Smart Home, Building, Hotel, Office Automation

eHouse LAN - Smart Home, Building Automation and Management Catalog

Automation for:

- ✔ home
- ✔ office
- ✔ school
- ✔ special objects
- ✔ building
- ✔ hotel
- ✔ sport facilities
- ✔ any other building and premises
- ✔ flat
- ✔ pension
- ✔ swimming pools

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1. Introduction.

eHouse is complex solution of home automation from iSys.PL, developed since 2000.
eHouse LAN (eHouse4Ethernet) controllers working directly in Local Area Network. Controllers are connected to Ethernet Switch, WiFi Router.
Architecture is suitable for control whole room from single controller allows division of eHouse system to most natural independent segments (Rooms).
Each segment can be located in professional room switch-board for 230V mains installation minimization to single room.
Segments are integrated each other by eHouse software and control protocols for sending events, controllers statuses, etc.

1.1. eHouse system applications

eHouse system was designed for interfacing software applications and all sort of electric and electronic devices. Main application of eHouse are:
✔ Home Automation
✔ Smart Home
✔ Building / Facility Management
✔ Office Automation
✔ Access Control & Limitation
✔ Security Systems
✔ Safety Systems
✔ Hotel automation
✔ Measurement systems
✔ Electronic Houses
✔ Low voltage house installations
✔ Control systems
✔ Visualization and graphical control
✔ Systems integration

1.2. Main features of eHouse LAN system

✔ Cheapest Professional home automation system available on the market thanks to large optimized micro-controllers electronic management modules
✔ Long live applications
✔ Not sensitive for elements aging
✔ Not sensitive for external interference, disruption, noise, sabotage, malfunction comparing to wireless systems
✔ Low voltage controllers contain a lot of digital outputs, PWM/DC dimmer outputs, digital inputs, measurement inputs (ADC), digital Inputs, with individually programmed and configured functionality
✔ Professional Installation in Room Switch-Board, Central Switch-Board with external relays modules for security, safety, trouble-free, fast service
✔ Multi Platform software for integration, configuration, visualization, programming libraries
✔ Possibility of self development, programming integration with attached programming libraries, templates, open source code.

2. eHouse LAN Controllers

eHouse LAN (eHouse4Ethernet) controllers work directly in LAN (Local Area Network) architecture. Controllers are stand-alone, self supported, requires direct connection to Ethernet / WiFi (Switch / Router) with Ethernet RJ-45 socket.

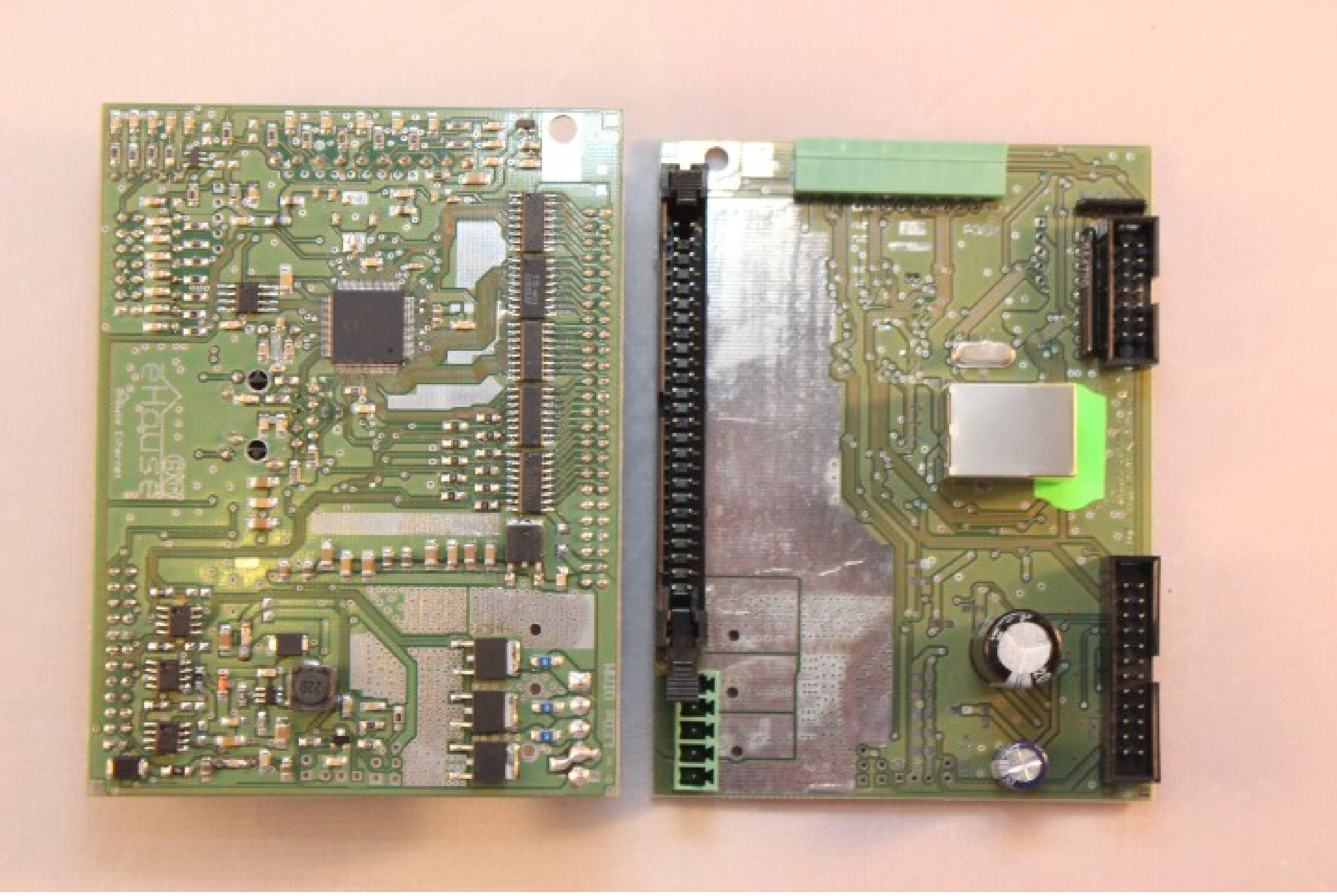
2.1. Ethernet RoomManager (ERM)

EthernetRoomManager is decentralized medium range low voltage smart home controller (separated from Mains for safety and DIY solutions) dedicated for control and management of whole rooms in following applications:

✔ home automation, smart home
✔ building, office, hotel management
✔ intelligent building integration

Main functions of EthernetRoomManager (ERM)
✔ 32 programmable digital outputs (on/off) with relays drivers
✔ 12 programmable digital inputs (on/off) for connecting sensors, switches, etc.
✔ 8 programmable ADC inputs with individually programmed levels (min,max)
✔ 3 PWM 12VDC/3A Dimmers with or without optoisolator for LEDs / LED RGB (optional)
✔ switching power supply for battery operation (optional)
✔ IR receiver compatible with Sony (SIRC) system for direct control of ERM by remote controllers
✔ IR transmitter for remote control of external Audio, Video, HiFi equipment
✔ 128 programmable clock and scheduler items for running eHouse events
✔ 12 ADC measurement/regulation programs
✔ 24 Output/Dimmer Programs/Scenes
✔ 250 programmed IR remote control codes for external A/V equipment
✔ 250 programmed IR control codes for ERM
✔ SPI Interface for extension of systems (optional)
✔ I2C Interface for extension of systems (optional)
✔ RS232-TTL interface for installation extension modules to the controllers (optional)
✔ up to 250 ERM can be installed in eHouse LAN System

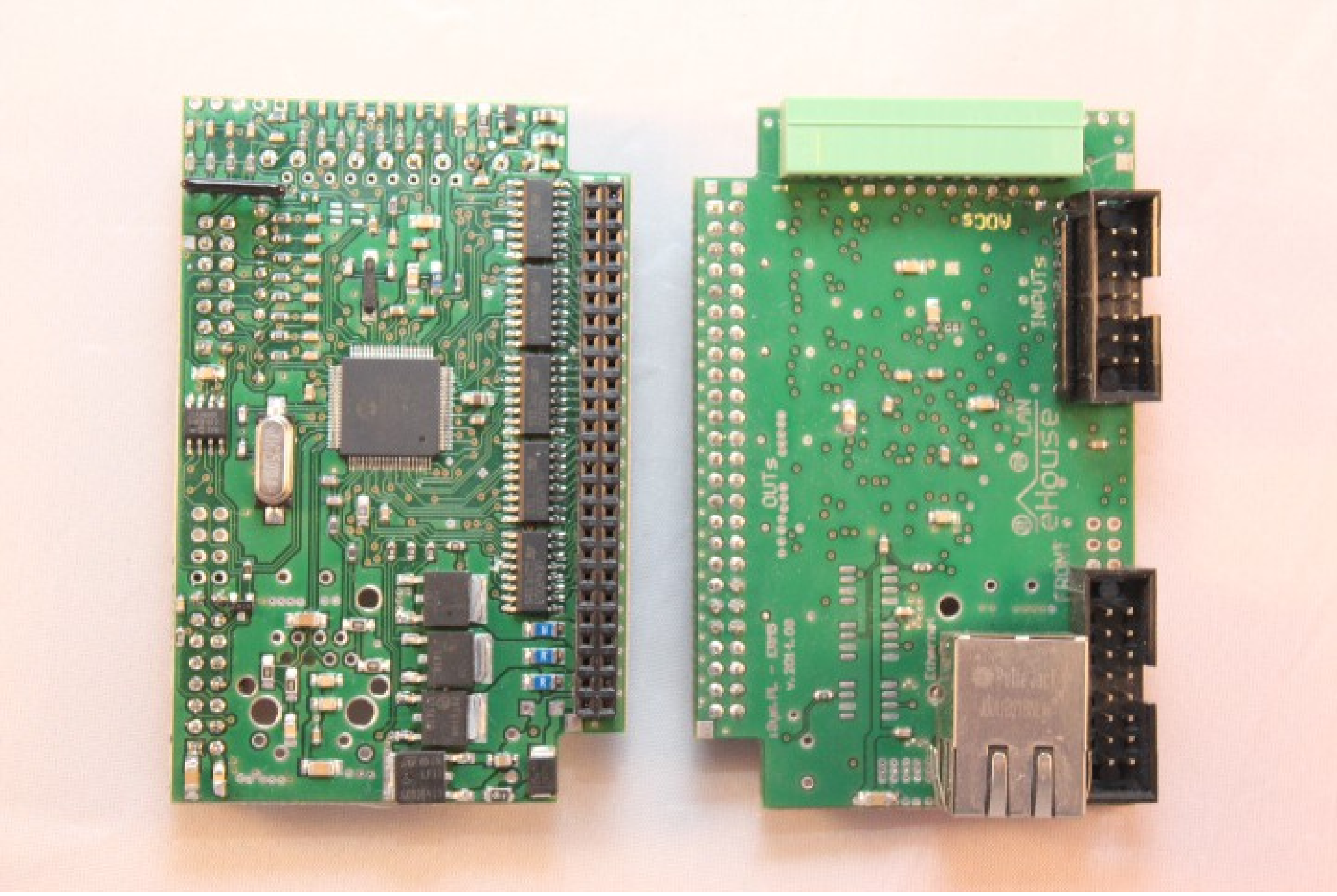
2.1.1 ERM Standard Rev. 2,3,4 (Stand-alone) - ERM-4



Picture for information only Not for Reference may be changed during production and development.
Pictures are not in 1:1 scale.
Dimensions: 114*86*35mm and may be changed during production and development

- ✔ Modules can be painted with insulation materials on demand
- ✔ Modules may be RoHS or not on demand
- ✔ Installable Product RoHS not required for CE
- ✔ Complying with CE norms for (EMI)

