domat
MEMBER OF CEZ ESCO

PRODUCT OVERVIEW

Energy under control

CONTENTS

COMPANY PROFILE

Domat Control System provides a comprehensive range of products and system solutions for building, energy control and measuring systems. The company mission is to develop, produce, and distribute building and industry control systems worldwide. We at Domat Control System focus on reliability, advanced technologies, modern communication features, remote access, and flexibility: the system development is able to swiftly respond to customers' demands which is a must at today's projects. Standard signals, interfaces, and communication protocols are used at all system levels. Therefore, the system is open for a wide range of integrated solutions. In addition, our own hardware and software development team allow us to respond flexibly to the lack of certain components on the market and thus maintain continuity of all deliveries. We are also certified ISO 9001, 14001 and 27001.

SYSTEM SOLUTIONS

For construction companies, developers, and end customers, Domat Control System offers turnkey installations – calculation, design, cabling, cabinets, installations, programming, commissioning, and service. The company team has long-term experience at both domestic and international projects, executed for global market players in industry, energetics, retail, development and facility management. A special segment are centralised management systems for retail chains, energy production and distribution plants, and other distributed systems.

PRODUCT SALES

Domat Control System delivers a comprehensive range of control components, including input and output peripherals, to system integrators, HVAC manufacturers and other customers. Programmable controllers, converters and individual room controllers, as well as the programming and configuration software, are designed and manufactured in the Czech Republic. All system software tools are free of charge. Domat provides regular trainings and extensive individual technical support. Customers can be sure to finish their projects successfully and on time.

SERVICE AND OPERATIONS

Handing over of a project is in fact the starting point of co-operation with customers. Domat Control System provides warranty and post-warranty service of control systems, and operates technology IT networks and management systems, mainly the ContPort – a cloud service for storage, processing and presentation of energy data. ContPort is used by facility managers and energy systems operators who need to record and interpret operation data, such as temperatures, energy consumptions, environmental data, etc. Regular service of building control systems includes also optional preventive maintenance, periodic seasonal inspections, and out-of-hours service.

DOMAT INTERNATIONAL

Based in the Czech Republic, Domat Control System co-ordinates its daughter company in Slovakia and a network of system partners in Armenia, Austria, Benelux, Bulgaria, Croatia, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Jordan, Lithuania and Latvia, Malaysia, Netherlands, Norway, Poland, Portugal, Qatar, Romania, Slovenia, Serbia, Spain, Sweden, Switzerland, Turkey, Vietnam.

PRODUCTS AND SERVICES

- Providing hardware and software components to system integrators
- Consulting services and design of HVAC controls and building control systems
- Comprehensive, turnkey solutions of HVAC and building control systems and system integrations
- Service and upgrades of turnkey installations
- Technical support and free proofreading of projects and shop drawings containing Domat components
- Free trial of system components and licenses for 30 days
- Free trainings for designers, software engineers, and users

ISO 9001:2016
ISO 14001:2016
ISO 27001:2014
BUREAU VERITAS
Certification

Modbus MEMBER
Member of Modbus Organization

BACnet®
BACnet Vendor

SYSTEM ADVANTAGES

1 Web access at automation level, easy-to operate SCADA graphics, flexibility, fast and safe installation

2 Open system working on standard platforms, using Ethernet and most of the protocols used by BMS manufacturers

3 Possibility of choice of hardware – card WALL/modular MARK, both programmable in one software environment Merbon

4 Dozens of compatible M-Bus meter types, easy integration

5 Complete system from room sensors to database applications

6 Smart control of energy production and distribution, e.g. based on weather forecast

Individual technical support and trainings
7 • Training and Technical Support Center Prague – Klecany
   T: +420 461 100 666, E: support@domat.cz
   WhatsApp +420 732 806 418, www.domat.cz

INTERESTING PRODUCTS

wMXcom – assembly with processor unit, 88 inputs and outputs, universal serial port, support of Modbus/BACnet protocols, 2x Ethernet, web server, programming in Merbon IDE environment, reasonably priced

markMX.3 – compact controller with 88 inputs and outputs, 4 serial ports, 2x Ethernet, web server, programming in Merbon IDE

IMIO110.2 – small powerful compact controller with display and buttons, 16 inputs and outputs, RS485 serial port, 2x Ethernet

UI3xx – communicative room controller with PIR, CO_2, rH and external temperature connection

RO91 – DALI/Modbus TCP converter, multimaster, complete DALI command set (via Modbus ballast settings) and simple control of ballasts, groups and scenes via direct write

DIP200 – combined communicative (Modbus RTU) motion and lighting sensor for control lights and air conditioning in offices, workshops and common areas

FCRO13 – communicative controller for HVAC systems 2x DO, 3x AO, 2x DI, 2x RS485, use in combination with the UCO13 room controller, which measures temperature

HIGHLIGHTS

Domat Control System perceives its commitment to provide advanced solutions and up-to-date technology. As a consequence, we always do our best to introduce new products, services and product updates on a frequent basis. Below please find the list of the most important changes in the product range.

Redesign of the MARK PLC.2/LX series

As part of the redesign of the MARK series controller, which was necessary due to the availability of components for production, the most of the PLCs in this series have had their 2nd generation. The change involved PLC mark320LX, mark220LX, mark130.2 markMX.2/.3, ICIO205.2, IMIO105.2, IMIO110.2. It was an opportunity to focus on the new features of these controllers while completely changing the printed circuit board. A major change was made to the PLCs IMIO105.2/IMIO110.2, mark130.2 and ICIO205.2, where the original processor was replaced by a more powerful one, which enables the use of the Linux operating system. This made it possible to compare the performance of our PLCs to a higher level. Another new feature is a dual Ethernet port, which can be useful when a graphic terminal has to be connected to the PLC and remote access to the PLC via web or SCADA from another network shall be available at the same time.

Compact PLC w751-9301:
new platform of the WALL series

As part of the expansion of the hardware platform of the WALL series, which is advantageous for its flexibility (card system), a small powerful compact with 8 DI, 4 DO, 4 AI, 2 AO is now available. It also contains a RS485 serial interface, two Ethernet interfaces and support for Modbus and BACnet protocols. The WALL series system is an attractive solution especially for applications such as home heat recovery units, air handling units or compact heat exchangers. The advantage is remote management via Merbon WEB, Merbon Visual or Merbon SCADA control panel. Mutual compatibility with the HT200 panel.

More powerful platforms
in the WALL and MARK series

We have expanded both our WALL and MARK series with new, more powerful processor variants. In the MARK series this is the mark520, which includes 2x RS485, Ethernet, 2x RS232, display with buttons, and the markMXL, which includes 88 inputs and outputs, 2x RS485, 2x Ethernet and 2x RS232. In the WALL series, this is the w750-8212 processor. All of these controllers feature larger RAM and flash memory. This enables .NET driver support on these processor units. These .NET drivers will also be supported by w751-9301.

SYSTEM OVERVIEW

1 Energy management system

ContPort is a software package for energy consumption analysis – a customized database client for history data processing. It contains a ticketing system, online data access, statistic modules and benchmarking. ContPort evaluates energy flows in buildings and exports the processed data into enterprise management systems. It is a tool for system optimization, effective energy saving, and performance contracting services.

2 SCADA

Environment supports visualization of technological schemes, as well as clear tabular access to process values. Easy access using a web browser. Thanks to the flexible topology provides evaluation and routing of alarms, storage of historical data and a wide range of communication options with Domat Control System as well as with other control and regulation systems.

3 Process stations

The core of the Domat Control System topology are process stations with Merbon RUNTIME, a freely programmable DDC application with universal and HVAC-specific blocks. Two hardware platforms WALL and MARK, plus one Merbon programming environment IDE. They run on the Linux operating system.
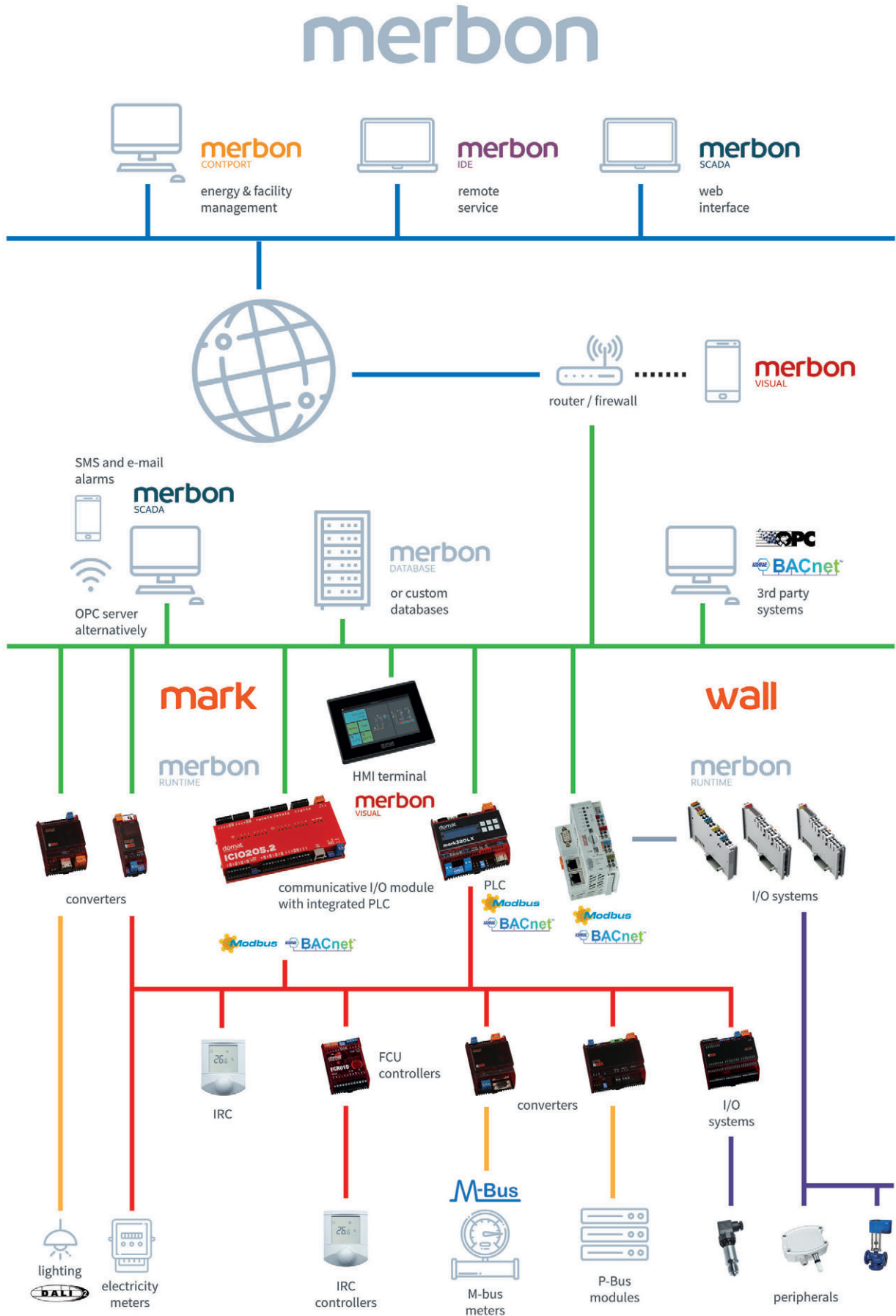
4 I/O modules

The Domat Control System input and output modules provide standardized interfaces between the process and the control system. It is used not only for regulation and control, but for data acquisition in metering systems as well. Standard modules (4/12 DO, 16/32 DI, 8 AI, 8 AO, counters), and compact modules with HVAC-optimized I/O mix are available. In the WALL series, the possibility of composing the number of signals using individual cards is even more flexible. The controllers of the individual rooms are also integrated at this level.

5 Peripherals

A broad range of Domat Control System peripherals: temperature, humidity, pressure, air quality (VOC, CO_2), and light sensors with standard outputs for both indoor and outdoor usage. Thermostats for air and water, safety elements, and other components provide reliable data for the superset system layers. Elegant room controls and sensors also in customer design.

SYSTEM TOPOLOGY

merbon

merbon CONTPORT — energy & facility management

merbon IDE — remote service

merbon SCADA — web interface

router / firewall ······ merbon VISUAL

SMS and e-mail alarms

merbon SCADA

OPC server alternatively

merbon DATABASE — or custom databases

OPC BACnet — 3rd party systems

mark

merbon RUNTIME

HMI terminal

merbon VISUAL

converters

communicative I/O module with integrated PLC

Modbus BACnet

PLC

Modbus BACnet

Modbus BACnet

wall

merbon RUNTIME

I/O systems

IRC

FCU controllers

converters

I/O systems

M-Bus

lighting DALI

electricity meters

IRC controllers

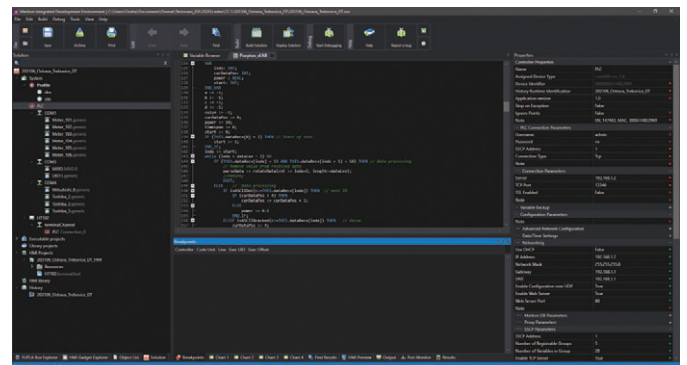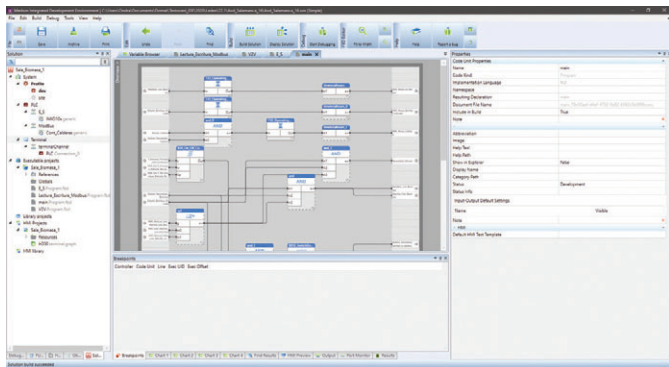M-bus meters

P-Bus modules

peripherals

MERBON IDE DEVELOPMENT ENVIRONMENT

The MARK and WALL process stations are configured and programmed in the Merbon Integrated Development Environment (IDE). Programming is supported in two languages: function blocks (FUPLA) and structured text (ST) according to IEC 61131-3. Programming with function blocks speeds up development of simple and standard applications, while the structured text is more suitable for complex and special functions. Both languages can be combined in the setup.

Users may work in Simple mode where most of the functions are preconfigured with lower flexibility, or in Full mode with complete access to all program functions. In simple mode, the project is limited to a single process station, there is a single task in the controller, and only programming with function blocks is available. Therefore, it is more suitable for beginners or projects where more engineers will be involved in commissioning: using function blocks increases readability and reduces errors.

In Full mode, it is possible to combine both block and structured text programming, but above all to create your own function blocks and functions, again in both languages: FUPLA and ST. For comfortable commissioning, Merbon IDE contains an intuitive debugger with program tracing, step-by-step debugging, and stepping into procedures and composed function blocks. It is also possible to trend the variables and monitor the serial communication (port monitor), even over the Internet. Merbon IDE thus helps saving service and commissioning costs. Now the PLC can also store historical data in its memory, which can be later downloaded as a CSV file.

The user interface attracts by its ribbon with function buttons which adapts to context and always offers functions which make sense in the current situation. The ribbon helps to speed up the learning curve and engineering. Both menu and help are available in English and Czech with possible translation into other languages. The project engineering is fast and efficient thanks to predefined functions and function blocks listed in six libraries: analogue, digital, string-oriented, communication, system functions, and HVAC functions. The libraries contain all basic ST blocks and functions according to IEC 61131-3, together with proven function blocks as known from SoftPLC IDE.

Merbon IDE supports BACnet/IP, Modbus RTU a TCP, all of them as client and as server, M-Bus, and IEC 62056-21 for metering data readout. Communication between process stations and to SoftPLC controllers is possible. Another attractive feature which is implemented in Merbon IDE is creating customized bus devices. The devices can be modified and copied easily, which speeds up engineering of 3rd party technologies like integrated room controllers, VSDs, meters, etc.

