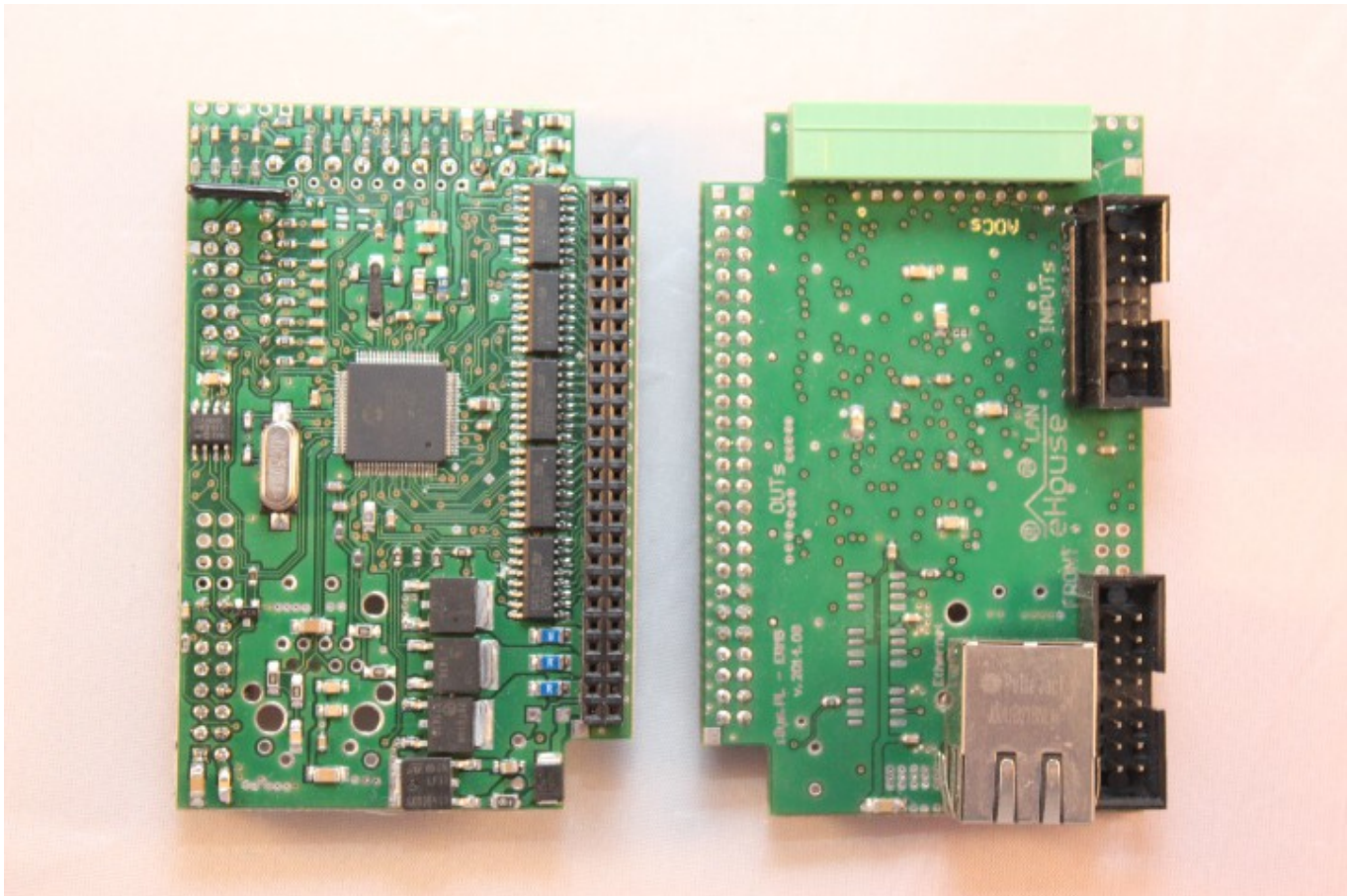




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1.eHouse LAN Smart Home ERM Mini (ERM-MINI) for direct MP- 18 relay module connection



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



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- ✓ Installable Product RoHS not required
- ✓ Complying with CE norms for (EMI

1.1. "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

1.1.1 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

1.1.2 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



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- ✓ 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

1.1.3 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

1.1.4 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



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- ✓ Online status via WiFi, Ethernet, LAN, Internet
- ✓ Supports eHouse 1, eHouse LAN, eHouse.PRO versions

1.1.5 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

1.1.6 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



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1.1.7 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

1.1.8 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



1.2. 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.