2.1.2 ERM Mini (ERM-MINI) for direct MP-18 relay module connection

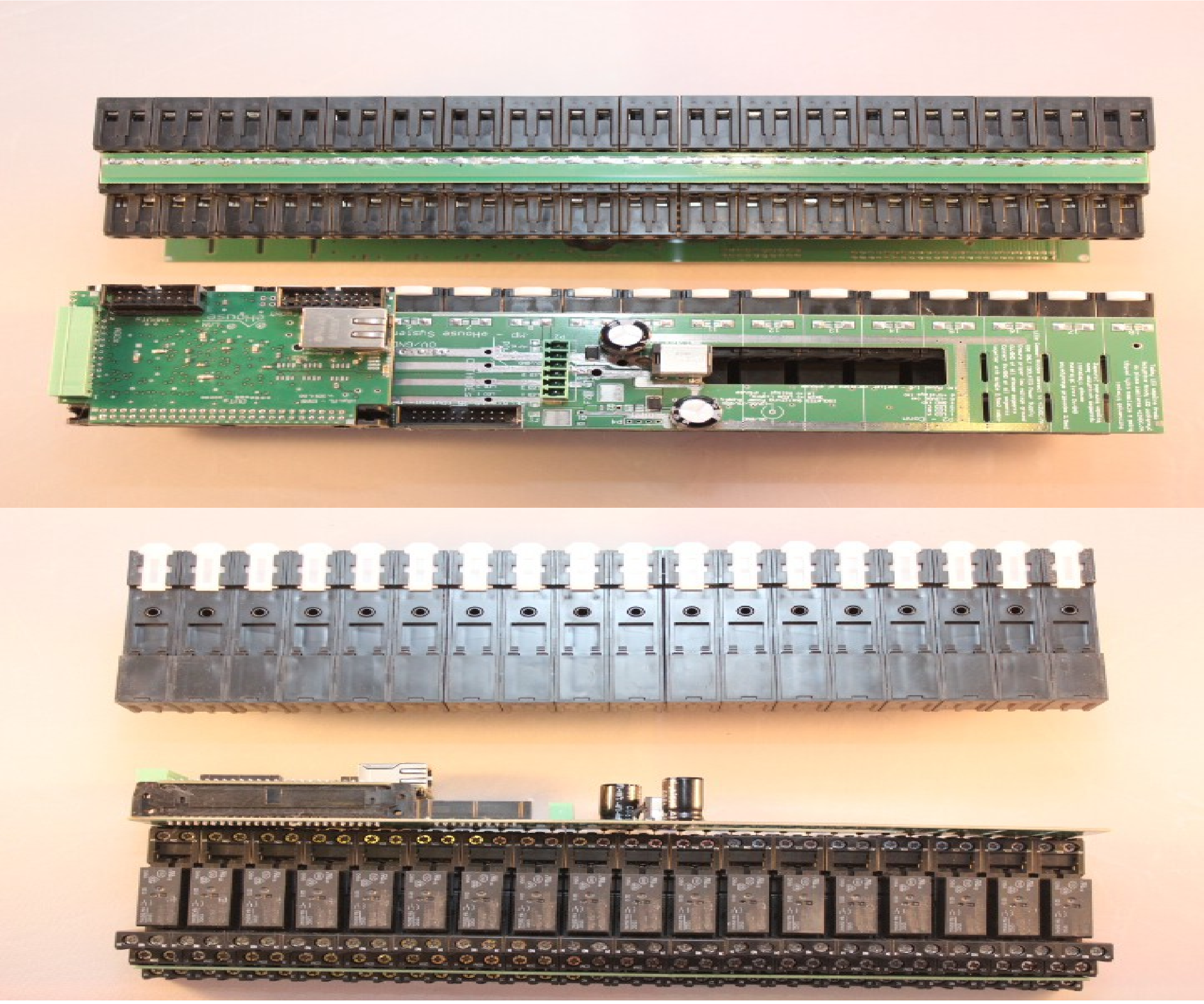


Differences from standard ERM version:

- ✔ No build-in switching power supply
- ✔ Other pins and gender of IDC-50 socket
- ✔ Smaller than Credit Card (86*55*30mm) - may be changed during production and development
- ✔ Modules may be RoHS or not on demand
- ✔ Installable Product RoHS not required
- ✔ Complying with CE norms for (EMI)

2.1.3 ERM Mini + MP-18 DIN Relay Module Set – for direct installation In Room-SwitchBoard for professional installations (291*110*60mm) - ERM-SET

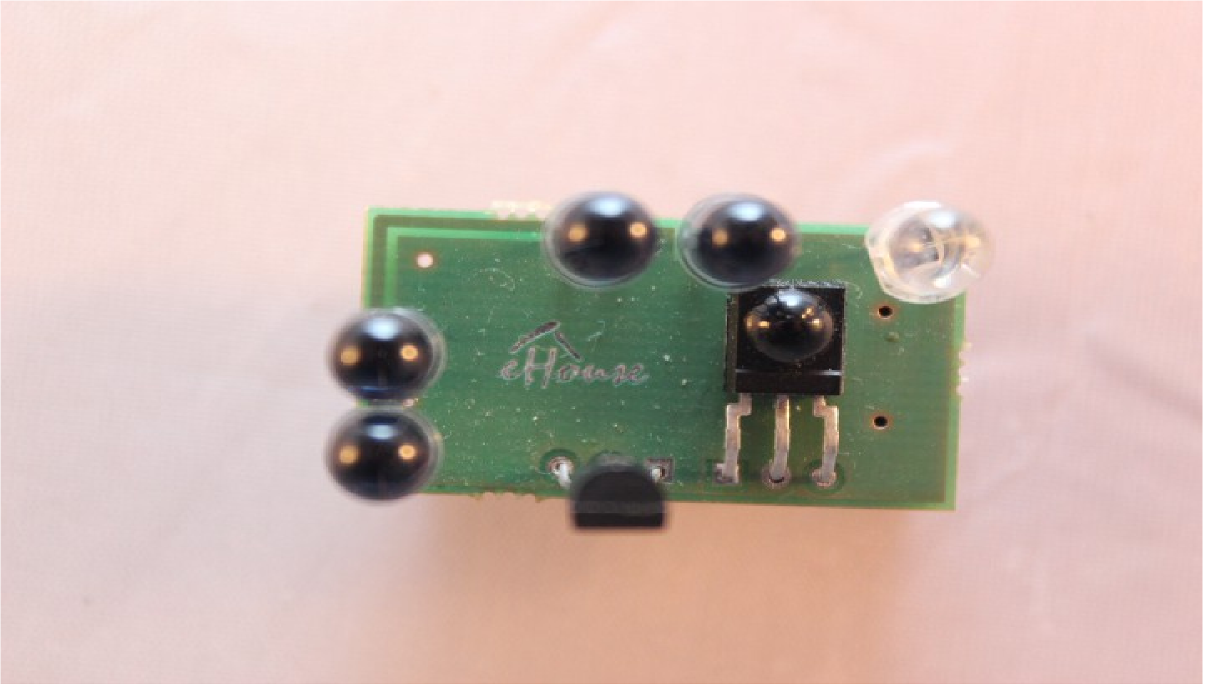
✔ Complete Switch-Board implementation
✔ Cover box 1x18 modules for 18 relays, 2x18 for 24, 32 relays
✔ Requires only connection of LAN, 12VDC Power Supply, inputs to switches, External IR Panel for complete low voltage installation



2.1.4 IR Front Panel for EthernetRoomManager - IR-EXT

IR front panel is designed for infrared support for eHouse controllers in both direction. Module without a cover for best IR ranges, adjustments, performance.

External IR Panel for RM, ERM, ERM Mini:
✔ IR Transmitter 4 narrow angle (15 degree) IR diodes (Range up to 8m)
✔ connection wires can be bend ca. 90 degree in any direction to get best range and performance depending on relative position to A/V equipment
✔ IR Receiver
✔ Temperature Sensor
✔ Light Level Sensor
✔ IDC-16 Socket for direct ERM connection (up to 8m)



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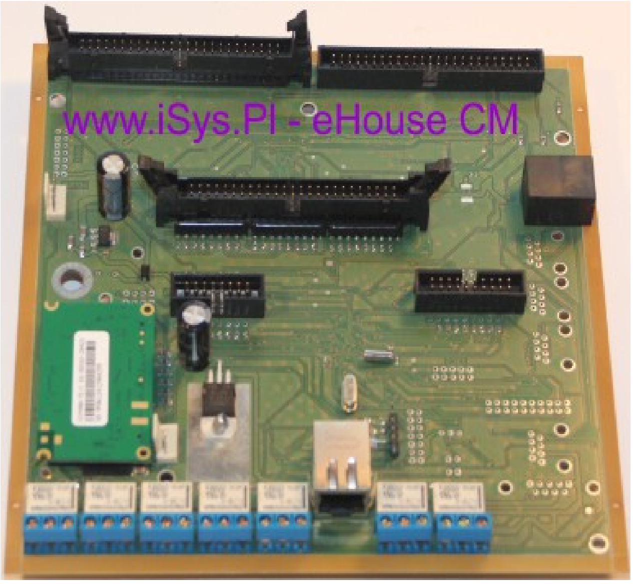
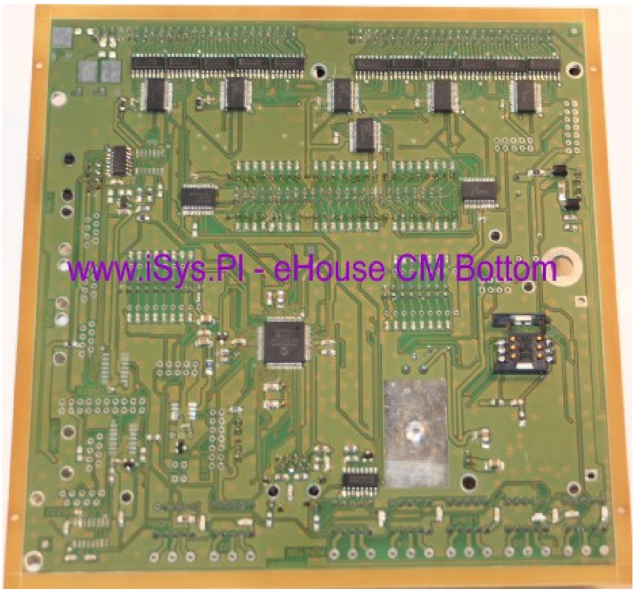
2.2. CommManager (CM) / LevelManager (LM)

CommManager / LevelManager is integrated communication module:
✔ Ethernet
✔ GSM/SMS
✔ RS-485 (eHouse 1 support)
✔ security system
✔ rollers, drives, gates, windows, gateways controller (CM)
✔ single outputs mode (LM)

Main features of CommManager / LevelManager
✔ self contained security system with SMS notifications, controlled remotely
✔ 48 programmable digital inputs for switches, alarm sensors
✔ build in roller, gates, shadow awnings, doors drives controller (max 35) in Somfy / Direct standard (CM)
✔ enables alternative usage of outputs as a single - compatible with EMR max 77 (LM)
✔ RS485 interface for direct connection to “eHouse 1” data bus (supervision of "eHouse 1" controllers)
✔ Ethernet interface for direct control (over LAN, WiFi, WAN, Internet)
✔ contains GSM module for security system notification and controls the system via SMS
✔ enables direct connection of Early Warning Horn, Alarm Horn, Alarm Lamp, Alarm Monitoring device
✔ 128 position scheduler / calendar
✔ incorporates TCP/IP servers / clients for communication via (LAN)
✔ supports 21 security zones
✔ supports 4 level mask individually defined for each activated alarm sensor and each security zone:
  1) alarm horn (A)
  2) alarm light (W)
  3) monitoring (M)
  4) launch event associated with current alarm sensor (E)
✔ CommManager contains 24 rollers program definition together with security zone selection

