1.Ehouse LAN Home Automation system - Ethernet RoomManager (ERM)
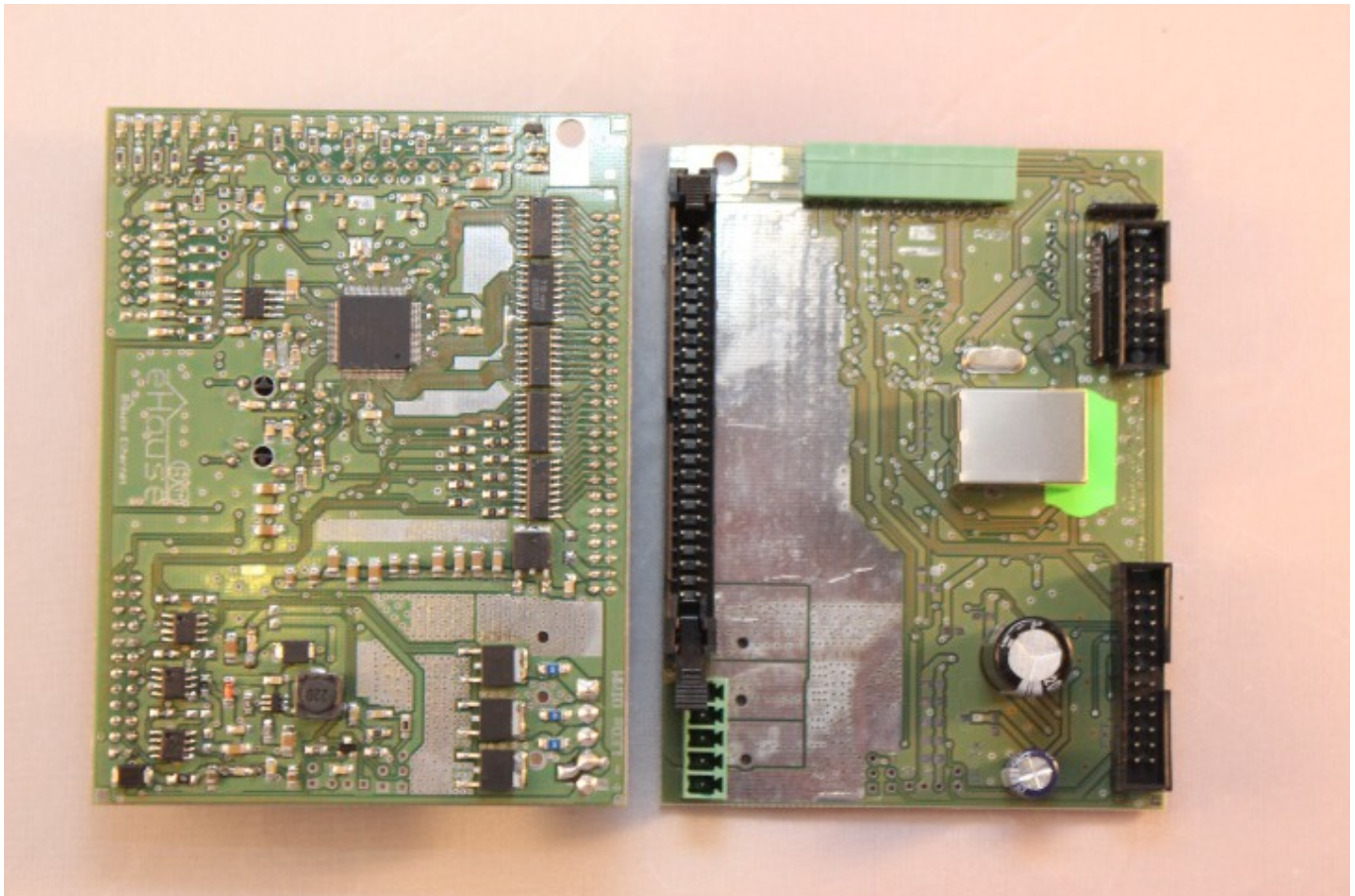
EthernetRoomManager is decentralized medium range low voltage smart home controller (separated from Mains for safety and DIY solutions) dedicated for control and management of whole rooms in following applications:

✔ 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

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.
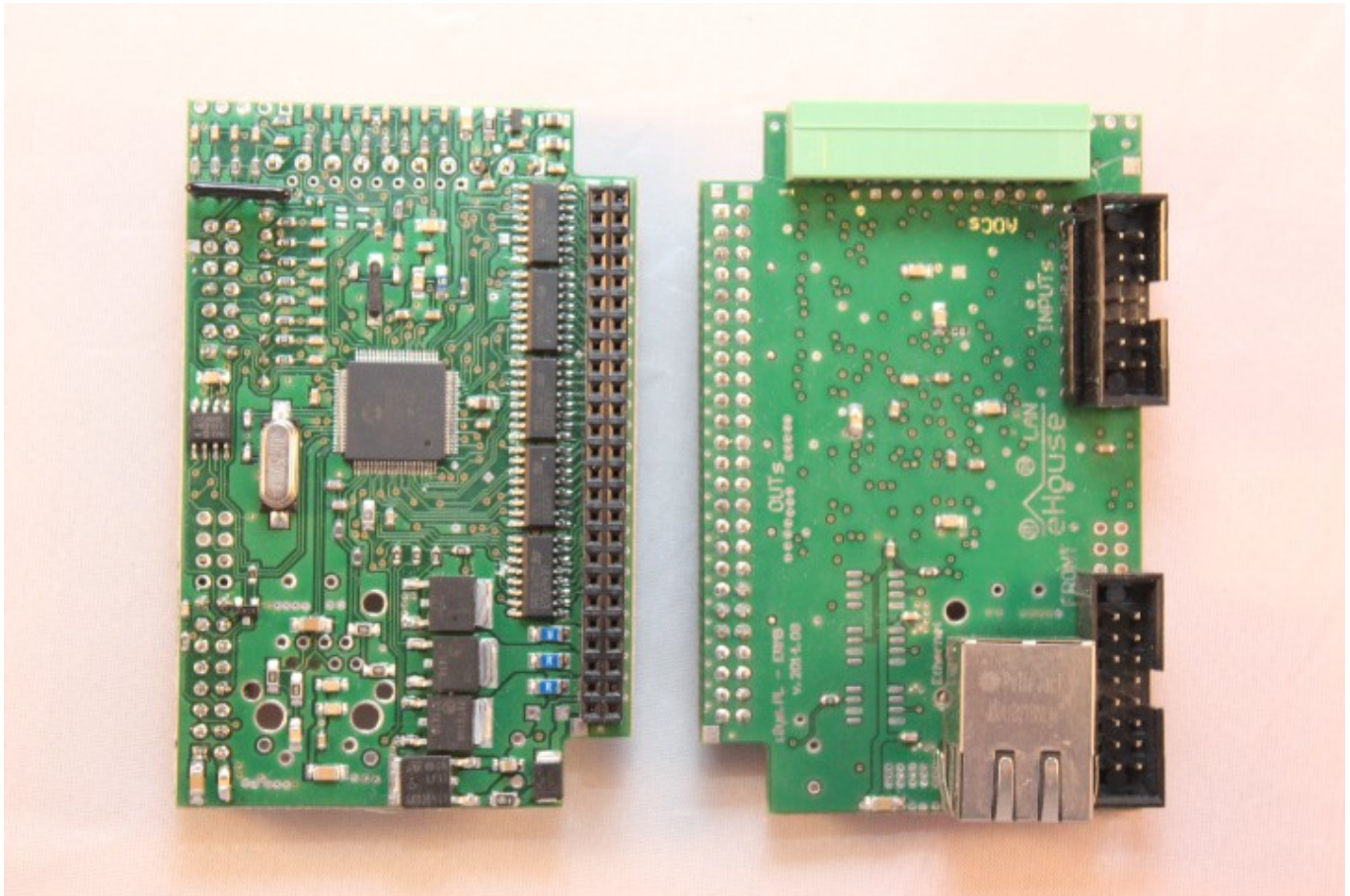Dimensions: 114*86*35mm and may be changed during production and development

