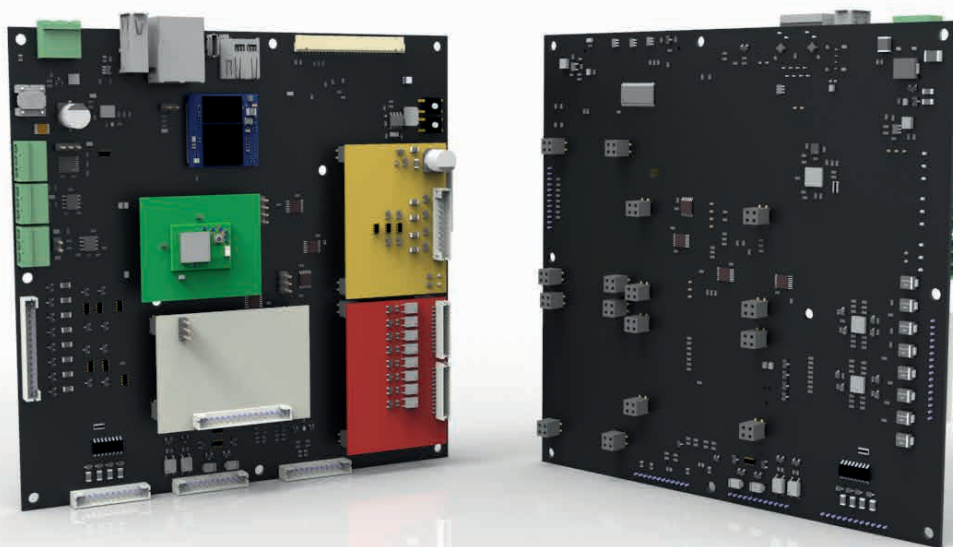
+SMART CUBE ARCHITECTURE

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.





SMART CUBE

OPTIONS

- | | |
|--|---|
| ■ MODULAR ARCHITECTURE (UP TO 8 ADDITIONAL MODULES) | ■ ACTUATOR'S PORTS |
| ■ HIGH PERFORMANCE CPU | ■ CUSTOMER'S PROGRAMMABILITY |
| ■ HIGH RESOLUTION GRAPHICS AND MULTIDISPLAY | ■ INDUSTRIAL MULTIPROTOCOL ETHERNET BASED |
| ■ SOLENOID VALVE ENERGY AND PID MANAGEMENT | ■ CAN, I2C |
| ■ SENSOR'S PORTS | ■ 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 |
| | 4 x 0-10V Analog Input |
| | 2 x 4-20mA Analog Input |
| 1 x Real Time Clock LCD connector for 7" and 10" High resolution Screen and Capacitive Touch | |

OPTIONAL MODULES

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

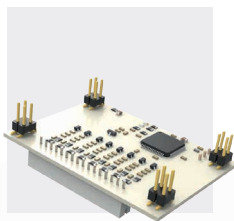
8 x Digital Opto-isolated Inputs
and Outputs

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

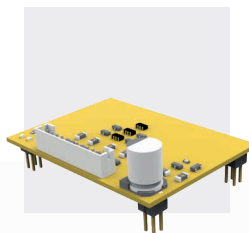
4 x 0-10V, 4 x 4-20mA Analog
Inputs 12 bit

Stepper Motor Driver

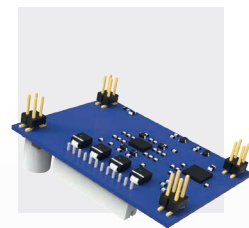
Communication module
(Wifi; 4G; NBIoT; Bluetooth;)



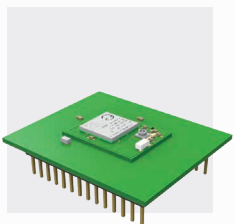
**ANALOG
INPUTS**



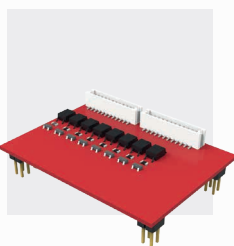
**SOLENOID
VALVE PWM**



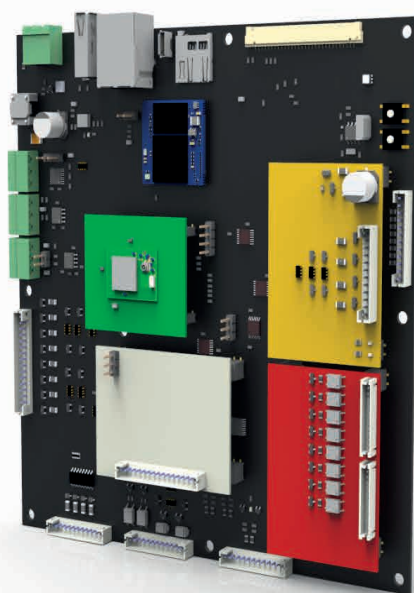
**STEPPER
MOTOR DRIVER**

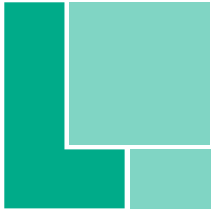


COMMUNICATION



DIGITALS I/O





IOT FOR CLOUD COMMUNICATION

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

+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.