✔ broadcast status via UDP over LAN for all panels in the system
✔ contains SPI, I2C interfaces (optional)
✔ enables alternative usage of outputs as a single (Compatible with RoomManager max 77)





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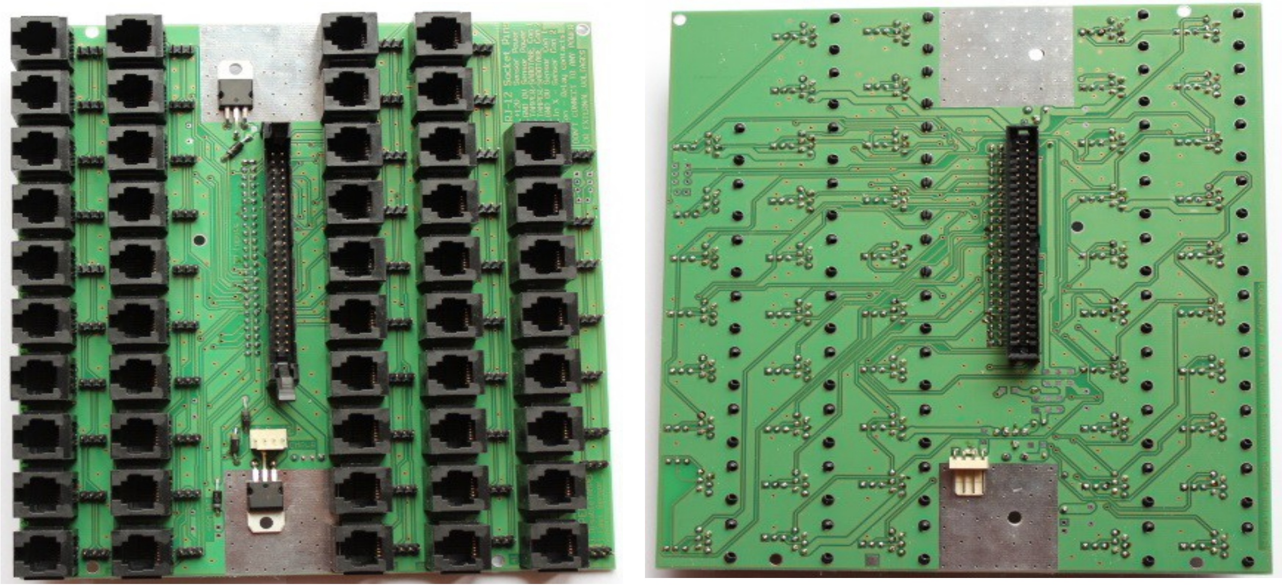
Dimensions: 170mm*170mm*40mm and may be changed during production and development

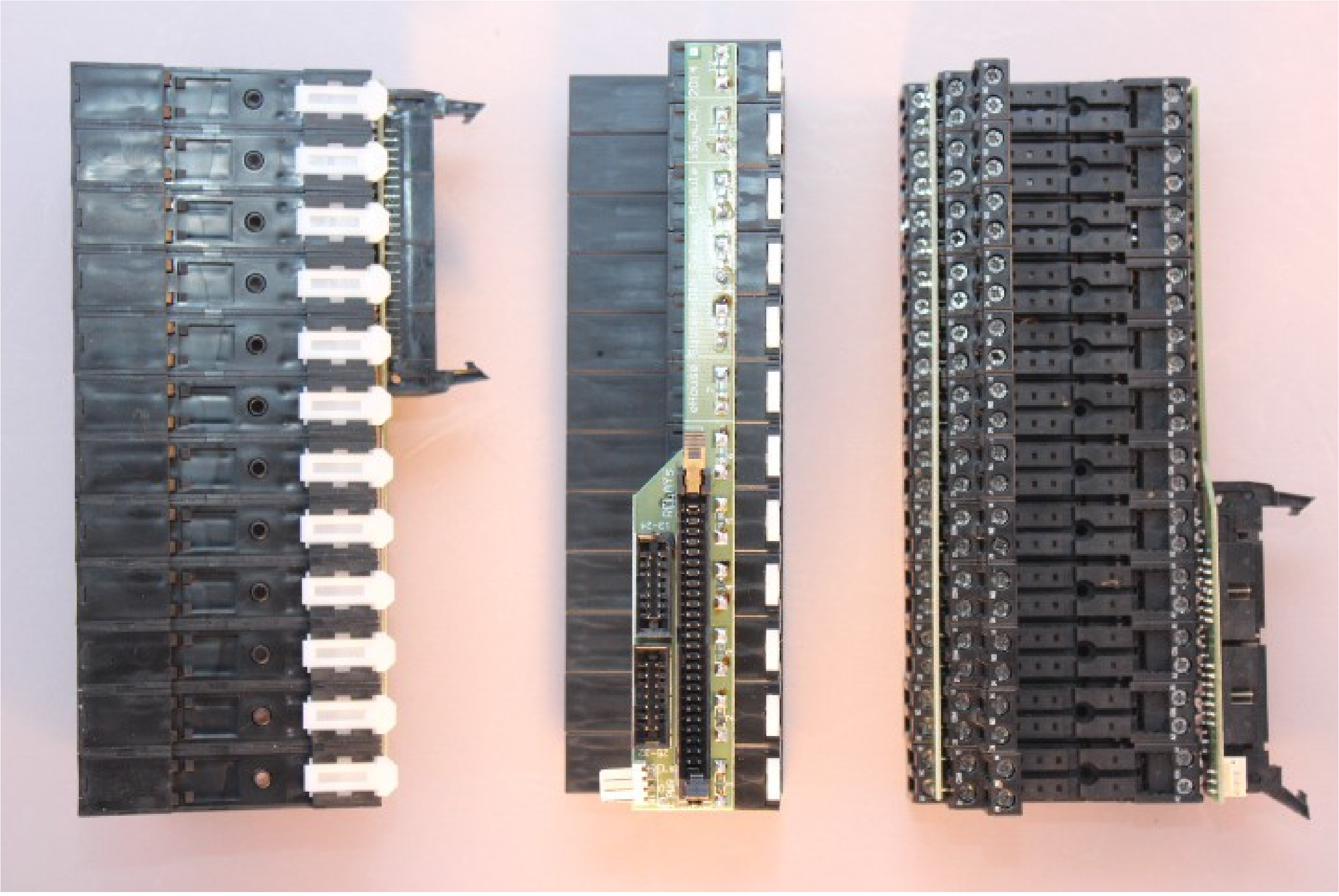
✔ Modules can be painted with insulation materials on demand
✔ Modules may comply RoHS or not on demand
✔ Installable module RoHS conformance is not required
✔ Complying with CE norms for (EMI)

2.3. Input Expander (48) for CM for professional installation - EXP-48



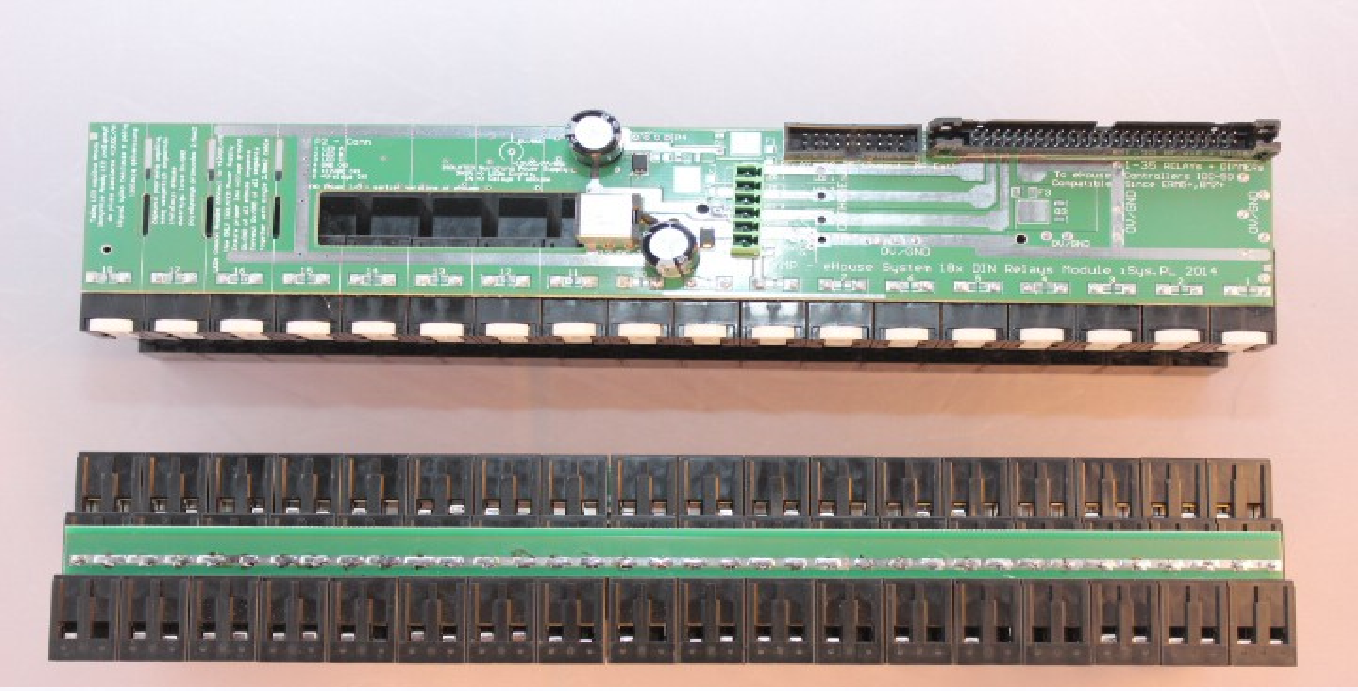
✔ 48 * RJ-12 telephone socket for connection of security sensors (switch-board)
✔ Power supply for GSM/SMS module
✔ Tamper options set by jumpers
✔ Fast Installation, Deinstallation, Service, Maintenance

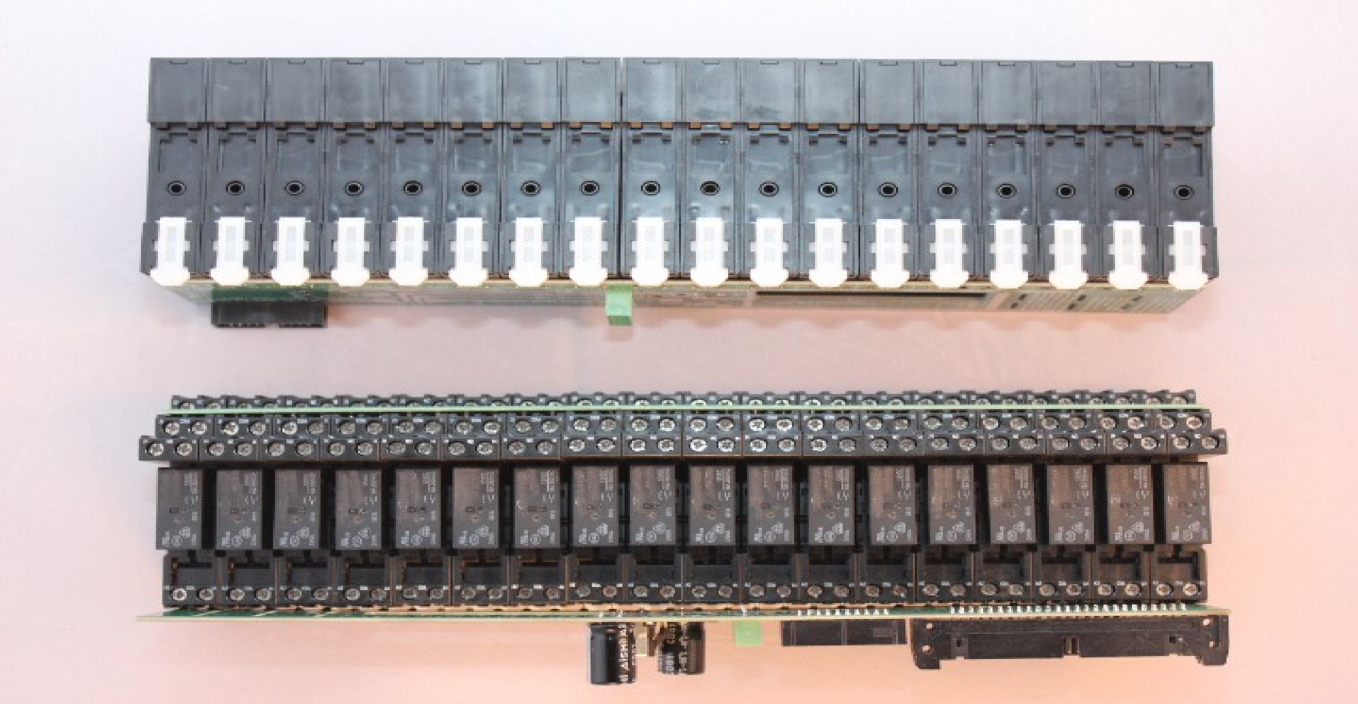
2.4. DIN Relay Module 12 for professional installation - MP-12