✔ 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)

1.1.1   eHouse LAN Smart Home ERM Mini (ERM-MINI Rev.5) 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)

1.2. "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

1.2.1 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

1.2.2 Linux software package eHouse4cServer (eHouse.PRO) binary

eHouse4cServer assures supervision and integration of all versions of eHouse system.
Currently supported Linux versions:
✔ RaspberryPi, RaspberryPi 2, Banana PRO 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

1.2.3 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

1.2.4 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

1.2.5 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

1.2.6 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

1.2.7   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

1.2.8   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

1.3.   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,

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
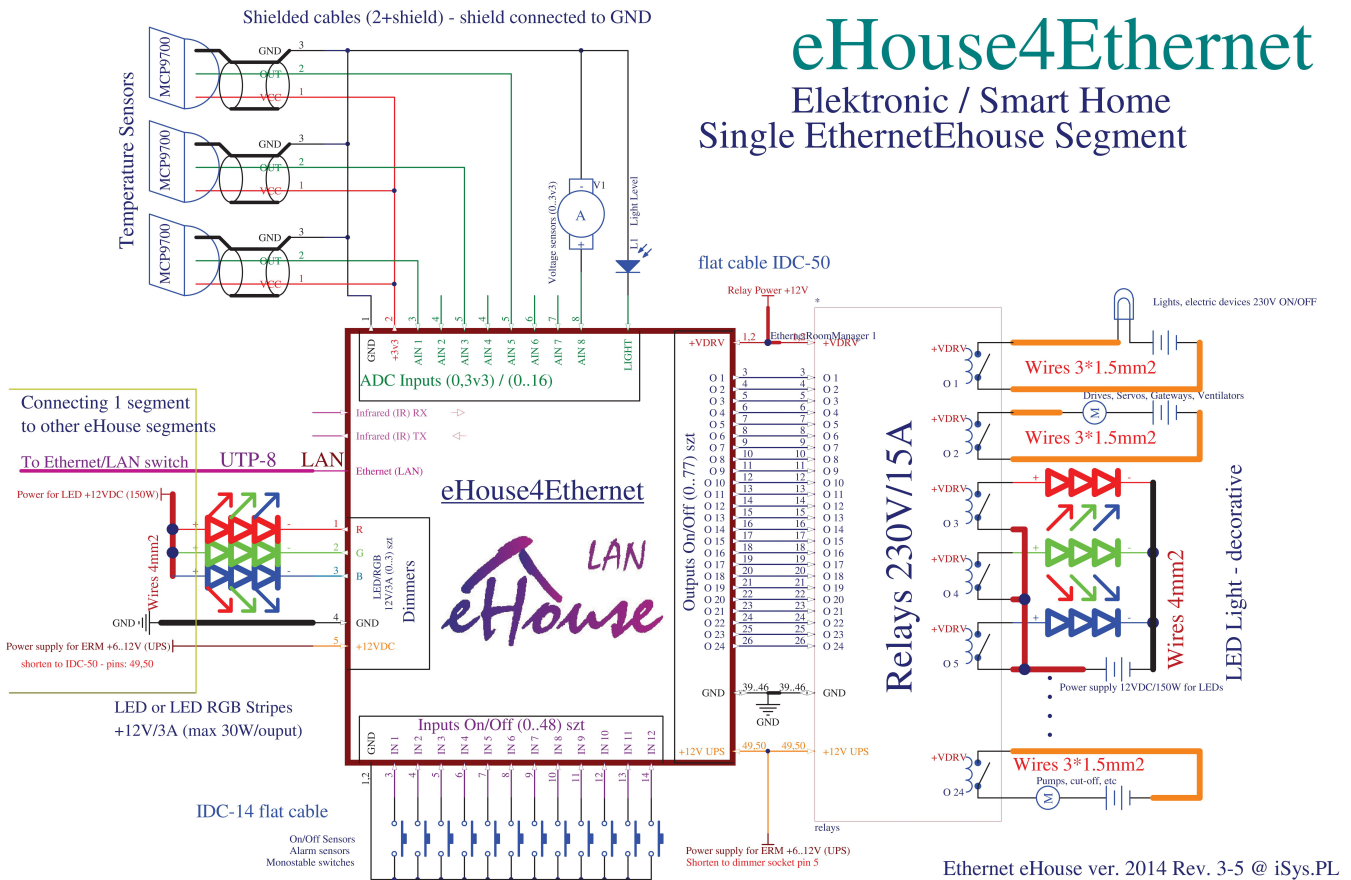✔ integrated security system with SMS notification managed outside controlled

zone

✔ Control external Devices, Systems, Applications, Programs by HTML Requests
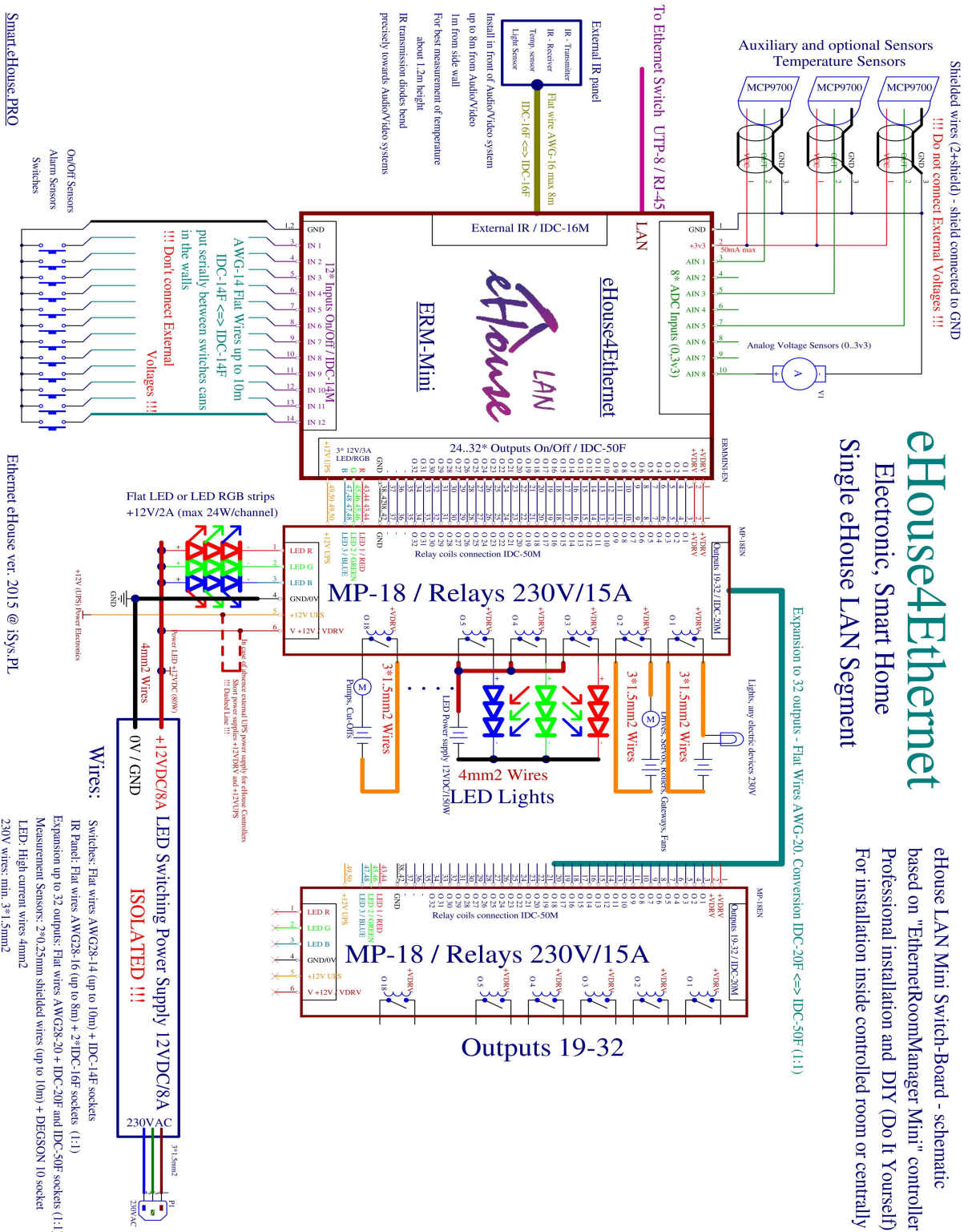
2.4.   EthernetRoomManager ERM Installation Schematic Diagram

1) ERM Standard Rev. 2,3,4

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

Smart.eHouse.PRO

Ethernet eHouse ver. 2015 @ iSys.PL

Auxiliary and optional Sensors
Temperature Sensors

MCP9700 MCP9700 MCP9700

GND   GND   GND

Shielded wires (2+shield) - shield connected to GND
!!! Do not connect External Voltages !!!

External IR panel
IR - Transmitter
IR - Receiver
Temp. sensor
Light Sensor

Install in front of Audio/Video system
up to 8m from Audio/Video
In from side wall
For best measurement of temperature
about 1.2m height
IR transmission diodes bend
precisely towards Audio/Video systems

To Ethernet Switch UTP-8 / RJ-45

Flat wire AWG-16 max 8m
IDC-16F <=> IDC-16F

External IR / IDC-16M

LAN

ERM-Mini

eHouse4Ethernet

GND
+3v3   50mA max
AIN 1
AIN 2
AIN 3   8* ADC Inputs (0..3v3)
AIN 4
AIN 5
AIN 6
AIN 7
AIN 8

Analog Voltage Sensors (0..3v3)

On/Off Sensors
Alarm Sensors
Switches

GND
IN 1
IN 2
IN 3
IN 4
IN 5   12* Inputs On/Off / IDC-14M
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
!!! Don't connect External
Voltages !!!

put serially between switches cans
in the walls

24..32* Outputs On/Off / IDC-50F

3* 12V3/3A

GND +12V UPS

Relay coils connection IDC-50M

MP-18 / Relays 230V/15A

Outputs 19-32 / IDC-20M

Flat LED or LED RGB strips
+12V/2A (max 24W/channel)

LED R
LED G
LED B
GND/0V
+12V UPS
V +12V VDRV

Power LED +12VDC (80W)

+12V (UPS) Power Electronics

In case of influence external UPS power supply
!!! Short power supplies +12VDRV and +12VUPS

LED Power supply 12VDC/150W

LED Lights
4mm2 Wires

3*1,5mm2 Wires

Pumps, Cut-offs

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)

Wires:
0V / GND
+12VDC/8A LED Switching Power Supply 12VDC/8A
ISOLATED !!!

230VAC
3*1,5mm2
230VAC

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

MP-18 / Relays 230V/15A
Outputs 19-32

LED R
LED G
LED B
GND/0V
+12V UPS
V +12V VDRV

Relay coils connection IDC-50M

Outputs 19-32 / IDC-20M

2.5. 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. 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

4. Contact and Cooperation

iSys – Intelligent Systems
Wygoda 14, 05-480 Karczew
Poland
tel: +48504057165
email: i s @ i s y s . p l

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