Merbon IDE requires .NET4.5 at Microsoft Windows Vista (Service Pack 2 and above), or Windows 7 - 11.

MARK... CONTROLLERS

The MARK... process stations bring flexibility of freely programmable devices to the I/O module level. Thanks to modern technologies, Domat offers compact controllers IMIO110.2 (16 I/O, LCD display) and ICIO205.2 (30 I/O) with Ethernet and RS485 in the new range of PLCs. For larger sites, the markMX with 88 I/Os is the right choice. Compact process stations combine the control unit and I/O modules in one housing, which makes installation easier. It is still possible to extend the system with standard I/O modules over the RS485 interface. The Ethernet interface is used for programming and client communication, such as SCADA, web browser, or 3rd party programs.

Process station with no integrated I/Os can be used both in standard control system with I/O modules, and as freely programmable protocol converters and communicators. Controllers with one RS485 port (mark130.2, mark220LX), or with two RS485 and two RS232 ports (mark320LX) are available. These process stations are perfect for small sites, such as compact heat exchange stations, small home controllers, or heat pump and small AHU controllers.

The controllers use the operating system Linux, which runs on the ARM® Cortex® processor i.MX6UL. Some of them are also available in a version for panel door with IP65 protection (mark130.2).

The MARK... process stations are part of the open controller range by Domat Control System. Free OPC server is supplied for easy 3rd party integration. It is possible to integrate heat, electricity and water meters, as well as other technologies (e.g. VSDs and heat pumps) at the automation level, as the process stations support standard protocols – IEC62056-21, M-Bus client and Modbus RTU/TCP client and server. All types include BACnet client and server.

All controllers have an Ethernet interface for client connection, web access and configuration. The SSCP protocol, which is used for configuration, programming, and process data communication, is fit for Internet communication because of autentification and TLS encryption. It also makes possible to upload new software to the controllers on a remote basis, even over the SSCP protocol/RS485, which can be used at refurbishments of old sites where it is not possible to set up an Ethernet network. The controllers also support direct writing into Merbon DATABASE and Proxy server, which simplifies communication to controllers which are located in corporate networks where neither NAT mapping nor VPN communication is possible.

Type	Display	RS232	RS485	Ethernet	I/O	.NET driver
IMIO105.2	–	–	1	2	16	–
IMIO110.2	LCD 3x16	–	1	2	16	–
ICIO205.2	–	–	1	2	30	–
mark130.2	LCD 4x20	1	1	1	–	–
mark220LX	LCD 3x16	–	1	1	–	–
mark320LX	LCD 3x16	2	2	1	–	–
mark520	LCD 3x16	2	2	2	–	YES
markMX.3	–	2	2	2	88	–
markMXL	–	2	2	2	88	YES

I/O MODULES

The I/O modules and peripherals are connected to serial ports either directly, or over separating interface converters. The I/O modules are powered by 10 to 30 V DC or 12 to 24 V AC. Inputs and outputs, power part and communication are optically separated from each other which prevents the rest of the bus from damage in case of overvoltage at one module. Each module is addressed by a configuration software, or by Merbon IDE when commissioning (possibly also using the DIP switches on the device). Analogue inputs provide configurable measuring range: either they are declared as active (0..10 V, 0(4)..20 mA) or passive for connection of all common temperature sensor types (Pt100, Pt500, Pt1000, Ni1000-5000, Ni1000-6180). For special sensor characteristics, each input can be separately linearized with freely defined linearization curve.

Digital outputs with relays can switch directly 230 V AC low voltage, so that for small loads no separate contactors/relays are necessary. Digital inputs and outputs statuses are indicated by LEDs.

The modules communicate over a separated RS485 bus with Modbus RTU at configurable baudrate. Using a standard protocol, they provide an open I/O bus also for 3rd party manufacturers. All Modbus tables are available at www.domat.cz. The other way round, 3rd party devices, such as variable speed drives, IRC controllers, and energy meters using one of the supported protocols can be integrated directly into the process station. Sometimes they can be even connected to the same I/O bus as the I/O modules, providing integration at the I/O level. The process station is usually installed at a place accessible for the maintenance staff. As the I/O bus may reach up to 1000 m, data from the whole building can be linked to one process station, or more panels with I/O modules can be connected together to one process station, which saves cabling costs.

For installation outside of the panel, small I/O modules are the right choice: MW240-B for lights and blinds control with flush-mounted box installation, or MLIO – the distributed module for installation on a cable tray or on a wall.

A Modbus client, ModComTool, allows to address, set up, and check the functionality of I/O modules. It is free for download at www.domat.cz.

To connect the I/O bus to the computer, use a USB/RS485 converter (Domat RO80 or any other type) or Modbus TCP/RTU router, e.g. RO35. Fast addressing and remote setup can be done by any Domat PLC switched to Converter mode.
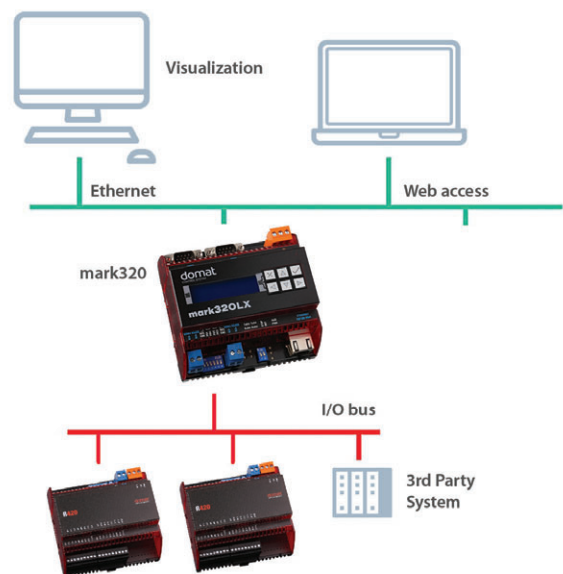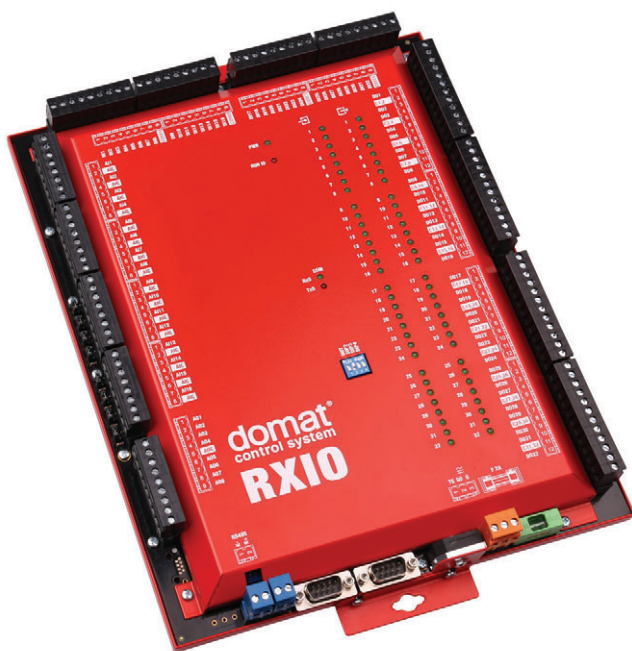
WALL... CONTROLLERS

Another application platform for the Merbon system is card solution for stations with Merbon RUNTIME named WALL. The stations are programmable in the Merbon IDE, like all other platforms.

To simplify logistics and design, the PLCs are available in packs together with I/O card mix, with optional extensions by standard I/O cards on-site. In addition to the w750-8101 and w750-8102 base units, over 30 other types of I/O cards are available. The complete list of cards can be found in the current price list.
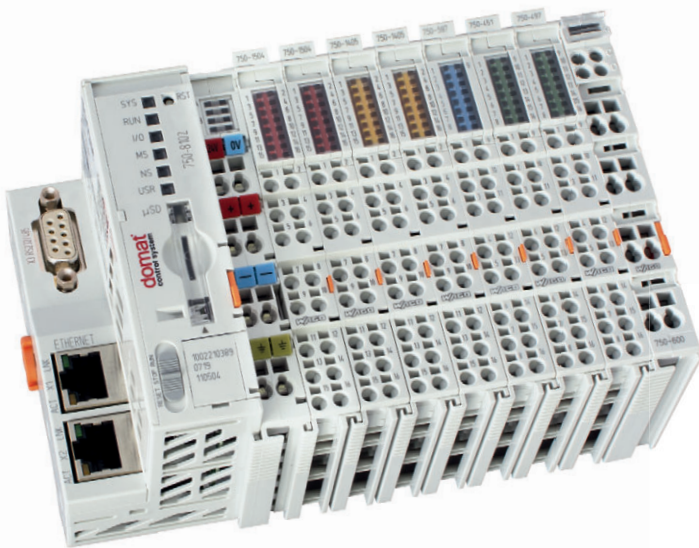
The main advantages of WALL PLCs is less occupied space in the panel together with possible extensions by standard I/O cards, inclusive communication cards (currently 1xRS232/RS485 card with galvanic separation).

Budget sets with I/O packs optimized for most common HVAC applications:

The basic processor unit concept, complete with I/O cards, saves space in the rack and allows you to assemble the I/O mix exactly according to technology needs. Modular units are very suitable for installations with a non-standard I/O pattern and wherever space saving is necessary. The controllers are certified for the most demanding environments, including shipping.

AutoCAD and EPLAN macros for designers are available at the Domat website.

The WALL series controllers are fully compatible with other components of the Domat system, such as terminals (HT200), mobile application Merbon Visual, Merbon SCADA, Merbon DATABASE, energy management portal CONTPORT, and other products. As with other Merbon PLCs, BACnet server, Modbus TCP server, OPC server or native SSCP libraries are available.

Type	AI	AO	DI	DO	RS232 RS485	.NET driver
w751-9301	4	2	8	4	1	YES
wCIO	8	8	8	8	–	–
wMX	16	8	32	32	–	–
wCIOcom	8	8	8	8	1	–
wMXcom	16	8	32	32	1	–

ROOM UNITS AND CONTROLLERS

Design range of communicative room units and controllers brings new dimensions in room controls. Large LCD display (60 x 60 mm) displays room temperature and status so that the data are visible up to 5 m distance. With a push/turn knob both temperature correction and operation mode changes are easy, as is multi-level parameter setting inclusive weekly schedule plan.

For air handling units, small boilers, A/C units and other complex devices, UI room units are the best choice. They provide basic functionality (room temperature, room setpoint, operation mode setting) as well as more complex functions: heating curve selection, setting the outdoor temperature at which it starts to heat, DHW temperature setting, relative display and setting humidity, displaying five other arbitrary values, etc. The set of functions to enable is configured at the commissioning time. For example, the set of operation modes may be residential (Day, Night, Auto, Off, Party mode) or hotel/office (Comfort, Standby, Off). Each mode provides separate setpoints for heating and cooling. To make configuration easy, ModComTool is available free of charge for addressing and setting drivers and controllers. CO_2 sensor controllers, types UI90..., are used where air quality-controlled ventilation is required. The rH sensor is now standard at all UI... controllers. A new feature is the UI300 with analog input for an external temperature sensor.

Universal controllers are also available with two inputs and two outputs for collecting signals from the presence sensor or window contact and controlling typically heating (thermic actuator) and possibly cooling. In this case, the control logic is configured in the controller and the algorithm is fully under the control of the application author.

Individual room controllers, on the other hand, represent a solution where the firmware already contains the PI control algorithm and logic for operating mode switching. Thanks to the default preset values, there is no need to set the controllers in addition to addressing, but individual functions (valve protection, change-over,

selected operating modes) can be enabled or disabled via the bus.

The UC102 room controller provides one SSR PWM output to control a thermic actuator or electrical heater, UC200 features two outputs for heating and cooling. Both versions also have two potential-free inputs for the presence signal (e.g. from the access card reader) and a window contact or dew point sensor for systems with cooling panels. Floor heating is precisely controlled by the UC300, a communicative controller with an additional analogue input for the floor temperature limitation sensor Pt1000 and the same controls as the other devices in the series.

To control fan-coil units, choose FCR010 with room unit UC010. The controller has 3 relays for the fan-coil stages, two outputs for heating and cooling, and two inputs for presence sensor and window contact. The controller communicates with the room unit over a RS485 bus. The FCR013 controller has two outputs for heating and cooling and two inputs for the presence signal and window contact and a trio of 0...10 V analog outputs for controlling EC fans. The FCR015 with room unit UC905 is ready for VAV box control according to CO_2 concentration in a room, induction units and other combined systems by assigning control sequences or combinations thereof to individual outputs.

Controllers and room units may feature a blue display and knob backlight. The backlight can be controlled either automatically by the knob or over Modbus.

Controllers and room units can be integrated either into process stations to communicate heating/cooling demand signals to control the primary units or receive a central depression signal, or directly into the visualization over a Modbus RTU/TCP router.

All controllers and room units are not only compatible with the Domat Control System PLCs. They can also be integrated into other control and SCADA systems thanks to the open Modbus RTU protocol and wide voltage supply range.

USER INTERFACE MERBON VISUAL

The graphical user interface (HMI) is an important part of the projects. The graphics editor for websites and all kinds of terminals is in the Merbon IDE development environment. Templates, i.e. panels with graphics or text menus, can be assigned to different types of terminals and web servers. The panels contain objects with text, images, control buttons, graphs, values and other functions. Transparency of objects is also selectable. Panel resolution is optional, so either choose one of the predefined sizes as the default screen format, or enter your own resolution. All data is saved in vector format, and browsers adjust the panel size to the current resolution, so there is no need to redraw the project when changing the display resolution. Generic websites, such as an overview of alarms or events, do not need to be configured at all.
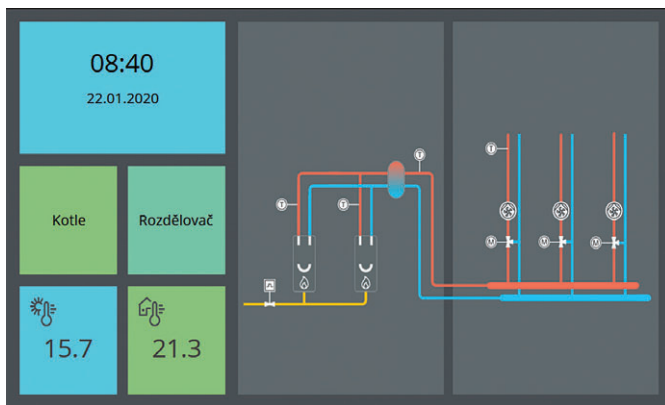
Entering values can be protected against unauthorized access by a four-digit code. Alarm acknowledgment can be set as unprotected, which sometimes proves to be an advantageous option for less trained or occasional operators.

The stations also allow the control of technologies by means of time programs. These are defined in the runtime as required and are set by using the graphical dialog. Three types of time programs are available: binary, multi-state and analog, which allows entering any values within the given limits. There are also exception programs for defining holidays, etc.

An important part of the application is a module for sending alarm e-mails and SMS messages. A separate message can be created for each alarm with a defined addressee, subject, message content, etc.

Creating a project in the editor is very easy. Users appreciate the intuitive environment, extensive copying and swapping of the texts, as well as mass changes to object properties, making project creation easier and faster. The finished project can be exported for the web by touching of a button. The panels are accessible via a web browser anywhere on the network, including embedded graphs and the ability to change values. The

application also exists for iOS, OSX, Linux, Android and Windows environments, making process data available for tablets, communicators and other portable devices.

In addition to HMI application, an OPC server can be installed on the top of a SoftPLC or Merbon RUNTIME. It is a fast and cost-effective way to integrate data from a SoftPLC or Merbon RUNTIME into any visualization system which supports OPC technology. Modbus/OPC server, BACnet/OPC server, M-Bus/OPC server etc. can be installed at the price of SoftPLC or Merbon RUNTIME license with minimal engineering costs. Unlike conventional OPC servers, mathematical and logical operations (e.g. average, sums and differences, maximum/minimum, counters, unit conversions, etc.) can be executed in the runtime using function blocks or structured text.

Modbus RTU or TCP server can be used for data transfer to process controllers with serial communication: over a RS232 or RS485 line or Ethernet interface, data from Merbon RUNTIME (i.e. from PLC) can be shared with other PLCs which communicate as Modbus RTU clients.

