

## Smart Building System

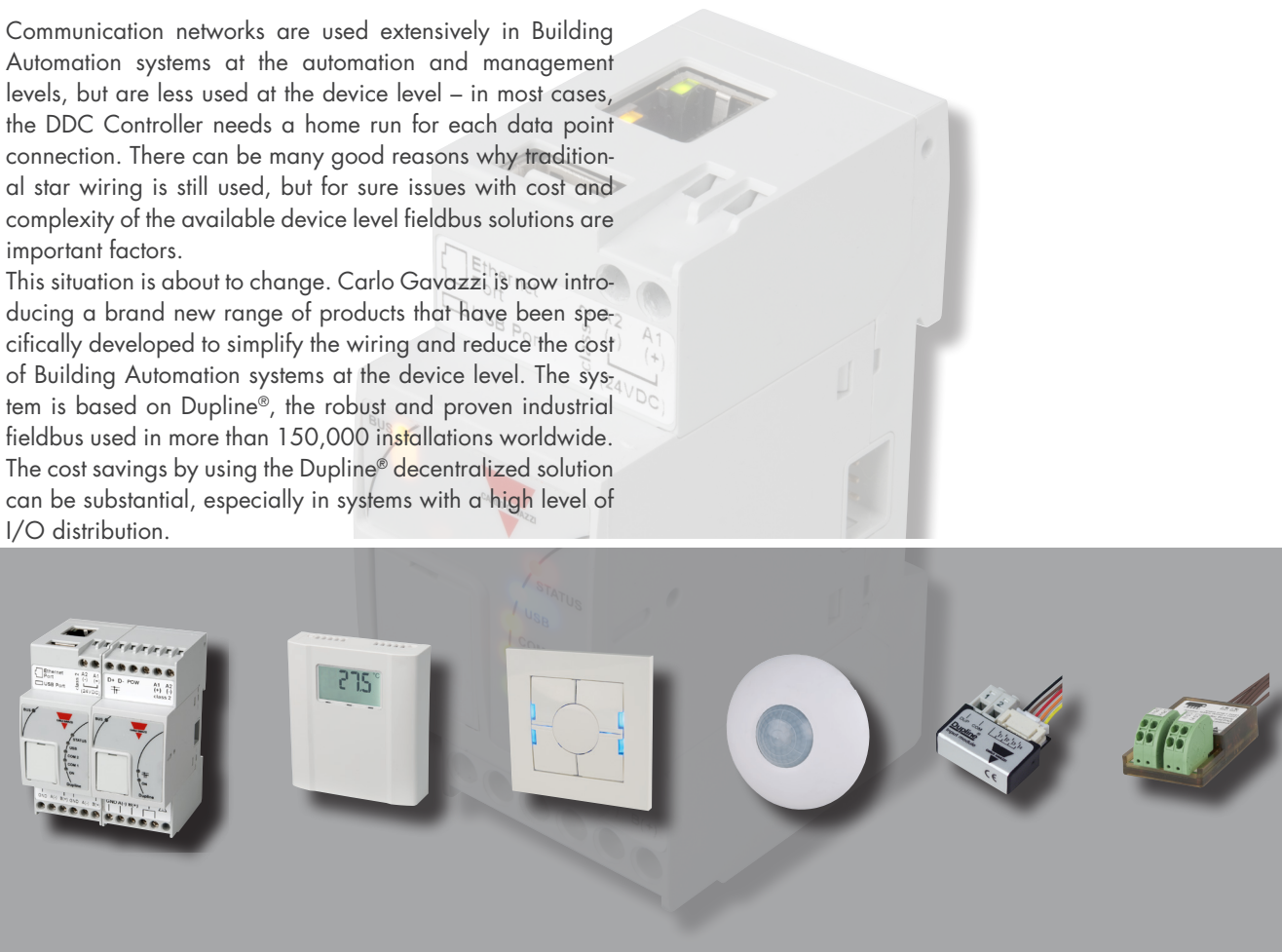
# Fieldbus

# Smart Building System

## Benefit from the Dupline® decentralized solution

Communication networks are used extensively in Building Automation systems at the automation and management levels, but are less used at the device level – in most cases, the DDC Controller needs a home run for each data point connection. There can be many good reasons why traditional star wiring is still used, but for sure issues with cost and complexity of the available device level fieldbus solutions are important factors.