✔ 12 relays with DIN Sockets
✔ Implement complete Low Voltage connection for connection to eHouse controllers (Relay coils + Power Supply) IDC-50 socket
✔ IDC-14 sockets for expansion modules
✔ up to 3 modules can be connected (36 relays)
✔ Common rail for relay contacts
✔ Fast and professional low voltage installation without additional wires in switch-board

2.5. DIN Relay Module 18 for professional installation - MP-18

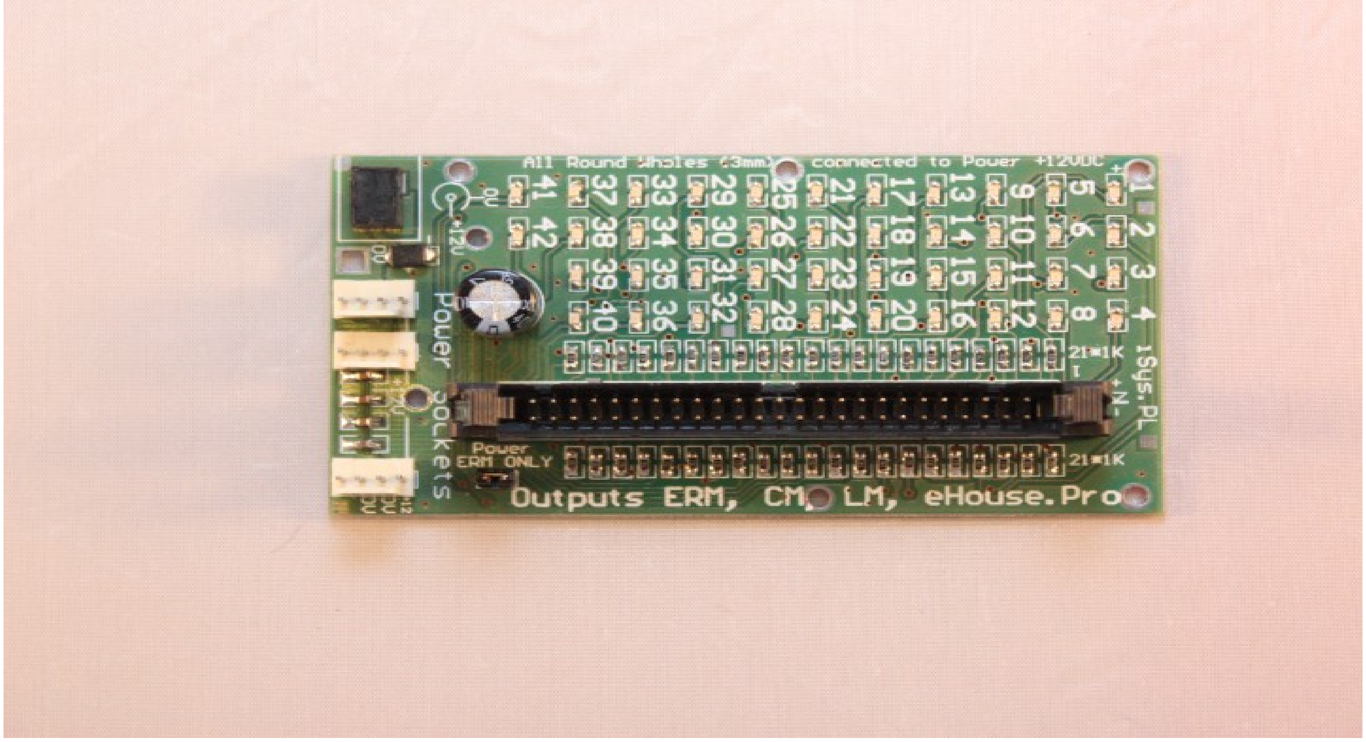




2.6. eHouse LAN Evaluation, Demo Boards

Ethernet eHouse evaluation/demonstration boards enables testing, debuging and development **„on the desk”** configuration on short wires installation. It strongly shorten eHouse controllers education, implementation, configuration and time to market of eHouse4Ethernet system.

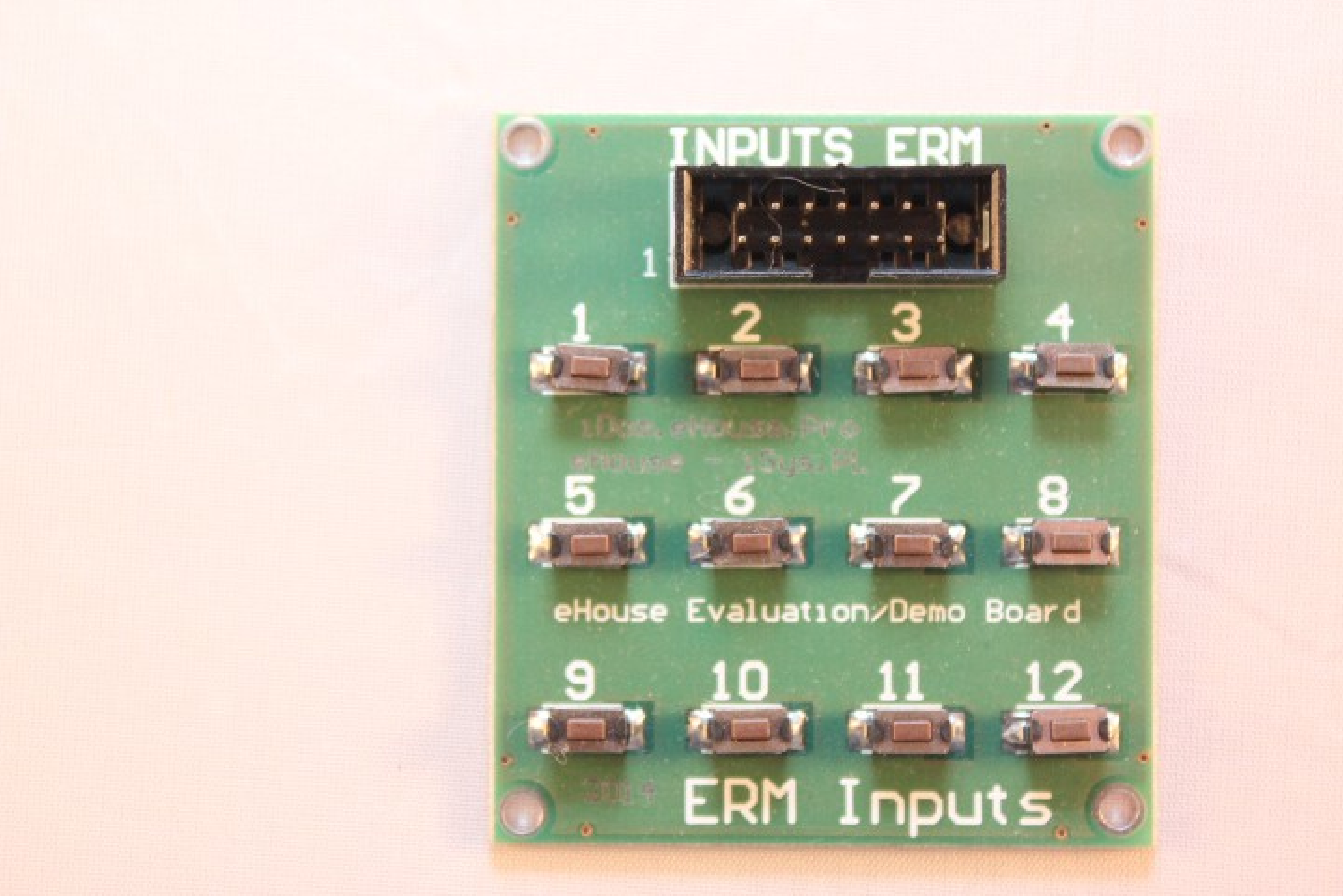
2.6.1 Outputs Demo Board – DEMO-OUT


All Round Wholes (3mm) connected to Power +12VDC
Power
Sockets
Power
ERM ONLY
Outputs ERM, CM, LM, eHouse.Pro
iSys.PL

Main functions of Outputs Demo Board:

- ✔ 42 LEDs for testing and evaluating outputs of eHouse Controllers
- ✔ IDC-50 socket for connecting single CM/LM, ERM, eHouse.PRO, RM
- ✔ Contains Power sockets for mature versions of controllers

2.6.2 Inputs Demo Board – DEMO-IN


INPUTS ERM
1
1
2
3
4
5
6
7
8
eHouse Evaluation/Demo Board
9
10
11
12
ERM Inputs

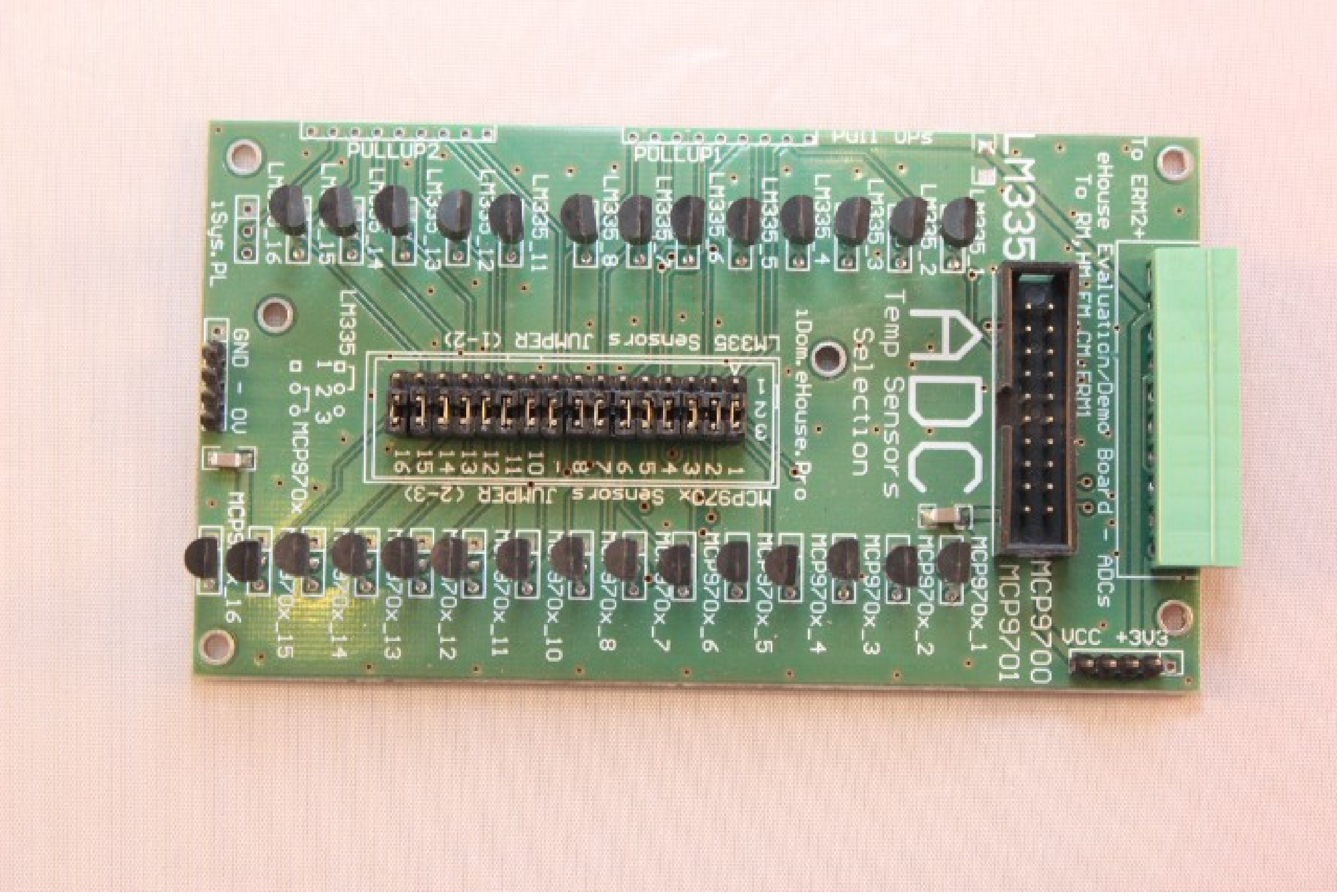
Main Functions of Input Demo Board:

✔ 12 micro switch for testing and evaluating inputs of eHouse Controllers

✔ Build in 12 micro switch connected to IDC-14 pin (ERM inputs)

✔ switch compatible to ERM, RM (Normally Opened)

2.6.3 ADC Measurement Demo Board – DEMO-ADC



Main Functions of Input Demo Board:

- ✔ 14 LM-335 temperature sensors selected via jumpers
- ✔ 15 MCP9700 temperature sensors selected via jumpers
- ✔ IDC-20 socket for ADC inputs compatible with eHouse Controllers
- ✔ 10-pin socket for ADC inputs compatible with eHouse Controllers

For evaluation Infrared support please use IR external panel - IR-EXT

2.7. Boxes and mounted switch-boards.

2.7.1 MINI box for ERM, RM Switch-board (18 outputs 230V/16A) - SWBOX18

Metal installation box for switch-board montage type in the room / storey.

Size 458*308*115 mm with front frame / 406*254*110 mm without front frame

Consists of components:

- ✔ 1 DIN/TH rail for 18-22 modules for installation MP-18 relay modules
- ✔ 2 rails of 2*18 for neutral and safety cables
- ✔ removable front frame with door (left/right) with key closure
- ✔ threaded wholes for eHouse LED 12V/8A power supply (3 combinations)
- ✔ threaded wholes for installation various ERM controllers
- ✔ metal shield/cover for electronic and low voltage part of installation
- ✔ threaded wholes for screwed connectors of external wires 230V and LED

2.7.2 MINI Switch-board for ERM, RM (18 intelligent outputs 230V/16A) - MINIERMLAN18

Mounted eHouse LAN smart home MINI Switch-board for rooms, based on EthernetRoomManager, ready to install in the building. It contains complete set of accessories and components of single segment of eHouse LAN installation:

✔ metal switch-board box SWBOX18

✔ EthernetRoomManager controller ERMMini / ERMMP18

✔ DIN/TH relay module with relays and sockets 18*230V/16A - MP18

✔ IR control panel

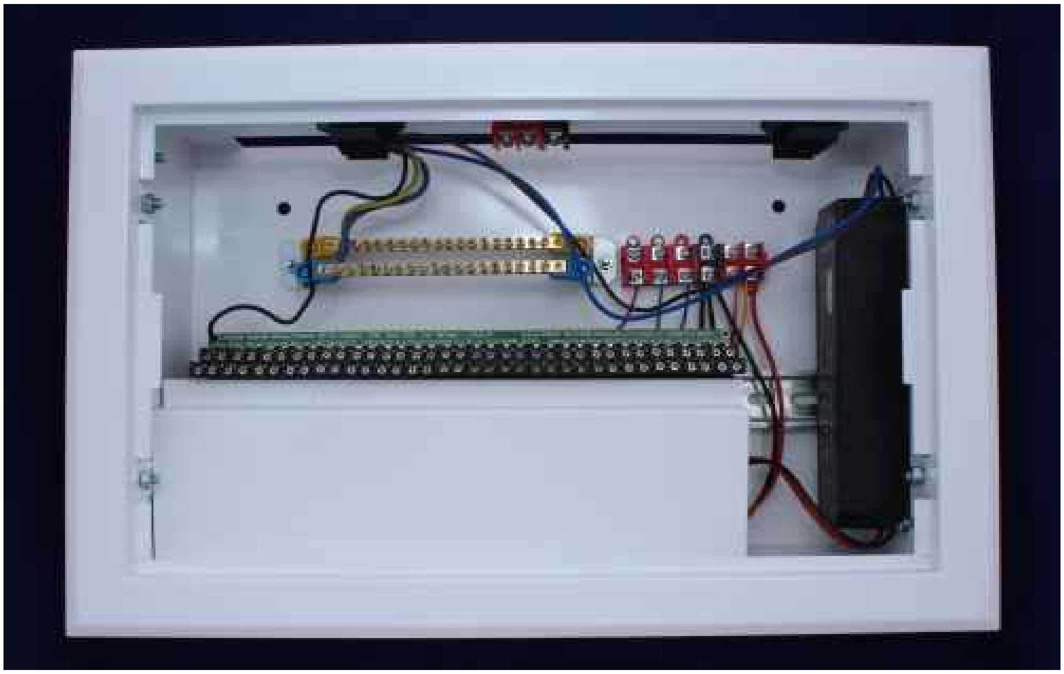
✔ switching power supply 230V=>12V/8A for eHouse and LED lights (eHousePSLED)

✔ screwed connector for 230V cables

✔ screwed connector for LED lights

✔ mounted low voltage cables (IDC-14, IDC-16 flat cables) – Optional

✔ mounted temperature sensors with cables 8*10m - Optional



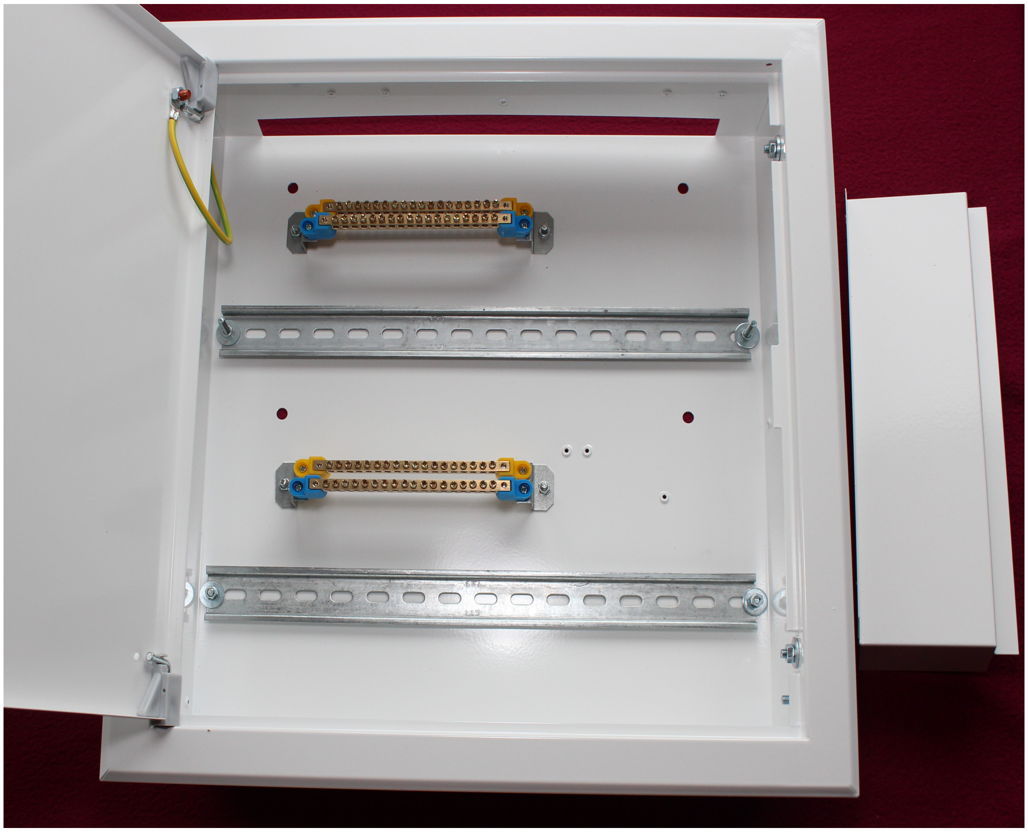
2.7.3 MIDI box for ERM, RM Switch-board (32 outpus 230V/16A) – SWBOX36

Metal installation box for switch-board - montage in the room/storey

size: 458*468*115 mm with front frame / 406*414*110 mm without front frame.

Contains:

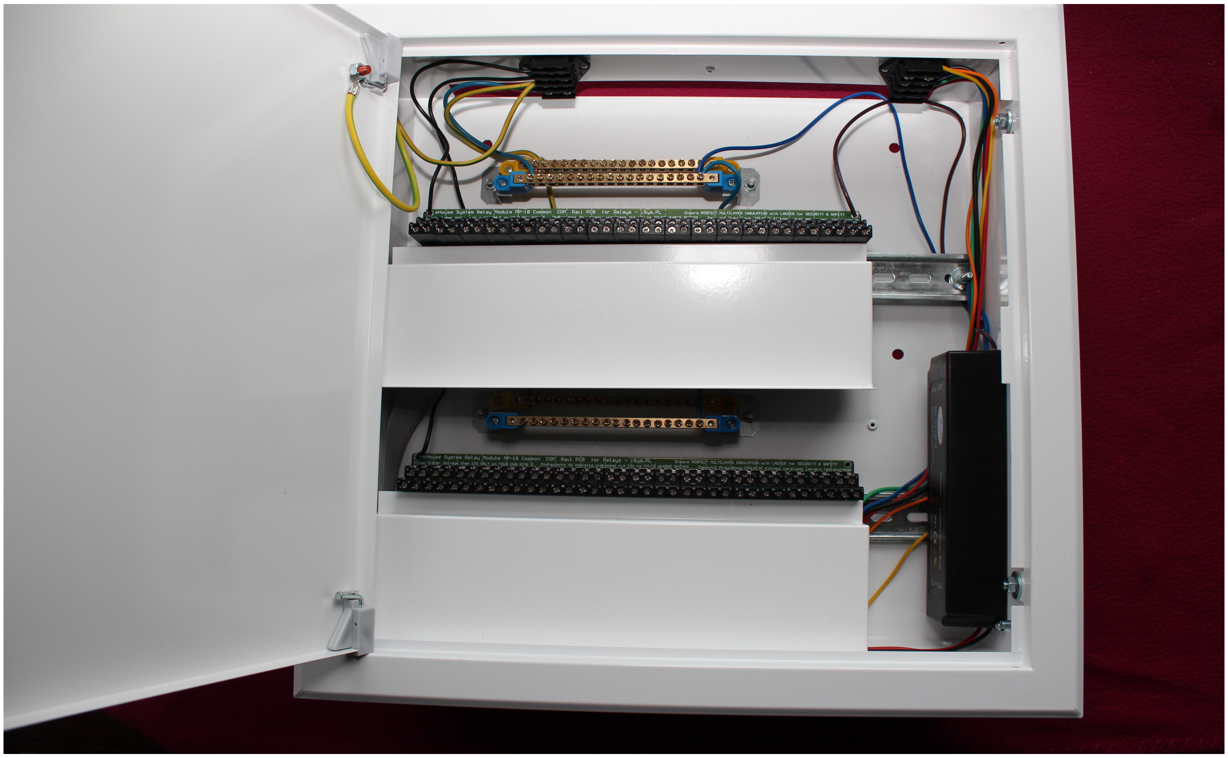
- ✔ 2 DIN/TH rails for 2*(18-22) modules for installation MP-18 relay modules
- ✔ 4 rails of 4*18 for neutral and safety cables for 230V
- ✔ removable front frame with door (left/right) with key closure
- ✔ threaded wholes for eHouse LED 12V/8A power supply (3 combinations)
- ✔ threaded wholes for installation ERM controller
- ✔ metal shield/cover for electronic and low voltage part
- ✔ threaded wholes for screwed connectors of external wires: 230V and LED