Merbon Visual application, designed for mobile devices with iOS and Android operating systems, is now able to download definition of graphic or text menu directly from Merbon PLC. All you need to do is enter your connection parameters and sign in. The application enables reading and setting of values and time programs as well as working with alarms in process stations with both Merbon and SoftPLC runtimes. It connects to the PLC via the Internet. It is free to download on the App Store and Google Play. Merbon Visual supports connection to multiple PLCs and can be configured for access from a local network or from the Internet. Switching between local and remote access is easy and fast, the entire application is optionally password protected for added security. A new feature is the display of the log and alarm overview.
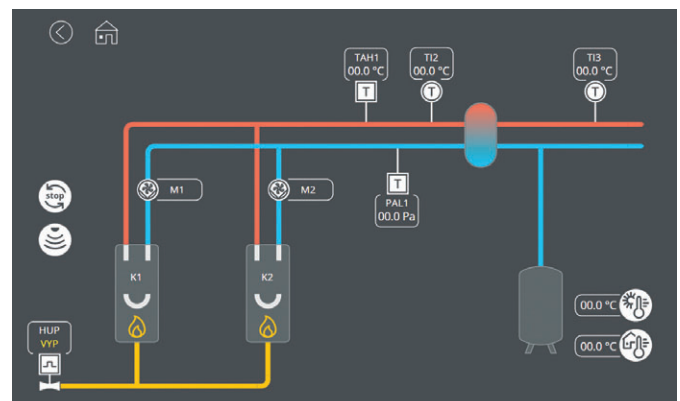
VISUALIZATION MERBON SCADA

The operator must always have up-to-date and accurate information about the status of the relevant technology, be it a boiler room, a network of heat exchangers, an individual room control system in an office building or hotel, a PV plant or system of energy resources which make up a virtual power plant.
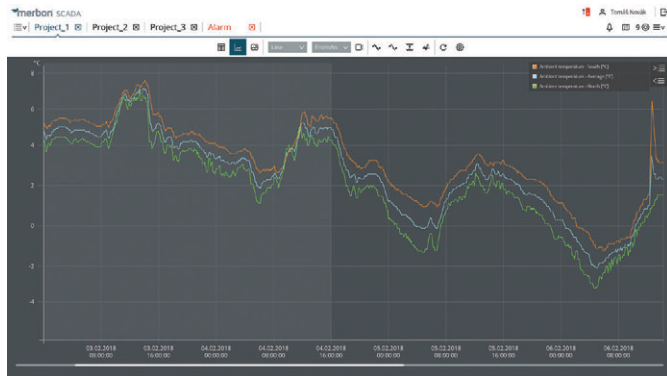
This information is provided by process visualization (SCADA). Data are available as tables and schemas offering current values, graphs, alarm and event overviews as well as other information. The application consists of a server, and client stations. The server communicates with process level (PLCs), acquiring online data, and with databases, which provide history data (trends). The server then provides all clients with schemas of technologies and floor plans, tables, etc., which display the data. Clients use web browsers, which simplifies maintenance, licensing, and workstation management.

A graphic workstation allows to display and record data not only from Domat-based control systems. As far as larger projects and installations are concerned (where technology is gradually refurbished or expanded based on the investment abilities of the operator), we are able to integrate visualization with other control systems such as process stations, photovoltaic inverters, cooling equipment, boilers or energy meters. For this purpose, Domat offers a wide range of software components and drivers which allow communication with control systems produced by other manufacturers, either via standard protocols such as Modbus, BACnet, M-Bus or OPC, or via company-specific protocols developed by other manufacturers. This allows us to display values at central management stations.

Panels with technology schemas, which are the main tools for data presentation, may contain animations, static images, texts, user notes, setters, links to other panels, etc. Design is fully in the hands of the graphics creator. A modern library of technology symbols from building management is available free for download. Merbon SCADA includes extensive user and role management.

Alarm management is processed at the process stations or via the SCADA computer - based on system size, and alarm forwarding and routing requirements. Alarms may be reported/displayed on a screen, via SMS, e-mail or through other ways.

VISUALIZATION MERBON SCADA
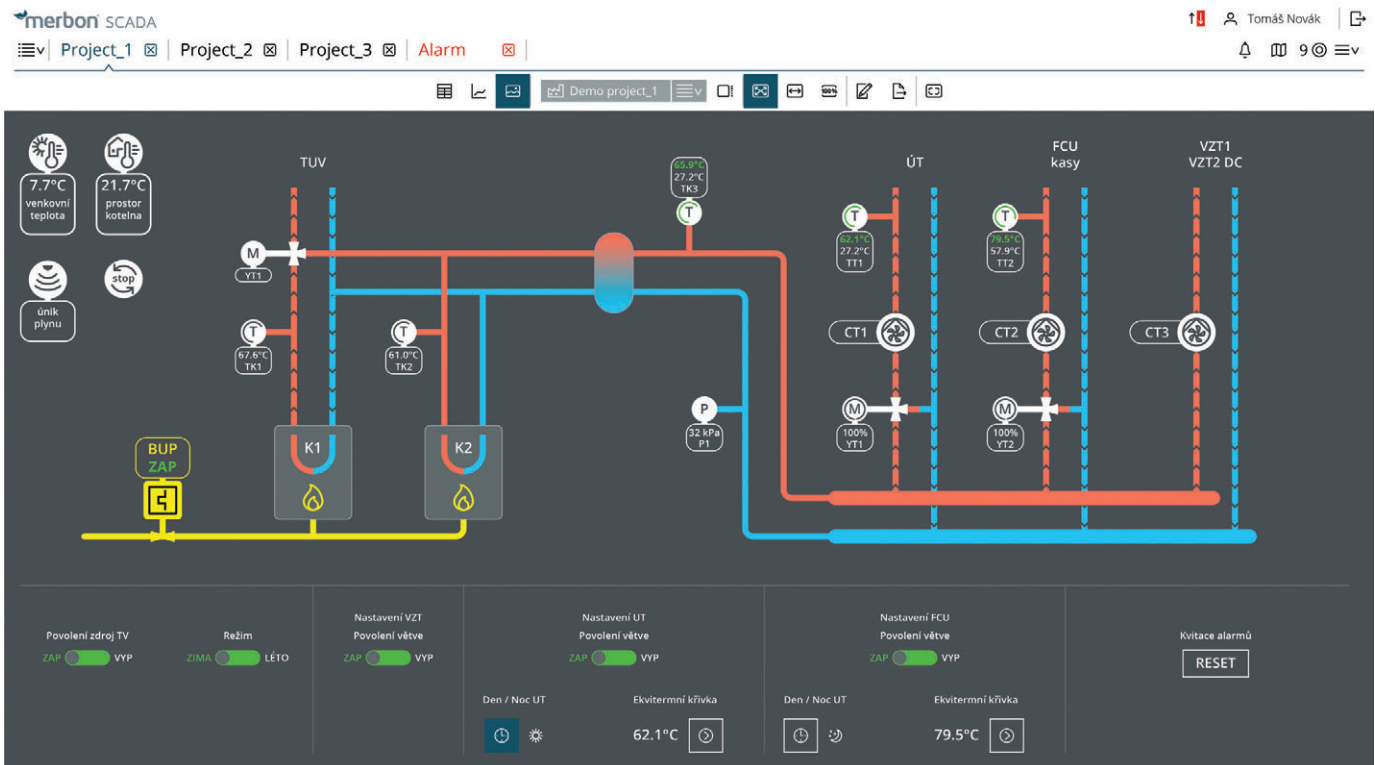
Part of the Merbon SCADA is the Merbon Alarm Server, which sends events to users according to predefined criteria depending on priority, technology unit, device location and preferred communication channel. It is thus possible, for example, to report all alarms on the computer screen during working hours and to send the user only critical alarms such as SMS requiring confirmation after the shift (according to the schedule or information from the integrated attendance system).

Alarms are available in two views: the active alarm table and event history, again with sorting and filtering options according to number of criteria. System alarms, such as non-communicating devices, are visualized differently from technology alarms. Alarms pass through a state machine and can also be sorted as in alarm, unconfirmed, normal, and undeleted. Thus, the alarm status can affect the technology (for example, it is only possible to allow the device to run after the alarm has been acknowledged and deleted). The number of active alarms is shown in the top bar.

The technical preview is a table with all data points in the system. Each point displays the current value, the time of the last communication, the communication quality, the description and other parameters that are more used for diagnostics. The data points are arranged in a tree structure for easier access and at the same time they can be

searched and filtered. The user can mark selected data points in the table and then display them as a trend, for example.

A very important feature is the evaluation of historical data. Merbon SCADA offers not only classic line and bar charts, but also modulo charts, differential charts and carpet charts. This facilitates rapid problem analysis and provides the operator with a comprehensive picture of the state of all technologies. Trend previews can be saved as templates and referenced for example from graphics. You can export trend data as an image, a spreadsheet, or text.

In simple installations, data files are used to store historical data, i.e. sampled values. For demanding requirements such as storing tens of thousands of values every minute, Domat utilizes its own high-performance binary database optimized for recording industrial process values, Merbon DATABASE, or Influx database. They can handle hundreds of thousands of values per minute. Databases have an open interface (API), so data can be read and used in other systems, such as accounting and ERP programs.
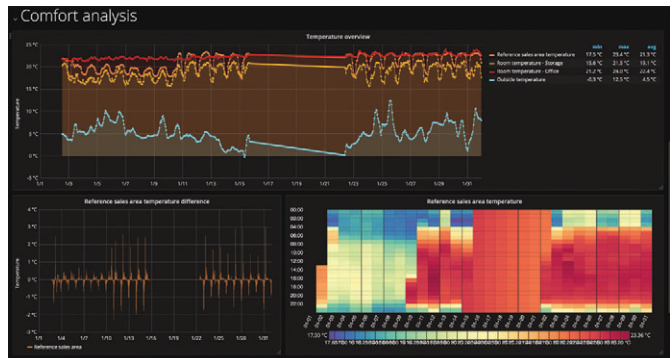
MANAGEMENT PORTAL MERBON CONTPORT

ContPort is a management tool which helps with intro-duction and long-term operation of energy manage-ment in a company or at a manufacturing plant. It is a comprehensive cloud application available over the web from any device. Thanks to ContPort, corporate targets can be checked, energy consumption monito-red, and reports received on a regular basis. The tool provides wide functionality for data analysis and pro-cessing, and reporting – customized visualization. The service module gives control both of service subcon-tractors and the internal team who takes care of plant management. ContPort is also used as a data bank of information on managed properties and technologies, and data storage for documents, such as audit reports, manuals, and images.

The service module (helpdesk) and maintenance offer comprehensive archiving of both technical and sales documentation and workflow of warranty, post-warran-ty, and predictive servicing and maintenance. The mo-dule contains a ticketing system for subcontractors and internal employees. There are all relevant documents stored in the system necessary for safe and econo-mical operation of technologies and buildings: project documentation, service and operation agreements, sa-fety audit reports, etc. The workflow of a service event starts with reporting of a problem – either manual over a web interface, or automatic, generated by an alarm from the control and monitoring system. The service event is then processed, closed and invoiced. Preven-tive maintenance is planned in advance and service events are generated automatically.

The on-line data acquisition module collects data from technologies either directly from PLCs and I/O modu-les, external databases, or from energy meters. It uses rich company know-how in 3rd party integration and communication using serial protocols (M-Bus, Modbus, IEC 62056-21) and APIs. The values are displayed on the portal and saved in a database. Users then have access to the entire history, anytime. Data also can be entered and edited manually, e.g. for manual energy readouts.

These data show how efficient the plant operation is: consumption of plants and plant parts, environmen-tal values (outside temperature, solar irradiation, wind speed etc.), process and comfort values (temperatu-res, flows...), and energy consumptions (electricity, gas, heat, water). Values are presented on a management level in dashboards and long-term planning tools. Key performance indicators can be specified and monito-red by ContPort as well. Dashboards can be compiled into screens and monitored on daily basis. The KPIs are presented as graphs, carpet plots, semaphores, tables, colour indicators, and other graphic elements.
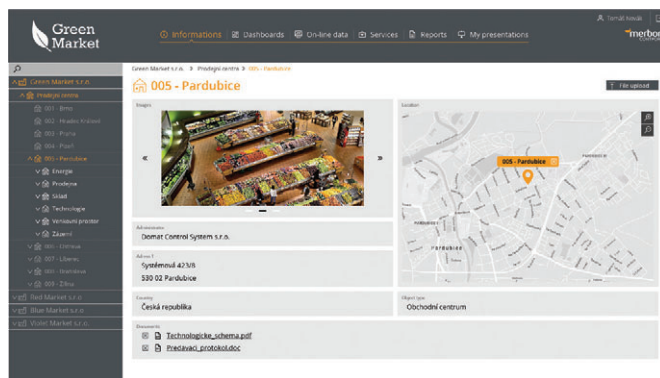

The module for reporting and economical evaluati-on works with data acquired in the previous modules or imported from other resources (such as automatic import of meteo data from the Internet or .csv files). Various report types can be defined, from the simple ones, like operation costs of a plant for a time period, to more complex benchmarking of similar plants in diffe-rent locations, related to specific units (m^2, kWp, years). Reports may be sent to the recipients automatically by e-mail.

Thanks to these functions, data from old and difficult to maintain Excel tables can be imported into the sys-tem and controlled from any device.

ContPort is hosted in data centers with availability of 99.9 % and data backup at two locations. Its appli-cation core is based on Microsoft Dynamics CRM, with application layer and web portal on the top. User in-terface is available in several languages, and users can switch between them.

ContPort was designed for service and facility man-agement companies and for investors managing diffe-rent technologies – in general, for users who need to have a comprehensive overview of costs and efficien-cy. Service companies mostly use the application part, while their subcontractors access the system using the ContPort web portal.

The connection to ContPort is encrypted and data access is limited according to user access policies. Your data and functionalities are safely preserved from unauthorised access.

REFERENCES

RETAIL CHAINS TECHNOLOGY MANAGEMENT

Domat Control System is one of the largest suppliers of building management systems for retail chains and retail in the countries of Central and Eastern Europe (Czech Republic, Slovakia, Slovenia, Croatia, Hungary, Poland, Romania). For large shopping centers, such as the Prague shopping center Harfa, the customer is

the developer of the building. Domat regulation can be found, for example, in the Czech Republic in Billa, Penny stores, in DEK construction stores, in Burger King and KFC restaurants, in Slovakia and Austria in Starbucks cafes, in Sportisimo sporting goods stores (CZ, PL, SK, RO), in Kaufland stores (SK), and in Decathlon (CZ, HU). In these cases, the delivery is carried out directly for the retail chain with the help of our system integrators.

The common feature of these applications is not only the supply of control systems at the branches, but also the central dispatching, where all the branches are integrated. Depending on how the chain is organized, there are national headquarters (Interspar in Hungary, Slovenia or Croatia) or a central dispatching center common to all stores across countries. Customers, who also deal with energy management, choose the cloud system ContPort over the headquarters (SCADA). In this way, the energy company has an overview of environmental parameters and energy consumption internationally, which can provide interesting incentives for technological innovation and energy savings.

In retail shops, two concepts are most often encountered: they can be found as smaller buildings, usually detached, with a sales area of up to 1000 m², as well as large shopping centers with a dominant supermarket of 3000 m² and other shops and services in the common hall. A separate chapter are the giant shopping centers, for example the Černý Most Center, Westfield Chodov shopping center, etc.

Heating is usually handled by an air handling unit, which is also used for ventilation. Underfloor heating is not used, although it would make sense considering the available low-potential waste heat from commercial cooling. The problem is that the sales area is occupied by shelves with goods, which both reduces the possible heating area, and on the other hand, the goods could lose their quality because of the heat. Often, the cash register area, which is usually near the entrance, is often discussed: previously, radiant panels were installed in this zone to achieve the comfort of cashiers. But they did not work well, because the radiant heat could not compensate for the cold air flowing from the entrance. The current solution consists in better air distribution in the area of cash registers together with hot air curtains. Ideally, however, would be the local heating directly in the cash booths.

The central air handling unit for the sales area is controlled by a time schedule according to the shop's operating hours, often in combination with a fresh air regulation using CO_2 sensor.