This situation is about to change. Carlo Gavazzi is now introducing a brand new range of products that have been specifically developed to simplify the wiring and reduce the cost of Building Automation systems at the device level. The system is based on Dupline®, the robust and proven industrial fieldbus used in more than 150,000 installations worldwide. The cost savings by using the Dupline® decentralized solution can be substantial, especially in systems with a high level of I/O distribution.



### Dupline® 2-wire bus

Robust and proven technology with over 150,000 installations worldwide including building automation, mining, oil drilling, railroads, and many, many, more...

### Cost reduction using device level bus technology

- Direct interface with industry accepted DDC solutions, using BACnet/IP communications
- Freely compatible with new and existing building automation systems, thus saving time and money on commissioning

### Simplified wiring at the field level

- Standard 2-wire Dupline® bus connecting all devices, such as sensors, indicators and actuators
- Eliminates expensive wiring home runs, saving money on wiring and installation costs versus traditional Device-to-DDC solutions

### Fewer subpanels and DDC controllers

- Distance from subpanel or DDC to field devices is greatly increased using Dupline® 2-wire bus technology
- Number of I/Os of DDC Controller is substantially increased

### Flexible, modular and expandable

- System can easily be expanded by simply extending the Dupline® bus cable and adding the desired modules
- System flexibility, backwards compatibility and expandability save costs by minimizing the requirements for the system
- Last minute changes are easily accommodated

### Easy handling

Easy design, planning, installation and commissioning are inherent features of the Dupline® fieldbus. Saving time in these project phases is a key factor to reduce cost of the complete solution.

## SB2WEB – The BACnet link to Dupline® decentralized I/O

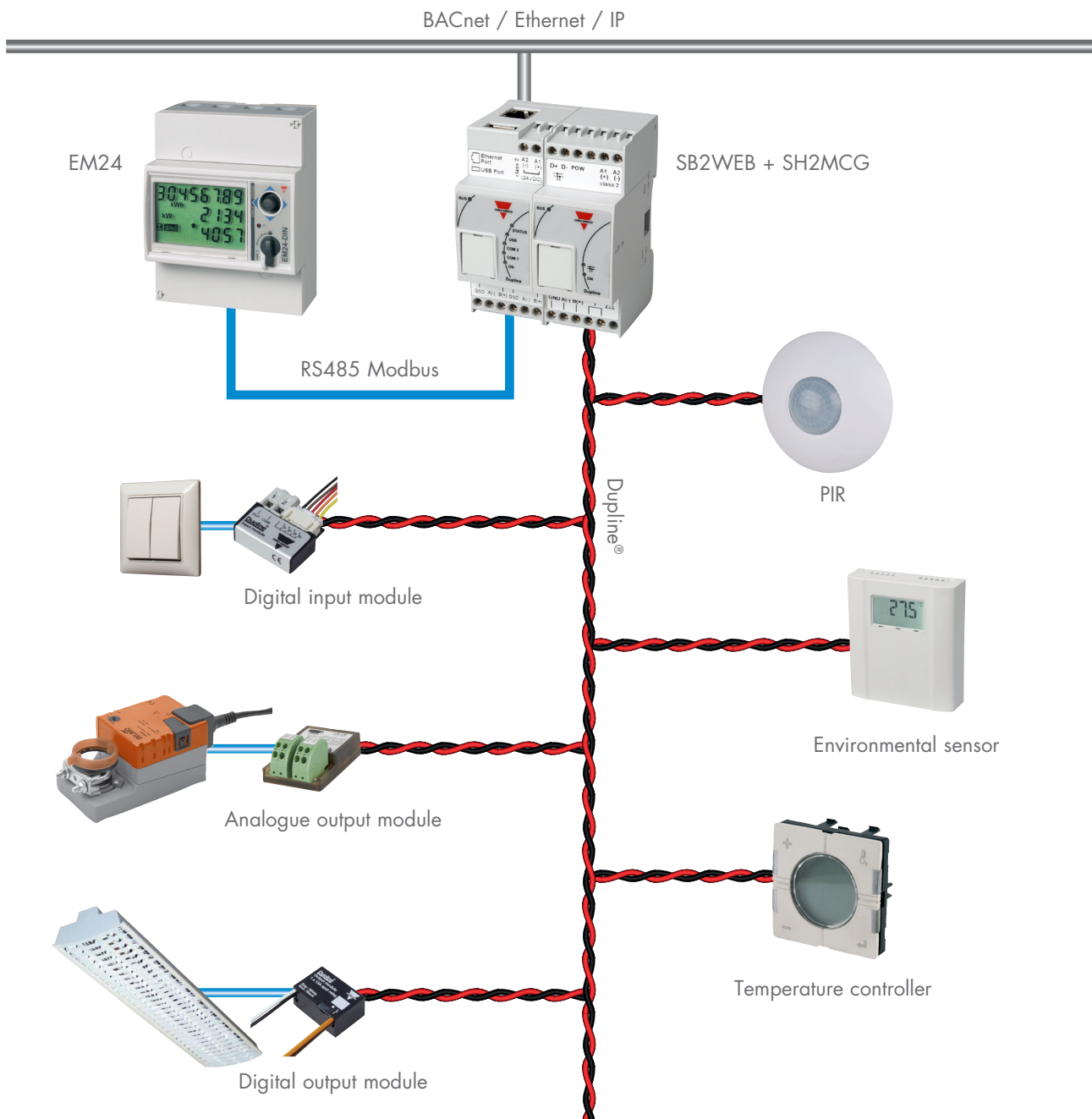
Bus-powered sensors and decentralized I/O-modules installed at the actual field device locations are linked together via the Dupline® 2-wire bus in a multi-drop connection. This greatly simplifies the wiring compared to a DDC star connection. The wiring topology is free, a branch can be made at any point, and even loop wiring providing redundancy is allowed. There is no need for special cable, e.g. a standard

unshielded 2 x 1.5 mm<sup>2</sup> cable can be used, and the cable runs can be up to 5 km long. It is allowed to run the bus cable in parallel with power cables in the same conduit, and cable end terminations are not required.

In order to provide an easy and fast integration with the DDCs and BMS, all the Dupline® data points are automatically made available as BACnet objects through the SB2WEB BACnet

Controller. This allows for all major DDC brands to integrate in a seamless way to the Dupline® system via BACnet/IP.

The SB2WEB also connects via RS485/Modbus to Carlo Gavazzi Energy Meters and 3'rd party devices and makes all the electrical parameters available as BACnet objects.



# Smart Building System

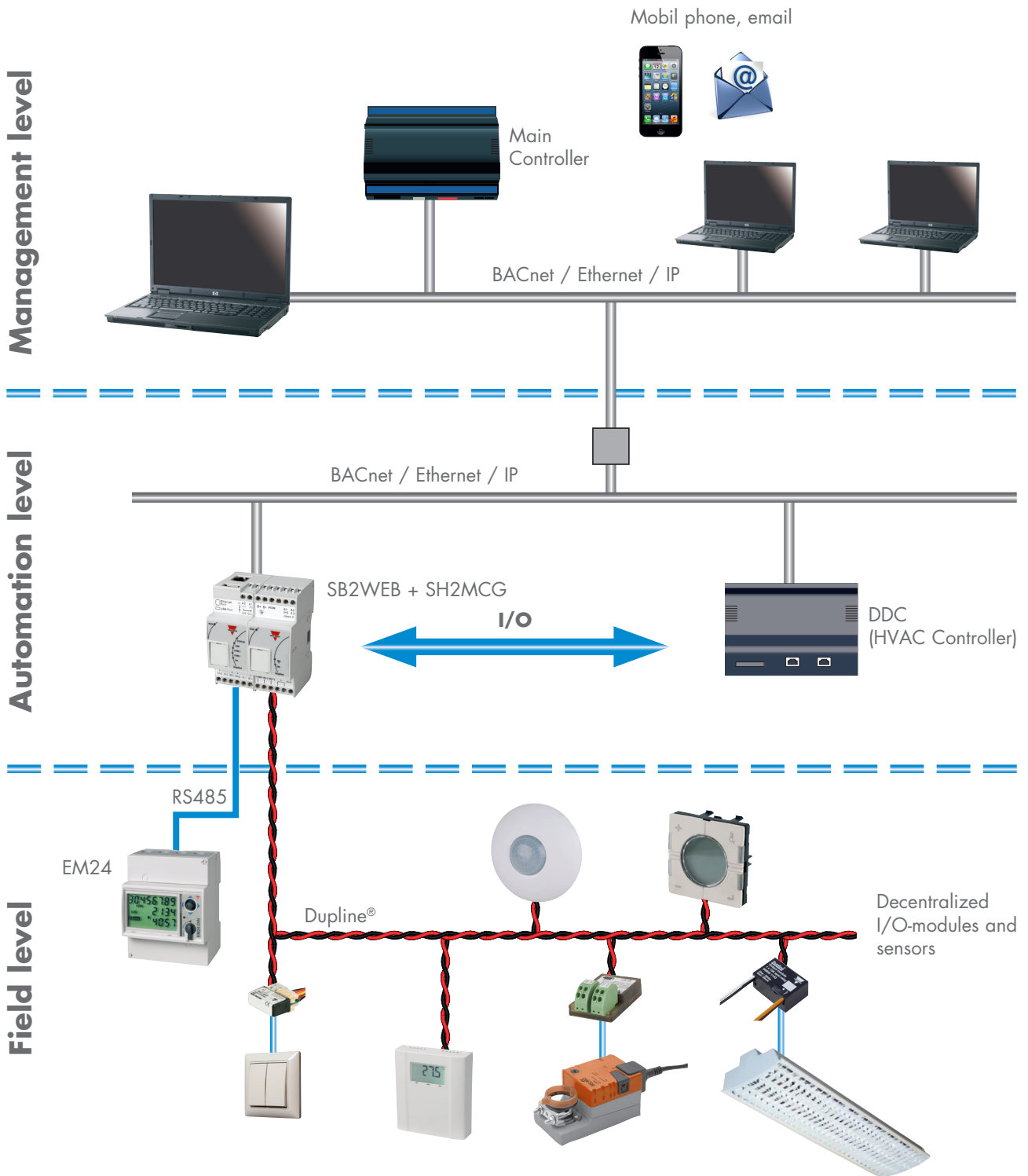
## Benefit from the Dupline® decentralized solution

### SB2WEB – How it fits into the BAS infrastructure

The Dupline® fieldbus carries out the task to link together all the field level devices in a simple and cost-effective way, and centralize the data in the

BACnet Controller SB2WEB. Any DDC and BMS front end with the capability to act as BACnet client then have access to all the Dupline® data points

via the BACnet/IP connection, thereby eliminating the need for hardwired I/O.



## SB2WEB - BACnet building controller

The SB2WEB is the controller in Carlo Gavazzi's modular concept for Smart Buildings. The Linux-based controller is equipped with an Etherport for BACnet/IP and Modbus/TCP communication, and via the two RS485 ports it can collect data from Carlo Gavazzi energy meters and various 3<sup>rd</sup> party modbus devices. Through the local bus connector in the side it connects to up

to 7 Dupline<sup>®</sup> driver modules, each able to manage more than 400 data points. Similar communication modules for DALI and wireless field devices are under development.

### USB

USB port supports flash for data transfer

### Local bus 2

GSM modem

### USB, SD

Data transfer using PC or SD card

### RS485

Modbus-RTU devices



### RJ connection

- BACnet/IP
- Modbus/TCP
- Webserver

### Local bus 1

Communication modules (up to 7)  
- Dupline<sup>®</sup>

### RS485

Energy meters

## Dupline<sup>®</sup> environmental sensors

Carlo Gavazzi's new line of buspowered CO<sub>2</sub>, temperature and humidity sensors provides significant wiring advantages in HVAC control systems, especially in those cases where the sensors are widely distributed into

several rooms of the building. The Dupline<sup>®</sup> 2-wire bus cable is simply multi-dropped from sensor to sensor collecting all the measured values - no power supply is required. If additional sensors are needed later on, it is

merely a question of connecting them to the already existing bus cable. The measured values can be shown on the optional backlit LCD display.



# Smart Building System

## Benefit from the Dupline® decentralized solution

### BACnet building controller



#### SB2WEB24

- Multi-protocol device
- Flexible modular plug-in concept for Dupline® bus drivers
- Manages up to 7 Dupline® Bus segments
- Connects directly to Energy Meters via Modbus RS485
- Any data point and internal value available as BACnet object
- Easy and fast configuration
- Compact 2-DIN housing
- DC Power Supply
- cUL approved

### Dupline® bus driver



#### SH2MCG24

- Master Channel Generator for one Dupline® bus segment
- Capacity for 120 DigIn, 116 Dig-Out, 256 Analogue I/O
- Provides power and communication for the connected Dupline® modules
- Compact 2-DIN housing
- DC Power Supply
- cUL approved

### Digital output modules - DIN-rail



#### SH2RE16A2E230

- DC powered module with 2x16A relay outputs and built-in load energy metering (kWh, W, V, A ..)

#### SH2RE16A4

- Bus-powered module with 4x16A relay outputs

#### SH2SSTRI424

- DC powered module with 4x10W TRIAC outputs for heating valve control

#### SH2ROAC224

- DC powered modules with 4x5A interlock relay outputs for control of 2 roller blind motors, AC or DC

All modules listed above are cUL approved

### Digital input modules - DIN-rail



#### SH2INDI424

- Module with 4 digital inputs
- Input types: NPN, PNP or voltage free
- Inputs can be used as counters
- Compact 2-DIN housing
- DC Power Supply
- cUL approved

### Digital input modules - decentralized



#### BDB-INCON4-U

- Bus-powered small-dimension 4 x contact input module

#### BDB-INCON8-U

- Bus-powered small-dimension 8 x contact input module

#### BDB-IOCP8-U

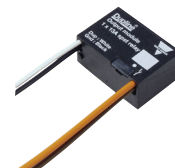
- Bus-powered small-dimension 4 x contact input / 4 x PNP output module

#### BDA-INVOL-U

- Bus-powered small-dimension 1 x voltage input module

All modules listed above are cUL approved

### Digital output modules - decentralized



#### BDA-RE13A-U

- Bus-powered small-dimension 1 x 13A relay output module
- High inrush current capability (130A), thereby suitable for direct lighting loads
- cUL approved

#### SHDRODC230

- AC-powered small-dimension 2 x 5A relay outputs for control of roller blind motor
- Relay interlock function for roller blind motor protection
- cUL approved



## Analogue I/O modules - decentralized



### SHPINV324

- DC powered small-dimension 3 x 0-10 V input module

### SHPINT1P1

- Bus-powered small-dimension 1 x 10K3 + 1 x Variable resistor input module

### SHPINV2T1P124

- DC powered small-dimension 1 x 10K3 + 1 x Variable resistor + 2 x 0-10 V input module

### SHPOUTV224

- DC powered small-dimension 2 x 0-10 V output module

All modules listed above are cUL approved

## Environmental sensors



- Bus-powered, low current consumption sensors for temp. and %RH
- Wall-mounting
- Available in different combinations
- CO<sub>2</sub> measuring range: 0 to 2000 ppm
- CO<sub>2</sub> measurement: Dual source infrared NDIR technology
- Temperature measuring range: -20 to +50°C (-4 to 122°F)
- Humidity measuring range: 0 to 100 %RH

### SHSUXXXXD

- Environmental sensor with backlit LCD display
- Touch button in the front to switch on backlighting and select value

### SHSUXXXXL

- Environmental sensor with RGB traffic light for CO<sub>2</sub> level indication

### SHSUXXXX

- Environmental sensor with blind front plate

## PIRs



### SHSQP360L

- Bus-powered PIR detector 360° for ceiling mounting

### SHXXXP90L & SHSDP90L

- Bus-powered 90° PIR detector with LUX for wall-mounting

### SHSPP90L

- Bus-powered 90° PIR detector with LUX for outdoor use

### SHSPP90LA

- Bus-powered 90° PIR detector with LUX

All modules listed above are cUL approved

## Light switches



### SHE5XLS4TH

- Bus-powered light switch with 4 programmable pushbutton inputs + 4 LED outputs
- Fits into sockets from Gira, Jung and ELKO (55x55 mm)
- Built-in temperature and humidity sensors
- Temperature range: -40 to +60°C (-40 to 140°F)
- Humidity range: 5-95 %RH
- cUL approved

### SHA4XLS4TH

- Fits into sockets from Schneider (DK), Nico (B) and Legrand
- Other functions and features are identical to SHE5XLS4TH (see above)

## Temperature controllers



### SHE5XTEMDIS

- Temperature controller with display
- Fits into sockets from Gira, Jung and ELKO (55x55 mm)
- Shows room, floor and outdoor temperatures
- Switch ON/OFF heating / cooling
- Set wanted room/floor temperature
- Energy Save through 3 heating/cooling setpoints
- cUL approved

### SHA4XTEMDIS

- Fits into sockets from Schneider (DK), Nico (B) and Legrand
- Other functions and features are identical to SHE5XTEMDIS (see above)

## Other sensors and detectors



### BSN-ANE-U

- Bus-powered wind sensor

### BSF-WAT-U

- Bus-powered water leakage detector

### BSG-SMOA-U

- Buspowered smoke detector without battery backup

### BSG-SMO-U

- Buspowered smoke detector with battery backup

### BSH-LUX-U

- Buspowered lux sensor

### BSI-TEMANA-U

- Buspowered outdoor temperature sensor

## OUR SALES NETWORK IN EUROPE

**AUSTRIA** - Carlo Gavazzi GmbH  
Ketzergasse 374, A-1230 Wien  
Tel: +43 1 888 4112  
Fax: +43 1 889 10 53  
office@carlogavazzi.at

**BELGIUM** - Carlo Gavazzi NV/SA  
Mechelsesteenweg 311, B-1800 Vilvoorde  
Tel: +32 2 257 4120  
Fax: +32 2 257 41 25  
sales@carlogavazzi.be

**DENMARK** - Carlo Gavazzi Handel A/S  
Over Hadstenvej 40, DK-8370 Hadsten  
Tel: +45 89 60 6100  
Fax: +45 86 98 15 30  
handel@gavazzi.dk

**FINLAND** - Carlo Gavazzi OY AB  
Petaksentie 2-4, FI-00661 Helsinki  
Tel: +358 9 756 2000  
Fax: +358 9 756 20010  
myynti@gavazzi.fi

**FRANCE** - Carlo Gavazzi Sarl  
Zac de Paris Nord II, 69, rue de la Belle  
Etoile, F-95956 Roissy CDG Cedex  
Tel: +33 1 49 38 98 60  
Fax: +33 1 48 63 27 43  
french.team@carlogavazzi.fr

**GERMANY** - Carlo Gavazzi GmbH  
Pfnorsir. 10-14  
D-64293 Darmstadt  
Tel: +49 6151 81000  
Fax: +49 6151 81 00 40  
info@gavazzi.de

**GREAT BRITAIN** - Carlo Gavazzi UK Ltd  
7 Springlakes Industrial Estate,  
Deadbrook Lane, Hants GU12 4UH,  
GB-Aldershot  
Tel: +44 1 252 339600  
Tel: +44 1 252 326 799  
sales@carlogavazzi.co.uk

**ITALY** - Carlo Gavazzi SpA  
Via Milano 13, I-20020 Lainate  
Tel: +39 02 931 761  
Fax: +39 02 931 763 01  
info@gavazziacbu.it

**NETHERLANDS** - Carlo Gavazzi BV  
Wijkemeerweg 23,  
NL-1948 NT Beverwijk  
Tel: +31 251 22 9345  
Fax: +31 251 22 60 55  
info@carlogavazzi.nl

**NORWAY** - Carlo Gavazzi AS  
Melkeveien 13, N-3919 Porsgrunn  
Tel: +47 35 93 0800  
Fax: +47 35 93 08 01  
post@gavazzi.no

**PORTUGAL** - Carlo Gavazzi Lda  
Rua dos Jerónimos 38-B,  
P-1400-212 Lisboa  
Tel: +351 21 361 7060  
Fax: +351 21 362 13 73  
carlogavazzi@carlogavazzi.pt

**SPAIN** - Carlo Gavazzi SA  
Avda. Iparraguirre, 80-82,  
E-48940 Leioa (Bizkaia)  
Tel: +34 94 480 4037  
Fax: +34 94 480 10 61  
gavazzi@gavazzi.es

**SWEDEN** - Carlo Gavazzi AB  
V:a Kyrkogatan 1,  
S-652 24 Karlstad  
Tel: +46 54 85 1125  
Fax: +46 54 85 11 77  
info@carlogavazzi.se

**SWITZERLAND** - Carlo Gavazzi AG  
Verkauf Schweiz/Vente Suisse  
Sumpfstrasse 3,  
CH-6312 Steinhausen  
Tel: +41 41 747 4535  
Fax: +41 41 740 45 40  
info@carlogavazzi.ch

## OUR SALES NETWORK IN THE AMERICAS

**USA** - Carlo Gavazzi Inc.  
750 Hastings Lane,  
Buffalo Grove, IL 60089, USA  
Tel: +1 847 465 6100  
Fax: +1 847 465 7373  
sales@carlogavazzi.com

**CANADA** - Carlo Gavazzi Inc.  
2660 Meadowvale Boulevard,  
Mississauga, ON L5N 6M6, Canada  
Tel: +1 905 542 0979  
Fax: +1 905 542 22 48  
gavazzi@carlogavazzi.com

**MEXICO** - Carlo Gavazzi Mexico S.A. de C.V.  
Calle La Montaña no. 28, Fracc. Los Pastores  
Naucalpan de Juárez, EDOMEX CP 53340  
Tel & Fax: +52.55.5373.7042  
mexicosales@carlogavazzi.com

**BRAZIL** - Carlo Gavazzi Automação Ltda.  
Av. Brig. Luis Antônio, 3067  
Jd. Paulista - São Paulo - SP  
CEP 01401-000  
Tel: +55 11 3052 0832  
Fax: +55 11 3057 1753  
info@carlogavazzi.com.br

## OUR SALES NETWORK IN ASIA AND PACIFIC

**SINGAPORE** - Carlo Gavazzi Automation  
Singapore Pte. Ltd.  
61 Tai Seng Avenue  
#05-06 UE Print Media Hub  
Singapore 534167  
Tel: +65 67 466 990  
Fax: +65 67 461 980  
info@carlogavazzi.com.sg

**MALAYSIA** - Carlo Gavazzi Automation  
(M) SDN. BHD.  
D12-06-G, Block D12,  
Pusat Perdagangan Dana 1,  
Jalan PJU 1A/46, 47301 Petaling Jaya,  
Selangor, Malaysia.  
Tel: +60 3 7842 7299  
Fax: +60 3 7842 7399  
sales@gavazzi-asia.com

**CHINA** - Carlo Gavazzi Automation  
(China) Co. Ltd.  
Unit 2308, 23/F.,  
News Building, Block 1, 1002  
Middle Shennan Zhong Road,  
Shenzhen, China  
Tel: +86 755 83699500  
Fax: +86 755 83699300  
sales@carlogavazzi.cn

**HONG KONG** - Carlo Gavazzi  
Automation Hong Kong Ltd.  
Unit 3 12/F Crown Industrial Bldg.,  
106 How Ming St., Kwun Tong,  
Kowloon, Hong Kong  
Tel: +852 23041228  
Fax: +852 23443689

## OUR COMPETENCE CENTRES AND PRODUCTION SITES

Carlo Gavazzi Industri A/S  
Hadsten - **DENMARK**

Carlo Gavazzi Ltd  
Zejtun - **MALTA**

Carlo Gavazzi Controls SpA  
Belluno - **ITALY**

Uab Carlo Gavazzi Industri Kaunas  
Kaunas - **LITHUANIA**

Carlo Gavazzi Automation  
(Kunshan) Co., Ltd.  
Kunshan - **CHINA**

## HEADQUARTERS

Carlo Gavazzi Automation SpA  
Via Milano, 13 - I-20020  
Lainate (MI) - **ITALY**  
Tel: +39 02 931 761  
info@gavazziautomation.com



**CARLO GAVAZZI**  
Automation Components

*Energy to Components!*

www.gavazziautomation.com