2.7.4 MIDI Switch-board for ERM, RM (32 intelligent outputs 230V/16A) - MINIERMLAN32

Mounted eHouse LAN smart home MIDI Switch-board for rooms/storey based on EthernetRoomManager, ready to install at the building. It contains complete set of accessories and components of single segment of eHouse LAN installation:

- ✔ metal switch-board box SWBOX36
- ✔ EthernetRoomManager controller ERMMini / ERMMP18
- ✔ 2 DIN/TH relays modules with relays and sockets 2*18*230V/16A - MP18
- ✔ IR control panel
- ✔ switching power supply 230V=>12V/8A for eHouse and LED lights (eHousePSLED)
- ✔ screwed connector for 230V cables
- ✔ screwed connector for LED lights
- ✔ mounted low voltage cables (IDC-14, IDC-16 flat cables) – optional
- ✔ mounted temperature sensors with cables 8*10m - optional



2.8. "eHouse" Software Package

eHouse4Ethernet system is also equipped in auxiliary software for many operating systems including configuration, management, control, visualization, graphical control, web browser support, integration to other systems interfaces

2.8.1 eHouse4Ethernet Windows package

✔ monitoring devices state
✔ allows easy, intuitive, secure configuration, naming of whole eHouse system from PC
✔ eHouse system event editing and creating
✔ scheduler editing and programming
✔ generating images for visualization purposes
✔ creating eHouse system logs
✔ decoding IR remote controller signals
✔ updating new firmware and configuration to all controllers

2.8.2 Linux software package eHouse4cServer (eHouse.PRO) binary

eHouse4cServer assures supervision and integration of all versions of eHouse system.

Currently supported Linux versions:

✔ RaspberryPi or other based on ARM11
✔ x64
✔ x86
✔ Other Linux boxes may be developed depending on availability on the market

Main Functions (in reference to eHouse4Ethernet):

✔ Web Browser integration
✔ Apache Web Server integration (TCP Server)
✔ TCP Clients for eHouse4Ethernet connection for integration
✔ TCP Servers for panels connection
✔ UDP listener for eHouse4Ethernet status reception
✔ eHouse1 support for integration
✔ eHouse.PRO support for integration
✔ eHouse4CAN support for integration
✔ Implements SMS hardware gateway support for SMS reception and transmission
✔ HTML requests support to control other systems, applications, programs
✔ Update configuration of eHouse4CAN controllers
✔ Generate automatic visualization of each eHouse controller
✔ TCP server for integration to other systems
✔ Supports Onkyo Audio-Video systems via Ethernet
✔ Supports Denon, Marantz Audio-Video systems via Ethernet
✔ Process IR control signals received from any controllers

eHouse4cServer are under constant development and functionality may change without notice

2.8.3 eHouse4Apache Module

✔ Enables integration eHouse4cServer with Apache WWW server
✔ transfer data between web browser and eHouse4cServer
✔ transmit events, commands, configuration
✔ send statuses to web browser

2.8.4 Android (Java) - Control Panel Software since 4.0.0 (eHouse4Android)

eHouse4Android application is supported by various hardware devices eg.

- ✔ Pods
- ✔ Pads
- ✔ SmartPhones
- ✔ SmartTV

Main functions:

- ✔ Text control
- ✔ Voice control (Speech recognition)
- ✔ graphical control
- ✔ Online status via TCP, UDP (Local Network)
- ✔ Graphical visualization individually designed
- ✔ Graphical visualization automatic for each eHouse Controller
- ✔ Control via WiFi, Ethernet, LAN, Internet, SMS, eMail
- ✔ Online status via WiFi, Ethernet, LAN, Internet
- ✔ Supports eHouse 1, eHouse LAN, eHouse.PRO versions

2.8.5 Java - PC Control Panel Software (eHouse4Java)

- ✔ Linux
- ✔ Windows
- ✔ other Java enabled system

Main functions:

- ✔ Text control
- ✔ Graphical control
- ✔ Online status TCP, UDP (Local Network)
- ✔ Graphical visualization individually designed
- ✔ Automatic graphical visualization for each eHouse Controller
- ✔ Control via WiFi, Ethernet, LAN, Internet, eMail
- ✔ Online status via WiFi, Ethernet, LAN, Internet
- ✔ TCP server for connecting external panels
- ✔ TCP server for OpenRemote support
- ✔ Supports eHouse 1, eHouse LAN, eHouse.PRO versions

2.8.6 Windows Mobile 6.x+ .Net, .Net Compact Framework - Control Panel for devices (Mature)

✔ Pods
✔ Pads
✔ SmartPhones

Main functions:
✔ Text control
✔ Graphical control
✔ Online status TCP, UDP (Local Network)
✔ Graphical visualization individually designed
✔ Automatic graphical visualization for each eHouse Controller
✔ Control eHouse system via WiFi, Ethernet, LAN, Internet, SMS, eMail
✔ Online status via WiFi, Ethernet, LAN, Internet
✔ Supports eHouse 1, eHouse LAN versions

2.8.7 JavaScript script - for Web browser client side support

✔ online status reception via JSON, data update
✔ online text control
✔ online graphical control
✔ online graphical visualization
✔ sending control commands (events) to eHouse system
✔ supports eHouse 1, eHouse LAN, eHouse.PRO versions
✔ supports SVG (Scalable Vector Graphics), XML

2.8.8 CorelDraw VBA script - for creating visualizations for all control panels

✔ WebBrowser: HTML, SVG, XML
✔ Custom programmed formats (text)
✔ Windows XP, Vista, 7, 8 - PC, Pods, Pads
✔ Windows Mobile .Net, .Net Compact Framework - Pods, Pads, Smartphones
✔ Java - visualization and graphical control for PCs Java enabled platforms
✔ Android - visualization and graphical control for SmartPhones, Pods, Pads, SmartTV
✔ supports eHouse 1, eHouse LAN, eHouse.PRO versions
✔ supports templates

2.9. Programming libraries and code sources for development

For eHouse system developers and members of eHouse Alliance we offer programming libraries and scripts for most of operating systems:
✔ Windows XP, Vista, 7, 8, .Net
✔ Windows Mobile 6.x,7,8 .Net Compact Framework
✔ Linux x86, x64, ARM, RaspberryPi
✔ Java enabled platforms and operating systems
✔ Java Mobile for PDAs, Palmtops, Smartphones
✔ Web Server (Apache) modules
✔ Web Browser Integration scripts
✔ OpenRemote.Org integration
✔ Android

Libraries and scripts are in most important programming languages:
✔ Delphi, Pascal
✔ C,C++
✔ C#, .Net, .Net Compact Framework
✔ Java, Java Mobile (MIDP)
✔ Android (Java)
✔ VBA – Visual Basic
✔ PHP
✔ SVG, XML
✔ HTML
✔ JavaScript

Libraries are individually distributed base on license agreement and fees.

3. Appendix

3.1. Additional features of eHouse LAN system

✔ Support of PC computer together with eHouse software package for configuration, visualization, graphical control, communication gateways, continuous system state monitoring and logging
✔ Possibility of individual (end user - "Do It Yourself") and complete design (companies solutions based on eHouse controllers), configuration and installation
✔ Usage common electric switches, sensors, executive devices (without dedicated devices with build-in logic) for lowest costs
✔ Possibility to upgrade firmware of eHouse controllers from PC in working installation
✔ Possibility to implement individual / dedicated firmware for Vendors and third party cooperatives
✔ Possibility of individual programming (under PC computer, PC boards, Mobile Panels, Pads, Smartphones) and implementing own and dedicated control algorithms
✔ Possibility of creating individual images for visualization and graphical control for multiple methods in CorelDraw
✔ Many installations variants (low budget, comfort, economic, maximal, VIP / dedicated, centralized, decentralized, with / without PC supervision)
✔ eHouse Controllers are large/medium range low voltage (12V/ ~0.1A), low power electronic controllers for cost efficiency. This enables self installation (DIY), servicing and do not require local regulatory approvals, certification, conformance etc. eHouse requires external Relays or drivers to control external 230V devices.
✔ eHouse controllers are sold as electronic modules (without covers), thus it do not impose final equipment or arrangement of building
✔ For common applications external low costs relays modules containing (relays 230V/10A) can be used. For inductive, high power, three phase device - special relays are necessary.
✔ eHouse system contains binary software Windows XP+, Linux, Android, Windows Mobile (*), Java Platforms, WWW Web Browser, Apache support
✔ eHouse software library, templates for vendors development based on license agreement (Delphi Pascal, C, C++, C#, .Net, .Net Compact Framework, Java,

Java Mobile, HTML, SVG, XML, JavaScript, PHP, Visual Basic Script, Apache module).

✔ Free eHouse open-source libraries for system integration, implementing individual algorithms (Delphi Pascal, C, C++, C#, .Net, .Net Compact Framework, Java, Java Mobile, HTML, SVG, XML, JavaScript, PHP, Visual Basic Script)

3.2. Management of eHouse system

eHouse Home Automation System can be manage and controlled from:
✔ Web Browser WWW
✔ PC Computer, Pads, Pods, Touch screen panels - eHouse software package (Windows XP, Vista, 7, 8, Linux, Java)
✔ Practically Any Mobile phone, PDA, Smart Phone, Touch Phone, Pod, Pad, Smart TV thanks to software package: Android 4+ (Java), Windows Mobile 6.x+ (*), Java Mobile MIDP (*) - No dedicated panels necessary
✔ IR Remote Controller - supported SONY standard protocol (SIRC) (using common SONY remote controller, universal, smart IR panel eg. Logitech, Philips, etc)
✔ Advanced scheduler, calendar
✔ Common electric switches
✔ Touch sensors