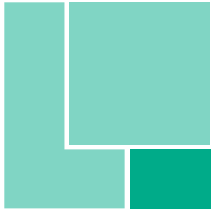
HIGHLIGHTS

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





APPLICATION AND AWARDS

+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.



INDUSTRIAL



PACKAGING



HVAC/HVACR



**FOOD AND
BEVERAGE**



MEDICAL



**WATER &
WASTEWATER**



AUTOMOTIVE



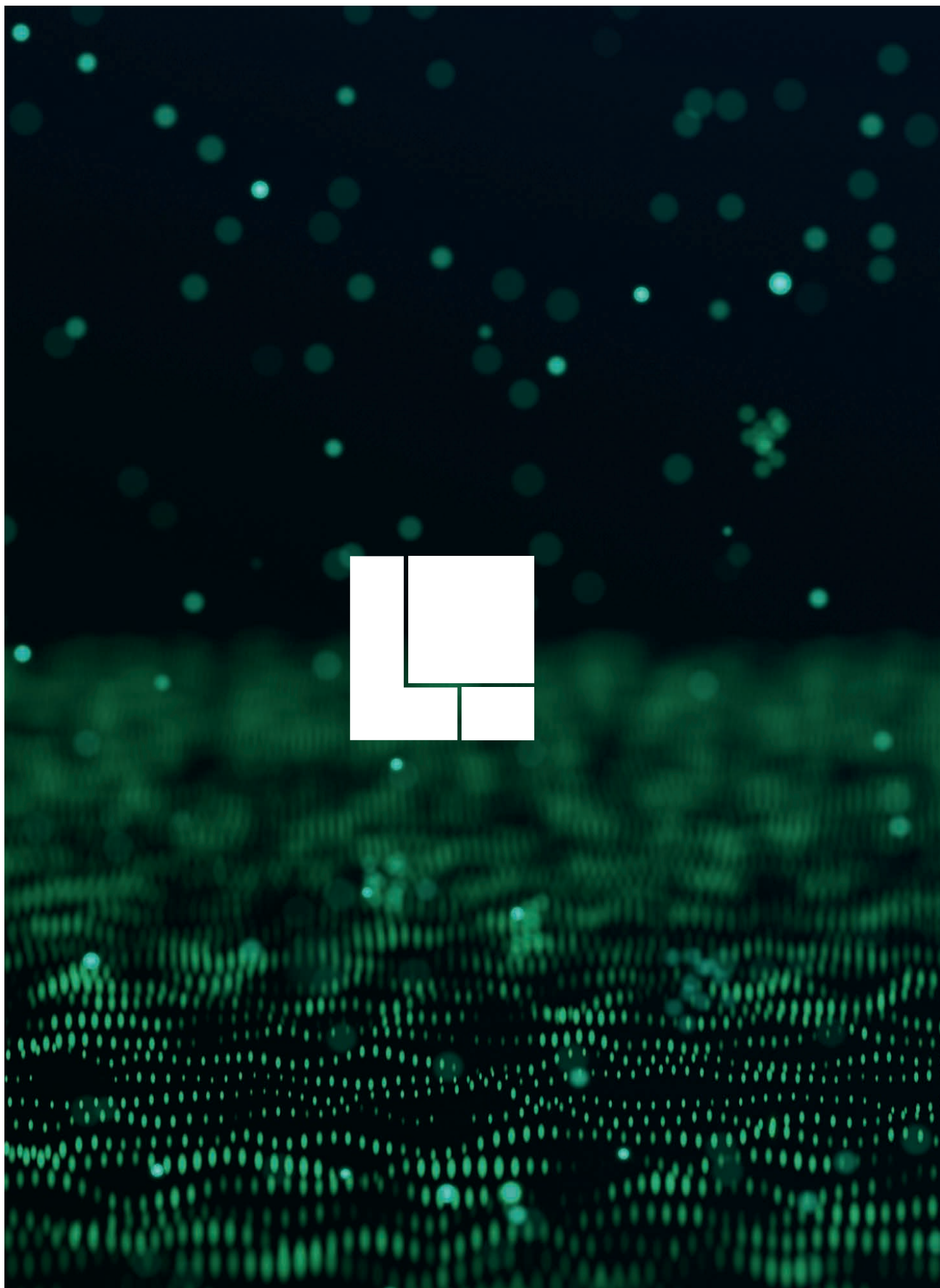
OIL AND GAS



COMPRESSOR



AWARDED AT HOST MILANO 2017
40° international hospitality exhibition





+SMART

+SMART CUBE

+SMART COMPACT

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