For cooling the sales area, warehouses and other operating areas either separate systems are used, similar to office buildings, or split air conditioning units, so popular for its simple assembly, low cost and easy billing (only electricity consumption is measured, tenants need not install calorimeters). Specialized suppliers of commercial refrigeration, however, also offer a comprehensive solution where heat pumps produce both refrigeration for food and air conditioning as well as heat for heating and hot water.

Traditionally, the lights on the sales area are managed in groups. About a third is switched by the time program as the first stage and the rest a few minutes before the start of the sales period. In places where daylight is also used, it is worth installing dimmable lights (e.g. with DALI interface) and controlling them in addition to the time program also according to the outdoor light sensor. For large stores, up to 20 – 30 circuits are independently controlled by time programs, including outdoor advertising lighting, parking lots, ramps, etc.

In smaller shops, it is not worth training any local staff, the systems are parametrizable, and all technology is operated by a dedicated team of technicians at the headquarters. For large shopping centers, one local SCADA station is installed at the central control room of the building, which is used by the maintenance personnel to deal with common operational situations, while long-term data evaluation is the responsibility of an energy specialist.

REFERENCES

BUILDINGS AND INDUSTRY

Main Point Pankrác and V-Tower

The latest landmarks of Prague's Pankrác Plains are two buildings completed during 2019: Main Point Pankrác (MPP) and V-Tower.

The MPP building was designed with the aspiration to obtain the LEED Platinum certificate. It is ventilated by air conditioning while maintaining the possibility of natural ventilation through the windows. There are three air-conditioning engine rooms in the building. The air-conditioning have suction and outlets solved through facade blinds and building ventilation ducts, so that only roof outlets from restaurants, toilets and garages are terminated on the roofs. The air from the offices is recycled to the garages.

The rooms are cooled by induction units in the office parts and by fan-coil units in the rental part. Additional cooling technology and local server rooms are provided by smaller units with direct cooling. The heat source is a heat exchanger station connected to district heating networks. The office space is fitted with floor convectors, the other space with panel or fin radiators. During the construction, a heat pump was added to the heating system to extract heat from the wastewater of the neighboring V-Tower.

The building management system includes 23 freely programmable stations, mostly Domat markMX, and more than 500 zone controllers (including 156 fan-coils and induction controllers and 356 radiators and cooling panel controllers). In visualization, this represents more than 6000 data points. Merbon SCADA software was used as a visualization program.

Since the building was being completed and rented gradually, commissioning was possible with fewer technicians than is normally the case for such an event. However, this was not the case for assemblies – they were practically simultaneous throughout the building.

With its 104 meters, V-Tower has become the tallest apartment building in the Czech Republic. It has 130 apartments located in two towers (east and west, up to the 28th floor) and in the central part (up to the 15th floor). Primary technologies (heat and cold production, 44 air handling units for common space ventilation and integration of foreign equipment) are controlled by ten powerful markMX and mark320 process stations, with a total of nearly 3000 data points. Furthermore, there is one markMX controller in each apartment with about 120 data points, so only the apartments represent more than 15000 data points. The building management system also monitors the swimming pool technology located on the roof of the building in the penthouses.

In the case of flats, emphasis was placed on noise insulation, so that due to the acoustics, ventilation units had to be regulated in the flats. Each unit has individually calculated and controlled inlet and outlet pressure parameters. Some of the flats were supplemented with steam humidifiers according to the owners' wishes, while others were customized. This meant that the original concept of several type wiring disintegrated into an individual project and control software for each apartment.

Each apartment has water meters for hot and cold water, calorimeters for measuring heat and cold and another calorimeter for cooling consumption for air conditioning. Nearly 150 electricity meters are installed to measure electricity consumption in common areas and garages. In total, there are about 800 M-Bus meters in the V-Tower, connected to data concentrators, from which the values are brought into the visualization.

The V-Tower and MPP project has historically been one of Domat's largest contracts. Despite the common problems of coordination, lack of time and constant changes in the technical solution, we managed to finish the event on time. This created a project that combines modern technology, comfort and energy efficiency.

REFERENCES

Majaland, Prague

Majaland children's amusement park was recently ope-ned in Tuchoměřice, not far from Prague Airport. On an area of over 9000 m², there are twelve themed attrac-tions, including a roller coaster or a 30 m long slide, a restaurant, a toy store and a theater. It is the largest facility of this type in the country.

The building management system contains eleven swit-chboards, which control mainly air conditioning, heat and cold source and pool technology. However, there is also measurement of consumption for evaluating the energy parameters of the building. Measurement and regulation are solved by freely programmable substa-tions of the wall series, connected by a technological network, which is connected to the building's intranet. There is a HT200 graphics terminal for local control on three switchboards (LV substation, pool technolo-gy room and engine room for heating and cooling), the other switchboards are without local controls and can be accessed from the graphics center.


The heat and cold source is a system of heat pumps, supplemented by 300 kW cooling units. Heating and cooling water is accumulated in two tanks of 1500 l and then further distributed to two heating and two cooling circuits. The regulation of individual rooms is represented in the offices of eleven FCU controllers, which control fans and six-way valves for heating and

cooling. Large air handling units (two for the main hall, one for the kitchen) are equipped with their own gas condensing boilers and, of course, recuperation. Other HVAC units deal with ventilation of premises, facilities and offices.

The air handling unit for the main hall is equipped with destratifiers, which are controlled by six CO_2 sensors and twelve temperature sensors located in the hall. This guarantees both air exchange and its proper distributi-on in the entire area intended for visitors.

The graphics center with Merbon SCADA visualizati-on contains over 1200 data points. It is located in the control room of the entire outlet and also allows remo-te access, which is necessary for ongoing maintenance and service. In such a large building, where the public moves, the emphasis is mainly on safety and comfort. The building management system therefore also serves as a central for collecting signals of technology failu-res, so it is possible to start troubleshooting before it affects the environmental parameters. These are mainly water levels in swimming pool technologies, the state of backup sources, flooding and the like. The implementa-tion took place in the autumn and winter of 2021 and the entire amusement park was opened on December 27, 2021.
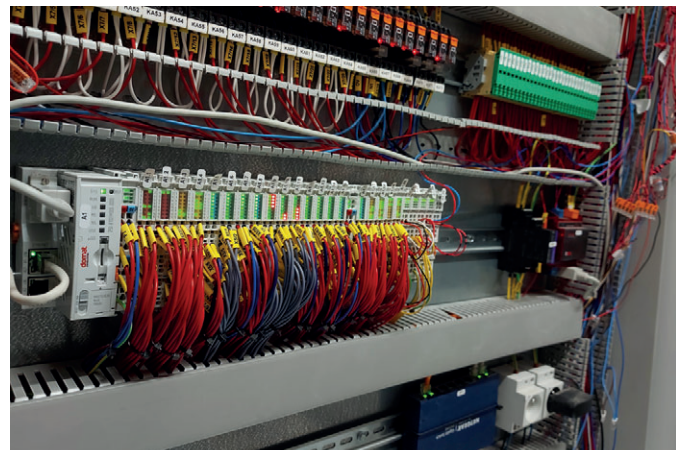
REFERENCES

INTERNATIONAL PROJECTS

The Doha Metropolitan, Qatar

Since 2016, Domat Control System takes part at the supply of components for building management system of the Doha Metropolitan, Qatar. As this was one of major international projects for Domat, let's have a look at some of its features.

The entire metropolitan is planned as four lines with 85 stations in total, three lines being in construction. The first line is about to be completed in 2019. Domat supplied to Lysys, the local partner, room cooling controllers for shopping and office areas. More than 1000 fancoil controller and the same amount of room units have been shipped so far.

The FC025 hardware origins from the FC020 fan coil controller. The FC020 controls a three-stage fan and, unlike the smaller FC010, contains also analogue inputs and outputs and more binary inputs.

The controller also features two RS485 interfaces with Modbus RTU: one for the UC010 room unit and optio-

nal slave controllers, one for integration to a BMS (Building Management System). The communicative room unit UC010 may be replaced or enhanced by a passive temperature sensor and optionally a potentiometer to set a room setpoint correction.

The second type of controller, FC026, has customized hardware. Instead of a three-stage fan in this configuration, the EC fan is controlled by a continuous 0... 10 V signal. EC (Electronically Controlled) fans have been an excellent modern alternative to conventional three-stage fans in recent years - they are easier to plug in, can be controlled continuously from 0 to 100% speed

and do not contain capacitive ballasts that have often been a source of problems.

The fan-coils are used for cooling only. For European conditions, unconventional data points are inputs for sensing the valve position, for the differential pressure filter and for blocking the function from the EPS system.

The technical support was easier thanks to the fact that the controllers are set up over a serial line and a simple configuration program. It allows to export the complete setting of a controller into a file which can be sent by e-mail to the support engineer who is able to duplicate the exact setting of a controller at his desk. After parameter correction or setup change, the file is sent back and simply uploaded to the controller by the customer. This was how some problems due to wrong binary inputs configuration were discovered and explained.

The whole project was slightly more demanding than projects of similar magnitude in Europe, but it was successful in the end and we believe that also the other Doha Metro lines climate will be controlled by the Domat room controllers.

Hotel resort Hilton Rijeka Costabella, Croatia

The Costabella resort complex is located on the Adriatic coast, between the seaside towns of Opatija and Rijeka. It is surrounded by the Risnjak National Park and the Učka Nature Park. In addition to accommodation, it offers two swimming pools, six restaurants and a full--service spa.

In 2020, our company created a measurement and regulation project for the construction of a building control system, which solves the automatic operation of ventilation, heating and air conditioning technology of this area.

These are mainly technologies of heating, cooling, air conditioning and climate control in individual rooms. To ensure the required technological parameters, signaling of operation and faults of 8 large HVAC units and four engine rooms for hot water production, the project proposes the use of our freely programmable control system. Autonomous technologies are data-integrated into the on-site measurement and control system using open protocols:

- Modbus RTU / RS485: Daikin air conditioning, Caterpillar diesel generator, Schneider Electric electricity meters
- Modbus TCP: DHW and Hoval boiler preparation, Berndorf pool technology
- M-Bus: Siemens calorimeters, Schneider Electric electricity meters
- BACnet / UDP: Sauna technologies - Loxone, Carrier heat pump, Menerga pool air conditioning

The project includes control, monitoring and data integration of beach, hotel, outdoor pool and villa

REFERENCES

equipment and addresses the following areas: field control level, i.e. peripherals and their installation on HVAC technology, control system (substation) for HVAC technology control (automation level), high-current technology installations and data integration of autonomous devices.

Heat/cold source

The heat/cold source for the building is a pair of water/water heat pumps, the source of which is seawater. Before starting these pumps, the seawater submersible pumps, condenser pumps and evaporator pumps are started (a total of 8 pumps). Seawater transfers heat or cold to technological heating or cooling water via exchangers located in the engine room. The process water is then fed via shut-off valves to a distributor/collector, from which the hotel and the congress center are fed.

For seawater treatment, a chlorinator is located in the engine room, from which the basic operating states and speed values of one of the submersible pumps can also be read. Other pumps are controlled via FM frequency converters located in the high-current switchboard, which is taken care of by DDC regulation. Setpoints for FM control are transmitted via data via MaR (LAN) communication. The primary heating/cooling water is fed to the engine room via three-way mixing valves. Heat pumps are data-integrated into the measurement and control system using the BACnet/IP protocol.

Cooling water from the evaporator side of the pump is led to the cold distributor/collector. On the manifold there are two pump branches for two-pipe change-over distribution for FCU hotel rooms, villas and air conditioning units. The branches for the two-pipe distribution to the FCU are equipped with shut-off flaps for redirecting cooling or heating water to the two-pipe distribution.

The heating water from the condensing side of the pump is led to the heating water distributor/collector. There are two flap-closed branches for FCU hotel and villas, one pump branch for air conditioning, one pump branch for heating the outdoor pool, one pump branch for heating the indoor pools and one equithermal mixing branch for underfloor heating. The heating water supply from the second heat pump can be redirected with shut-off dampers to heat the heating water storage tanks.

There are two boilers on the roof of one of the buildings, which are data-integrated into the building control system using the Modbus protocol. This boiler heater provides DHW heating, radiator heating and power supply to the heating water distributor/collector.

The whole system also regulates underfloor heating and pool water heating. For some FCU and HVAC units, a four-pipe distribution is used to supply the heating and cooling medium. The exchangers on the mentioned devices are used for the common function of heating and cooling. To switch the flow of heating/cooling medium, a six-way valve with a continuous actuator with a 0-10 V control signal is installed in fan coil units, when at 5 V the valve for the appliance is closed, bands below and above 5 V are used for continuous regulation of heating sequence cooling. In front of the heat exchanger units, intelligent pressure-independent two-way continuous control valves are installed for power control in the heating and cooling sequence in combination with two-state ball valves. Intelligent control valves are data-integrated into the MaR system via LAN and the BACnet IP protocol. Frost protection of outdoor heating/cooling water distribution is ensured by an electric self-regulating heating cable.

Air conditioning

The required air temperature in the supply duct is regulated by cascade regulation, i.e. the required air temperature in the supply duct is determined on the basis of the difference between the actual and the required temperature in the exhaust duct resp. in space. This basic requirement is further corrected with respect to the outdoor temperature by a compensation curve and delimited by a selectable range of minimum and maximum values. The reason for compensation in the summer is to save energy and prevent thermal shock when moving into and out of the building. In winter, a higher temperature of the blown air improves thermal comfort. The control elements of the air exchangers are then controlled so that this value is actually reached in the outlet channel.

System and communication

For local communication of the operator with the equipment of the control system, LCD graphic touch panels are located on the doors of the switchboards, where the basic parameters from the controlled technology can be read and set on them. The hotel's LAN data network is used for interconnection between individual switchboards.

A graphic control station is installed in the control room of the building for efficient management of the building. The software with which it is equipped enables fast and targeted monitoring and control of the BMS system using realistic graphics. A web server for remote control is also installed in the station. The selected data is available to other authorized users via the local network via a web browser. The entire measurement and control system can be easily expanded to other future investor requirements.

PRODUCT OVERVIEW

I/O MODULES / PROCESS STATIONS / INTEGRATED ROOM CONTROL / SCADA / ENGINEERING TOOLS
/ PERIPHERALS

HOW TO USE THE PRODUCT OVERVIEW

Each price list item contains Type identification which is used for ordering in the default configuration. This is detailed in the Brief description part. If the item has more configuration options, they are listed in the right column and each group of options is marked with an asterisk. **Example:** In case of the room combined sensor the default type RFTF-U provides one active 0..10 V temperature output, however, passive temperature sensors can be delivered instead, e.g. RFTF-U Pt1000. Another option are 4...20 mA outputs instead of the 0..10 V outputs. The sensor type ID is then RFTF-I and – as it is set in bold letters – the price is same as that

of the default type, RFTF-U. The type ID RFTF-I Ni1000-5000 then provides a 4...20 mA output for humidity, and Ni1000-5000 passive temperature sensor.

At each of the options, there may be a LCD display to display measured values, e.g. RFTF-U Pt1000 display. The prices of all basic types as well as options are listed in the Domat Control System price list or communicated upon request (customized cable lengths etc.).

All data are subject to changes.

Type ID   *Brief description*   *Bold type identification = same price*

RFTF-U

Room humidity and temperature sensor
Capacitive element, 20..80 %rH: ±2 %, 0..100 %rH: ±3 %
Temperature 0..50 °C, output 2× 0..10 V, power supply 24 V AC / DC
Wall mounting, dimensions 85 × 85 × 27 mm

* **RFTF-I**: 4..20 mA (only DC power)
* display
* passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-6180, NTC1.8kOhm

Image

Technical data subject to ordering code

*Possible options, each marked with the * symbol. Their prices may differ from the prices of the basic type.*
See details in the price list.

PROCESS STATIONS, CONTROLLERS
PROCESS STATIONS MARK WITH MERBON RUNTIME

mark130.2

DDC controller, RS485, RS232, display
Ethernet, web, RS485, RS232, 4 × 20 LCD display, programming in Merbon IDE. ARM i.MX6UL 528 MHz, 128 MB RAM, 64 MB FLASH, 128 kB NVRAM.
Supply: 24 V AC/DC ± 20 %; max. 5 VA. panel door mounting, IP65, dimensions 158 × 106 × 36 mm

IMIO105.2

DDC controller, 16 I/O, RS485
2× Ethernet, web, RS485, 4 AI, 2 AO, 4 DI, 6 DO, programming in Merbon IDE. ARM i.MX6UL 528 MHz, 128 MB RAM, 64 MB FLASH, 128 kB NVRAM.
Supply: 24 V AC/DC ± 20 %; max. 5 VA. DIN rail mounting, dimensions 98 × 67 × 102 mm

Use terminal HT200 for local operation on front panel door.

IMIO110.2

DDC controller, 16 I/O, RS485, display
2× Ethernet, web, RS485, 4 AI, 2 AO, 4 DI, 6 DO, programming in Merbon IDE. ARM i.MX6UL 528 MHz, 128 MB RAM, 64 MB FLASH, 128 kB NVRAM. Supply: 24 V AC/DC ± 20 %; max. 5 VA. DIN rail mounting, dimensions 98 × 67 × 102 mm

Use markPLC KIT to install the controller into a front panel.

ICIO205.2

DDC controller, 30 I/O, RS485
Ethernet, RS485, web, 8 AI, 6 AO, 8 DI, 8 DO, programming v Merbon IDE. ARM i.MX6UL 528 MHz, 128 MB RAM, 64 MB FLASH, 128 kB NVRAM. Supply: 24 V AC/DC ± 20 %; max 10 VA. dimensions 217 × 115 × 40 mm

Use terminal HT200 for local operation on front panel door.

mark220LX

DDC controller, RS485, display
Ethernet, web, RS485, 3 × 16 LCD display, programming in Merbon IDE. ARM i.MX6UL 528 MHz, 128 MB RAM, 64 MB FLASH, 128 kB NVRAM. Supply: 24 V AC/DC ± 20 %; max. 5.5 VA. DIN rail mounting, dimensions 98 × 67 × 102 mm

Use markPLC KIT to install the controller into a front panel.

mark320LX

DDC controller, 4 ports, display
Ethernet, web, 2× RS485, 2× RS232, 3 × 16 LCD display, programming in Merbon IDE. ARM i.MX6UL 528 MHz, 128 MB RAM, 64 MB FLASH, 128 kB NVRAM. Supply: 24 V AC/DC ± 20 %; max. 5.5 VA. DIN rail mounting, dimensions 98 × 67 × 102 mm

Use markPLC KIT to install the controller into a front panel.

mark520

DDC controller, 4 ports, display
2x Ethernet, web, 2× RS485, 2× RS232, 3 × 16 LCD display, programming in Merbon IDE. ARM i.MX6UL 528 MHz, 512 MB RAM, 256 MB FLASH, 128 kB NVRAM. Supply: 24 V AC/DC ± 20 %; max. 5.5 VA. DIN rail mounting, dimensions 98 × 67 × 102 mm. .NET driver support.

Use markPLC KIT to install the controller into a front panel.

markMX.3

DDC controller, 88 I/O
2× Ethernet, web, 2× RS232, 2× RS485. 16 AI, 8 AO, 32 DI, 32 DO, programming in Merbon IDE. i.MX6UL 528 MHz, 128 MB RAM, 64 MB FLASH, 128 kB NVRAM. Supply: 24 V AC/DC ± 10 %. Mounting on panel backplane. 265 × 292 × 40 mm

Use terminal HT200 for local operation on front panel door.

markMXL

DDC controller, 88 I/O
2x Ethernet, web, 2× RS232, 2× RS485. 16 AI, 8 AO, 32 DI, 32 DO, programming in Merbon IDE. i.MX6UL 528 MHz, 512 MB RAM, 256 MB FLASH, 128 kB NVRAM. Supply: 24 V AC/DC ± 10 %. Mounting on panel backplane. 265 × 292 × 40 mm. .NET driver support.

Use terminal HT200 for local operation on front panel door.

PROCESS STATIONS, CONTROLLERS
PROCESS STATIONS WALL WITH MERBON RUNTIME

w750-8101

DDC controller
2× Ethernet, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (–25...+30%), DIN rail mounting, dimensions 71.9 × 61.5 × 100 mm

Use terminal HT200 for local operation on front panel door.

wCIO

DDC controller, 32 I/O
2× Ethernet, 8DO, 8DI, 8AO, 8AI, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (–25...+30%), DIN rail mounting, dimensions 71.9 × 121.5 × 100 mm

Use terminal HT200 for local operation on front panel door.

wMX

DDC controller, 88 I/O, RS485
2× Ethernet, RS485, 32DO, 32DI, 8AO, 16AI, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (–25...+30%), DIN rail mounting, dimensions 71.9 × 158 × 100 mm

Use terminal HT200 for local operation on front panel door.

w750-8102

DDC controller, RS485
2× Ethernet, RS485, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (–25...+30%), DIN rail mounting, dimensions 71.9 × 61.5 × 100 mm

Use terminal HT200 for local operation on front panel door.

wCIOcom

DDC controller, 32 I/O, RS485
2× Ethernet, RS485, 8DO, 8DI, 8AO, 8AI, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (–25…+30%), DIN rail mounting, dimensions 71.9 × 121.5 × 100 mm

Use terminal HT200 for local operation on front panel door.

wMXcom

DDC controller, 88 I/O, RS485
2× Ethernet, RS485, 32DO, 32DI, 8AO, 16AI, web, programming in Merbon IDE. ARM Cortex A8, 600 MHz, 12 MB RAM, 64 kB NVRAM. Supply 24 V DC (–25…+30%), DIN rail mounting, dimensions 71.9 × 158 × 100 mm

Use terminal HT200 for local operation on front panel door.

w751-9301

DDC controller, 18 I/O, RS485
2×Ethernet, RS485, 4DO, 8DI, 2AO, 2AI-V, 2AI-R, web, programming in Merbon IDE. ARM Cortex A7, 650 MHz, 512 MB RAM, 4096 MB FLASH, 128 kB NVRAM. Supply 24 V DC (–25…+30%), DIN rail mounting, dimensions 62 × 108 × 90 mm

Use terminal HT200 for local operation on front panel door.

I/O MODULES WALL

w750-600

Terminating module of the internal bus.

w750-450

4 analog inputs module – resistance
4 AI, resistance, configurable, 2/3/4 – wire connection

w750-451

8 analog inputs module – resistance
8 AI, resistance, configurable, two-wire connection

w750-453

4 analog inputs module – current
4 AI, 4…20 mA, two-wire connection, asymemtric input

w750-455

4 analog inputs module – current
4 AI, 4…20 mA, two-wire connection, asymmetric input

w750-457

4 analog inputs module - voltage
4 AI, ±10 V DC

w750-458

8 analog inputs module - resistance
8 AI, thermocouples, configurable, two-wire connection

w750-459

4 analog inputs module – voltage
4 AI, 0...10 V, asymmetric input

w750-496

8 analog inputs module – current
8 AI, 0/4...20 mA, configurable, two-wire connection

w750-497

8 analog inputs module
8 AI, 0...10 V / ±10 V, configurable, two-wire connection

w750-553

4 analog inputs module – current
4 AI, 0...20 mA, two-wire connection

w750-556

2 analog inputs module – voltage
2 AI, ±10 V DC

w750-1400

16 binary inputs module
16 DI, 24 V DC, 3 ms, ribbon cable connection

w750-1405

16 binary inputs module
16 DI, 24 V DC, 3 ms

w750-1406

16 binary inputs module
16 DI, 24 V DC, 0.2 ms

w750-1415

8 binary inputs module
8 DI, 24 V DC, 3 ms, two-wire connection

w750-1506

8 binary inputs/outputs module
8 DI/DO, 24 V DC, 0.5 A, configurable

w750-555

4 analog outputs module
4 AO, 4...20 mA

w750-559

4 analog outputs module
4 AO, 0...10 V DC

w750-597

8 analog outputs module
8 AO, 0...10 V / ±10 V DC, configurable

w750-515

4 relay outputs module
4 DO, relay 250 V AC, 30 V DC, 3 A

w750-530

8 binary outputs module
8 DO, 24 V DC, 0.5 A

w750-1500

16 binary outputs module
16 DO, 24 V DC, 0.5 A, ribbon cable connection

w750-1504

16 binary outputs module
16 DO, 24 V DC, 0.5 A

w750-1515

8 binary outputs module
8 DO, 24 V DC, 0.5 A, two-wire connection

w750-404

Counter module
1-channel counter (up/down), 24 V DC, 32 bit, max. 100 Hz, 2DO

w750-638

Counter module
2 - channel counter (up/down), 24 V DC, 500 Hz

w750-511

PWM module
2-channel PWM module, 24 V DC, 250 Hz, 2DO

ACCESSORIES WALL MODULES

w750-960

Connector
PROFIBUS fieldbus connector
D-Sub plug, 9 pin

w750-602

Power module
Power supply module 24 V, max. 10 A

w750-613

Power module
Power supply module 24 V, max. 2 A

w750-627

Bus extension termination module
Bus termination
The possibility of connecting to another bus using RJ-45

w750-628

Bus extension module
Counterpart w750-627

w750-5044

Interface module for system connection
Connector with power pins
20 pin, 16 channel relay output, 1 changeover contact

w750-2054

Interface mudle for systém connection
Connector with power pins
20 pin, 16 channel DI/DO

w706-3057/300-100

System cable for Schneider TSX
16 DI/DO, 1 m

w852-111

Ethernet switch

w787-722

Switched power supply
Output voltage 24 V, current 5 A
1-phase

w247-513

Description card Mini-WSB
With marking, 00...09 (10x)
Mini-WSB snap-on

COMMUNICATION MODULE WALL

w750-652

RS232/RS485 serial interface, configurable

PROCESS STATIONS, CONTROLLERS
PROCESS STATIONS WITH SOFTPLC RUNTIME

IPCB.1

Process station with no display
PLC incl. SoftPLC Runtime, no display, Intel Atom D2550, 1.8 GHz, 2 GB RAM,
2× RS232, 2× USB, 2× LAN, VGA, Audio Out, 9...36 V DC, aluminium case, Windows

IPCT.1

Process station with 8" touch screen
PLC incl. SoftPLC Runtime, iPC 08 118T, SSD 32 GB, Windows

PROCESS STATIONS, CONTROLLERS
PROCESS STATIONS WITHOUT RUNTIME AND OS

iPC 08 118T

Process station, 8" LCD touch screen
PC, LCD 8" 800×600, Intel Celeron N2930 1.83 GHz, 4 GB DDR3L RAM on board,
2× COM, 2× USB 3.0, 2× GbE LAN, aluminium body, 9...36 V DC

iPC 10 118T

Process station, 10" LCD touch screen
PC, LCD 10" 1280×800, Intel Celeron N2930 1.83 GHz, 4 GB DDR3L RAM
on board, 2× COM, 2× USB 3.0, 2× GbE LAN, aluminium body, 9...36 V DC

iPC 12 118T

Process station, 12.1" LCD touch screen
PC, LCD 12,1" 800×600, Intel Celeron N2930 1.83 GHz, 4 GB DDR3L RAM on
board, 2× COM, 2× USB 3.0, 2× GbE LAN, aluminium body, 9...36 V DC

iPC 15 118T

Process station, 15" LCD touch screen
PC, LCD 15" 1024×768, Intel Celeron N2930 1.83 GHz, 4 GB DDR3L RAM on
board, 2× COM, 2× USB 3.0, 2× GbE LAN, aluminium body, 9...36 V DC

iPC 18 118T

Process station, 18.5" LCD touch screen
PC, LCD 18.5" 1280×1024, Intel Celeron N2930 1.83 GHz, 4 GB DDR3L RAM on
board, 2× COM, 2× USB 3.0, 2× GbE LAN, aluminium body, 9...36 V DC

iPC 21 118T

Process station 21" LCD touch screeen
PC, LCD 21" 1920×1080, Intel Celeron N2930 1.83 GHz, 4 GB DDR3L RAM on board, 2× COM, 2× USB 3.0, 2× GbE LAN, aluminium body, 9...36 V DC

iPC 00 160

Process station with no display
PC, Intel Celeron N2930 1.83 GHz, 4 GB DDR3L RAM on board, 3× COM, 4× USB 2.0, 2× USB 3.0, 2× LAN, 1× VGA, Audio Out, 9...36 V DC

PROCESS STATIONS, CONTROLLERS
PROCESS STATIONS – ACCESSORIES

markPLC kit

Mounting frame for markPLC
For fixing of markPLC into front panel: cut a 103 × 46 mm aperture and holes for the screws in the front door, then use a 150 mm DIN rail to mount the MiniPLC from inside. The frame covers the aperture on the outer side.

PROCESS STATIONS, CONTROLLERS
INDIVIDUAL ROOM CONTROLS

UC102

Heating controller, RS485
Display 60 × 60 mm, push / turn knob, temperature and humidity sensor, setting of values, real time clock, status indication and switching, 2× DI (presence, window), 1× DO (24 V AC radiator valve), Modbus / RS485 galv. separated

Replacement of UC100 – extension by 2 digital inputs, full backward compatibility. Use ME210/ME220 for more actuators.
* no display, no knob – UC102/DK
* backlit display – UC102/BL

UC200

Heating/cooling controller, RS485
Display 60 × 60 mm, push / turn knob, temperature and humidity sensor, setting of values, real time clock, status indication and switching, 2× DI (presence, window), 2× DO (24 V AC radiator, cooling panel), Modbus / RS485 galv. separated

* backlit display – UC200/BL

UC300

Floor heating controller, RS485
Display 60 × 60 mm, push / turn knob, temperature and humidity sensor, 1× AI for ext. Pt1000 floor sensor, setting of values, real time clock, status indication and switching, 1× DO (24 V AC thermic actuator), Modbus / RS485 galv. separated

FCR010

Fan coil controller, RS485
2× DI (presence, window), 2× DO triac 24 V AC for thermic valves (heating, cooling), 3 × relay for three-stage fancoil, 1× Modbus slave / RS485 for SCADA/primary controller, 1× Modbus master / RS485 for UC010

Use UC010 or galvanically separated UC011 as a room unit.

FCR011

Fan coil controller, RS485, power 230 V AC
2× DI (presence, window), 2× DO triac 230 V AC for thermic valves (heating, cooling), 3 × relay for three-stage fancoil, 1× Modbus slave / RS485 for SCADA/primary controller, 1× Modbus master / RS485 for UC010

Use UC010 or galvanically separated UC011 as a room unit.

FCRO13

Fan coil controller for EC motors 0...10 V, RS485
2× DI (presence, window), 3× AO 0...10 V, 2× DO SSR 0.4 A, 1× Modbus slave / RS485 for SCADA/primary controller, 1× Modbus master / RS485 for UCO13

Use UCO13 as a room unit.

FCRO15

VAV controller, communicative
VAV box (CO_2) controller, 2× DI (presence, window), 2× DO triac 24 V AC, 3× AO 0...10 V (VAV controller, heating and cooling valves), 1× Modbus slave / RS485 for SCADA/primary controller, 1× Modbus master / RS485 for UC905

Use UC905 as a room unit.

UCO10

Room unit, RS485
Display 60 × 60 mm, push / turn knob, temperature and humidity sensor, setting of operation mode, fancoil stages and setpoints, status indication and switching, Modbus / RS485 communication

Room unit for FCRO10 or FCRO11 fan coil controller
UCO10/DK: no display, no knob (for schools, corridors etc.)
backlit display – UCO10/BL

UCO11

Room unit, RS485
Display 60 × 60 mm, push / turn knob, temperature and humidity sensor, setting of operation mode, fancoil stages and setpoints, status indication and switching, Modbus / RS485 galv. separated

Room unit for FCRO10 or FCRO11 fan coil controller
* backlit display – UCO11/BL

UCO13

Room unit for FCRO13, RS485
Display 60 × 60 mm, push / turn knob, temperature and humidity sensor, setting of operation mode, fancoil stages and setpoints, status indication and switching, Modbus / RS485 galv. separated

Room unit for FCRO13 fan coil controller
* backlit display – UCO13/BL

UC905

Room unit with CO_2 sensor for FCRO15, communicative
Display 60 × 60 mm, push / turn knob, temperature, humidity and CO_2 sensor, setting of operation mode, VAV mode and temperature setpoints, status indication and switching, Modbus / RS485 galv. separated

Room unit for FCO15 VAV controller

UC120

Radiator or cooling controller, RS485
Display 60 x 60 mm, rotatable knob with button, temperature measurement, set. values, clock, switching and indication of states, 2x DI (presence, window), 1x DO 0...10 V st for controlling the radiator or el. modulated heating, com. MODBUS / RS485 galv. separated

UC120/DK – version without display and knob.

UC220

Regulator of radiators and cooling, RS485
Display 60 x 60 mm, rotatable knob with button, temperature measurement, status. values, hours, switching and indication of states, 2 x DI (presence, window), 2 x DO 0...10 V st for controlling the radiator or el. modulated heating, com. MODBUS / RS485 galv. separated

EPC102

Heating controller with external temperature sensor, RS485
External room temperature sensor, 1× DI (window), 1× DO (triac 24 V/1A AC radiator valve), Modbus / RS485 galv. separated

No operating elements, for schools, public buildings etc. The room sensor is part of delivery

PROCESS STATIONS, CONTROLLERS
COMMUNICATIVE ROOM UNITS AND SENSORS

UIO10

Room unit, RS485, temperature, rH
Display 60 × 60 mm, push / turn knob, temperature and rH sensor, setting of values, status indication and switching, Modbus / RS485 communication

blue backlit display – UIO10BL

UIO11

Room unit, RS485, temperature, rH
Display 60 × 60 mm, rotary knob with button, temperature and rH sensor, value setting, switching and status indication, Modbus / RS485 communication galv. separated

* without knob – UIO51, without knob and display – UIO71
* with blue display backlight – UIO11BL, UIO51BL

UIO12

Room unit, RS485, temperature, rH, 2DI, 1DO
Display 60 × 60 mm, push / turn knob, temperature and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 2× DI, 1× DO triac 24 V AC

no knob – UIO52, no knob / display – UIO72
blue backlit display – UIO12BL, UIO52BL

UIO20

Room unit, RS485, temperature, rH, 2DI, 1DO
Display 60 × 60 mm, push / turn knob, temperature and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 2× DI, 1× DO triac 24 V AC

* without knob – UIO55, without knob and display – UIO75
* with blue display backlight – UIO20BL, UIO55BL

UI300

Room unit, RS485, t, rH, 1DI, 1DO, 1AI
Display 60 × 60 mm, push / turn knob, internal temperature and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 1× DI, 1× DO triac 24 V AC, 1× AI for a Pt1000 external temperature sensor.

* without knob and display – UI300DK
* with blue display backlight – UI300BL

UI309

Room unit, RS485, t, rH, CO_2, 1DI, 1DO, 1AI
Display 60 × 60 mm, push / turn knob, internal temperature, CO_2 and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 1× DI, 1× DO triac 24 V AC, 1× AI for a Pt1000 external temperature sensor.

* without knob and display – UI309DK
* with blue display backlight – UI309BL

UI310

Room unit, RS485, t, rH, PIR, 1DI, 1DO, 1AI
Display 60 × 60 mm, push / turn knob, presence, temperature and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 1× DI, 1× DO triac 24 V AC, 1× AI for a Pt1000 external temperature sensor.

* without knob and display – UI310DK
* with blue display backlight – UI310BL

UI319

Room unit, RS485, t, rH, CO_2, PIR, 1DI, 1DO, 1AI
Display 60 × 60 mm, push / turn knob, internal presence, temperature, CO_2 and rH sensor, setting of values, real time clock, status indication and switching, Modbus / RS485 galv. separated, 1× DI, 1× DO triac 24 V AC, 1× AI for a Pt1000 external temperature sensor.

* without knob and display – UI319DK
* with blue display backlight – UI319BL

UI900

Room unit, RS485, temperature, CO_2, rH
Temperature, rel. humidity, and CO_2 sensor, communication Modbus / RS485 galv. separated.

UI901

Room unit, RS485, t, CO$_2$, rH, 2DI, 2DO
Display 60 × 60 mm, push / turn knob, temperature, CO$_2$ and rH sensor, setting of values, status indication and switching, Modbus / RS485 galv. separated, 2× DI, 2× DO triac 24 V AC, Function of thermostat, hygrostat or CO$_2$-stat.

no knob – UI903, no knob no display – UI907
blue backlit display – UI901BL, UI903BL

UI905

Room unit, RS485, temperature, CO$_2$, rH
Display 60 × 60 mm, push / turn knob, temperature, humidity and CO$_2$ sensor, setting of values, status indication and switching, Modbus / RS485 galv. separated.

* with backlight display UI-905BL

UX011

Room unit, RS485, temperature
Display 60 × 60 mm, 5× button, temperature sensor, setting of values, status indication and switching, 1× DI, 3× DO (triac 24 V AC), Modbus / RS485 communication galv. separated

* with rh – UX041
* with RTC – UX015

MANAGEMENT STATIONS
PC

PCD1

Management station PC
Configuration for RcWare Vision, HDD 500+ GB, LCD 17", colour printer, keyboard, mouse, OS.

MANAGEMENT STATIONS
VISUALIZATION MERBON SCADA AND DATABASE

Merbon SCADA 5 000

Licence for server SCADA. Fully web-based visualization, up to 5 000 datapoints. Alarm module, historical trends based on file system, events and map background integration.

Merbon SCADA 50 000

Licence for server SCADA. Fully web-based visualization, up to 50 000 datapoints. Alarm module, historical trends based on file system, events and map background integration.

Merbon SCADA unlimited

Licence for server SCADA. Fully web-based visualization, unlimited number of datapoints. Alarm module, historical trends based on file system, events and map background integration.

Merbon DB 40 000

Database system for time-series data storage.
Powerful database for connecting of PLC Runtimes and SCADA server, up to 40 000 datapoints. Including API for third party systems integration. For large applications where native SCADA file system is not sufficient.

Merbon DB + 10 000

Merbon DB database extension by 10 000 data points.

ENERGY MANAGEMENT SYSTEM
PORTAL CONTPORT

merbon CONTPORT

CP–Config

ContPort configuration
Installation of customer data on the ContPort server, device configuration, definition of data points and technologies, user training.

merbon CONTPORT

CP–Admin

ContPort administrator licence
The administrator has rights to configure other users, assign user rights, configure data and technology structures etc.

merbon CONTPORT

CP–Storage

ContPort data storage
Data storage of the CRM part – contracts, documents, schemas, floor plans etc.

merbon CONTPORT

CP–User

ContPort client licence
User access to ContPort – users can display trend and statistics data, work with the ticketing system etc.

merbon CONTPORT

CP–OnData

Online data in ContPort
Recording of data for a data point (max. 4 samples per hour)

MODULES AND CONVERTERS
I/O MODULES

R220

12 relay output module
max. 8 A / 250 V AC or 8A / 24 V DC, DIN rail mounting, dimensions 98 × 105 × 61 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated

R312

8 triac outputs module
To control 8 groups of 24 V thermic actuators, output current max. 0.5 A per output. The PWM signal is generated in the module, controlled as 0...100 %. DIN rail or 2 screws mounting, dimensions 98 × 70 × 35 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galvanically separated.

If there are more than 2 actuators per output use triac amplifiers ME210, ME220.

R313

8 triac outputs module, 230 V AC
To control 8 groups of 230 V thermic actuators, output current max. 0.5 A per output. The PWM signal is generated in the module, controlled as 0...100 %. DIN rail or 2 screws mounting, dimensions 98 × 70 × 35 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galvanically separated.

R320

16 digital outputs (OC) module
open collector, 50 V DC, 0.5 A, DIN rail mounting, dimensions 98 × 105 × 61 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated

R330

32 digital outputs (OC) module
open collector, 50 V DC, 0.5 A, DIN rail mounting, dimensions 98 × 105 × 61 mm.
Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated

R420

16 digital inputs module 24 V
24 V AC / DC, 15 mA, common ground for each 8 inputs. DIN rail mounting, dimensions 98 × 105 × 61 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated

R430

32 digital inputs module 24 V
24 V AC / DC, 15 mA, common grounds for 24 and 8 inputs. DIN rail mounting, dimensions 98 × 105 × 61 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated

R500

8 analogue inputs module
8× AI (± 10 V, 4...20 mA), 16 bit. DIN rail mounting, dimensions 105 × 90 × 58 mm.
Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated

R560

8 analogue inputs module
Pt1000, 20...5000 Ohm, 0...10 V, 4...20 mA, 16 bit. DIN rail mounting, dimensions 98 × 70 × 61 mm. Supply 24 V AC/DC ±20 %, Modbus RTU / RS485 galv. separated

R610

8 analogue outputs module
0..10 V, max. 10 mA, optically separated, common ground. DIN rail mounting, dimensions 98 × 70 × 61 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated

R710

4 pulse counters module, battery backup
for dry contacts / OC (12 V, 15 mA), 4 byte counters, DIN rail mounting, dimensions 98 × 70 × 61 mm. Ready for load shedding (E-Max). Supply 24 V AC/DC ±20 %, Modbus RTU / RS485 galv. separated

MW240-B

Module for controlling lights or blinds
2× DI for sweat-free. switch contacts (button logic), 2 x DO relay 230 V AC / 5 A ohmic load. Installation in an installation box, dimensions 49 × 49 × 30 mm. Power supply 24 V AC / DC ±10 %, Modbus RTU / RS485 galv. dept.

MW241

Control module for 2 LED lighting groups
2x DI for dry contacts (switches or buttons), 2 x DO SSR 230 V AC / 1 A AC1 load. Flush box mounting, dimensions 49 × 49 × 30 mm. Supply 24 V AC/DC ± 20 %, Modbus RTU / RS485 galv. separated

For switching of LED power supplies with capacitive load

MW501

Voltage measurement module
1× AI 0...10 V, dimensions 70 × 63 × 33 mm, Modbus RTU / RS485 galv. separated

RMIO

Combined I/O module, 17 I/O
4× AI (Pt1000 or potentiometer, 2× 0...10 V or 0...20 mA), 4× DI dry contact, 2× AO 0...10 V, 5× relay (230 V AC / 5 A), 2× DO triac (24 V AC / 0.4 A). DIN rail mounting, dimensions 90 × 105 × 58 mm, supply 24 V AC / DC ± 20 %, Modbus RTU / RS485 galv. separated

RCIO

Combined I/O module, 30 I/O
8× AI (0...10V, Pt100, Pt1000, Ni1000, T1, 4× 4...20 mA), 6× AO (0..10V), 8× DI (24 V), 8× DO relay (230V/5A). DIN rail mounting, dimensions 217 × 115 × 40 mm, supply 24 V AC ± 10 %, Modbus RTU / RS485 galv. separated

RXIO

Combined I/O module, 88 I/O
16× AI (Pt100, Pt1000, Ni1000, T1, 8× 0...10V, 4...20 mA) galv. sep., 32× DI 24 V, 8× AO 0...10 V galv. sep., 32× DO relay (230 V AC / 5 A). Dimensions 265 × 292 × 40 mm, supply 24 V AC / DC ± 10 %, Modbus RTU / RS485 galv. separated

See also markMX in the Process stations section.

MLIO

Module for distributed inputs/outputs, 7 I/O
4× AI (Pt1000, 0...5000 Ohm, 0...10 V or DI for a dry contact), 1× AO 0...10 V, 2× DO relay (230 V AC / 5 A ohmic load). Dimensions 162 × 120 × 72 mm. Power 10...35 V DC / 24 V AC, Modbus RTU / RS485 galv. separated

Installation on a wall or to a conduit.

MODULES AND CONVERTERS
COMMUNICATION CONVERTERS

R005

Sauter EY2400 – RS232 converter
For integration of Sauter 2400 controllers into IPLC5xx, IPCT.., IPCB... Galvanic separation, max. 20 controllers on the bus, 2× LED. Power 230 V AC. DIN rail mounting, dimensions 98 × 105 × 61 mm

R012

RS232 / RS485 converter
Baudrate 1200...19200 bit/s, bus termination switch, optical separation, 3× LEDs Rx, Tx, Power. Supply 10...35 V DC / 24 V AC. DIN rail mounting, dimensions 98 × 35 × 61 mm

R025

RS232 / Ethernet converter, Modbus router
Terminal server up to 230400 bit/s, modem emulation, serial bridge. COM port driver for Windows and Linux. Modbus RTU / TCP routing functionality. Supply 24 V AC ± 10 %, 1.5 VA. DIN rail mounting, dimensions 98 × 35 × 61 mm

R035

RS485 / Ethernet converter, Modbus router
Terminal server up to 230400 bit/s, serial bridge. COM port driver for Windows and Linux. Modbus RTU / TCP routing functionality. Supply 24 V AC ± 10 %, 2 VA. DIN rail mounting, dimensions 98 × 35 × 61 mm

RO60

MP-Bus / Modbus RTU/TCP converter
For control of up to 8 Belimo actuators on MP-Bus over Modbus TCP or Modbus RTU/RS485. Optical separation, power 24 V AC/DC ± 15 %, 3 VA. MP-Bus service connector RJ11. Dimensions 98 × 70 × 31 mm.

RO65

DMX512 / Modbus TCP converter
For control of up to 2× 512 DMX lights over Modbus TCP. 2× DMX port. Power 24 V AC/DC ± 15 %, 3 VA. DIN rail mounting, dimensions 98 × 70 × 31 mm.

RO80

USB / RS485 converter
Small and handy USB powered converter for service and commissioning. Optically separated, 3× LED (PC link, Rx, Tx). Inclusive driver and comfortable universal Modbus RTU / TCP client SW. 49 × 34 × 20 mm, USB cable 140 cm.

The client software ModComTool and RO80 USB drivers are available at www.domat.cz

RO85

P-Bus / Modbus RS485 converter
Landis & Gyr P-Bus to Modbus RTU / RS485 converter for integration of PTM.., PTK.. module bus into any Modbus compatible PLC. Native support in SoftPLC IDE and Merbon IDE. Power supply 230 V AC, 32 BE (P-Bus load units). DIN rail mounting, dimensions 98 × 105 × 61 mm.

* RO86: 64 BE (zátěžových jednotek P-Bus)

RO91

DALI2 (multi master) / Modbus TCP converter
Control of up to 64 DALI ballasts over Modbus TCP, with switchable DALI bus supply. Web access for commissioning and service. DALI short circuit protection, auto reset. Power supply 24 V AC/DC ± 20 %, 6 VA. DIN rail mounting, dimensions 98 × 70 × 61 mm.

RO95

M-Bus / RS232 converter, 25 devices
Supply 20...24 V AC, 6 VA max. 25 M-Bus meters, short-circuit protection with auto reset, RS232 screw terminals + CANNON 9M. DIN rail mounting, dimensions 98 × 70 × 61 mm.

RO96

M-Bus / RS232 converter, 60 devices
Supply 20...24 V AC, 6 VA max. 60 M-Bus meters, short-circuit protection with auto reset, RS232 screw terminals + CANNON 9M. DIN rail mounting, dimensions 98 × 70 × 61 mm.

MODULES AND CONVERTERS
DISPLAY UNITS, ACCESSORIES

HT200

Touch screen operator unit
Terminal with touch screen 7", 800×480, ARM Cortex A8 600 MHz, 256 MB FLASH, 256 MB DDR3 DRAM, Ethernet, microSD slot (card not included), Linux, power 24 V DC ± 10 %, 30 W, power supply not included

PWR010

Transformer 230 / 24 V
Safety transformer 10 VA, installation to a DIN rail.

PWR011

Transformer 230 / 24 V, 2x triac
Safety transformer 10 VA, installation to a DIN rail. On-board are 2× 230 V / 0,5 A triacs controlled by external 24 V AC signal for separation and pull-up of 2 PWM signals.

ME200

Power relay module
For connecting of the UX... room unit to the blinds actuator. 2× relay 250 V / 5 A. Mounts in a flush box. Dimensions: 49 × 49 × 30 mm.

ME210

Triac amplifier
To connect more actuators to UC..., FC..., and UI.... Provides 1× triac output 24 V / 2 A.
Flush box mounting, dimensions 49 × 49 × 14 mm.

Up to 4 thermic actuators may be connected to the output.

ME220

Triac amplifier, 2 triacs
To connect more actuators to UC..., FC..., and UI.... Provides 2× triac output 24 V / 2 A. Each output may be controlled separately. Flush box mounting, dimensions 49 × 49 × 14 mm.

Up to 4 thermic actuators may be connected to each of the outputs. If IN1 and IN2 inputs are connected in parallel, ME220 may control up to 8 valves with one signal.

PERIPHERALS
DOMAT DESIGN SENSORS

UT001

Room temperature sensor
Wall-mounted, dimensions 90 × 107 × 26 mm
Measuring element Pt1000

UT051

Outside temperature sensor
Wall-mounted, dimensions 90 × 107 × 26 mm, -20...70 °C, IP 43
Measuring element Pt1000

UT090

Room sensor, temperature, CO_2, 2 × 0...10V
Internal range setting 0...2000 / 0...5000 ppm, temperature 0...50 °C. Power 10...35 V DC / 24 V AC. Wall-mounted, dimensions 90 × 107 × 26 mm, IP 43

UT100

Communicative temperature sensor, Modbus RTU
For external Pt1000 measuring element (not supplied). Measuring range -30...100 °C. Power 10...35 V DC / 24 V AC. Dimensions 70 × 63 × 34 mm, IP 43

UT200

Communicative temperature sensor, Modbus RTU
Inclusive Pt1000 measuring element. Measuring range -30...100 °C. Power 10..35 V DC / 24 V AC. Dimensions 70 × 63 × 34 mm + stem 25 mm, IP 43

PERIPHERALS
DOMAT STELIX SENSORS

DIP200

Communicative motion and lighting sensor
Modbus RTU / RS485. Motion: IR sensor, lighting: photodiode 2...3000 lx. To control air-condition and lights in offices, workshops etc. Power 12...24 V DC.

Interchangeable mounting bases and lenses for different mounting methods and characteristics of the TH08-MS sensor.

PERIPHERALS
TEMPERATURE SENSORS, PASSIVE

RTF1

Room temperature sensor
Wall-mounted, dimensions 98 × 98 × 33 mm
Measuring element Pt1000

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm, NiTK

ALTF1

Strap-on temperature sensor
-35...105 °C, IP63/68, dimensions Ø 6 × 50 mm, contact metal sheet. Strap band mm, for pipes Ø 13...92 mm. Measuring element Pt1000

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* silicon cable – up to +180°C

ALTF02

Strap-on temperature sensor
-30...110 °C, IP54, dimensions 72 × 64 × 37.8 mm. Strap-on metal band 300 mm, for pipes Ø 13...92 mm. Measuring element Pt1000

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm

TF-43

Temperature sensor, IP54
Measuring element Pt1000, -30...150 °C, dimensions 72 × 64 × 37.8 mm + stem. Brass TH08-MS or stainless steel TH-VA pocket 1/2" (as immersion sensor) or flange MF-15-K (as duct sensor) must be ordered separately.

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* length 50, 100, 150, 200, 250, 300 mm

TF-65

Temperature sensor, IP65
Measuring element Pt1000, -30...150 °C, dimensions 72 × 64 × 37.8 mm + stem. 1/2" well brass TH08-MS or stainless steel TH-VA (for use as an immersion sensor) or flange MF-15-K (for use as channel sensor) is ordered separately.

* Pt100, Ni1000-5000, Ni1000-6180, NTC1.8kOhm
* length 50, 100, 150, 200, 250, 300, 400 mm

TH08-MS

Brass nickel-plated immersion sleeve
1/2", 150 mm, 10 bar, max. temperature +150 °C, Ø 8 mm. For installing the TF-65 or TF-43 sensor in the pipeline.

* length 50, 100, 150, 200, 250, 300, 400 mm

TH-VA

Stainless steel immersion sleeve
1/2", 150 mm, 40 bar, max. temperature +600 °C, Ø 8 mm. Material VA 1.4571. For installing the TF-65 sensor in the pipeline.

* length 50, 100, 150, 200, 250, 300, 400 mm

MF–15–K

Plastic flange
For installing the TF–65 sensor in the ventilation duct. Mounting with two screws on the channel wall. 58 x 86 x 25 mm, Ø 15.2 mm. Max. temperature +100 °C.

ATF1

Outdoor temperature sensor
–50...90 °C, dimensions 72 × 64 × 37.8 mm
Wall mounting, IP67
Measuring element Pt1000

Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm

ATF2

Outdoor temperature sensor
–50...90 °C, dimensions 72 × 64 × 37.8 mm
Wall mounting, IP65, measuring element in an external stainless steel well. Measuring element Pt1000,

Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm

MWTF

Average temperature channel sensor
–30...80 °C, dimensions 72 × 64 × 37.8 mm + stem 400 mm
Plastic coated copper stem Ø 6 mm, IP65
Measuring element Pt1000

Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm
length 0.4, 3, 6 m or customer length up to 20 m
Pt100, Ni1000–5000

HTF50

Cable temperature sensor–35...105 °C, dimensions Ø 6 × 50 mm + cable 1.5 m
Steel housing, IP65
Measuring element Pt1000

Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm
silicone cable up to 180 °C, length on request
IP65, IP68

HTF200

Cable temperature sensor, silicone cable
–35...105 °C, dimensions Ø 6 × 200 mm + silicone cable up to 180 °C, 1.5 m. Steel housing, IP65. Measuring element Pt1000

RPTF1

Pendulum room temperature sensor
–5...60 °C, dimensions Ø 16 × 142 mm + cable 1.5 m. Stainless steel tube, IP65.
Measuring element Pt1000

Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm
cable lengths of 3 m, 6 m or customer

RPTF2

Pendulum room temperature sensor
–5...60 °C, plastic globe Ø 50 mm, cable 1.5 m.
For air temperature and radiating temperature metering.
Measuring element Pt1000, IP65

Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm
cable lengths of 3 m, 6 m or customer

RSTF

Room radiation temperature sensor (semi–global)
–30...75 °C, plastic globe.
For air temperature and radiating temperature metering.
Measuring element Pt1000, IP30

Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm

PERIPHERALS
TEMPERATURE SENSORS, ACTIVE

TH08-MS

Immersion sleeve for immersion sensors, nickel-plated brass
1/2", 150 mm, 10 bar, Ø 8 mm. To be ordered with TF-65 or TF-43 in corresponding length.

length 50, 100, 150, 200, 250, 300, 400 mm

TH-VA

Pocket for immersion sensors, stainless steel
1/2", 150 mm, 40 bar, Ø 8 mm. Stainless steel VA 1.4571. To be ordered with TF-65 in corresponding length

length 50, 100, 150, 200, 250, 300, 400 mm

MF-15-K

Mounting flange, plastic
To be ordered with TF-65 for installation of sensors into air ducts. 58 × 86 × 25 mm.

RTM1-U

Room temperature sensor
0...50 °C or -20...150 °C, dimensions 85 × 85 × 27 mm.
Wall mounting, output 0...10 V, power supply 24 V AC / DC.
Housing ABS, colour pure white RAL9010

RTM1-I: 4..20 mA (only DC power)
RTM1-U,D: with display
other measuring ranges
stainless steel cover

RPTM1-U

Pendulum room temperature sensor
0...50 °C or -20...150 °C, dimensions 72 × 64 × 37.8 mm + probe 1.5 m.

RPTM1-I: 4..20 mA (only DC power)
other measuring ranges
cable length 3 m, 6 m or custom

RPTM2-U

Pendulum (globe) room temperature sensor
0...50 °C or -20...150 °C, dimensions 72 × 64 × 37.8 mm + probe 1.5 m, plastic globe Ø 50 mm
Output 0...10 V, power supply 24 V AC / DC

* **RPTM2-I**: *4..20 mA (only DC power)*
* *other measuring ranges*
* *cable length 3 m, 6 m or custom*

PERIPHERALS
HUMIDITY SENSORS

KFF-U

Duct humidity sensor
Capacitive element, 20...80 %rH: ±2 %, 0...100 %rH: ±3 % stem Ø 20 × 235 mm, IP65
Output 0...10 V, power supply 24 V AC / DC

4...20 mA (only DC power)
display

KFTF-U

Duct humidity and temperature sensor
Capacitive element, 20...80 %rH: ±2 %, 0...100 %rH: ±3 %
Temperature -35...80 °C (switchable ranges), stem Ø 20 × 235 mm, IP65
Output 2× 0...10 V, power supply 24 V AC / DC

KFTF-I: 4...20 mA (only DC power)
display
passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-
6180, NTC1.8kOhm

AFF-U

On-wall humidity sensor
Capacitive element, 20...80 %rH: ±2 %, 0...100 %rH: ±3 %
Stem Ø 16 × 55 mm, IP65
Output 0...10 V, power supply 24 V AC / DC

AFF-I: 4...20 mA (only DC power)
display

AFTF-U

On-wall humidity and temperature sensor
Capacitive element, 20...80 %rH: ±2 %, 0...100 %rH: ±3 %
Temperature -35...80 °C (switchable ranges), stem Ø 16 × 55 mm, IP65
Output 2× 0...10 V, power supply 24 V AC / DC

AFTF-I: 4..20 mA (only DC power)
display
passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-
6180, NTC1.8kOhm

KFF-20U

Duct humidity sensor, high-precision
Capacitive element, 10...90 %rH: ±1.8 %, 0...100 %rH: ±2 %
Stem Ø 20 × 235 mm, IP65
Output 0...10 V, power supply 24 V AC / DC

KFF-20I: 4..20 mA (only DC power)
display

KFTF-20U

Duct humidity and temperature sensor, high-precision
Capacitive element, 10...90 %rH: ±1.8 %, 0...100 %rH: ±2 %
Temperature -35...80 °C (switchable ranges), stem Ø 20 × 235 mm, IP65
Output 2× 0...10 V, power supply 24 V AC / DC

* **KFTF-20I**: *4..20 mA (only DC power)*
display

AFF-SD-U

On-wall humidity and temperature sensor
20...80 %rH: ±2 % 0...100 %rH: ±5 %
Stem Ø 16 × 55 mm, IP65
Output 0...10 V, power supply 24 V AC / DC

display

AFF-20U

On-wall humidity sensor, high-precision
Capacitive element, 10...90 %rH: ±1.8 %, 0...100 %rH: ±3 %
Stem Ø 16 × 137 mm, IP65
Output 0...10 V, power supply 24 V AC / DC

* **AFF-20I**: *4..20 mA (only DC power)*
display

AFTF-SD-U

On-wall humidity and temperature sensor
20...80 %rH: ±2 % 0...100 %rH: ±3 %
Temperature -35...80 °C (switchable ranges), stem Ø 16 × 55 mm, IP65
Output 2× 0...10 V, power supply 24 V AC / DC

AFTF-20U

On-wall humidity and temperature sensor, high-precision
Capacitive element, 10...90 %rH: ±1.8 %, 0.100 %rH: ±2 %
Temperature -35...80 °C (switchable ranges) ± 2k, stem Ø 16 × 55 mm, IP65
Output 2× 0...10 V, power supply 24 V AC / DC

* **AFTF-20I**: *4...20 mA (only DC power)*
display

RFF-U

Room humidity sensor
Capacitive element, 20...80 %rH: ±2 %, 0...100 %rH: ±3 %
Output 0...10 V, power supply 24 V AC / DC
Wall mounting, dimensions 85 × 85 × 27 mm

* **RFF-I**: *: 4...20 mA (napájení pouze ss)*
displej

RFTF-U

Room humidity and temperature sensor
Capacitive element, 20...80 %rH: ±2 %, 0...100 %rH: ±3 %
Temperature 0...50 °C, output 2× 0...10 V, power supply 24 V AC / DC
Wall mounting, dimensions 85 × 85 × 27 mm

* **RFTF-I**: *4...20 mA (only DC power)*
display
passive temperature sensor Pt100, Pt1000, Ni1000-5000, Ni1000-
6180, NTC1.8kOhm

RPFF–U

Pendulum room humidity sensor
Capacitive element, 20...80 %rH: ±2 %, 0...100 %rH: ±3 %.
Output 0...10 V, power supply 24 V AC / DC
Dimensions 72 × 64 × 37.8 mm, cable 2 m

* **RPFF–I**: *4...20 mA (only DC power)*
* *display*

RPFTF–U

Pendulum room humidity and temperature sensor
Capacitive element, 20...80 %rH: ±2 %, 0...100 %rH: ±3 %.
Temperature –35...80 °C (switchable ranges). Output 0...10 V, power supply 24 V AC / DC Dimensions 72 × 64 × 37.8 mm, cable 2 m

* **RPFTF–I**: *4...20 mA (only DC power)*
* *display*

PERIPHERALS
PRESSURE SENSORS

SHD-U1

Pressure sensor for liquid and fluid media
Power supply 24 V AC / DC, measuring range 0...1 bar, output 0...10 V, ext. thread G1/2", stainless steel, overload 2 × measuring range, temp. range –40...135 °C, IP65

* *SHD-U2.5, SHD-U6, SHD-U10, SHD-U16, SHD-U25, SHD-U40 (number = measuring range in bar)*
* *SHD-I.. output 4...20 mA (only DC power)*

SHD692

Differential pressure sensor for liquid and fluid media
Power supply 24 V AC / DC, output 0...10 V, internal thread 1/8" – 27 NPT, stainless steel, overload 1.5× measuring range, system pressure max. 25 bar, temp. range –15...80 °C, IP65

* *SHD692-900: 0.1 bar, SHD692-907: 0.5 bar, SHD692-912: 1 bar, SHD692916: 2.5 bar, SHD692-918: 4 bar*

Premasgard 2111

Differential air pressure sensor Premasgard –1000...1000 Pa
Power 24 V AC / DC, output 0...10 V, incl. hose Ø 4/6 × 2000 mm, for non-aggressive and non-combustible gases, dimensions 72 × 64 × 37.8 mm, IP67

Adjustable range:
0(-100)..+100 Pa / 0(-300)..+300 Pa /
0(-500)...+500 Pa / 0(-1000)...+1000 Pa
* *DF-010I: 4...20 mA (only DC power)*

Premasgard 2125

Differential air pressure sensor Premasgard –5000...5000 Pa
Power 24 V AC / DC, output 0...10 V, incl. hose Ø 6 × 2000 mm, for non-aggressive and non-combustible gases, dimensions 72 × 64 × 37.8 mm, IP67

Adjustable range:
0(-1000)... +1000 Pa / 0(-2000)... +2000 Pa
0(-3000)... +3000 Pa / 0(-5000)...+5000 Pa
* *DF-050I: 4...20 mA (only DC power)*

Premasgard 7112-U

Premasgard 7112-U
Differential air pressure sensor Premasgard 0...25 Pa/–25...25 Pa
Power supply 24 V AC / DC, output 0..10 V, incl. hose Ø 6 × 2000 mm, for non-aggressive and non-combustible gases, dimensions 126 x 90 x 50 mm, IP65

Adjustable range:
0...25 Pa / -25...25 Pa
Premasgard 7112-I: 4...20 mA

PERIPHERALS
LIGHT INTENSITY, AIR QUALITY AND CO_2 SENSORS

AHKF–U

Outdoor light intensity sensor
Power supply 24 V AC / DC, output 0...10 V, measuring range 0..500 lx / 1 lx / 2 klx / 5 klx / 20 klx / 60 klx (switchable), wall-mounted, IP67, dimensions 72 × 64 × 43.3 mm

* *AHKF–I: 4...20 mA (only DC power)*

RHKF-U

Room light intensity sensor
Power supply 24 V AC / DC, output 0..10 V, measuring range 0...500 lx / 1 klx / 5 klx / 20 klx (switchable), wall-mounted, IP30, dimensions 85 × 85 × 27 mm

* RHKF–I, 4...20 mA (only DC power)

RBWF-W

Room motion sensor/presence detector
Power supply 24 V AC / DC, output 230 V / 2A change-over, IR, beam angle 360° × 110°, operating range ca. 10 m, timeout adjustable 4 s ... 16 min., wall mounted, IP30, dimensions 72 × 64 × 37.8 mm

KLQ-W

Duct air quality sensor
Power supply 24 V AC / DC, output 0..10 V or 4..20 mA ~ 100..0 % air quality referred to calibration gas, VOC sensor, IP65

* display

RLQ-W

Room air quality sensor
Power supply 24 V AC / DC, output 0...10 V or 4...20 mA ~ 100...0 % air quality referred to calibration gas, VOC sensor, IP30, dimensions 85 × 85 × 27 mm

* display

RCO2-W

Room CO_2 sensor
Power supply 24 V AC / DC, output 0...10 V or 4...20 mA ~ 0...2000 ppm, or 0...5000 ppm optical sensor NDIR, IP30, dimensions 85 × 85 × 27 mm

* display

RLQ-CO2-W

Room air quality and CO_2 sensor
Power supply 24 V AC / DC, output 2× 0...10 V ~ 0...2000 ppm or 0...5000 ppm (CO_2, optical sensor NDIR), 100...0 % AQ referred to calibration gas (air quality, VOC sensor), IP30, dimensions 85 × 85 × 27 mm

* display

RTM-CO2

Room temperature and CO_2 sensor
Power supply 24 V AC / DC, output 2× 0...10 V ~ 0...2000 ppm (CO_2, optical sensor NDIR), 0...50 °C (temperature), IP30, dimensions 98 × 48 × 33 mm

* display

KCO2-W

Duct CO_2 sensor
Power supply 24 V AC / DC, output 0..10 V ~ 0..2000 ppm or 0..5000 ppm, Ø 20 × 189 mm

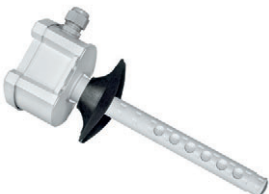** KCO2–I: 4..20mA (napájení pouze ss)*
* KCO2–SD: IP54, výstup 0...10V

KLQ-CO2-W

Duct air quality and CO_2 sensor
Power supply 24 V AC / DC, outputs 2× 0...10 V ~ 0...2000 ppm (CO_2, optical sensor NDIR), 100...0 % AQ referred to calibration gas (quality, VOC sensor), IP65

* display

KCO2-SD-U TYR2

Duct CO_2 sensor
Power supply 24 V AC / DC, output 0...10 V ~ 0...2000 or 0...5000 ppm (CO_2, optical sensor NDIR), 200 mm stem, electronics IP65

KLGF-1

Duct airflow monitor
Power supply 24 V AC / DC, output 0...10 V ~ 0..30 m/s, mounting flange, stem
Ø 10 × 140 mm, IP65

PERIPHERALS
THERMOSTATS

FST

Frost protection thermostat, mechanical
Output: change-over contact 10 (2) A, 250 V AC, dimensions 126 × 90 × 50 mm, IP65
Setpoint range –10...15 °C, hysteresis 1 K

* capillary length 6 m (FST-1D), 1.8 m (FST-3D), 3 m (FST-5D)

RTR-B121

Room temperature controller, mechanical (heating)
Setpoint range +5...+30 °C, hysteresis 0.5 K
Switching element: bimetal, contact 10 (4) A, 230 V AC
Dimensions 75 × 75 × 25 mm, IP30

RTR-B124

Room temperature controller, mechanical (heating)
Setpoint range +5...+30 °C, hysteresis 0.5 K
Switch element: bimetal, contact 10 (4) A, 230 V AC
Dimensions 75 × 75 × 25 mm. Input for depression –5K, IP30

RTR-B721

Room temperature controller, mechanical (heating / cooling)
Setting range +5...+30 °C, hysteresis 0.5 K
Bimetal, contacts 10 (4) A, 230 V heating, 5 (2) A cooling
Dimensions 75 × 75 × 25 mm IP30

RTR-B747

Room temperature controller, mechanical (heating / cooling)
Setting range +5...+30 °C, hysteresis 0.5 K
Bimetal, contacts 10 (4) A, 230 V AC heating, 5 (2) A cooling
Dimensions 75 × 75 × 25 mm, internal setting, IP30

ALTR-060

Strap-on temperature controller 0...+60 °C
Temperature range 0...+60 °C, hysteresis 8 K ±1 K
Change-over contact 16 (4) A, 24...250 V AC
Dimensions 38 × 48 × 103 mm, IP40, external setting

* internal setting: ALTR-060U

ALTR-090

Strap-on temperature controller 0...+90 °C
Temperature range 0...+90 °C, hysteresis 8 K ±1 K
Change-over contact 16 (4) A, 24...250 V AC
Dimensions 38 × 48 × 103 mm, IP40, external setting

* internal setting: ALTR-090U

ALTR-1

Strap-on temperature controller –35...+35 °C
Temperature range –35...+35 °C, hysteresis 5 K ±1 K Change-over contact 16 (1.5)
A, 24...250 V AC
Dimensions 73.5 × 70 × 108 mm, IP65, external setting

ALTR-3

Strap-on temperature controller 0...+60 °C
Temperature range 0...+60 °C, hysteresis 5 K
Change-over contact 16 (1.5) A, 24...250 V AC
Dimensions 73.5 × 70 × 108 mm, IP65, external setting

ALTR-5

Strap-on temperature controller 0...+90 °C
Temperature range 0...+90 °C, hysteresis 5 K ±1 K
Change-over contact 16 (1.5) A, 24...250 V AC
Dimensions 73.5 × 70 × 108 mm, IP65, external setting

ALTR-7

Strap-on temperature controller 0...+120 °C
Temperature range 0...+120 °C, hysteresis 5 K ±1 K
Change-over contact 16 (1.5) A, 24...250 V AC
Dimensions 73.5 × 70 × 108 mm, IP65, external setting

ETR-060

Built-in temperature controller 0...+60 °C
External setting temperature range 0...+60 °C, hyst. 3 K
Change-over contact 10 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

internal setting: ETR-060U
stainless steel pocket

ETR-090

Built-in temperature controller 0...+90 °C
Internal setting temperature range 0...+90 °C, hyst. 3 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

internal setting: ETR-090U
stainless steel pocket

ETR-0120

Built-in temperature controller 0...+120 °C
External setting temperature range 0...+120 °C, hyst. 5 K Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

stainless steel pocket

ETR-50140

Built-in temperature controller +50...+140 °C
External setting temperature range +50...+140 °C, hyst. 5 Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm mm, brass pocket Ms 1/2" 130 mm

stainless steel pocket

ETR-R6585

Built-in temperature controller +65...+85 °C
External setting temperature range +65...+85 °C, hyst. 0 / -15...20 K
Change-over contact 16 (1.5) A, 24...250 V st, IP65
Dimensions 73,5 × 70 × 108 mm, brass pocket Ms 1/2" 130 mm

STB function, restart after cooling down and manual reset
stainless steel pocket

ETR-R90110

Built-in temperature controller +90...+110 °C
External setting temperature range +90...+110 °C, hyst. 0/-15...20 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

STB function, restart after cooling down and manual reset
stainless steel pocket

ETR-060R85

Built-in temperature controller two-step
Temperature range 0...+60 °C and +65...+85 °C, hyst. 3 and 0 / -15...20 K
Change-over contacts 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

upper step: STB function, restart after cooling down and manual reset
stainless steel pocket

ETR-090090U

Built-in temperature controller two-step
Internal setting temperature range 0...+90 °C and 0...+90 °C, hyst. 3 and 3 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

* stainless steel pocket

ETR-090R110

Built-in temperature controller two-step
Temperature range 0...+90 °C and +90...+110 °C, hyst.. 3 and 0 / –15...20 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP54
Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

upper step: STB function, restart after cooling down and manual reset
* stainless steel pocket

ETR-1

Built-in temperature controller –35...+35 °C
External setting temperature range –35...+35 °C, hyst. 3 K Change-over contact 16 (1.5) A, 24...250 V AC, IP65.
Dimensions 73.5 × 70 × 108 mm, brass pocket 1/2" 130 mm

* stainless steel pocket

KTR-060

Duct temperature controller 0...+60 °C
External setting temperature range 0...+60 °C, hyst. 3 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

* internal settings: KTR-060U

KTR-090

Duct temperature controller 0...+90 °C
External setting temperature range 0...+90 °C, hyst. 3 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

* internal settings: KTR-090U

KTR-0120

Duct temperature controller 0...+120 °C
External setting temperature range 0...+120 °C, hyst. 5 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

KTR-50140

Duct temperature controller +50...+140 °C
External setting temperature range +50...+140 °C, hyst. 5 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

KTR-R6585

Duct temperature controller +65...+85 °C
External setting temperature range +65...+85 °C, hyst.
0 / –15...20 K Change-over contact 16 (1.5) A, 24...250 V AC, IP65 Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

STB function, restart after cooling down and manual reset

KTR-R90110

Duct temperature controller +90...+110 °C
External setting temperature range +90...+110 °C, hyst.0 / –15...20 K Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

STB function, restart after cooling down and manual reset

KTR-060R85

Duct temperature controller two-step
Temperature range 0...+60 °C and +65...+85 °C, hyst. 0 / –15...20 K
Change-over contacts 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

upper step: STB function, restart after cooling down and manual reset

KTR-090090U

Duct temperature controller two-step
Internal setting temperature range 0...+90 °C and 0...+90 °C, hyst. 3 and 3 K
Change-over contacts 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

KTR-090R110

Duct temperature controller two-step
Temperature range 0...+90 °C and +90...+110 °C, hyst. 3 a 0 / -15...20 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

upper step: STB function, restart after cooling down and manual reset

KTR-1

Duct temperature controller -35...+35 °C
External setting temperature range -35...+35 °C, hyst. 3 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm, stem Ø 14 × 205 mm

TR-040

Temperature controller 0...+40 °C
Temperature range 0...+40 °C, hysteresis 2 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm

* internal setting: TR-040U

TR-060

Temperature controller 0...+60 °C
Temperature range 0...+60 °C, hysteresis 2 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm

* internal setting: TR-060U

TR-22

Temperature controller -35...+35 °C
Temperature range -35...+35 °C, hysteresis (adjustable) 3 K ±1 K
Change-over contact 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73,5 × 70 × 108 mm

* internal setting: TR-22U

TR-04040

Temperature controller 0...+40 °C
Temperature range 0...+40 °C and 0...+40 °C, hysteresis 2 K and 2 K
Change-over contacts 16 (1.5) A, 24...250 V AC, IP65
Dimensions 73.5 × 70 × 108 mm

* internal setting: TR-04040U

PERIPHERALS
HYGROSTATS

TW-U

Dew point sensor, active
Switches when reaching relative humidity setpoint, incl. 300 mm strap-on metal band Dimensions 64 × 72 × 43.3 mm, IP65
Power supply 24 V AC / DC, output 0...10 V

KW-W

Dew point sensor (condensing)
Switches at 93 %rH (adjustable), incl. 300 mm strap-on metal band
Dimensions 64 × 72 × 43.3 mm, IP65
Power supply 24 V AC / DC, C/O contact 24 V

RHT-1

Room hygrostat and thermostat
10..35 °C, 35...100 %rH, power supply 24..230 V AC, change-over contacts rH 5 (0,2) A, t 10(4)A, switch
Dimensions 127.5 × 75 × 28.6 mm, IP30

For flush box installation, order inclusive mounting frame ARA1.7E

RH-2

Room hygrostat
25...95 %rH, hyst. 4 % rH, power supply 24 AC/DC,
change-over contact 5 (0,2) A
Dimensions 98 × 98 × 39 mm, IP30

* internal setting RH-2U

KH-10

Duct hygrostat, mechanical
Setpoint 35..100 %rH, change-over contact 24..250 V AC, 15 (2) A.
Dimensions 108 × 73.5 × 70 mm, stem Ø 20 × 223 mm, IP65

* internal setting: KH10-U Accessories (to be ordered separately): flange MF-16-K, wall installation clamp WH-20

PERIPHERALS
MANOSTATS

DS-205F

Differential pressure switch 20..300 Pa
Contact 5(0,8) A, 30...250 V AC, ambient temperature –30...85°C, silicone membrane, dimensions: Ø 81 × 55 mm, IP54
Inclusive connecting set: hose 2 m and nipples.

* DS-205B 50...500 Pa
DS-205D 200...1000 Pa
DS-205E 500...2500 Pa

PERIPHERALS
SWITCHING SENSORS

KLSW-3

Airflow control switch, electronic
0.1...30 m/s (adjustable), relay 230 V / 10 A, power supply 230 V AC or 24 V AC/DC, adjustable switch-on (15...120 s) and switch-off (2...20 s) delay, dimensions 108 x 72.5 x 70 mm
+ stem Ø 10 x 140 mm

* KLSW-4 power supply 24 V AC / DC
* KLSW-6 two-stage (0.1...15 m/s)

WFS-1E

Airflow control switch, mechanical
2.5...9.2 m/s (adjustable), relay 24...250 V / 15(8) A, 108 × 73.5 × 70 mm + vane 80 × 175 mm, suitable for polluted air (oily vapours)

Accessories PWFS-08 – spare vane

SW1-E

Flow monitor, mechanical
0.6...90 m³/h (adjustable using different paddle lenghts and setpoint knob), relay 24..250 V / 15(8) A, 108 × 73.5 × 70 mm + paddle 29 × 34...167 mm, screw socket 1", suitable for liquid and gaseous media up to 120 °C

PERIPHERALS
ROOM UNITS

RTF LT

Room temperature sensor, button, LED
Wall mounted, dimensions 98 × 98 × 33 mm
Measuring element Pt1000
ABS, colour: white RAL9010

* Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm

RTF T

Room temperature sensor, button
Wall mounted, dimensions 98 × 98 × 33 mm
Measuring element Pt1000
ABS, colour: white RAL9010

* Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm

RTF P

Room temperature sensor, setpoint
Wall mounted, dimensions 98 × 98 × 33 mm
Measuring element Pt1000, setpoint potentiometer 1K5

* Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm
* setpoint from the R6 range
* various scales / arrow shapes

RTF PT

Room temperature sensor, button, setpoint
Wall mounted, dimensions 98 × 98 × 33 mm
Measuring element Pt1000, setpoint potentiometer 1K5

* Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm
* setpoint from the R6 range
* various scales / arrow shapes

RTF PLT

Room temperature sensor, button, setpoint, LED
Wall mounted, dimensions 98 × 98 × 33 mm
Measuring element Pt1000, setpoint potentiometer 1K5

* Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm
* setpoint from the R6 range
* various scales / arrow shapes
LED colors

RTF PW

Room temperature sensor, setpoint, switch
Wall mounted, dimensions 98 × 98 × 33 mm
Measuring element Pt1000, setpoint potentiometer 1K5, switch A–O–I–II–III up to 50 V

* Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm
* setpoint from the R6 range
* various scales / arrow shapes

RTF P D4

Room temperature sensor, setpoint, switch
Wall mounted, dimensions 98 × 98 × 33 mm
Measuring element Pt1000, setpoint potentiometer 1K5, switch A–O–I–II–III III up to low voltage

* Pt100, Ni1000–5000, Ni1000–6180, NTC1.8kOhm
* potenciometr z řady R6
* různé tvary stupnice a šipek

PERIPHERALS
ROOM CONTROLLERS

RTR-S010

Room controller – heating and cooling
Setpoint +5...+30 °C P band 1...5 K, pt1000
Power supply 24 V AC/DC, output 2× 0...10 V / 10...0 V, 5 mA
Dimensions 98 × 98 × 33 mm, IP30

RTR-S011

Room controller – heating and cooling
Setpoint 21 °C ± 8 K, P band 1...5 K, pt1000
Power supply 24 V AC / DC, output 2× 0...10 V / 10...0 V, 5 mA
Dimensions 98 × 98 × 33 mm, IP30

RTR-S012

Room controller – heating and cooling
Setpoint +5...+30 °C, P band 1...5 K, pt1000
Power supply 24 V AC / DC, output 2× 0...10 V / 10...0 V, 5 mA
Dimensions 98 × 98 × 33 mm, IP30, 2× LED (heat / cool)

Temperature sensor external Pt1000, must be ordered separately

RTR-S013

Room controller – heating and cooling
Setpoint +21 °C ± 8 K, P band 1...5 K, pt1000
Power supply 24 V AC / DC, output 2× 0...10 V / 10...0 V, 5 mA, Dimensions 98 × 98 × 33 mm, IP30, 2× LED (heat / cool)

Temperature sensor external Pt1000, must be ordered separately

RTR-S014

Room controller – heating and cooling, fancoil
Setpoint +5...+30 °C, P band 1...5 K, pt1000
Power supply 24 V AC / DC, output 2× 0...10 V / 10...0 V, 5 mA, 4 stage fancoil
Dimensions 98 × 98 × 33 mm, IP30, 2× LED (heat / cool)

Temperature sensor external / internal Pt1000, manual fancoil switch 230 V 0–I–II–III

RTR-S015

Room controller – heating and cooling, fancoil
Setpoint 21 °C ± 8 K, P band 1...5 K, pt1000
Power supply 24 V AC / DC, output 2× 0...10 V / 10...0 V, 5 mA, 4 stage fancoil
Dimensions 98 × 98 × 33 mm, IP30, 2× LED (heat / cool)

Temperature sensor external / internal Pt1000, manual fancoil switch 230 V 0–I–II–III

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