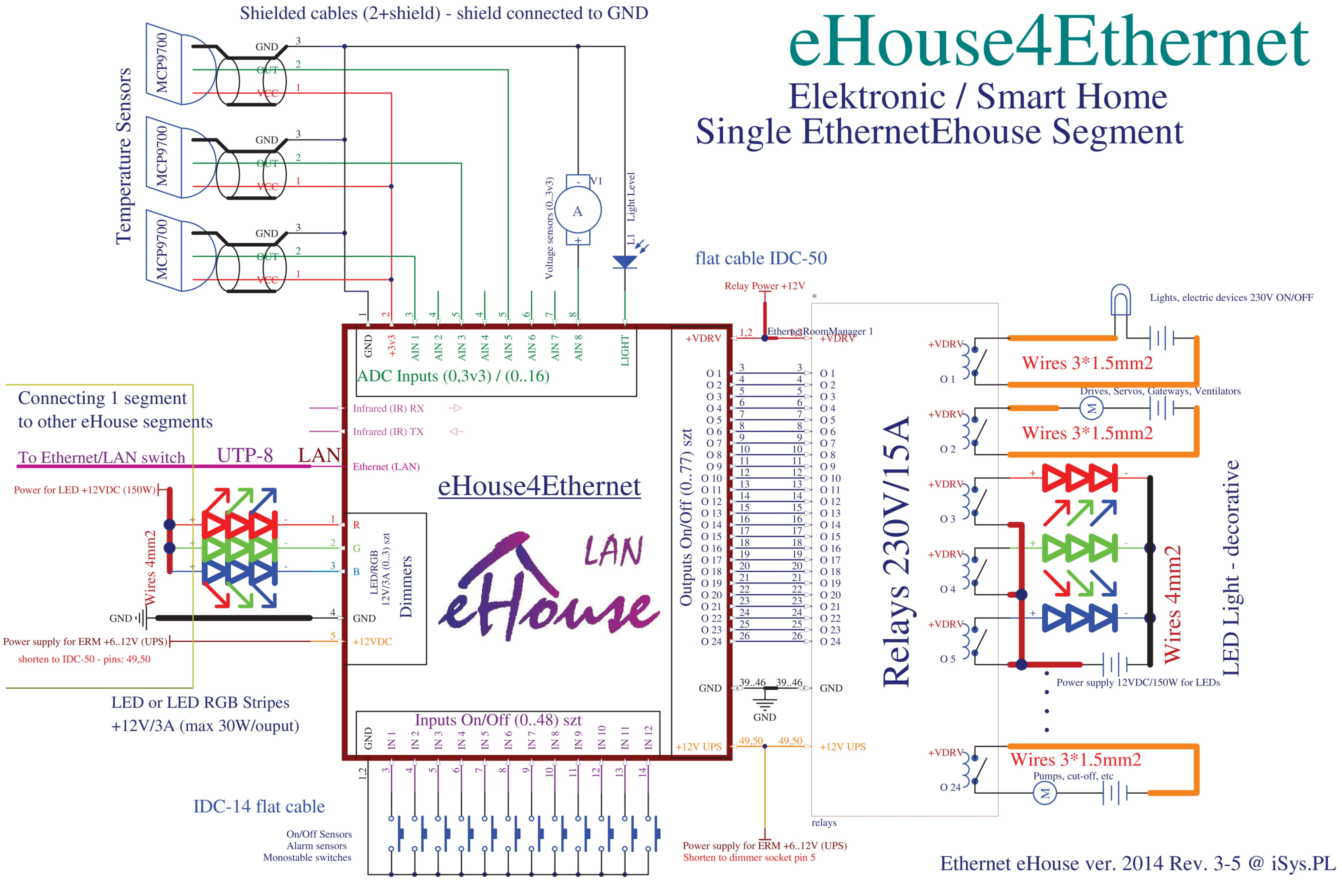
(*) Mature solutions available for vendors for development

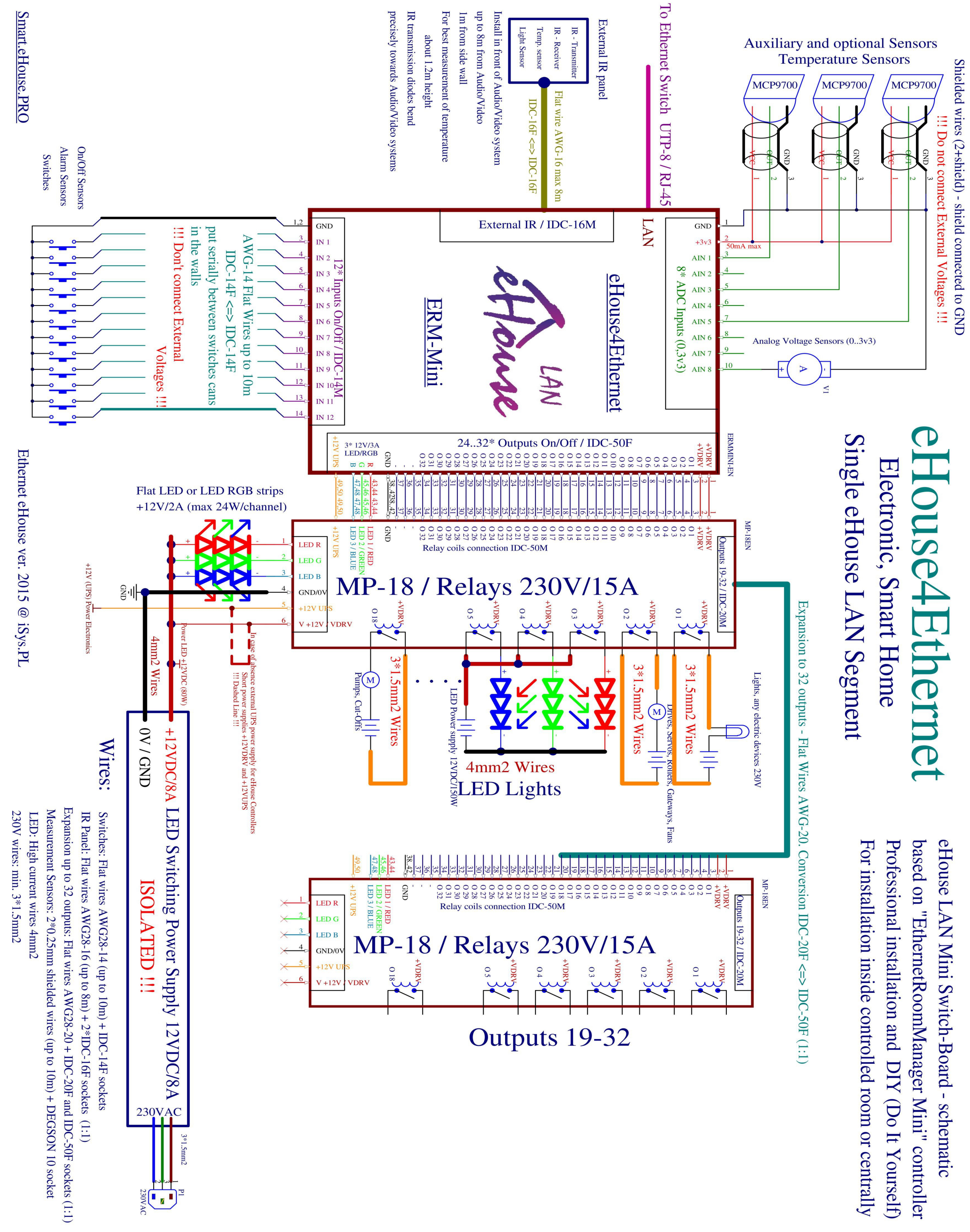
3.3. Systems and devices controlled by eHouse

eHouse system can control and integrate a lot of external devices and systems:
✔ internal and external lights (any voltage AC / DC, LEDs, RGB, PWM dimmers for 12VDC lights)
✔ temperature measurement, regulation, management in rooms
✔ individual, central, floor, convector or ventilation heating
✔ pumps, motors, ventilators, executive devices, cut-off
✔ any electric and electronic devices (on / off)
✔ HiFi, Audio, Video systems via remote controller signal learn and send
✔ VideoLAN application from IR remote controller and eHouse system
✔ rollers, shade awnings, gates, gateways, drives, servo-motors
✔ integrated security system with SMS notification managed outside controlled zone
✔ Control external Devices, Systems, Applications, Programs by HTML Requests

3.4. EthernetRoomManager ERM Installation Schematic Diagram

1) ERM Standard Rev. 2,3,4


Shielded cables (2+shield) - shield connected to GND
Temperature Sensors
MCP9700
GND
OUT
VCC
Voltage sensors (0..3v3)
V1
A
L1
Light Level
eHouse4Ethernet
Elektronic / Smart Home
Single EthernetEhouse Segment
flat cable IDC-50
Relay Power +12V
EthernetRoomManager 1
+VDRV
GND
+3v3
AIN 1
AIN 2
AIN 3
AIN 4
AIN 5
AIN 6
AIN 7
AIN 8
LIGHT
ADC Inputs (0,3v3) / (0..16)
Connecting 1 segment
to other eHouse segments
To Ethernet/LAN switch
UTP-8
LAN
Infrared (IR) RX
Infrared (IR) TX
Ethernet (LAN)
eHouse4Ethernet
Power for LED +12VDC (150W)
Wires 4mm2
R
G
B
LED/RGB
12V/3A (0..3) szt
Dimmers
GND
+12VDC
Power supply for ERM +6..12V (UPS)
shorten to IDC-50 - pins: 49,50
LED or LED RGB Stripes
+12V/3A (max 30W/ouput)
Inputs On/Off (0..48) szt
IN 1
IN 2
IN 3
IN 4
IN 5
IN 6
IN 7
IN 8
IN 9
IN 10
IN 11
IN 12
IDC-14 flat cable
On/Off Sensors
Alarm sensors
Monostable switches
Outputs On/Off (0..77) szt
O 1
O 2
O 3
O 4
O 5
O 6
O 7
O 8
O 9
O 10
O 11
O 12
O 13
O 14
O 15
O 16
O 17
O 18
O 19
O 20
O 21
O 22
O 23
O 24
39..46
+12V UPS
49,50
Power supply for ERM +6..12V (UPS)
Shorten to dimmer socket pin 5
relays
Relays 230V/15A
Lights, electric devices 230V ON/OFF
Wires 3*1.5mm2
Drives, Servos, Gateways, Ventilators
Wires 4mm2
LED Light - decorative
Power supply 12VDC/150W for LEDs
Pumps, cut-off, etc
M
Ethernet eHouse ver. 2014 Rev. 3-5 @ iSys.PL



To Ethernet Switch UTP-8 / RJ-45
LAN
External IR / IDC-16M
External IR panel
IR - Transmitter
IR - Receiver
Temp. sensor
Light Sensor
Flat wire AWG-16 max 8m
IDC-16F <=> IDC-16F
Install in front of Audio/Video system
up to 8m from Audio/Video
1m from side wall
For best measurement of temperature
about 1.2m height
IR transmission diodes bend
precisely towards Audio/Video systems
Smart.eHouse.PRO
On/Off Sensors
Alarm Sensors
Switches
12* Inputs On/Off / IDC-14M
GND
IN 1
IN 2
IN 3
IN 4
IN 5
IN 6
IN 7
IN 8
IN 9
IN 10
IN 11
IN 12
AWG-14 Flat Wires up to 10m
IDC-14F <=> IDC-14F
put serially between switches cans
in the walls
!!! Don't connect External
Voltages !!!
eHouse4Ethernet
ERM-Mini
8* ADC Inputs (0,3v3)
GND
+3v3
50mA max
AIN 1
AIN 2
AIN 3
AIN 4
AIN 5
AIN 6
AIN 7
AIN 8
Auxiliary and optional Sensors
Temperature Sensors
MCP9700
MCP9700
MCP9700
Shielded wires (2+shield) - shield connected to GND
!!! Do not connect External Voltages !!!
Analog Voltage Sensors (0..3v3)
V1
24..32* Outputs On/Off / IDC-50F
3* 12V/3A
LED/RGB
ERMMINI-EN
Flat LED or LED RGB strips
+12V/2A (max 24W/channel)
+12V (UPS) Power Electronics
GND
MP-18EN
Outputs 19-32 / IDC-20M
Relay coils connection IDC-50M
MP-18 / Relays 230V/15A
LED R
LED G
LED B
GND/0V
+12V UPS
V +12V VDRV
Power LED +12VDC (80W)
In case of absence external UPS power supply for eHouse Controllers
Short power supplies +12VDRV and +12VUPS
!!! Dashed Line !!!
4mm2 Wires
Pumps, Cut-Offs
3*1,5mm2 Wires
LED Power supply 12VDC/150W
4mm2 Wires
LED Lights
Drives, Servos, Rollers, Gateways, Fans
Lights, any electric devices 230V
Expansion to 32 outputs - Flat Wires AWG-20. Conversion IDC-20F <=> IDC-50F (1:1)
MP-18 / Relays 230V/15A
Outputs 19-32
+12VDC/8A LED Switching Power Supply 12VDC/8A
0V / GND
ISOLATED !!!
230VAC
3*1.5mm2
P1
230VAC
Ethernet eHouse ver. 2015 @ iSys.PL

eHouse4Ethernet

Electronic, Smart Home

Single eHouse LAN Segment

eHouse LAN Mini Switch-Board - schematic
based on "EthernetRoomManager Mini" controller
Professional installation and DIY (Do It Yourself)
For installation inside controlled room or centrally

Wires:

Switches: Flat wires AWG28-14 (up to 10m) + IDC-14F sockets
IR Panel: Flat wires AWG28-16 (up to 8m) + 2*IDC-16F sockets (1:1)
Expansion up to 32 outputs: Flat wires AWG28-20 + IDC-20F and IDC-50F sockets (1:1)
Measurement Sensors: 2*0.25mm shielded wires (up to 10m) + DEGSON 10 socket
LED: High current wires 4mm2
230V wires: min. 3*1.5mm2

3.5. Screenshots

http://home-automation.isys.pl/all,eHouse_smart_home_visualization_galery.htm

http://www.isys.pl/all,inteligenty_dom_budynek_galeria_software.htm

3.6. Comparison table of eHouse Versions

Many eHouse versions (RS-485, LAN, CAN, PRO) enables individual selection depending on preference, budget, architecture, amount of controlled points and many aspects to achieve most accurate home automation system to user needs. All versions are integrated by eHouse.PRO server so it can be any combination of hybrid instalation and works under the same eHouse Control Panel software applications on different operation systems.