2. Appendix

2.1. 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,



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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)

2.2. 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

2.3. 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



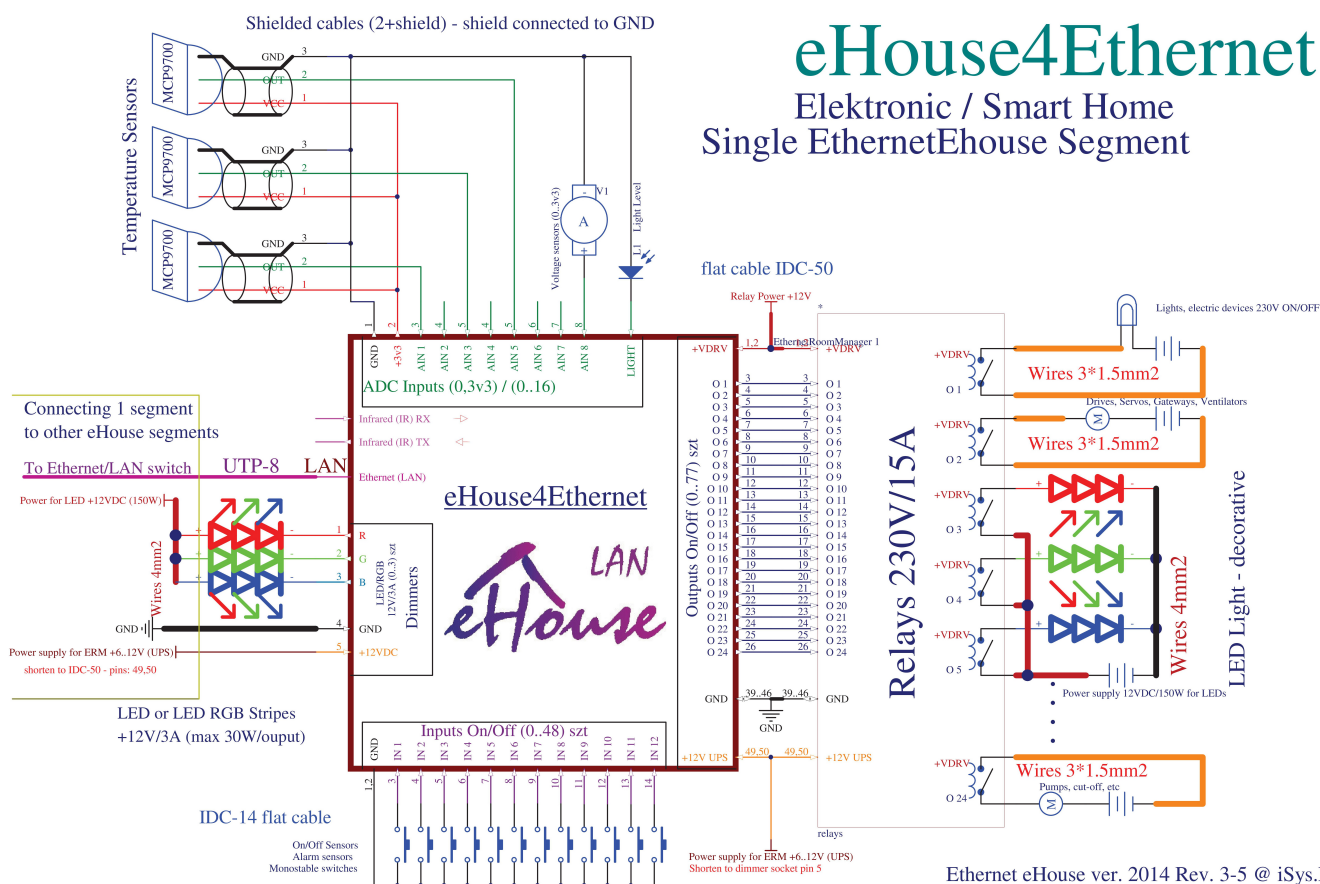
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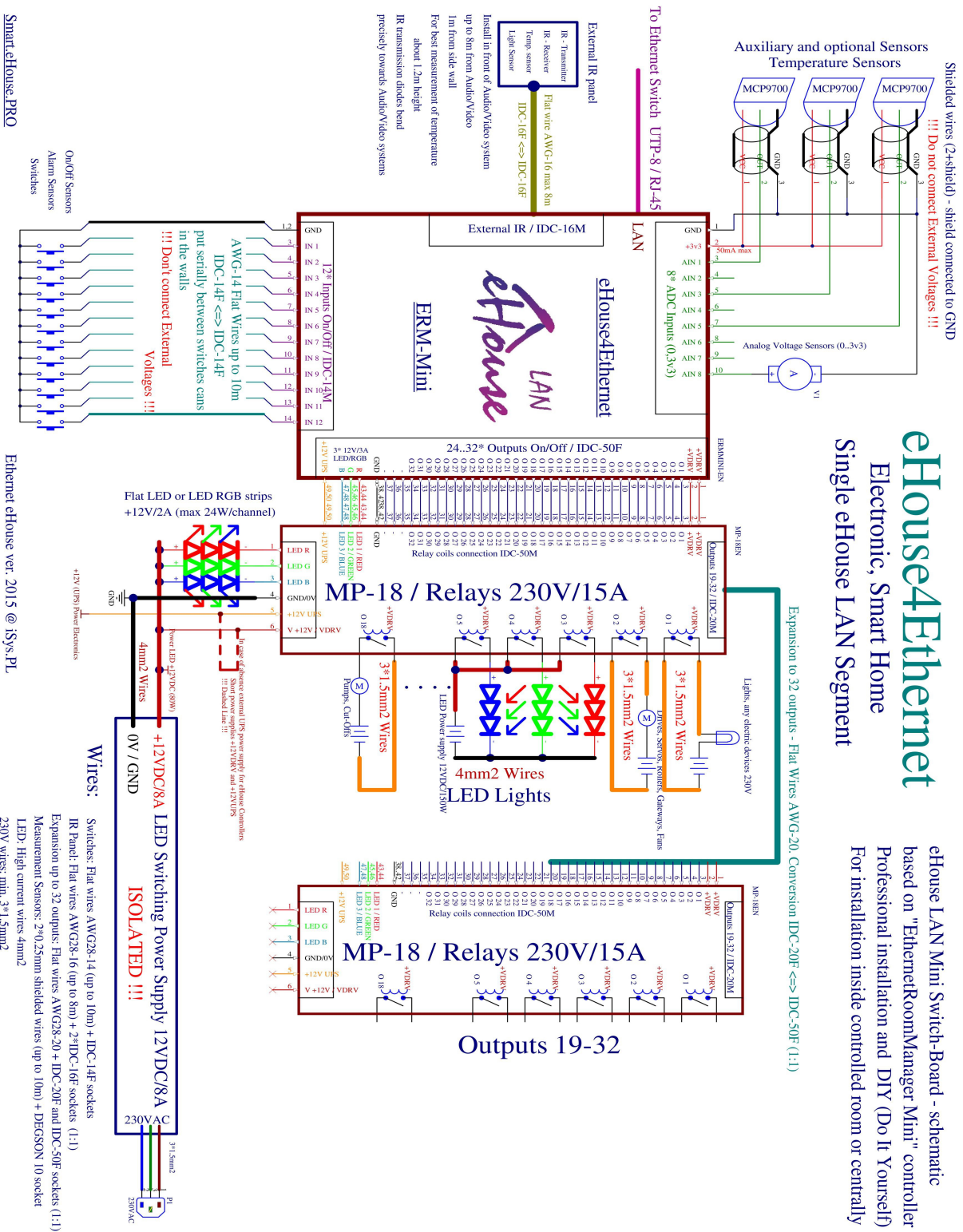
zone

✓ Control external Devices, Systems, Applications, Programs by HTML Requests

2.4. EthernetRoomManager ERM Installation Schematic Diagram

1) ERM Standard Rev. 2,3,4







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2.5. Screenshots

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

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

2.6. 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.



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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 eH4cServer 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



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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 board, 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



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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	-



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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



3. 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, screenshots 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



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<http://smart.ehouse.pro/category/programming/java/> - Multiplatform Java programming, screenshots

<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



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4. 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