



eHouse BMS, Hotel Automation ouse étouse RWS **BMS, BAS, IoT, Cloud and Integrations** RFID HYBRID ouse étouse **BAS, BMS, IH Integrations** Access Controls RS-485 PRO eHouse ét **Central/Main Switchboards (BAS)** LAN **Room Switchboards (IH)** "B Plans", Temporary functions, Wireless, Smart I/O





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1. Possibilities available in eHouse BMS

- **eHouse BMS** integration of BMS, HVAC systems, building automation, BMS visualizations, etc.
- **eHouse Cloud** work in the cloud: local database (in the facility) or remote (Internet). Synchronizing current data with the database.
- **eHouse RFID** access control of proximity cards for hotel rooms and service, maintenance, general.
- **eHouse HYBRID** integration of various variants of building automation eHouse LAN, PRO, WiFi, RS-485 into one coherent BAS system
- eHouse PRO Building Automation for large central switching-boards (BAS). It contains intelligent I/O modules with alarm functions, drive controls, SMS notification, control via SMS, LAN, WiFi, Internet. It contains 5 alarm outputs for anomaly signaling in the BMS / BAS system.
- eHouse LAN Distributed automation of hotel rooms (IH Intelligent Hotel) and other rooms. It implements comprehensive room control / management (intelligent outputs, lighting, heating, intelligent inputs for connecting switches, dimmers, infrared support, lighting scenes, heating programs, scheduler-calendar, infrared data bases) Works autonomously without the need for other subsystems. they are galvanically isolated and have no impact on each other, which completely eliminates the possibility of failure of the entire system as a result of damage to one element.
- eHouse WiFi Wireless distributed automation, System extensions, Intelligent inputs / outputs / drives / sensors, temporary solutions, remote control or "Plans B". Works in a shared LAN, WiFi with variants eHouse LAN, eHouse PRO. It can be used to develop the system after finishing the object or when laying additional wires is not economical. We do not recommend planning these modules at the stage of the building's raw state, but use Ethernet wired modules (eHouse LAN) whenever it is possible.





2. Hotel Rooms Automations Conditions

- Possible low budget for interior decoration elements: (manipulators, switches, control panels, regulators)
- use of any standard switches available on the market (bell or shutter monostable) the system does not impose a specific model or type.
- Total elimination of expensive and system switches, sensors, sockets with built-in own logic.
- possible control from standard switches without a control panel
- You can also use elegant solutions of switches, wall panels.
- no scattered electronics / automation in sockets, electrical boxes, walls
- Distributed installation into individual rooms (significantly limiting wiring and labor costs)
- installation in room switchboards on the corridor (containing all electronics / automation for the room)
- Operation of rooms under the supervision of one autonomous building automation controller (room controller) after configuration even in the event of failure of other BMS and automation systems
- use of industrial components
- live cycle of the system and automation (10+ years)
- galvanically separated segments (minimization of damage in the event of a major accident)
- no serial bus (minimization of damage in the event of a major accident)
- system security against outside burglary (including connection from the inside of the installation)
- the possibility of duplicating the switches anywhere (duplication for the same circuit)
- The use of the Ethernet interface as the basic system communication for simplifying the installation and obtaining galvanic isolation of segments and the ease of integration with other IT systems, BMS, BAS.
- Possibility to use miniature WiFi controllers in case of necessity to expand the automation function after finishing the object.





3. eHouse BMS system components

Main eHouse BMS system components, Building Automation, Room Automation:

- Room controller EthernetRoomManger placed in a factory mini-switchboard with 18 relays for DIN / TH rail, metal locked with a key - one for each hotel room realizing comprehensive room control
- Room controller EthernetRoomManager placed in a factory midi-switchboard with 18/32 relays for DIN / TH rail - for each one VIP hotel room implementing comprehensive room control
- Room controllers EthernetRoomManager placed in the factory midi-switchboard with 18-32 relays for DIN / TH rail minimum one for each room (generally available, office, etc.) (according to the demand for the number of automation / control points (inputs / outputs / dimmers / points) measurement).
- Linux PC (eHouse system server for BMS system integration, creating logs) continuous work (eHouse BMS)
- Windows PC (For configuration of eHouse LAN Room Controllers) use only when changing configuration. It can be used for visualization.
- WWW software for visualization and graphic control
- Java PC software for visualization and graphic control (Windows, Linux and other systems supporting Java)
- Android software (Tablet, Smartphone, SmartTV) for visualization and graphic control (Windows, Linux and other systems supporting Java)
- Server Software eHouse PRO to integrate the eHouse system
- Dedicated eHouse BMS software for BMS integration (Clima-Convectors, Hotel Automation, etc.)
- Ability to work in a "local / remote cloud" / via the database
- The possibility of adding more PCs to control the system and visualization
- The possibility of installing Android control panels or tablets in the room for visualization and graphic control in the room
- The ability to create dedicated architectural / graphic visualizations for rooms, BMS systems
- Website via Internet connection with fixed IP address (provided by the Investor).
- Java application (PC supporting JAVA) visualization and remote control over the Internet connection with a fixed IP address (provided by the Investor).
- Android application for visualization and remote control (smartphone, SmartTv, tablet) via internet connection with fixed IP address (provided by the Investor).
- EHouse RFID access control system
- Room controllers work autonomously even in the event of failure of the eHouse PRO, BMS and HYBRID servers

Integration Software (Individual – dedicated for Hotels):

- Creating logs of the access control system
- monitoring the system status, rooms status of controllers, power supply
- status update
- visualization of the system status
- Integration of BMS, clima-convectors
- software and hardware alarm support





4. eHouse BMS, BAS System Description (Building Automation, Hotel Room Automation)

The designed BMS, BAS, IH system is an open system that allows free expansion in the LAN, WiFi architecture.

The eHouse LAN system is based on room controllers that implement a complete automation for the room (Programmable Inputs/Outputs, lighting, measurements and adjustments, heating, dimming, switches, bi-directional infrared control). This applies to both hotel rooms, service rooms, reception, office, SPA, Swimming pool, plot, terraces and other uses.

Room Controllers work autonomously (independently in a programmed way - configuration from a Windows application), even in the event of failure of other controllers, server and other BMS subsystems. They can also be managed and integrated freely into a larger system using the eHouse.PRO Server.

Room controllers decentralize the system taking over a significant part of the BMS server's processing power and repeatedly reducing the use of communication links. They also reduce the impact of failures of the integrated building / room automation system. The application for configuring the room controller can be made available to the client / investor / administrator of the facility.

They allow to distribute the installation thanks to large building automation / room controllers containing about 50 intelligent points of various types (inputs / outputs, measuring inputs, dimmers, infrared)



Size: 295 width, 100 height, 85mm depth (as on the picture)

Other installation variant are available (stand-alone, miniaturized without relays if only binary inputs are available, ADC measurement inputs, Infrared RX/TX, Dimmers)

3.1. Main Features eHouse LAN - EthernetRoomManager (ERM+MP18) – in switchboard:

- The room controller is extra low voltage (12-14V) without contact with grid voltages
- Includes an external relay module allowing direct screwing of the controller to the 230V/ 16A relay sockets providing high insulation (45mm) between the electronics and the mains voltage
- The 230V high-voltage installation is limited to a given room (operated by a mini-room switchboard located in a room or a corridor) minimizing expenditure on the installation cost of 230V cabling and its performance several / several times. This allows you to create small, professional, very easily serviced switchboards that are much easier than central separators or controllers located directly in electrical boxes.





- eHouse LAN controllers require authorization (logging in) with a dynamic code to prevent foreign hardware and software from breaking into the system - unlike eg MODBUS TCP / BACNet IP protocols or other protocols based on open protocols.
- They are galvanically separated from each other (independent insulated power supply for the controller and LED lighting 12VDC/100W) and placed in small room switchboards.
- They do not work on the serial data bus and there is no risk of damage to the entire system in the event of bus damage or high voltage puncture to the electronics.
- The eHouse LAN system can be serviced without disabling the entire system (other segments)
- The switchgear is made of metal and lockable and contains professional make contacts to minimize cabling in the box and increase the professionalism and life of the system.
- Even the worst case of driver damage does not affect other room controllers.
- Controllers do not overheat and use non-aging technologies (10 years +).
- They have external (non-PCB) industrial relays + stands (230V / 16A) for DIN rail with over 4.5cm insulation between low voltages and mains voltage. This completely eliminates the possibility of high voltage breakthrough when insects, rodents and moisture get into the box. They have several-dozen times longer life and load capacity than miniature relays. In case of damage, the relays can be replaced by themselves (remove from the stand) without having to replace the entire controller.
- The use of these controllers allows for any interior arrangement (switches, alarm detectors, control panels, infrared remote controls) without imposing system solutions.
- It is possible almost any number of control panels (Android, PC) without additional computer network load, WiFi

3.1.1. EthernetRoomManager Functionality eHouse LAN

- Ethernet communication interface with galvanic isolation work directly in a LAN computer network
- 18/32 intelligent on / off outputs for connecting external relays to 12V with DIN/TH (230V/16A) DIN rail supports
- 12 programmable on / off inputs for connecting switches, sensors, reed switches, etc.
- 8 intelligent measuring inputs (analog) eg: temperature, lighting, humidity, gas measurement can be used to regulate a given physical value
- 3 channels LED dimmers 12VDC / 2.5A or RGB (PWM)
- 1 input of an infrared receiver for remote room control with an infrared remote control in the SONY standard (optional IR panel)
- 1 infrared transmitter output for remote control of external A/V, Klima equipment (optional IR panel)
- 1 temperature sensor (option IR panel)
- 1 lighting sensor (optional IR panel)
- 24 light scenes go out on / off and dimmers
- 12 measurement and control programs
- 256 infrared codes (for remote room control)
- 256 infrared codes (for remote control of A/V equipment)
- 128 items of advanced schedule / calendar
- the possibility of software upgrade via LAN and remote configuration change
- · RS-232 interface for integration and dedicated solutions
- room controllers cyclically (every several seconds or after changing state) send information about statuses (broadcast UDP) over a computer network to any number of panels, computers and other devices Ethernet, LAN, WiFi





4. IH – Hotel Room Controller (LAN) EthernetRoomManager – example of allocation ERM Resources

- 4.1. 12 binary inputs DI (on/off) for switch connection:
 - DI1) 01 (*) DI2) 02 (*) DI3) O3 (*) O4 (*) DI4) DI5) O5 (*) DI6) 06 (*)
 - DI7)
 - O7 (*)
 - DI8) 08 (*)
 - DI9) O9 (*)
 - DI10) B1 (*)
 - DI11) B2 (*)
 - DI12) Programs/Light Scenes "Turn Off All" (**)

Flat Cable IDC-14 distributed in series between all switches allows parallel connection of any number of switches (for each circuit), without additional wiring and sacrificing additional controller intelligent inputs. Vertical placement of sockets and switches greatly facilitates the running of flat cable without the need to bypass high-voltage boxes (in case the sockets and switches are in one panel).

We recommend placing switches separately from 230V and communication sockets for additional protection against over-voltages, interferences and possible short-circuiting of electronics to 230V.

4.2. 8 Measurement Inputs AN (information/regulation) – alternatively might work as binary inputs (on/off)

- AN1) Temperature sensor bath-room (for heating regulation) (*)
- AN2) current measurement for switchboard optional (*)
- DI13) open window reed (*)
- DI14) card holder input (*) confirmation of putting card (guest in the room)
- DI15) external door reed (**) external door opened
- DI16) switch DIMMER 1 +/- (**)
- DI17) switch DIMMER 2+/- (**)
- DI18) switch DIMMER 3+/- (**) or temperature measurement controller/switchboard

Use only shielded cables for measuring sensors. For low voltage switches or reed switches, any Low Voltage Cables or IDC Flat Tapes.

4.3. 18 binary outputs DO for external relays connection 230V/16A

Ox – outputs dedicated to lights, sockets cans, etc





Bx – outputs for bathroom

DO1) O1 (*) DO2) O2 (*) DO3) O3 (*) DO4) O4 (*) DO5) O5 (*) DO6) O6 (*) DO7) O7 (*) DO8) O8 (*) DO9) O9 (*) DO10) B1 (*) DO11) B2 (*) DO12) Socket (towel dryer – heater) (*) DO13) Floor heating bathroom (electric) (*) DO14) Controlled Electric Sockets – all paralel / Max 16A (*) DO15) Bathroom Fan (**) - system override DO16) Mini bar Socket (**) - disable when room is not occupied DO17) Clima-Convector – {on/off} (**) - disable (service) DO18) Door electric lock - Emergency opening of the entrance door (**)

Possibility of expansion up to 32 binary output for VIP rooms (+ additional functionality) – MIDI switchboard

DO19) Lighting Panels/Switches DO20) Socket A DO21) Roller Open DO22) Roller Close DO23) Curtain Open DO24) Curtain Close DO25) Shade Awning Open DO26) Shade Awning Close DO27) Window Pain Dimm 1 DO28) Window Pain Dimm 2 DO29) O10 (**) - second room DO30) O11 (**) DO31) O12 (**)

4.4. IR panel (optional)

The infrared panel (for individual housing) enables two-way infrared remote control, Mounting vis a vis A/V equipment, max range 8m - built-in (**).

IRRx1) infrared receiver - for remote control CONDO with infrared remote control (SONY SIRC Standard)

IRTx1) infrared transmitters - for remote control of audio/video equipment, Klima-konvektor (several dozen infrared standards)

AN3) temperature sensor (half of the room height - temperature measurement in the living room) AN4) lighting level sensor - in the living room





4.5. 3 Dimmers Outpus (DIM) for LED 12V/2.5A or single RGB (**)

DIM1) LED light regulation 1 DIM2) LED light regulation 2 DIM3) LED light regulation 3

Due to the low voltage nature of the controller (12-15VDC), it can be directly supported from a locally installed battery. This will allow continuous operation of the controller itself without powering the relays. In this situation, we still have information about the system even after disconnecting voltages 230V / 400V, guaranteed power supply, etc. From the application we can still track the system status (temperature measurements, states of inputs and sensors, etc.)





5. Installation variants of eHouse LAN -EthernetRoomManager

5.1. Mounted Mini switch-board (18 outputs 230V/16A)

Metal distribution box containing the entire room automation (electronics and electrics), 12VDC LED power supply and electronics, rails to limit the number of 230V wires to a minimum. It uses other low-voltage connectors and cables (compared to 230V cables), which protects against installation mistakes and damage to the room controller.



Metal box with dimensions of 458 * 308 * 115mm with a front frame and 406 * 254 * 110mm without a frame.

Cover: <u>Mini Cover for 18 outputs ~22 modules</u> Switchboard: <u>Room Mini Switchboard of eHouse lan (18 outputs)</u> IR Panel: <u>Infrared Transmitter/Receiver, Temperature Sensor, Light Sensor</u> ERM+MP18 Relay Module: <u>Integrated EthernetRoomManger with relay modules</u>

effouse



5.2. Mounted Midi Switchboard (32 outputs, 36 relays)

In a situation where the number of 230V/16A outputs (18) is insufficient for one room, it can be extended as part of the operation from one room controller (adding another relay module MP-18)



Metal box with dimensions 458 * 468 * 115mm with front frame and 406 * 414 * 110mm without frame.

Cover: <u>midi-switchboard cover 32 outputs / 36 relays</u> Switchboard: <u>MIDI Switchboard (rooms) 32 outputs/36 relays</u> IR Panel for housing: <u>Infrared Transmitter, Receive, temperature+light sensors</u> ERM18 Relay Module: <u>Integrated EthernetRoomManager with Relay Module</u>

suse

Smart Hotel, ApartHotel, CondoHotel, BMS - eHouse



The switchgear enables locking the key and secures the installation against unauthorized access. It is possible to seal them or connect the alarm signaling switch.







5.3. Another installation variants of EthernetRoomManager (eHouse LAN) for external housing

(non integrated with relay module)

5.3.1. For external relay modules MP-6 up to MP-18



5.3.2. For External Covers (standalone)



House



5.4. Professional relay modules (relays+sockets) for DIN/TH rail

Professional, industrial relays - modules were used to limit the number of cabling in the switchgear and copper COMB - Comb rails, which can be cut into sections. This eliminates several dozens of cross-wiring wires inside the room switchboards. The relays can be replaced in case of damage (installation in sockets) without the need to replace the entire controller.



effouse



5.4.1. Industrial relays used in eHouse LAN, PRO

Single industrial relays with DIN rail supports were used to ensure longevity of the system and safety against moisture, puncture of high voltage to electronics, etc. **The distance of low voltage from 230V is over 4.5cm**



ouse

Smart Hotel, ApartHotel, CondoHotel, BMS - eHouse



5.5. MINI/MIDI Switchboard schematic connection - eHouse LAN







6. Central/Main switchboard - eHouse PRO/LAN

If there is a need for a larger number of inputs/outputs, central eHouse PRO switching-board can be used (up to 128 binary inputs / 128 binary outputs with 230V/16A relays with DIN rail mounting bases). The outputs have the ability to control the drives of roller shutters, gates, awnings, three-way solenoid valves, window actuators, servos, etc.

Copper rails "COMB - combs" for COM contacts of relays allow to limit 230V wires to the minimum. It is possible to use the variant of the controllers eHouse LAN or eHouse RS-485 inside the switchgear or I/O buffers (eHouse PRO).

Similarly to a room switchboard, the entire switching station can be powered from a 12..14V battery to maintain voltage in the event of very serious failures and disconnection of all power sources including guaranteed power supply.







For binary inputs (on/off), telephone connectors (RJ-12 - a telephone exchange) are used to simplify assembly, service, disassembly, replacement of controllers, and quick over-voltage of inputs. The connector also has a 12V power supply, eg for powering alarm detectors or lighting switches.

In the case of alarm sensors, you can also connect the TAMPER-SABOTAGE contact, which is connected in series with all the alarm detectors.

Alarm detectors, common switches, reed switches, etc. can be connected to the RJ-12 inputs. The inputs have the functionality of an alarm system and advanced signaling (alarm outputs: Siren, Warning Light, Early Warning, Silent Alarm, Radiolink Monitoring).

The security mask allows any configuration of security zones and alarm signals.

An SMS / GSM gateway can be connected to the system to support the alarm system, send alarm notifications, control by SMS from outside (especially when other links fail) and in a permanent failure state when all building power is turned off.

The eHouse PRO system can send SMS notifications about alarms with the information of the detector's name, which was activated.

The eHouse Hybrid system integrates other communication and installation eHouse variants (PRO, RS-485, LAN, CAN, RF, WiFi, RFID, Cloud) into one common system working in synergy.

The distribution box is closed with a key lock:



eHouse PRO Switchboard: Central switchboard of eHouse PRO/LAN





7. eHouse RFID Access Control.

The access control system **eHouse RFID** is an independent solution for authorizing guests, users, service, building administrators, building automation, room automation with the use of proximity cards, RFID blocks.

- It may or may not be integrated with the automation of the eHouse LAN, PRO building.
- Cards can be added / removed online to the system in a simple and intuitive way (copying and deleting files).
- Access card usage logs are created on a regular basis and automatically in HTML format for viewing in a web browser
- It can be configured for independent and unattended work (except for exceptional situations (lost card, card addition, etc.)
- It is possible to create administrator cards, service cards and cleaning teams.
- EHouse RFID readers work wired on the RS-485 serial bus (computer twisted pair) (1 reader for each secured room).
- For each floor, Ethernet Gate/Server eHouse RFID (maximum for 32 readers) is used.
- The readers can be connected with an electric lock to momentarily open the door.
- They are equipped with a beeper and a diode that can signal the touch of the card and the power LED.
- Readers can have preprogrammed card codes to use or the entire configuration can be located in the Gate / Server eHouse RFID and work ONLINE
- The reader can be installed on the surface (ECONO) or under the cover, eg from backlit glass with engraved logo and inscriptions (VIP)







8. eHouse WiFi Wireless controllers

If you need to use a wireless or distributed building automation, we recommend miniature controllers



"All-in-one" eHouse WiFi.

eHouse WiFi is especially recommended in cases:

- Implementation of "plans B"
- Implementation of temporary functions (lighting control, devices)
- Intelligent distribution boxes, etc.,
- restriction of wires outside the building (gazebos, sensors, outdoor lighting)
- automation distributed at distant points
- increasing the amount of LED / RGB dimmers
- · dispersed roller shutter controllers, drives
- temperature measurement and regulation
- remote control infrared system eHouse
- remote control of external Audio/Video equipment via infrared

eHouse WiFi Functionality:

- 4 ON/OFF Outputs (230V/5A) with drives/servos control functionality
- 3 LED/RGB 12V/3A Dimmers
- 230V=>5V Switching Power Supply (option)
- Temperature Sensor Input (-50,50C)
- IR receiver input eHouse
- IR transmitter output for external Audio/Video control
- 2 ON/OFF binary input
- support up to 3 different WiFi 2.4GHz b/g/n networks (SSID)
- size: fi 58mm, height 21mm (socket cans montage possibility)



DOC: <u>http://www.isys.pl/download/eHouseWiFiEN.pdf</u> DIY: <u>http://smart-home.ehouse.pro/category/ehouse-wifi/</u>





9. Contact