Item / Architecture	**PRO**	**RS485 supervision PC / CM**	**LAN**	**CAN (EC)**
Main Interface	Ethernet 100/10	RS-485 full duplex	Ethernet (10Mb)	CAN (Controller Area Network)
Interface Speed	100Mb	115.200kb	10Mb	100kb
Maximal Range Total	20m to Ethernet Switch	1200m segment, serially + terminators (theoretical)	20m to Ethernet switch	500m segment, serially + terminators (theoretical)
Maximal range star topology	20m	200m must be tested individually, 1 terminator	20m	100m must be tested individually, 1 terminator
Cable Type	UTP-8	UTP-8	UTP-8	UTP-8, AWT-6
Expandable segments	No need	+ unlimited (Hardware) / -	No need	+ unlimited (Hardware)
Controllers per segments	4	250 / 250	250	125
Total controllers in system	4	125 supported by apps ~65000 / 30	250 supported by apps / ~65000 theoretical	125 supported by apps / ~10000 theoretical
RoomManager	-	+	+	-
Rollers / Gates Control	128(256)	EM (13) / CM (40)	CM (40)	EC (2)
Rollers Programs	256	24 / 24	24	-
Max Rollers Controllers	1	1*EM / 1*CM	4*CM	125*EC
HeatManager	-	+	- / HM via CM	-
Stand-alone Security System	+	- / + CM	CommManager (CM)	- / Software **eH4c**Server implementation
Alarm Sensors Count	128/(256)	- / CM (48)	CM (48)	EC (4)
Max Alarm Sensors Controllers	1	- / 1 * CM	4 * CM	125 * EC
Security Zones	256	- / CM (21)	CM (21)	Individual Settings
Alarm Horn Output	Hardware	- / Hardware CM	Hardware CM	Software + Firmware Event
Alarm Warning Output	Hardware	- / Hardware CM	Hardware CM	Software + Event
Early Warning Output	Hardware	- / Hardware CM	Hardware CM	Software + Event

Item / Architecture	PRO	RS485 supervision PC / CM	LAN	CAN (EC)
Monitoring Output	Hardware	- / Hardware CM	Hardware CM	Software + Event
Silent Alarm	Hardware	-	-	-
GSM/SMS	Hardware	SmsGateway.exe / CM (Hardware)	CM (Hardware)	eH4C + Hardware SMSGate
Email control	-	EmailGate.exe / -	-	-
Ftp control	-	FtpGate.exe / -	-	-
BlueTooth	-	BlueGate.exe + RM BlueTooth Module	-	-
Mifare card reader - (attendance)	-	Optional RM expansion module	-	-
Access Control	-	RM + Mifare RFID	External RFID + Software	External RFID + Software
Function Limitation	-	RM + Mifare RFID	-	-
Digital Inputs	128/(256)	RM (12), EM (12)	ERM (12), CM/LM (48)	EC (4)
Inputs support touch sensors / switches	-	-	-	+
Inverted inputs support	+	-	+	+
Authorization to system	Challenge-response, xored password, plain password, none, Apache security	Not required	Challenge-response, xored password, plain password, none	Based on Apache web server security
Supervising Host	Not Required	Required PC, CM, computer board, uC	Not Required	Not Required
Communication gateway to LAN	Not Required	Required PC (RS232<=>485) + eHouse.exe/eH4C, computer boar, uC / CM not required	Not Required	Required (RS232<=>CAN) + linux Box + eH4C
Windows XP,Vista,7,8 app Manage&Control (M), Config (C),Visualization (V), Status (S), Graphical Visualization(G)	-MCVSG	+M +C +V +S +G	+M +C +V +S +G	+M +C +V +S -G only via WB

Item / Architecture	**PRO**	**RS485 supervision PC / CM**	**LAN**	**CAN (EC)**
Linux	+MCVSG (eH4c)	+MVSG -C (Java) +MVSG -C (eH4c + WB)	+MVSG -C (Java) +MVSG -C (eH4c + WB)	+MVS -CG (eH4c + WB) via WB only
Web Browser	+MCVSG	+MVSG -C (eH4c + WB)	+MVSG -C (eH4c + WB)	+MVSC -G (eH4c + WB)
Java Enabled Systems	+MVSG -C	+MVSG -C	+MVSG -C	-
Windows Mobile	-	+MVSG -C (.Net, .Net CF)	+MVSG -C (.Net, .Net CF)	+MVSC -G via WB only
Android	+MVSG -C (Java App)	+MVSG -C (Java App)	+MVSG -C (Java App)	+MVSC -G via WB only
Communication gateway to the Internet	not required	Required PC (RS232<=>485) + eHouse.exe, computer board, uC / for CM not required	Control not required / status of all controllers required LinuxBox + eH4C	Required (RS232<=>CAN) + linux Box + eH4C
Analog/Measurement Inputs ADC	-	RM (8), HM (16)	ERM (8)	EC (2)
ADC measurement Range	-	<0..5V>	<0..3.3V>	<0..5> or <0..3.3V>
Digital Outputs	128/(256)	RM (24)	ERM (24)	EC (4)
Single PWM dimmers	-	RM, EM, HM (3)	ERM (3)	EC (4)
RGB dimmers	-	RM (1)	ERM (1)	EC (1) + White
Build-In Power PWM MOSFET Dimmers Drivers	-	- , +	- , +	+
Power supply@ average current	5V/2A	7-12V@0.2A+Relays	6..12V/0.3A+Relays	7V..25V/0.21A..0.07A
Power supply type	Linear/Switch	Linear (Lin)	Lin/SW (Switch)/ Lin + SW	Lin / SW / SW + Lin
Relays	External	External (5V..12V) – DIN 230V/16A - single	External (5V..12V) – DIN 230V/16A - single	4 - Build-In (5V) 230V/5A or 2 - External Module (5V) 230V/20A
Output + Dimmers Programs	256	24	24	-
ADC Programs	-	together with outputs programs	12	-

Item / Architecture	PRO	RS485 supervision PC / CM	LAN	CAN (EC)
Scheduler	5000	248	128	-
RTC - synchronization	SNTP	Firmware - main host	Firmware - SNTP	Firmware - eH4c
Additional Interfaces	RS232,RS-485 (eHouse1), USB	RS232,SPI, I2C	RS232,SPI, I2C	RS232, SPI
Infrared Transmitter (IR)	-	+ 23 IR standards	+ 23 IR standards	+ 23 IR standards
Infrared Receiver (IR)	-	+ Sony SIRC standard 12,15,24b	+ Sony SIRC standard 12,15,24b	+ Sony SIRC standard 12,15,24b

4. Documentation / Do It Yourself – English Version

Most current documentation in English are located at producer home page:

http://home-automation.isys.pl/ehouse_doc,intelligent_house_building_doc.htm

Source code examples, templates, libraries: http://isys.pl/download/

Do It Yourself information: http://smart.ehouse.pro/ - **eHouse Blog**

Details DIY, Programming, Designing, Instalation, Configuration, Articles, tips & tricks:

http://smart.ehouse.pro/category/applications/ - eHouse applications

http://smart.ehouse.pro/category/boilerroom/ - Boiler Room & Central Heating

http://smart.ehouse.pro/category/building-management/ - Building Management General Info

http://smart.ehouse.pro/category/design/ - eHouse Design, solutions, demos

http://smart.ehouse.pro/category/ehouse4can/ - eHouse4CAN – Installation, Configuration

http://smart.ehouse.pro/category/ehouse-lan/ - eHouse Ethernet – Installation, Configuration

http://smart.ehouse.pro/category/ehouse-rs-485/ eHouse 1 – Installation, Configuration

http://smart.ehouse.pro/category/ehouse-pro/ - eHouse.PRO – Installation, Configuration

http://smart.ehouse.pro/category/renewableenergy/ - free and renewable energy usage

http://smart.ehouse.pro/category/general/ - eHouse general info

http://smart.ehouse.pro/category/integrationcontrol/ - Integration to other systems, devices, A/V

http://smart.ehouse.pro/category/openremote/ - Integration with OpenRemote.ORG

http://smart.ehouse.pro/category/os/linux/ - Linux programming for eHouse - „C”

http://smart.ehouse.pro/category/os/windows/ - Windows programming

http://smart.ehouse.pro/category/programming/android/ - Mobile Devices PADs, SmartPhone, SmartTV, Android programming , screenshoots for eHouse

http://smart.ehouse.pro/category/programming/apache/ - Apache integration to eHouse.PRO server

http://smart.ehouse.pro/category/programming/csharp/ - C#, .Net, .Net CF programming

http://smart.ehouse.pro/category/programming/c/ - C programming for Linux

http://smart.ehouse.pro/category/programming/delphi/ - Delphi, Pascal programming for Windows http://smart.ehouse.pro/category/programming/java/ - Multiplatform Java programming, screenshoots

http://smart.ehouse.pro/category/programming/windows-phone/ - Windows Mobile, Phone programming

http://smart.ehouse.pro/category/programming/www/ - Web browser support for eHouse

http://smart.ehouse.pro/category/visualization/ - Creating individual visualization and graphical control views

5. Contact and Cooperation

iSys – Intelligent Systems
Wygoda 14, 05-480 Karczew
Poland
tel: +48504057165
email: is@isys.pl

GPS: (N:52 st 2min 44.3s; E:21st 15min 49.19s)

Map

Producer, manufacturer, developer home page in English:

http://home-automation.isys.pl/ - Producer homepage
http://smart.ehouse.pro/ - Do It Yourself, designing, development, examples, applications
http://eHouse.Biz/ - eHouse smart home producer online shop

http://www.isys.pl/?home_automation - Other Languages (for information only not for reference)

Serwisy eHouse w języku polskim:

http://inteligentny-dom.ehouse.pro/ Zrób to sam, programowanie, przykłady, projektowanie, zastosowania
http://www.isys.pl/ - strona WWW producenta
http://ehouse.net.pl/ - sklep internetowy producenta inteligentnego domu eHouse
http://www.ehouse.pro/ - Automatyka domu, budynku, hoteli, pensionatów
http://sterowanie.biz/ - Sterowanie domem, budynkiem, mieszkaniem

6. Notes: