HIQ home automation

Manual v1.6 rev 4

robotina

Content

Overview

sensors - controllers - actuators - interface

HIQ

comfort

simplicity

security

safety

practical

flexibile

cost-effective

HIQ is a home automation system, including lights, blinds, heating and cooling; temperature monitoring, energy management, timetable, evant-based automation and alarm.

HIQ consists of both hardware and software. Devices are connected to each other with a common power supply and communication bus.

Although basically simple, expansion capabilities are virtually unlimited. System is configurable, programmable, and allow integration of multiple HIQ installations into a single functional unit.

HIQ can be used for a new project and renovation. Most of the work is done by a common electrician, no specialized expert is needed. Most of the configuration is done by end-user.
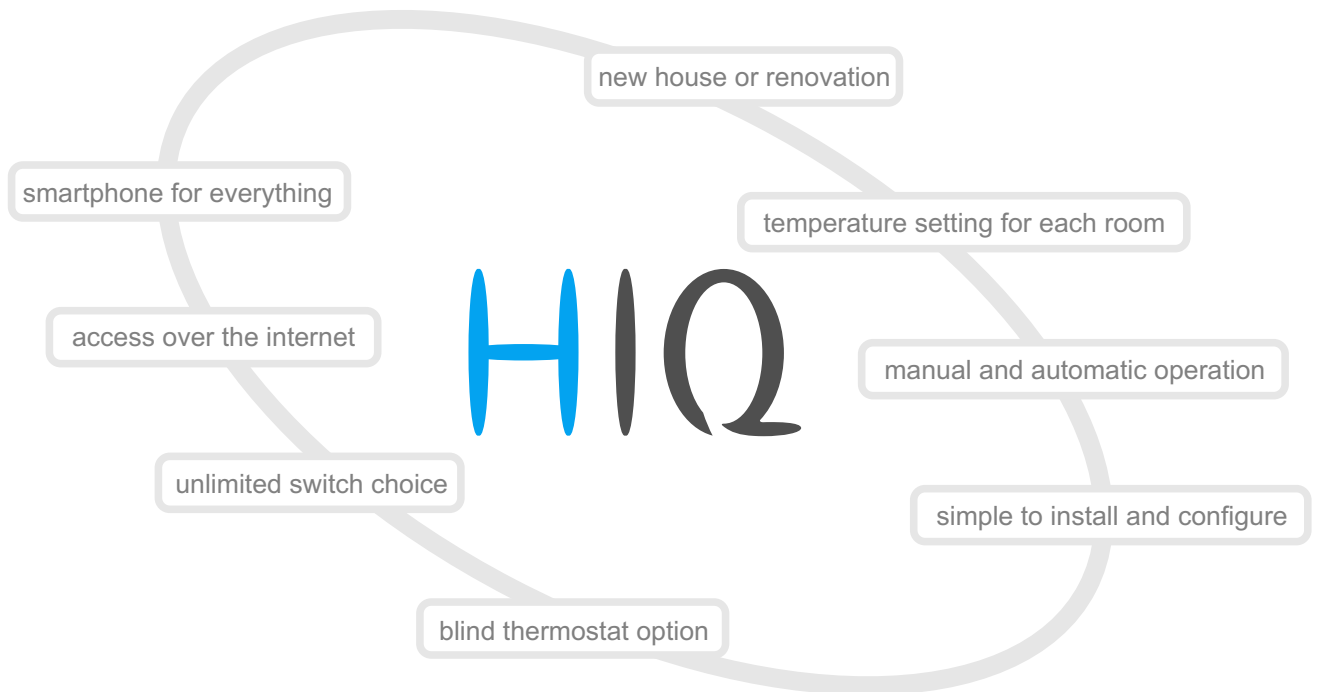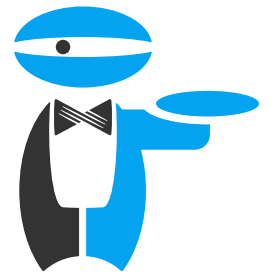
System design is very simple, there are no complicated compatibility or dependency rules.

HIQ is fully open to work with many other home devices, either by integrating them in the system (e.g. touchless buttons), or cooperate on the signal level (e.g. professional alarm).
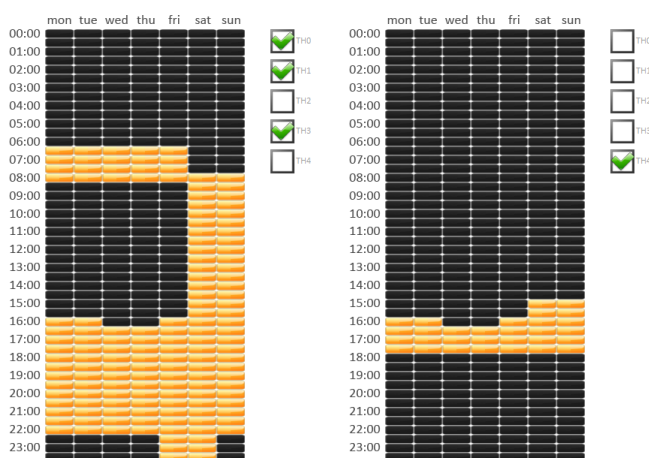
Features
new concept with unique features

new house or renovation

smartphone for everything

temperature setting for each room

access over the internet

HIQ

manual and automatic operation

unlimited switch choice

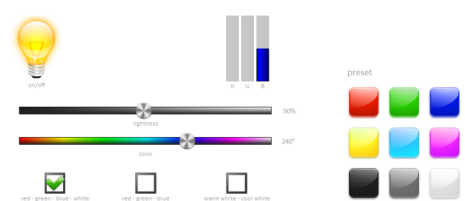simple to install and configure

blind thermostat option

Multiple timetables

Set things running up to your schedule. To configure the timetable, select active hours, then select devices to be affected. You can manually override output at any time.

Advanced RGB control

RGB mode allows control of hue, saturation and brightness; instead of individual red, green and blue channels.

In white temperature mode, output goes between different kinds of white, from bright daylight to warm incandescent light.

Evo light function provides synchronization between light temperature and time of day. In the evening, lights will automatically reach the warmer tone.

Feasibility

suitable for most lodging solutions
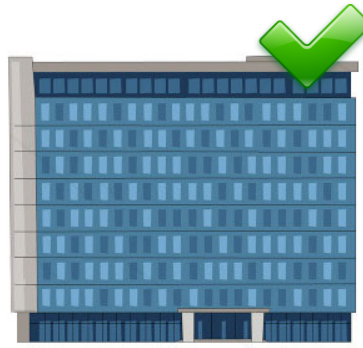

small house

large house

highrise

apartment building

office building

urban house

farm house

cottage

new house

full renovation

partial retrofit

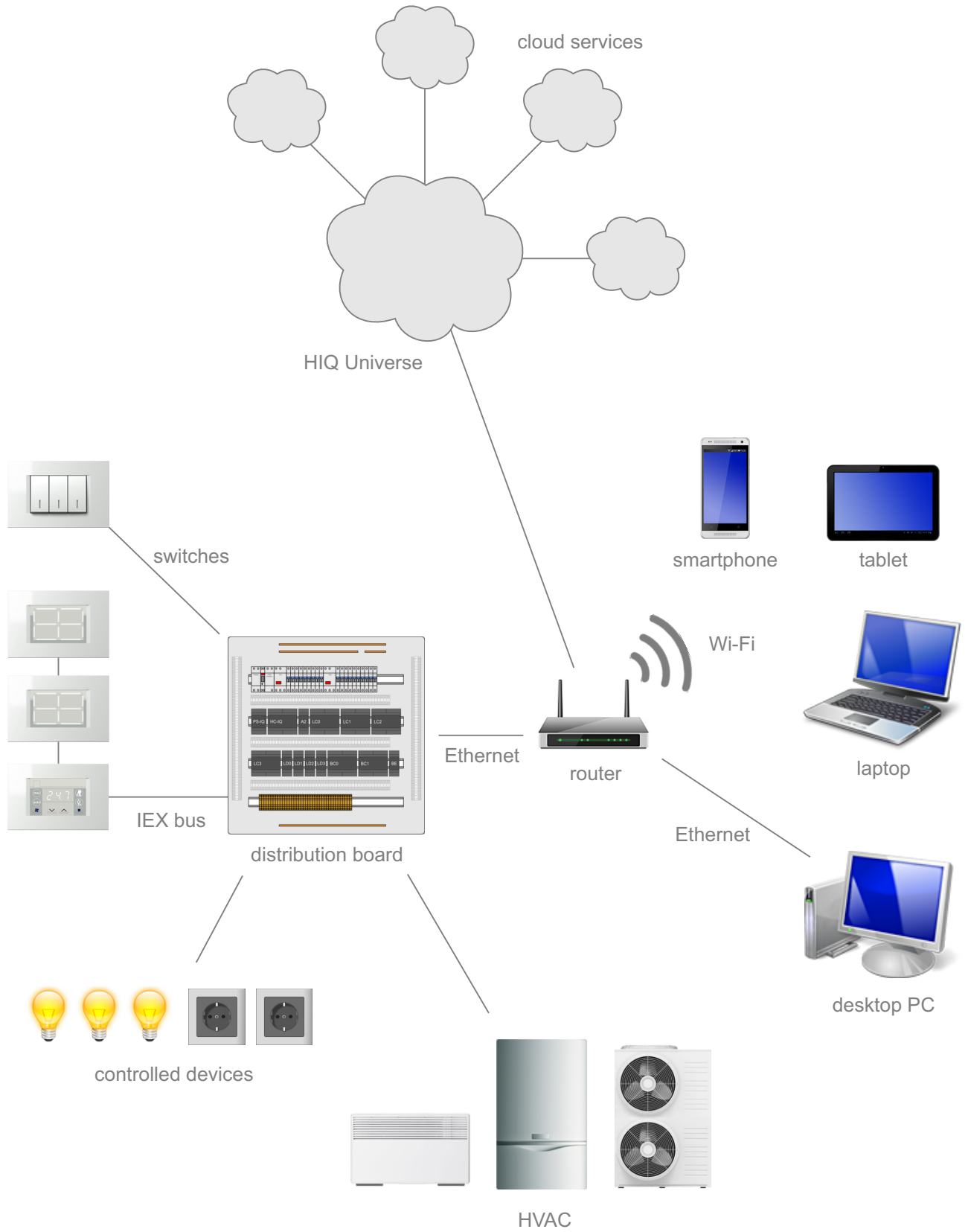HIQ system is suitable for house or apartment, small or large, residence or weekend house. It may not be the best choice for a partial or temporary retrofit, where wireless solution is prefered.
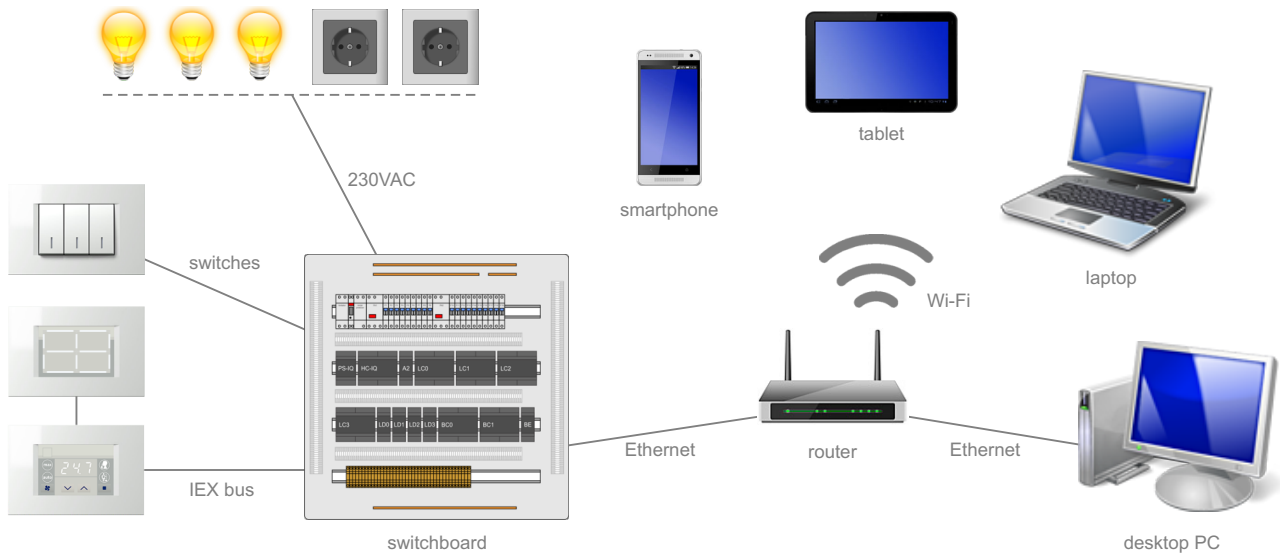
Layout

from a switch to the cloud computing

cloud services

HIQ Universe

switches

smartphone

tablet

Wi-Fi

Ethernet

router

laptop

IEX bus

distribution board

Ethernet

desktop PC

controlled devices

HVAC

Usage
what all this hardware is for

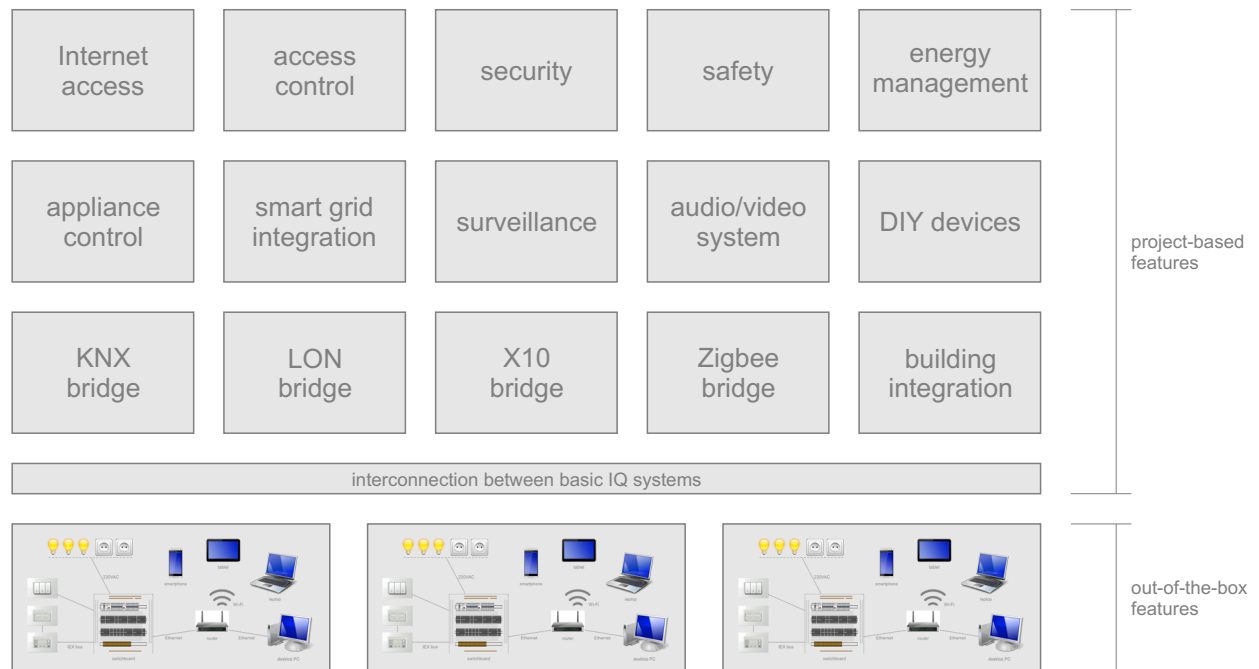| Device	Used for
LC-10-IQ light controller	halogen and LED downlighters, all kinds of general-purpose lights
	managed socket for floor lamp, table fan, hi-fi system, projector, and all kinds of appliances
LD-V4-IQ LED dimmer	LED stripes
LD-P4-IQ LD-D8-IQ universal dimmer	dimmable lights of all kinds
BC-5-IQ blinds controller	window blinds, shutters and jalousies
SC-4T-IQ scene controller	
SC-4S-IQ scene controller	user-selectable arrangement of lights and blinds
TH-1-IQ TH-2-IQ TH-3-IQ electronic thermostat	heating, cooling and fan control
FC-1-IQ fan-coil controller	
HC-IQ main controller	smartphone and PC connection, automation, timetable, alarm, energy and other functions

Expansion

out-of-the-box and project-based features

Basic system

Basic system covers approximately 200m2, or one floor of a multistory object.

Advanced system

Internet access	access control	security	safety	energy management
appliance control	smart grid integration	surveillance	audio/video system	DIY devices
KNX bridge	LON bridge	X10 bridge	Zigbee bridge	building integration

project-based features

interconnection between basic IQ systems

out-of-the-box features

HIQ system offer many out-of-the-box functions. However, modern home automation is all about integration, and that is where the HIQ excels. HIQ is capable of connecting various devices into a functional system. Integration is project-based, each home is attuned to investor and building requirements.

Background

technical experience behind the product

Design
Cybrotech originate from industry control and automation, all devices are designed and build up to a much higher standards then usually expected in home automation.

Features
- hardware watch-dog
- transient supression
- short circuit tolerant outputs
- reverse polarity tolerant supply
- wide temperature range
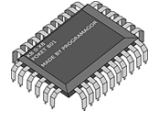
Addressing
Devices are addressed automatically, not a single address is set by user.

Firmware
All devices are build to implement firmware upgrade, so the future for your investment is assured.

Responsive
From keypress to action, typical reaction time cca. 10 milliseconds.

CAN bus is a multi-master, deterministic bus which offer optimum between performance, network architecture and cost.

Power consumption
HIQ take a great care to use as little electricity as possible.

Autorange inputs always ensure a full scale motion.

No batteries
The whole system is operated from a single 24V power supply.

No hidden costs at any level - everything is simple and elegant (and beautiful, too).

Programming tools are free, everybody is welcome to give it a try. Only a basic programming skills are needed. Join our group and discover how fun and simple house automation can be.
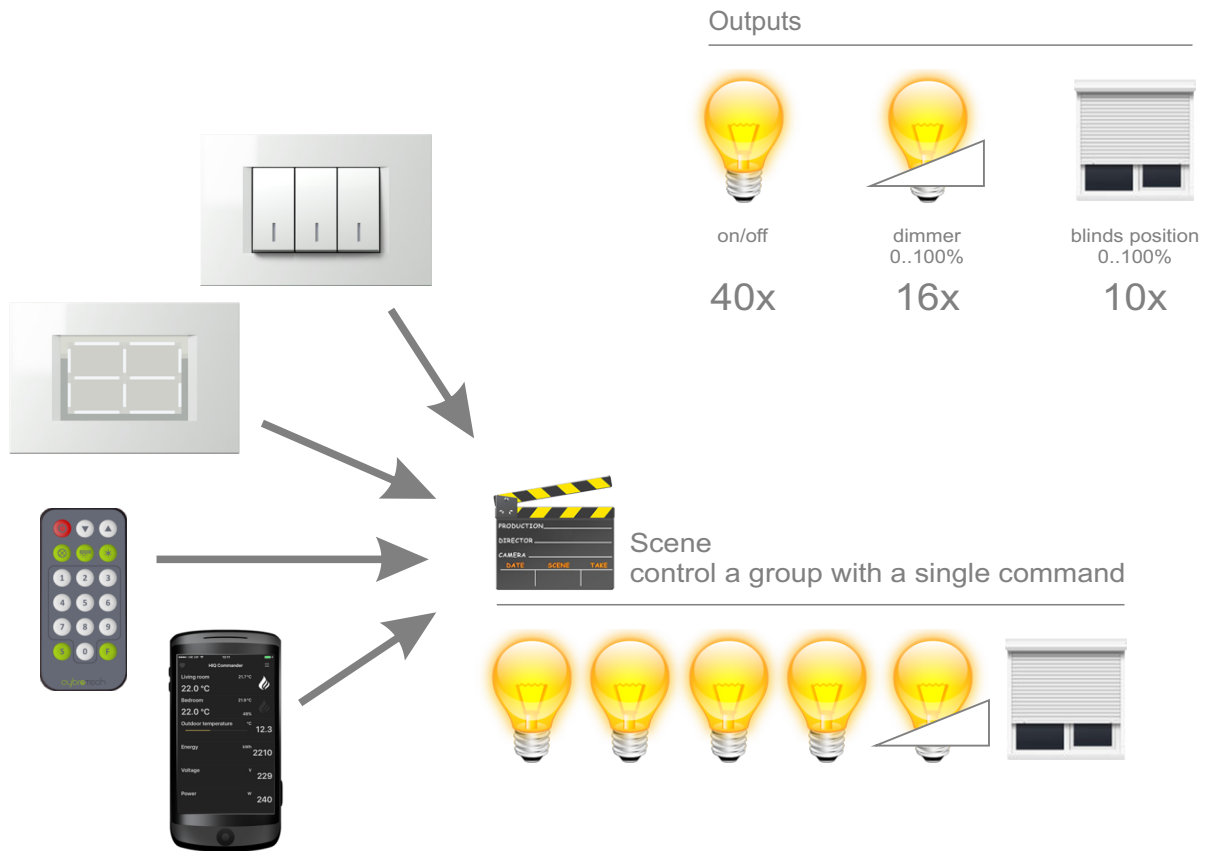
Wire vs. wireless
- no batteries
- more reliable
- faster response
- less EMI pollution
- simpler setup
- lower price

We don't sell switches, luminaries, computers, portable devices, tablets or phones; you have a freedom to select anything you like, buget models or expensive designer items. What we do sell is electronics, software and home automation experience at it's finest.
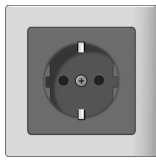
Lights and blinds
control everything from everywhere

Outputs

on/off
40x

dimmer
0..100%
16x

blinds position
0..100%
10x

Scene
control a group with a single command

Light type

incandescent/halogen

compact fluorescent

compact LED E27/E14

LED strip 12/24V

Blinds type

classic blinds

slatted blinds

Roman shades

managed socket for a floor lamp, table fan, dehumidifier, electric mosquito repellent, hi-fi system

blinds control with an intermediate position

RGB dimmer

hue, saturation and brightness

In RGB mode, dimmer channels are connected to red, green, blue and white lights. White channel is optional. Instead of individual channels, user controls total brightness, hue and saturation.

RGB dimmer may be used in white temperature mode. Here, user controls brightness and white temperature. White light is obtained by mixing all four channels. For the best results, RGB strip 5600K and white strip 2700K (warm white) must be used.

White temperature
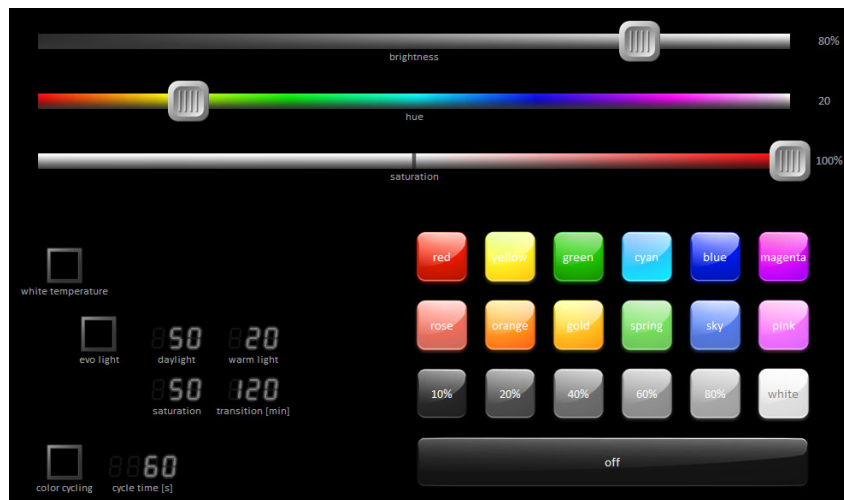
0%		50%		100%
1200K	3000K	5600K	7800K	10000K
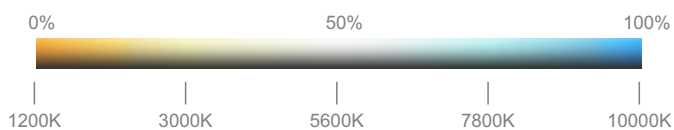
In RGB mode, saturation goes from natural white (white strip) to RGB white (0..50%), and then to selected color (50..100%).

In white temperature mode, saturation goes from natural white (white strip) to RGB white (0..100%).

Color cycling

Automatically rotate through the available colors. Brightness and saturation are selected manually.

Color picker

Color picker is a quick way to choose a color, available with the HIQ Commander application. To control the RGB, just touch a color or slide finger over the screen.

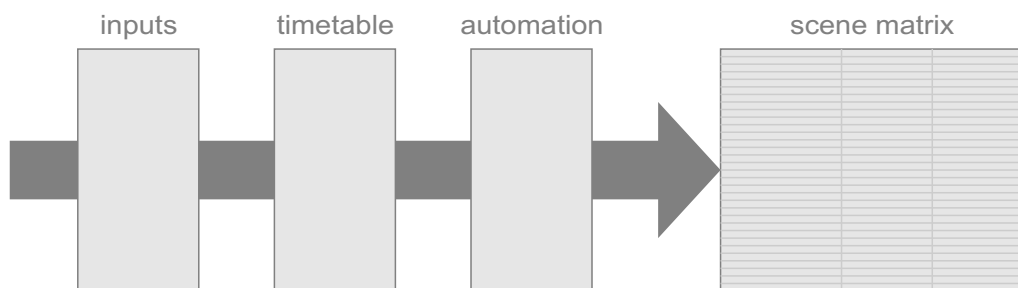
RGB mode   white temperature mode
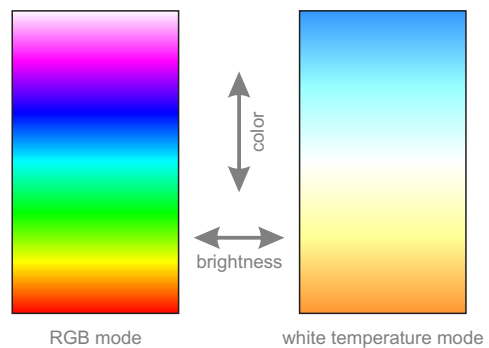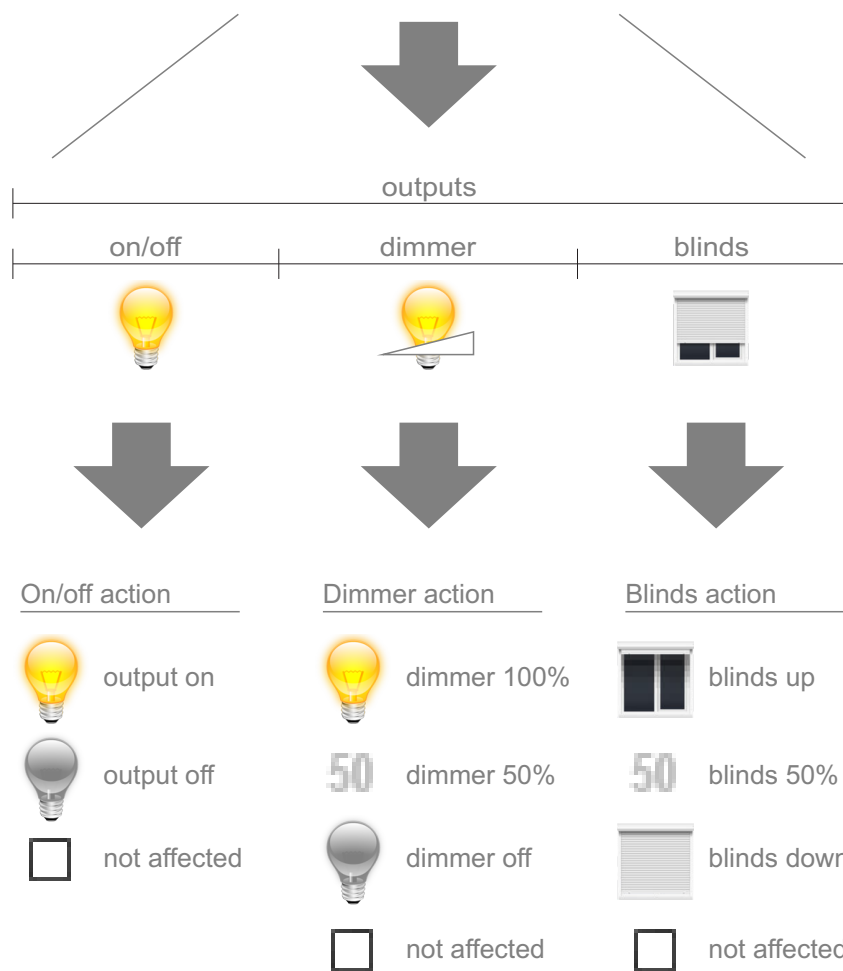
Scene

one touch to rule them all

Scene is user-defined memory including lights, dimmers and blinds. Each output is either defined by scene (on/off, lightness and position), or not affected.

inputs   timetable   automation   scene matrix

Scene mapping

SC0	0
	1
	2
	3
SC1	4
	5
	6
	7
SC2	8
	9
	10
	11
SC3	12
	13
	14
	15
	16
	17
	18
	19
	20
	21
	22
	23
	24
	25
	26
	27
	28
	29
	30
	31

Hint: use scene 31 to turn all lights off.

outputs

on/off	dimmer	blinds

On/off action

output on

output off

not affected

Dimmer action

dimmer 100%

dimmer 50%

dimmer off

not affected

Blinds action

blinds up

blinds 50%

blinds down

not affected

Scene is initially created with HIQ Configurator. Once saved, it can be modified with a long press.

Automatic lights

where and how to use automatic lights

Benefits of automation depend mostly on how the space is used:

Legend:
- smart light (orange)
- ready light (green)
- motion sensor (yellow)
- door sensor (blue)
- manual control (white)

Smart light is based on low light and presence signal, and it is used for a main living space. It can be combined with evo light to control light temperature during the evening.

Ready light take advantage of door and motion sensors. It is suitable for a space used occasionally, like a bathroom.

Motion sensor cover open spaces, hallway or porch.

Door sensor cover small rooms used temporary, like a closet, cloak or wardrobe.

Other areas, like a bedroom, are handled manually.

Simple automation

light automation based on a single sensor

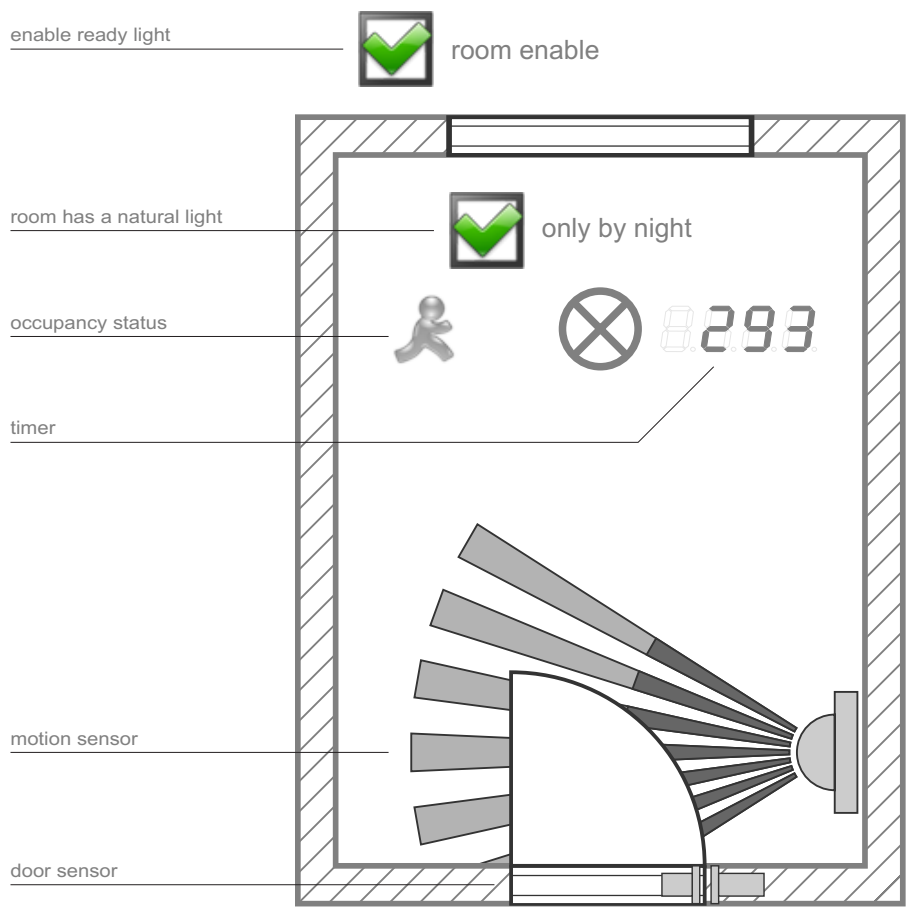| usage	input mode	output mode	description
on/off			press on, press off
on/off + timer			press on, press off in case light is left on, timer turns it off
staircase			press on press again to reload the timer when timer expires, light goes off
doorbell			press on, release off
scene			press to set scene preas again to turn the scene off
motion sensor			movement is keeping the light on when timer expires, light goes off
			movement is keeping the light on when timer expires, light goes off active only during the night
door sensor			open door to turn the light on close door to turn the light off
			open door to turn the light on close door to turn the light off active only during the night
ready light			used for ready light only

Ready light

advanced automatic light control

Ready light is an advanced lighting system, based on motion and door sensors. It is best suited for closed spaces that residents don't occupy permanently.

Features:
- instant turn on when door begins to open
- never turn off while people are inside
- quickly turn off when people get out

enable ready light ——————— ✅ room enable

room has a natural light ——————— ✅ only by night

occupancy status ———————

timer ———————

⊗ 293

Input setup

Sensors are connected to spare inputs of light controller. Input must be configured to ready light mode.
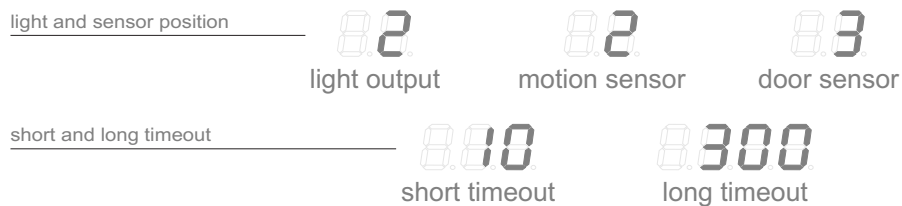
Sensor placement

For a best result, sensor must be activated just after person closes the door.

Short timeout

Time from closing the door to light off. If time is too short, light may turn off after entering the room.

Long timeout

Time from leaving the room to light off, without closing the door.

motion sensor ———————

door sensor ———————

light and sensor position ———————

2	2	3
light output	motion sensor	door sensor

short and long timeout ———————

10	300
short timeout	long timeout

Patent pending - Ready Light is in the proces of acquiring patent rights.

How it works

When door begins to open, reed sensor is activated and the light turns on. When a person enters the room and closes the door, PIR activation means person is surely in the room. As long as door is closed, light will stay on. When person leaves room and closes door, system will wait for a short time, then turn the light off. If the door is left open, long timeout is active. If the PIR sensor is not activated during that time, light switches off.
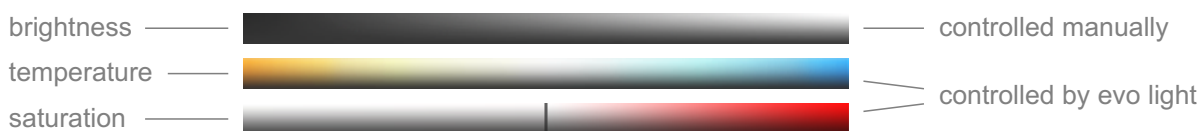
Evo light
warm light at late evening

Evo light is a half automatic system for controlling temperature of white light. It operates with RGB dimmer in white temperature mode. User controls brightness, hue and saturation are controlled by the system.

When enabled, it first produce a cool white light, then a warm light later in the evening, not disrupting the natural sleep cycle.

System can be combined with smart lights. In that case, operation is fully automatic, smart light controlls brightness, and evo light controlls light temperature.

brightness ———	[gradient bar]	——— controlled manually
temperature ———	[gradient bar]	controlled by evo light
saturation ———	[gradient bar]	

Term evo is a short for 'evolution'. During the most of our evolutionary past, our ancestors were using no artifical lighting, so daily rhythm was synchronized only by sunlight. Evo light is an attempt to mimic that natural conditions.

Operation
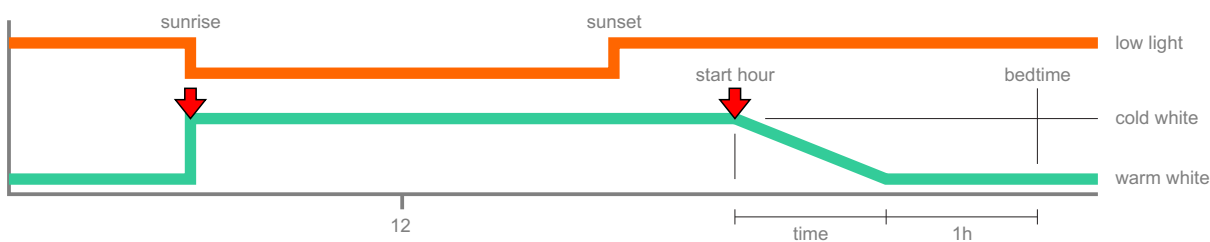
To configure evo light, first experimentally find the best light for early and late evening. Start hour and transition time should be configured so the warm light is reached at least one hour before bedtime.

When dimmer is switched back to RGB mode, evo light will automatically stop. Enabling again, it will catch on correctly, recalculating the new parameters.

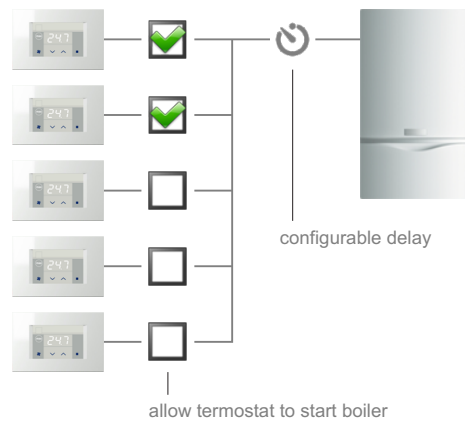Note: evo light setup is on RGB dimmer page. It can't be reached if RGB dimmer is not connected to system.

Heating and cooling

general features of heating/cooling system

Heating/cooling

Energy demand

configurable delay
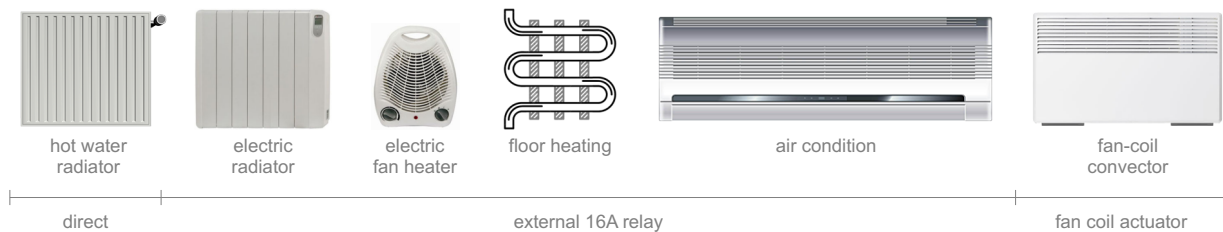
allow termostat to start boiler
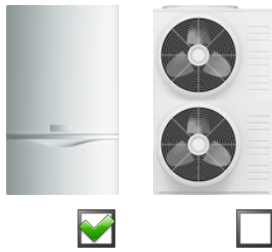
Up to five regulation zones are supported, each with their own thermostat. Generally, energy comes from boiler for heating and chiller for cooling, but other combinations are possible.
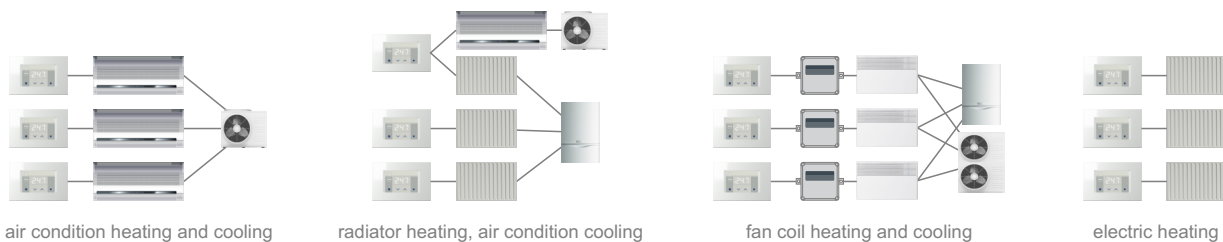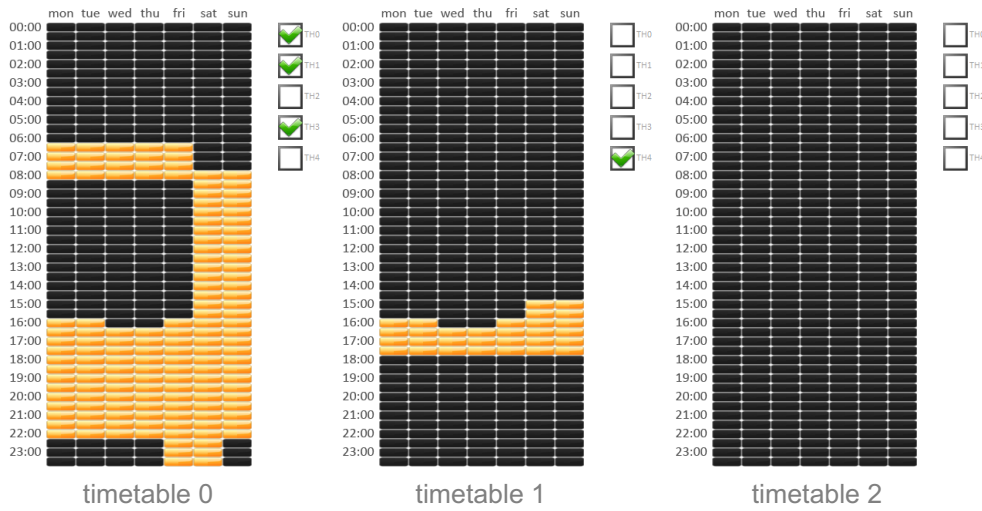
Thermostat

| TH-1M-IQ | TH-1T-IQ | TH-2-IQ | TH-3-IQ |

Actuator

| hot water radiator | electric radiator | electric fan heater | floor heating | air condition | fan-coil convector |

| direct | external 16A relay | | | | fan coil actuator |

System is versatile enough to handle most actuator options. Hot water valve is connected directly, others require either external power relay, or fan coil actuator. Different actuator types can be mixed.

Examples

air condition heating and cooling   radiator heating, air condition cooling   fan coil heating and cooling   electric heating

Timetable

weekly event scheduler

timetable 0
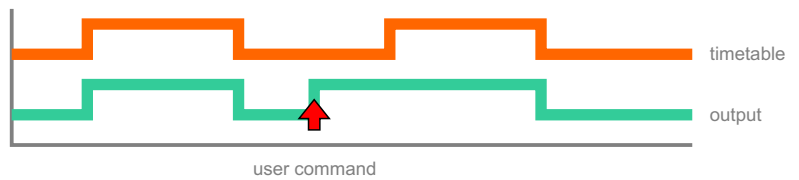
timetable 1

timetable 2

The last timetable can directly control an output or apply a selected scene.

Selected part is a period when heating system is active. Each rectangle represents a half hour. Tables are fully independent of each other. To set multiple fields, hold left button and drag mouse.
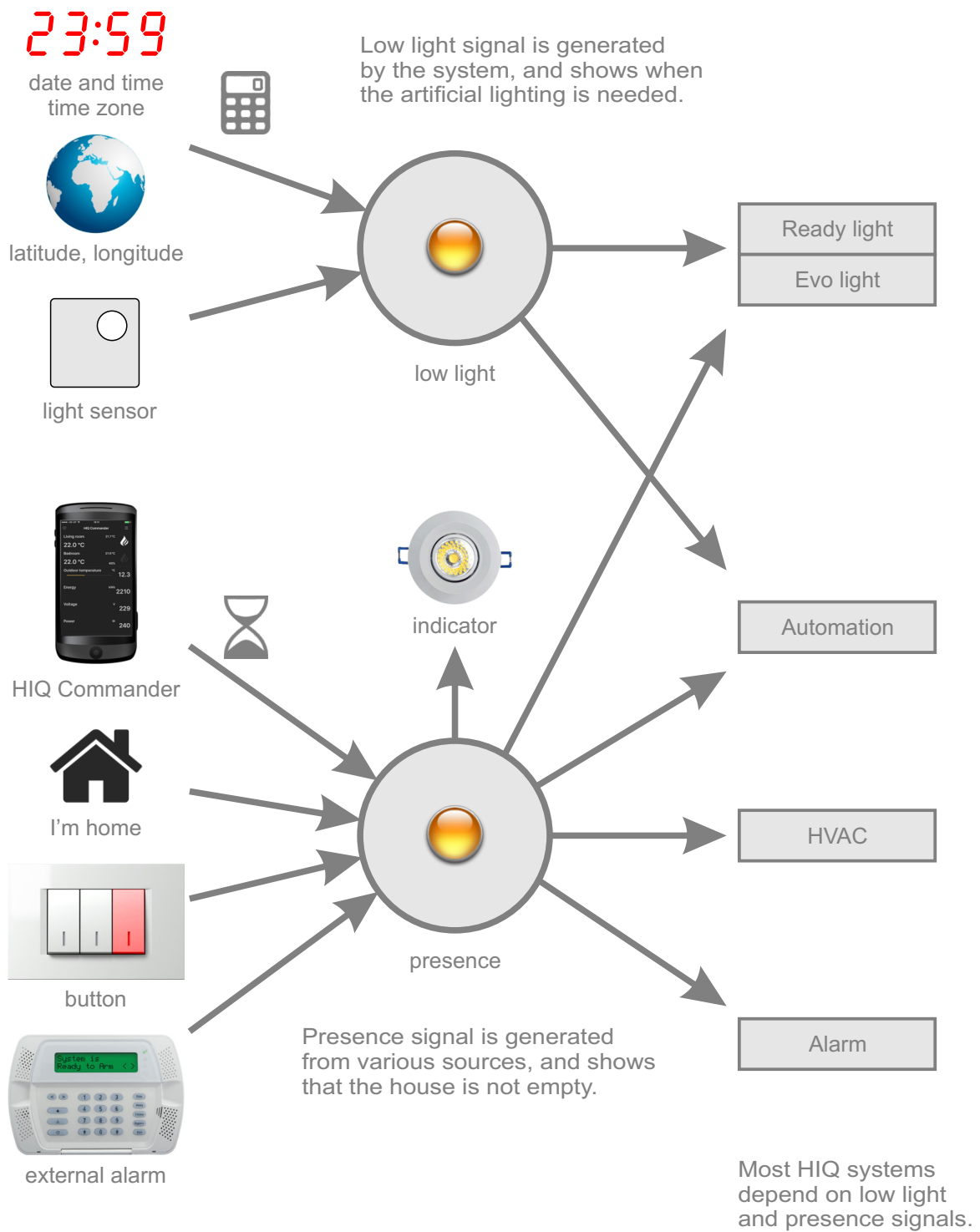

on

off
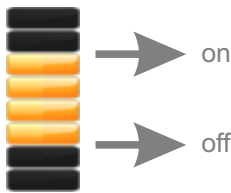
Each continuous block create on and off event.

timetable

output

user command

When timetable controls an output, manual override is possible at any time, timetable will catch on with the next transition.

timetable → scene → managed socket
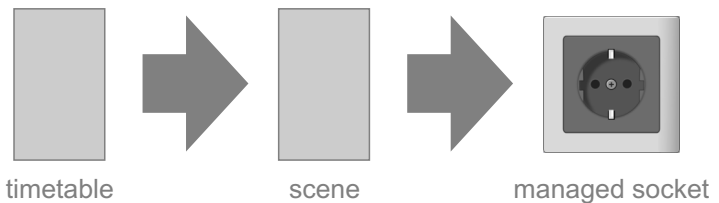
Timetable can be used to control mostly anything. Use a managed socket to create a time plan for your devices.

Key concepts
low light and presence indicators

23:59

date and time
time zone

latitude, longitude

light sensor

Low light signal is generated by the system, and shows when the artificial lighting is needed.

low light

Ready light

Evo light

HIQ Commander

I'm home

button

external alarm

indicator

presence

Presence signal is generated from various sources, and shows that the house is not empty.

Automation

HVAC

Alarm

Most HIQ systems depend on low light and presence signals.

ON
OFF
6   12   18   24
Low light goes up and down once a day.

ON
OFF
6   12   18   24
Presence goes up and down as you going out and comming home.

Automation

execute tasks automatically

Coming home
Let your house show how happy it is when you come back home. When phone connects to your wi-fi network, lights and heating will turn on automatically.

Default setpoint
When active, setpoint adjustment is valid for about half hour, then it returns to the predefined, optimal temperature.

Leaving home
When you leave the house, smartphone disconnects from home wi-fi network, a few minutes later system will turn lights and heating off.

Bio offset
Following your natural biological rhythm (chronotype), let the house be just a little warmer at the specified time of the day, morning, evening or both.

Comfort wake up
System will turn thermostat on a predefined number of minutes before smartphone rings, whenever you set the alarm.

Connect charger
Charge your smartphone every night? Use this action to automatically turn heating and lights off.

Sunny wake up
Wake up naturally, by gradually lifting blinds and let the sunlight wake you up, a predefined number of minutes before smartphone alarm.

Disconnect charger
Smartphone is charged until morning, right? When disconnecting the charger, automatically turn heating and lights back on.

Smart lights
In the evening hours, when sunlight goes down, automatically set evening scene, turn on the lights and lower blinds. Works only when tenants are at home.

Call notification
When you receive a call, selected light will turn on and off a couple of times, to bring the attention when phone is away or silenced.

Random lights
When nobody is at home, discourage snooping with a simple deception: turn lights on and off to leave impression that house is not empty.

Text notification
When you receive a text message, selected light will turn on and off a couple of times, to bring the attention when phone is away or silenced.

The most frequent question about home automation is - how to turn the damn thing off. However, regardless the inglorious reputation of smart machines, we strongly believe HIQ will gradually grow up into your daily routine. Events are generated automatically, you are in charge to assign actions according to your preferences.
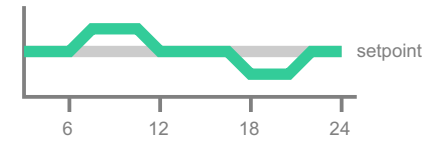
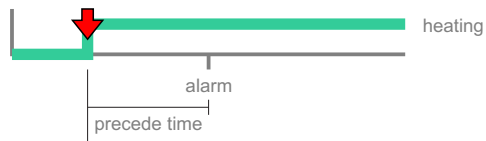# Operation

automation tasks explained

Comming and leaving

presence

heating

lights

comming home

leaving home

Use presence signal to trigger heating, and set a desired scene.

Bio offset

setpoint

6　12　18　24

A minute temperature correction depending on time of the day. Adjustable to warmer or colder.

Warm wake up

heating

alarm

precede time

warm wake up

Turn the heating on a few minutes before the alarm clock.

Sunny wake up

blinds

alarm

precede time
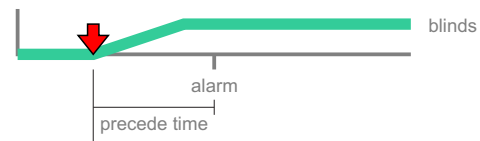
sunny wake up

Lift the blinds up a few minutes before the alarm clock.

Smart lights

sunrise

sunset

low light

brightness

12

transition time
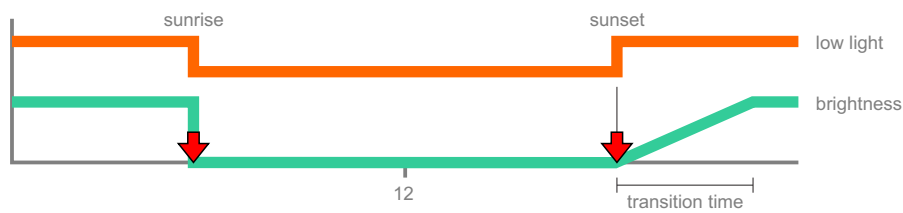
Automatic lights with an optional slope control, synchronized with the sunset.

Smart lights are aware of, but not triggered with presence signal. To activate lights on returning home, use comming home event.

Random lights

low light

presence

scene

random time　random time　random time　random time
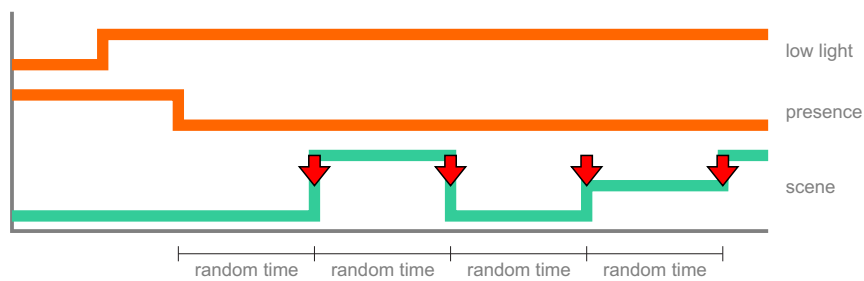
Turn the lights on and off to leave the impression that house is not empty, to discourage burglars.

Alarm

security at no additional cost
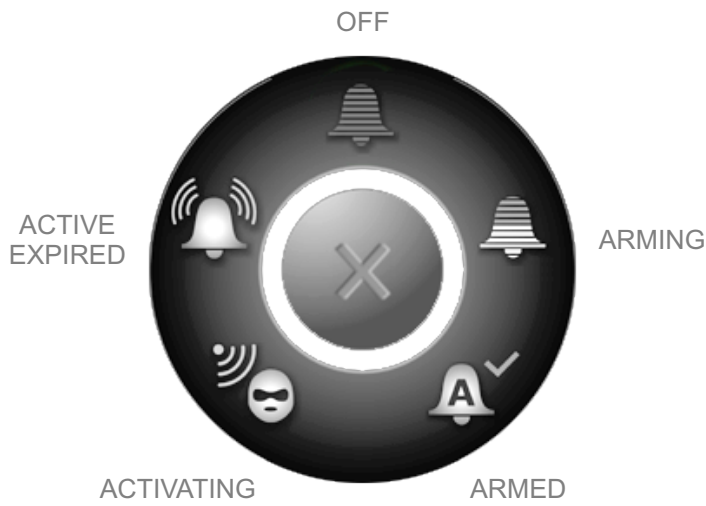
OFF	alarm inactive
ARMING	alarm turned on and will be armed when time expires (default 30s)
ARMED	alarm ready, no intrusion
ACTIVATING	sensor activated, alarm has to be turned off before delay time expires (default 30s)
ACTIVE	burglary, siren output active
EXPIRED	delay time expired, siren is turned off (default 120s)

Alarm on/off

- longpress on a selected wall switch
- smartphone using HIQ Commander
- smartphone by connecting to wi-fi (Android only)
- PC with HIQ Configurator
- PC with HIQ Configurator and 4-digit code
- automatically with presence signal

On/off indicator

- small light connected to an output
- blinking of a selected light
- smartphone with HIQ Commander
- PC with HIQ Configurator

Recommended zone covering

zone 0 - house exterior
zone 1 - ground floor, living area
zone 2 - first floor, sleeping area

Zone settings

residents at home: 0 (minimum security)
residents sleeping: 0 + 1 (partial security)
residents away: 0 + 1 + 2 (full security)

zone 0

zone 0+1

zone 0+1+2

Energy

electricity measurement

Energy monitoring is the first step to efficient energy usage. Once knowing how much energy something is using, one can make a rational strategy for saving.
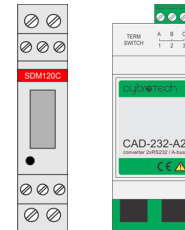
Energy consumption in last 30 days [kWh]
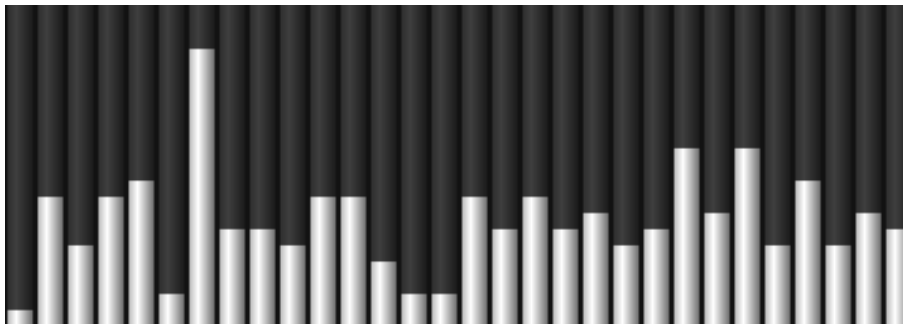
Bargraph for last 30 days is a quick way to check for an excess consumption.

Energy by output

Power count - a number how many times the output is turned on.

Working hours - total number of hours the output spent in on state.

Nominal power - output power configured by user. It can be measured by resetable power meter, or read from the label.

Current power - output power at the current moment.

Energy today - total energy used from last midnight, expressed in Watt-hours.

Energy total - total energy consumed by the specific output.

How to measure the amount of electricity something is using

1. Turn the output off.
2. Reset relative power.
3. Turn the output on.

A few seconds later, measured relative power is displayed. If the reading is not stable, temporary turn off any load which may consume variable amount of power.

Measured rating may be used to set the nominal power on 'By output' page.

Customization

get the maximum out of your system
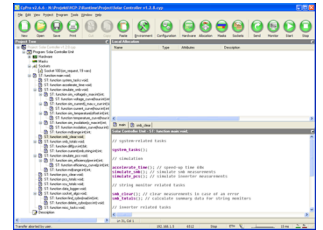
integrated development environment

The main goal of customization is to upgrade functionality up to some specific requirements. HIQ system is flexible and open for modifications of any kind. This page will give a short overview of kind of modifications possible.

Customization is for the one who wants to get the maximum out of the system. It requires a basic programming skills. Programming language is «structured text», a kind of very simplified Pascal. Development environment (editor, compiler, on-line monitor) is called CyPro, and it is free to download from www.cybrotech.co.uk.

standard IQ system

custom program   custom devices
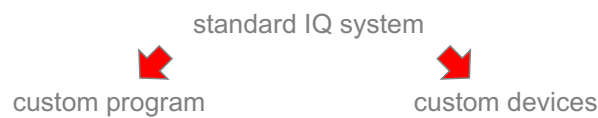
Modify HIQ program
- get program source directly from controller
- put your code into custom_algo module
- send modified program back to controller

Non-standard HIQ configuration
- custom selection of modules, e.g. 10x LC-10-IQ
- hardware setup, manually add new modules
- adjust program and mini scada up to your needs

Combine HIQ and non-HIQ modules
- all HIQ modules are fully IEX compatible
- delete unused HIQ modules for hardware setup
- add your own selection of IEX modules
- modify program according to your needs

Modify mini scada up to your needs
- no special environment is needed
- configuration consist of one text file and images
- use any image editor to create custom graphics
- create a custom application for Android or iPhone

HIQ Commander for non-HIQ applications
- allocate variables for autodetection manually
- use allocated variables in your cybro application
- for more details, check Cypro example

Connect HIQ systems together
- create system as big as you like
- use sockets as a link between controllers
- implement global commands like «turn all lights off»

Example

Task: count how many times a light is switched on

1. CyPro

- allocate variable lc00_qx00_count, make it retentive
- add the following lines of code into program
- send program to controller

2. Mini scada

- open CyBroMiniScada.xml in text editor (Notepad)
- add object to xml configuration, inside the first page
- use scada (ctrl-E) to move object to the right place

```
if fp(lc00_qx00) then
  lc00_qx00_count:=lc00_qx00_count+1;
end_if;
```
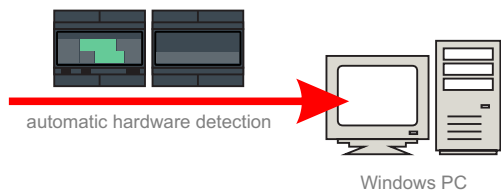
```
<object>
 <type>led</type>
 <var>c1000.lc00_qx00_counter</var>
 <digits>4</digits>
 <decimals>0</decimals>
 <zeroblanking>1</zeroblanking>
 <sign>0</sign>
 <ledcolor>$FF0000</ledcolor>
 <height>42</height>
 <x>100</x>
 <y>100</y>
</object>
```

HIQ Configurator

PC application for system setup and configuration

www.robotina.com

Install

automatic hardware detection

Windows PC

Edit name:
ctrl-E - edit mode
right click - rename
ctrl-E - return to normal mode

HIQ Configurator

- control center for everything
- universal configuration tool
- scren resolution 1366x768

HIQ Timeplot

- timeplot for temperatures
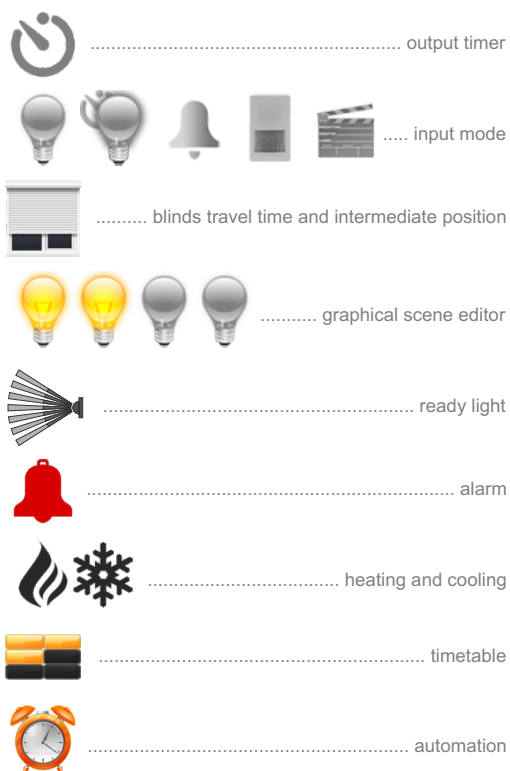- timeplot for consumed energy
- screen resolution 1920x1080

HIQ View

- template for custom app
- replace floorplan image
- add and rearrange icons

HIQ Simulator

- test all without the hardware

Configuration

.... output timer

..... input mode

.... blinds travel time and intermediate position

.... graphical scene editor

.... ready light

.... alarm

.... heating and cooling

.... timetable

.... automation

System limits

4x		LC-10-IQ light controller	40 on/off outputs
4x or		LD-V4-IQ LED dimmer	16 dimmer channels
4x or		LD-P4-IQ universal dimmer	
2x		LD-D8-IQ DALI dimmer	
2x		BC-5-IQ blinds controller	10 blinds
4x		SC-4-IQ scene controller	16 scenes
5x		TH-1-IQ thermostat	5 regulation zones
5x		FC-1-IQ fan-coil controller	
1x		HC-IQ main controller	one central controller

Autodetect
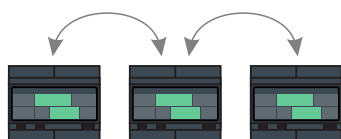
To swich from controller to controller, use Autodetect function.

Autoaddress
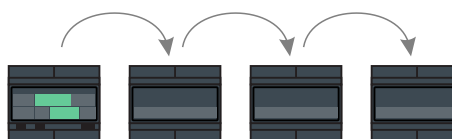
To get all modules in order, use Autoaddress function.

HIQ Commander

application for your smartphone
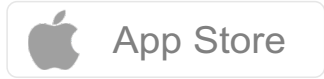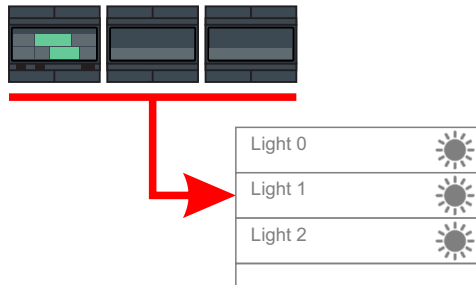
Multiple HC controllers are listed one after another. Number of controllers is limited only by practical matters.

Autodetect

Light 0	☀
Light 1	☀
Light 2	☀

Rename

Kitchen	☀

Rearrange

Kitchen	☀
Hallway	☀
Living room	☀

Remove

Light 19	☀

Undelete

Change icon

Living room	☀
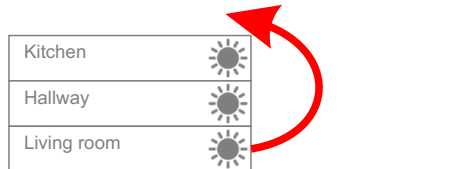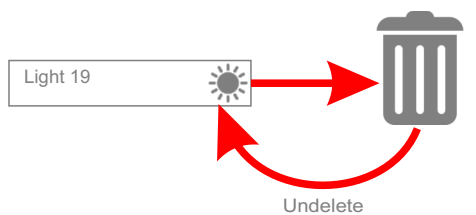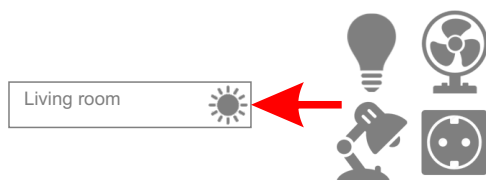
Features

Features	Android	Apple
direct control for all objects	✚	✚
comming home leaving home	✚	✖
warm wake up sunny wake up	✚	✖
smart lights random lights	✚	✚
default setpoint bio offset	✚	✚
connect charger disconnect charger	✚	✖
call notification text notification	✚	✖
export configuration to another phone	✖	✚

Limits

HIQ Commander will autodetect more devices then nominal system limits:

10x LC
10x LD
10x BC
10x TH

Additional devices are used for project-based features.

HIQ Universe

cloud service for internet access

HIQ Universe

Your home, smarter
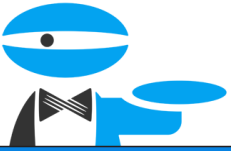
| Email |
| Password |

☑ Keep me logged in

Submit

Forgot password

HIQ Universe

Create new account

| Email |
| Password |
| Repeat password |

Contact
Privacy
Terms
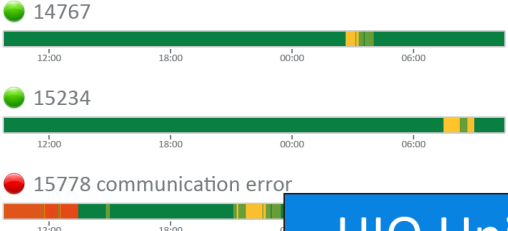
HIQ Universe

damir.skrjanec@cybrotech.hr

Status | Controllers | Phones | Settings | Logout

Controller status

🟢 14767

12:00 18:00 00:00 06:00

🟢 15234

12:00 18:00 00:00 06:00

🔴 15778 communication error

12:00 18:00

HIQ Universe

damir.skrjanec@cybrotech.hr

Status | Controllers | Phones | Settings | Logout

Add new controller

Serial	Description	Created	Last push	Status	Properties	Ping	Enable	Delete
14767	basement	2015-10-20 08:00	2015-11-20 11:20	🟢	🗋	✔	✔	−
15234	1st floor	2015-10-20 08:00	2015-11-20 11:20	🟢	🗋	✔	✔	−
15778	2nd floor	2015-10-20 08:00	2015-11-20 11:20	🔴	🗋	✔	✔	−

Contact
Privacy
Terms

PS-IQ power supply

power source for the whole system

power supply
for sensors

power supply
communication

230VAC   24VDC

Backup power

normally closed

secondary
power supply

IX

230VAC

primary
power supply

relay

5A

+24V

GND
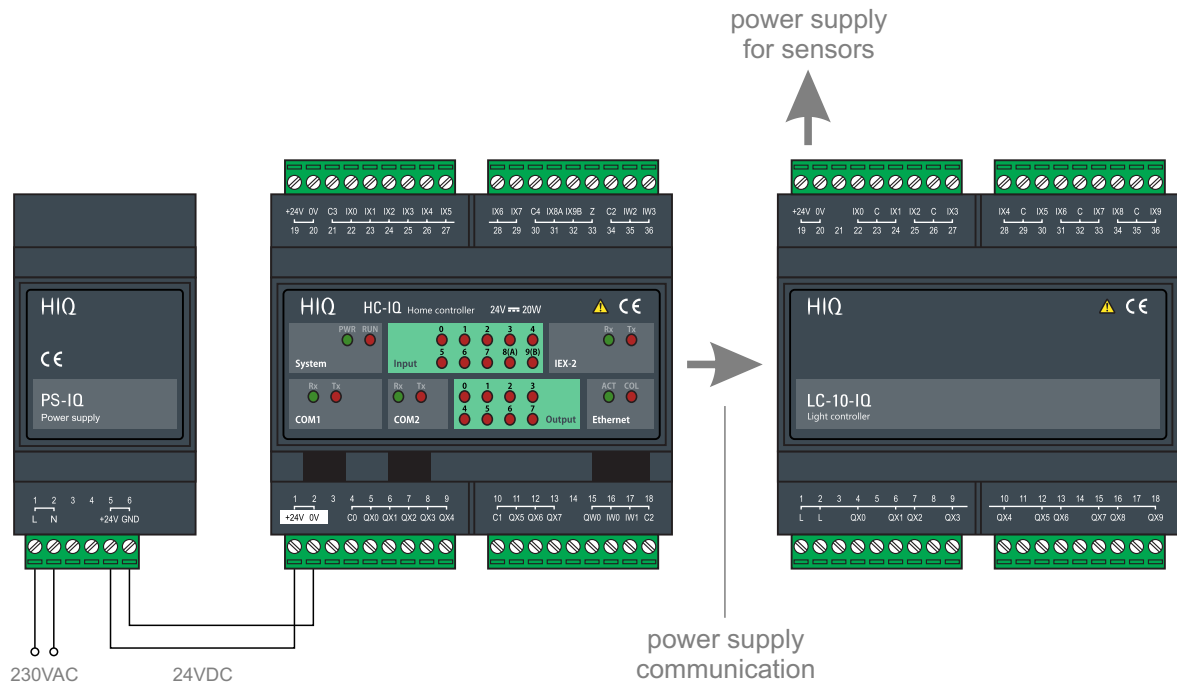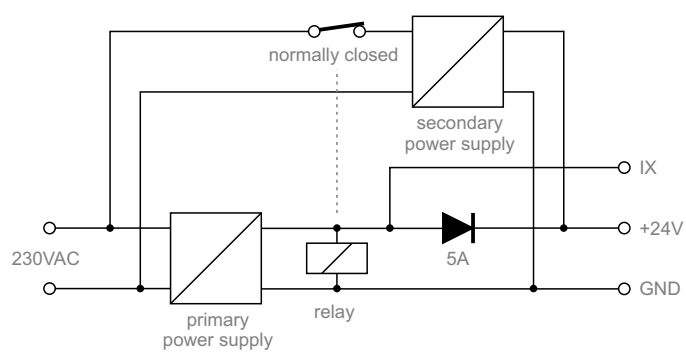
Power supply is usually the most vulnerable part of the system. To prolong
service life, secondary power supply may be added. When primary source
is broken, the secondary takes on, so the operation is not interrupted. As
secondary supply is connected to power only when first breaks, the same
service life can be expected as the primary one. A spare input can be used
as failure signal.

HC-IQ home controller

home automation main controller

Mounting: 35mm DIN rail 6M

106
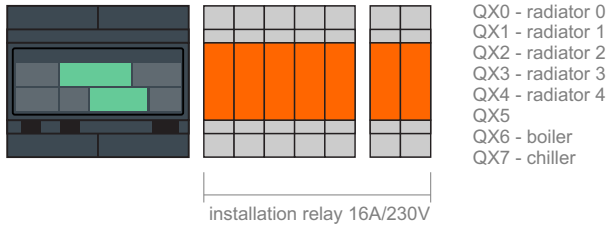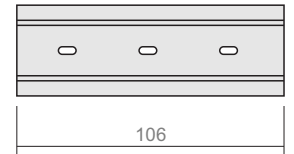
QX0 - radiator 0
QX1 - radiator 1
QX2 - radiator 2
QX3 - radiator 3
QX4 - radiator 4
QX5
QX6 - boiler
QX7 - chiller

installation relay 16A/230V

+24V 0V C3 IX0 IX1 IX2 IX3 IX4 IX5   IX6 IX7 C4 IX8 IX9 Z C2 IW2 IW3

+24V 0V   C0 QX0 QX1 QX2 QX3 QX4   C1 QX5 QX6 QX7   QW0 IW0 IW1 C2

radiator 0 radiator 1 radiator 2 radiator 3 radiator 4   boiler   chiller

power supply

230VAC

230VAC relay

hot-water radiator

230VAC relay

electric radiator

230VAC relay

air condition
control through power suppy

relay

air condition
control through window switch input

relay   boiler

old thermostat used as a backup

Features

smartphone connection
alarm
HVAC
timetable
automation
scene link
internet connection
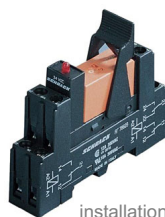
installation relay

Internal relay is used for valves, other loads
are recommended to use an additional 16A
installation relay.

IEX-2 © HIQ ▣ CE

Relay outputs: 3A/250V resistive load only
Communication: Ethernet 100M
Power supply: 24V/50mA
Ingress protection: IP20
Operating temperature: 0..45°C
Storage temperature: -20..75°C
Relative humidity: 0..95% n/c
Mounting: DIN rail
Dimensions: 106x108x58mm
Weight: 360g
Standards: EN 61000-6-2, EN 61000-6-3,
                        EN 61131-1, EN 61131-2,
                        EN 61000-3-2, EN 61000-3-3

LC-10-IQ light controller

10 relay outputs

Mounting: 35mm DIN rail 6M

106
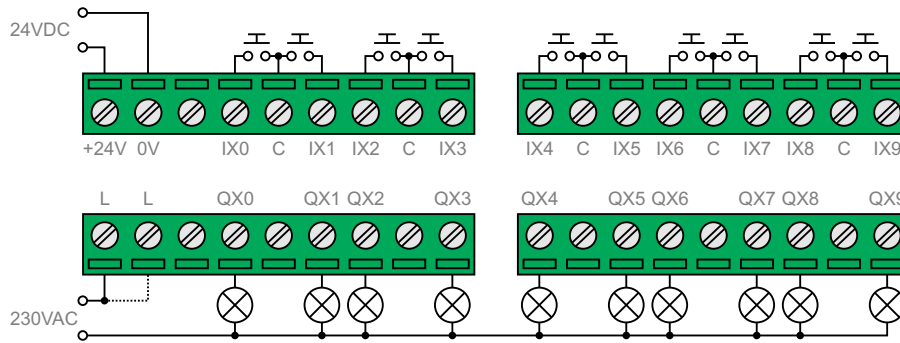
When total output power is 2kW or more, connect mains power supply to both L terminals.

Output mode

on

off

on/off mode
input turns the light on and off

on

off
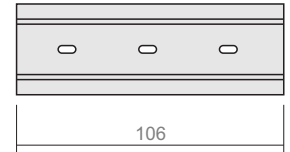
timer mode
input turns light on, and it
automatically goes off after
the predefined time
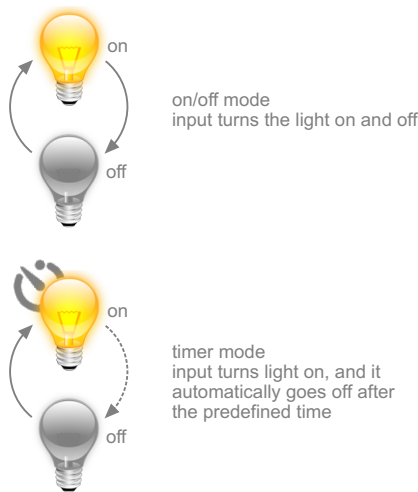
Features

8A
output relays are rated 8A,
for a more load use external
installation relay or contactor

power outage:
<10min - lights come back
>10min - lights will stay off
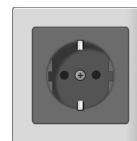
managed socket
for devices such as floor lamp,
table fan, dehumidifier, electric
mosquito repellent, hi-fi system...
a distinct color is recommended

Input mode

toggle (press on, press off)

timer extend edge (press to reload timer)

timer extend level (reloaded until released)

direct (press on, release off)

inverse (closed off, open on)

Input mode defines how input affect the output. Basic
functions are handled internally by light controller, night
mode and ready light are handled with home controller.

IEX-2 © HIQ ▣ CE

Output power per relay:
- incadescent / halogen 230V   800W
- halogen 12V with transformer   400W
- fluorescent with electronic ballast   400W
- parallel compensated fluo lamps   250W/30uF
- LED with transformer or compact   400W
Total output power (all relays):   4000W
Maximum input cable length: 50m
Power supply: 24V/120mA
Ingress protection: IP20
Operating temperature: 0..45°C
Storage temperature: -20..75°C
Relative humidity: 0..95% n/c
Dimensions: 106x108x58mm
Weight: 250g
Standards: EN 61000-6-2
   EN 61000-6-3
                                       EN 60730-1

LD-V4-IQ LED dimmer

4-channel constant voltage dimmer for LED stripes
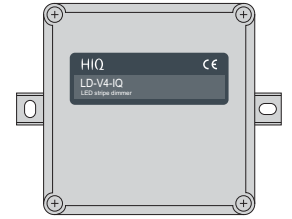
Mounting in-field, junction box or drywall
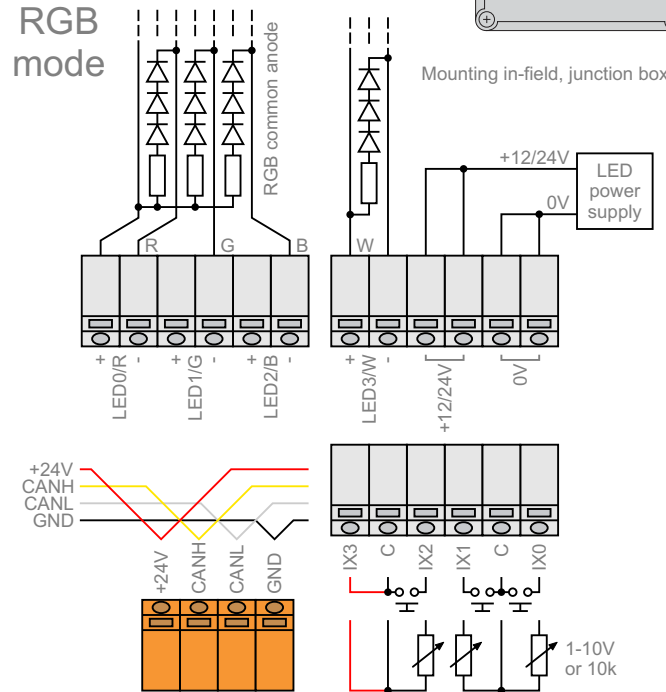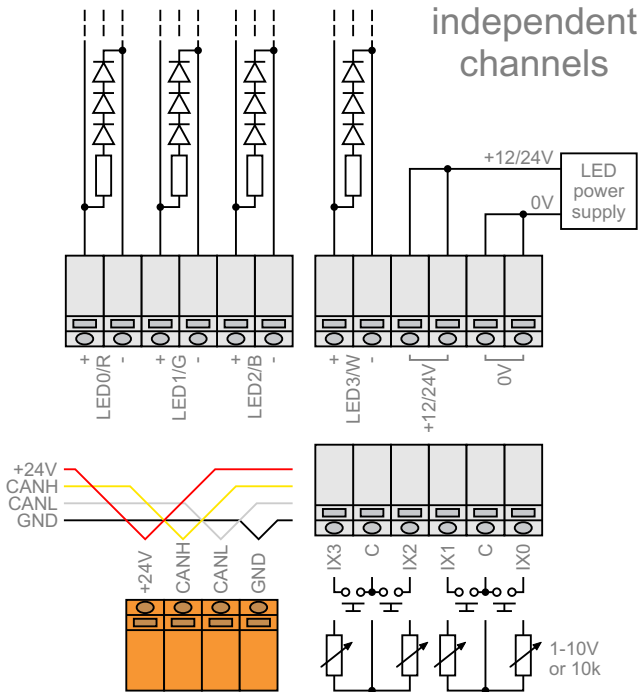
## independent channels

RGB mode

Features

RGB mode
hue, saturation, brightness
instead of individual RGB

white temperature mode
adjust hue in range from
warm white to cold white

button or potentiometer input:
- autodetect input mode
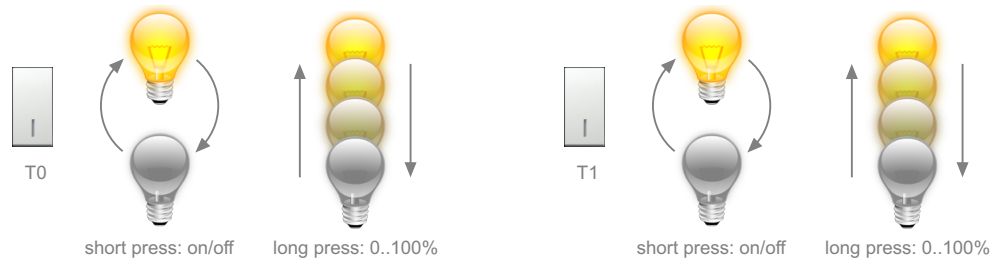- mixed controlls possible
- potentiometer auto-range

exponential output curve:
- more natural feel
- lowest level is 0.025%
- smooth output transition
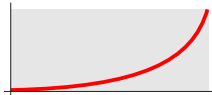
500Hz

high frequency PWM:
- no flickering
- avoid headache
- reduce eye-strain

power outage:
<10min - lights come back
>10min - lights will stay off

output protection:
- overcurrent
- overvoltage
- undervoltage
- watch-dog

maximum current	
output	supply
1x10A	1x10A
2x10A	2x10A
3x6.7A	2x10A
4x5A	2x10A

Operation

short press: on/off   long press: 0..100%
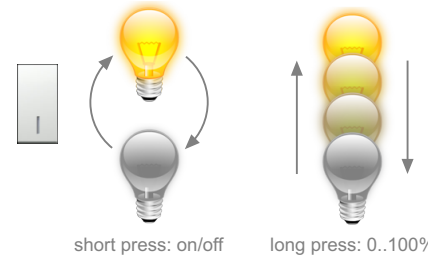
IEX-2 © HIQ □ CE

|	
LED power supply:	12/24V (10..28V)
Total output power:	240W at 12V
	480W at 24V
Max current per terminal:	10A
PWM frequency:	500Hz
Output resolution:	12-bit
Power supply:	24V/25mA
Galvanic separation:	supply/outputs
Operating temperature:	0..45°C
Storage temperature:	-20..75°C
Relative humidity:	0..95% n/c
Dimensions:	108x86x46mm
Weight:	160g
Standards:	EN 61000-6-1
	EN 61000-6-3
	EN 60669

LD-P4-IQ universal dimmer

4-channel dimmer with a separate power driver
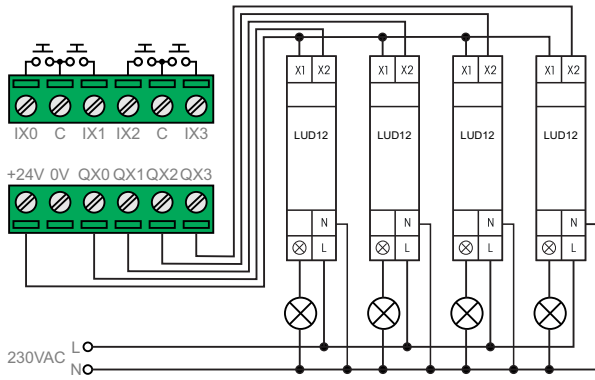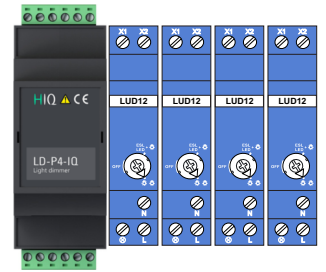
Standard connection with four independent power drivers
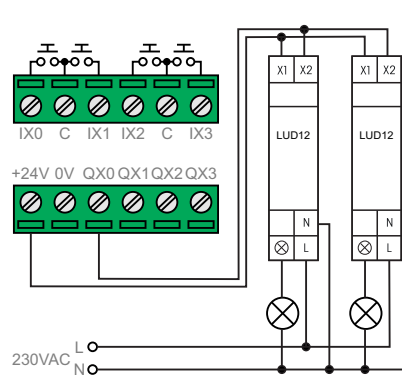
Power increased with a parallel connection of drivers

Mounting: 35mm DIN rail 2M + 4x1M
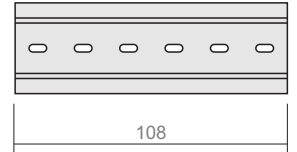
108

Features

RGB mode
hue, saturation, brightness
instead of individual RGB

white temperature mode
adjust hue in range from
warm white to cold white

button or potentiometer input:
- autodetect input mode
- mixed controlls possible
- potentiometer auto-range
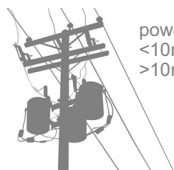
power outage:
<10min - lights come back
>10min - lights will stay off

- 400W power MOSFET
- automatic load detection
- low noise zero switching
- electronic overload protection
- overtemperature shutdown

Operation
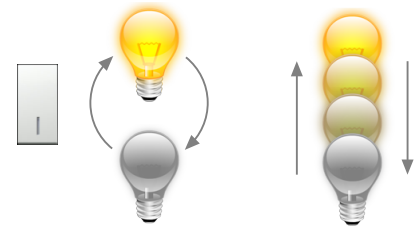
short press: on/off   long press: 0..100%

Driver rotary switch

ESL +
LED

OFF
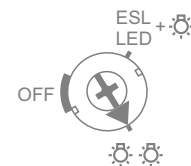
switch must
be adjusted
to indicated
position

Output options

incandescent/halogen

compact fluorescent

compact LED E27/E14
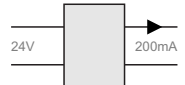
IEX-2 © HIQ ▣ CE

Lamp power supply: 230V
Output power per driver: 100W
Drivers per output channel: unlimited
Driver control signal: PWM 100Hz 24V
Power supply: 24V/25mA
Galvanic separation: supply/outputs
Operating temperature: 0..45°C
Storage temperature: -20..75°C
Relative humidity: 0..95% n/c
Dimensions: 36x108x58mm
Weight: 80g
Standards: EN 61000-6-1
   EN 61000-6-3
                            EN 60669

LD-D8-IQ DALI dimmer

8-channel dimmer for DALI ballasts

Features

8x   control 8 independent groups

64x   drive up to 64 ballasts

24V → 200mA   internal DALI current source, no additional power needed

DALI ballast
DALI ballast

DALI+ DALI-

IW0   C0   IW1

T0   T1

Mounting:
DIN rail 2M

36

Operation

T0   short press: on/off   long press: 0..100%

T1   short press: on/off   long press: 0..100%
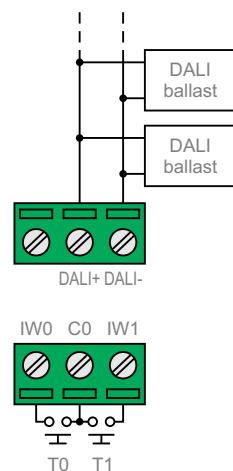
Groups 3 to 8 doesn't have physical input, so they can't be controlled directly, only as a scene or with a phone.

Ballast configuration

group 1
group 2
group 3
group 4

group 5
group 6
group 7
group 8

Organize your ballasts into groups with address 1 to 8. DALI dimmer master can't control individual ballasts.

Output options

incandescent lights

fluorescent

compact fluorescent

LED lights of any kind

IEX-2 © HIQ ▢ CE

Digital inputs: internal pull-up 12V, 2mA
DALI output: 64 ballasts/200mA max.
Power supply: 24V/120mA
Galvanic separation: none (DALI must be SELV)
Ingress protection: IP20
Operating temperature: 0..45°C
Storage temperature: -20..75°C
Relative humidity: 0..95% n/c
Dimensions: 36x108x58mm
Weight: 80g
Standards: EN 61000-6-2
    EN 61000-6-3

BC-5-IQ blinds controller

5-channel blinds position controller

Mounting: 35mm DIN rail 6M

106
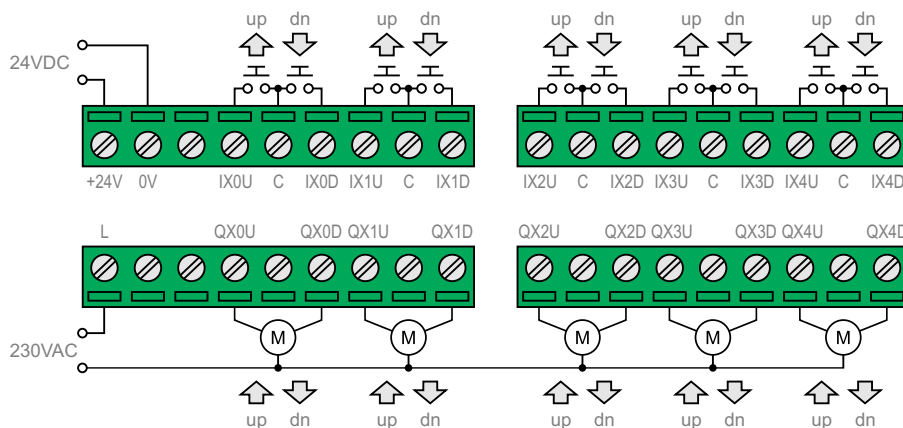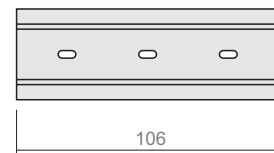
Features
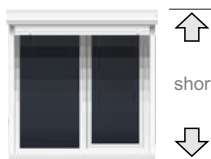
short press: move up/down

short press while moving: stop at the position
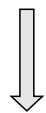
long press: stop after released

75%

short press: move to intermediate position

automatic position related to scene

up and down buton

automatic correction at boundary position

Travel time adjustment:

1. Adjust top and bottom limit switch.
2. Use stopwatch to measure travel time in both directions.
3. Mark a position on the window (e.g. 75%), then move blinds a few times up and down, without reaching the top or bottom. If the desired position shifts up, increase down time (or decrease up time) and check again. Repeat procedure until the positioning is precise enough.

IEX-2 © HIQ ▣ CE

Output power per relay:	200W
Total output power (all relays):	2000W
Maximum input cable length:	50m
Power supply:	24V/60mA
Ingress protection:	IP20
Operating temperature:	0..45°C
Storage temperature:	-20..75°C
Relative humidity:	0..95% n/c
Dimensions:	106x108x58mm
Weight:	250g
Standards:	EN 61000-6-2
	EN 61000-6-3
	EN 60730-1

SC-4-IQ scene controller

4-button universal scene controller
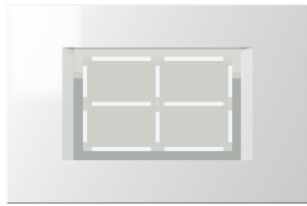
SC-4T-IQ
- 4 configurable touch buttons
- IR receiver + haptic feedback
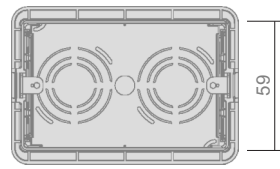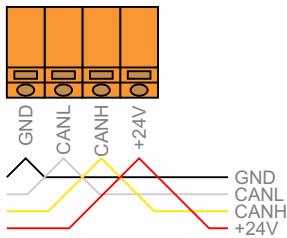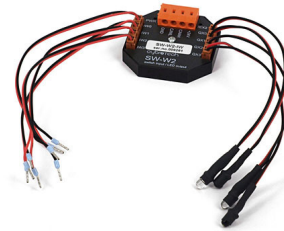
SC-4S-IQ
- 4 button inputs and 4 LED indicators
- connect to any classic button system
- extra-small size fits into any mounting

GND CANL CANH +24V

GND
CANL
CANH
+24V

59

96

mounting: rectangular box 3M

SC-4T-IQ

+24V
CANH
CANL
GND

GND / IX0
GND / IX1
GND / IX2
GND / IX3

GND CANL CANH +24V

QX0 / GND
QX1 / GND
QX2 / GND
QX3 / GND

SC-4S-IQ
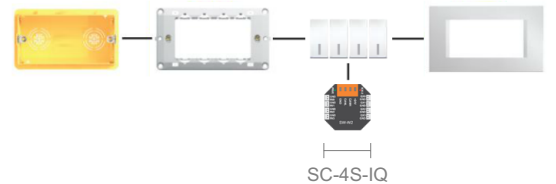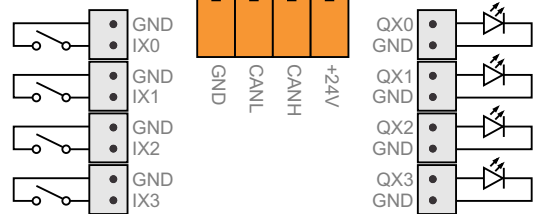
Panel layout (SC-4T-IQ)

1

1 | 2

1
2

1 | 2
3

1 | 2
3

1 | 3
2 | 4
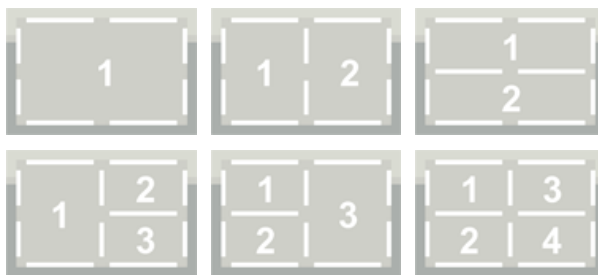
Button action
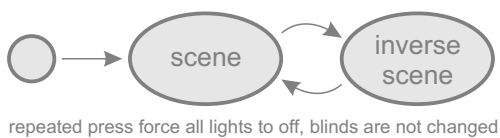
| on/off | 0..100% | blinds up/down | scene |

Remote controller

0 — set scene 0 (code 1152)

1 — set scene 1 (code 1153)

2 — set scene 2 (code 1154)
. . .

9 — set scene 9 (code 1161)

set scene 10 (code 1162)
. . .

set scene 31 (code 1183)

Inverse scene

scene ⇄ inverse scene

repeated press force all lights to off, blinds are not changed

Memorize scene

beep → memorize scene

long press, confirmed by beep, store current state as a new scene

IEX-2 © HIQ □ CE

IR remote receiver: RC5 36kHz
Power supply: 24V/25mA (SC-4T)
                         24V/35mA (SC-4S)
Ingress protection: IP20
Operating temperature: 0..45°C
Storage temperature: -20..75°C
Relative humidity: 0..95% n/c
Mounting: rectangular box 3M (SC-4T)
                         any installation box (SC-4S)
Dimensions: 122x80x23mm (SC-4T)
                         49x49x7mm (SC-4S)
Weight: 80g (SC-4T)
                         20g (SC-4S)
Standards: EN 61000-6-2
                         EN 61000-6-3

TH-1-IQ thermostat

simple electronic thermostat
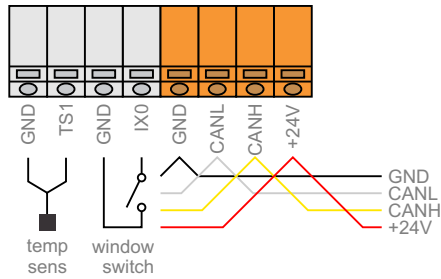
TH-1M-IQ
mechanic buttons

TH-1T-IQ
touch buttons

Mounting: rectangular box 3M
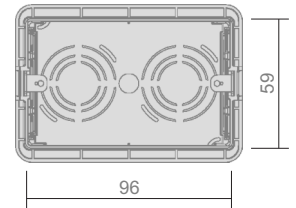
Features

■	on/off
∧ ∨	setpoint
✿	fan control
🌡◄	fan max maximum output for a limited time
15.0	secondary setpoint when thermostat is off
22.0	manual measurement correction
	window switch shut down heating when window is open
	night mode attenuate display during the night

Temperature sensor

internal   external   remote

Remote measurement should be handled by plc program

Fan options

FA1	fan speed 1
FA2	fan speed 2
FA3	fan speed 3
F2A	fan speed automatic 1 or 2
FAA	fan speed automatic 1, 2 or 3
600	maximum output for a limited time

Display when on

22.1	measured temperature
22.0	setpoint temperature
FA3	fan speed

Display when off

	off
	dashes
22.8	temperature

IEX-2 © HIQ ▣ CE

Window switch input:	internal pull-up 12V, 2mA
Temperature measurement:	internal and external
Measurement range:	0..45°C
Default offset:	-2.5°C
Power supply:	24V/15mA
Ingress protection:	IP20
Operating temperature:	0..45°C
Storage temperature:	-20..75°C
Relative humidity:	0..95% n/c
Mounting:	rectangular flush box
Dimensions:	122x80x23mm
Weight:	80g
Standards:	EN 61000-6-2
	EN 61000-6-3

TH-2-IQ thermostat

blind electronic thermostat

Mounting: on wall
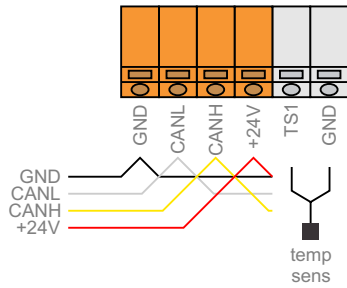
GND
CANL
CANH
+24V

GND
CANL
CANH
+24V
TS1
GND

temp
sens

Signalisation

🟡 device not addressed

⚪ device selected

🔴 setpoint change up

🔵 setpoint change down
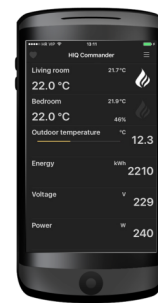
Features

on/off

setpoint

fan control

fan max
maximum output for a limited time

22.0 precise temperature measurement

22.0 manual measurement correction

15.0 secondary setpoint when thermostat is off

humidity meter

all functions handled
by a mobile phone

Temperature sensor

internal   external   remote

Remote measurement should be handled by plc program

IEX-2 © HIQ ▣ C E

Temperature measurement:	internal and external
Temperature range:	0..45°C
Default offset:	-1.4°C
Humidity range:	0..100%rh
Power supply:	24V/10mA
Ingress protection:	IP20
Operating temperature:	0..45°C
Storage temperature:	-20..75°C
Relative humidity:	0..95% n/c
Mounting:	wall surface
Dimensions:	71x71x27mm
Weight:	50g
Standards:	EN 61000-6-2
	EN 61000-6-3

TH-3-IQ thermostat

thermostat with display and configurable buttons
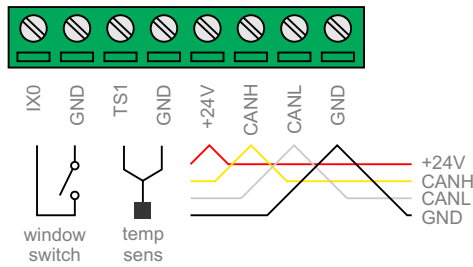
Mounting: regular 60mm junction box

Connector labels: IX0, GND, TS1, GND, +24V, CANH, CANL, GND

window switch — temp sens

+24V
CANH
CANL
GND

Features

on/off	
setpoint	
fan control	
fan max — maximum output for a limited time	
secondary setpoint when thermostat is off	
manual measurement correction	
window switch — shut down heating when window is open	
night mode — attenuate display during the night	
humidity meter	

Configuration

parameter ← → ↑ value ← →

press and hold

- on/off
- setpoint
- fan speed
- fan max
- scene

Features

- massive aluminium body
- glass power plate
- white blue alphanumeric display
- mechanical buttons with a click
- button function fully configurable
- IR reciver

Temperature sensor

internal   external   remote
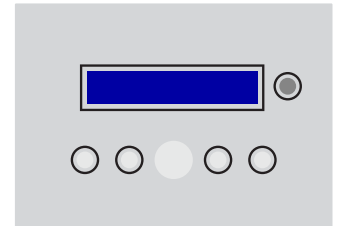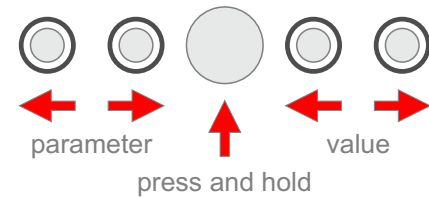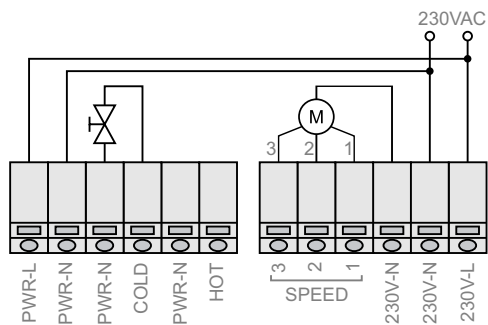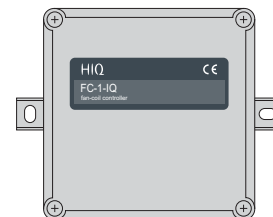
Remote measurement should be handled by plc program

IEX-2 © HIQ ▣ CE

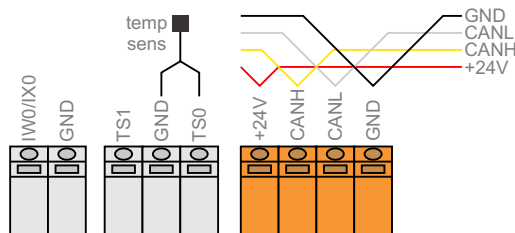Temperature measurement: internal and external
Measurement range: 0..45°C
Default offset: -2.0°C
Power supply: 24V/25mA
Ingress protection: IP20
Operating temperature: 0..45°C
Storage temperature: -20..75°C
Relative humidity: 0..95% n/c
Mounting: wall surface
Dimensions: 136x96x36mm
Weight: 450g
Standards: EN 61000-6-2
                            EN 61000-6-3

FC-1-IQ fan-coil actuator

3-speed fan coil actuator

230VAC

M

3 2 1

PWR-L
PWR-N
PWR-N
COLD
PWR-N
HOT

3
2
1
SPEED

230V-N
230V-N
230V-L

temp
sens

IW0/IX0
GND

TS1
GND
TS0

+24V
CANH
CANL
GND

GND
CANL
CANH
+24V

Mounting: inside fan-coil
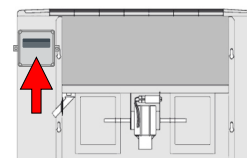
fan coil
- 2-pipe system
- electromechanical valve
- 3-speed fan
- both heating and cooling

Features

simple
no adjustments, no jumpers or DIP switches,
configuration is completely performed on PC

flexible
can be used with a wide range of
home, office and industrial convectors

fallback mode
device continue operation even in
case that communication is broken

IEX-2 © HIQ

Relay outputs:	3A/250V
Temperature measurement:	external sensor ES or ES-A
Power supply:	24V/45mA
Operating temperature:	0..45°C
Storage temperature:	-20..75°C
Relative humidity:	0..95% n/c
Mounting:	inside the fan coil unit
Dimensions:	108x86x46mm
Weight:	150g
Standards:	EN 61000-6-2
	EN 61000-6-3
	EN 60730-1

SDM-120C power meter

voltage, power, relative power and energy meter
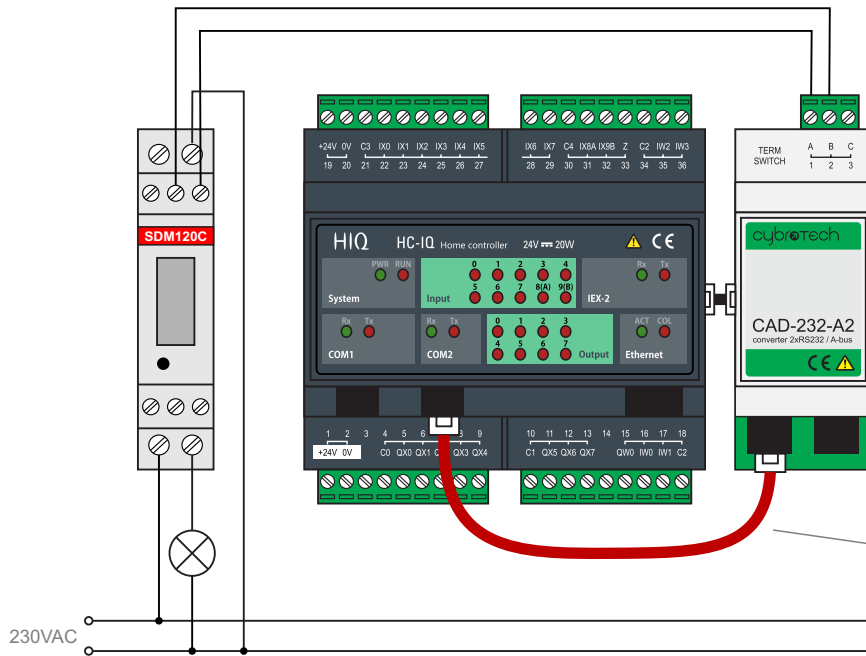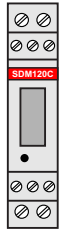
Mounting: 35mm DIN rail 1M + 2M

18	36
SDM120C	CAD-232-A2

SDM-120C
power meter

CAD-232-A2
RS232/485 converter
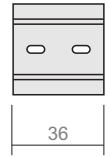
Note: CAD-232-P0 communication cable is delivered together with converter.

IEX-2 © HIQ ▣ CE

Nominal voltage:	230VAC, 110VAC
Voltage range:	77..300VAC
Maximum current:	45A
Operational frequency:	50..60Hz
Power consumption:	2W
Communication setup:	2400 8e1
Modbus address:	1
Communication cable:	CAD-232-P0
Ingress protection:	IP51
Operating temperature:	-25..55°C
Storage temperature:	-30..70°C
Relative humidity:	85%
Mounting:	DIN rail
Dimensions:	119x17.5x62mm
Weight:	85g
Standards:	IEC 62053-21

IR-580-IQ and other sensors

motion sensor, door sensor, light sensor

Motion sensor

+				+24V
AL				IX
-				GND

IR-580-IQ   **LC-10-IQ**

Door sensor

		IX
		GND

REED-SW   **LC-10-IQ**

Light sensor

24V				+24V
OUT				IW0
GND				C2

RHKF-U   **HC-IQ**
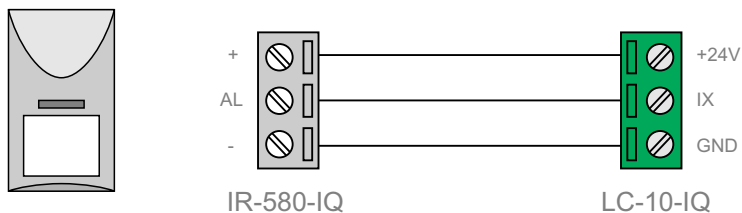
Motion sensor is mounted above or lateral to room entrance. People entering the room must intersect sensor beams. At the moment when closing the door, person should be in the area of maximum sensitivity.
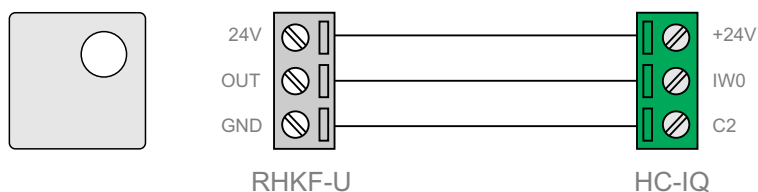
Door sensor is mounted on the knob side, usually about 20cm from the top. Magnet goes into the door, contact goes into the doorpost.

Sensors are connected to spare LC-10-IQ inputs. Input type must be configured as sensor input.

Light sensor is mounted on top of an outside looking window. Best option is west or south side.

For a room with more then one entrance, door sensors are connected in series (sensor is closed when door is closed), and motion sensors are connected in parallel.
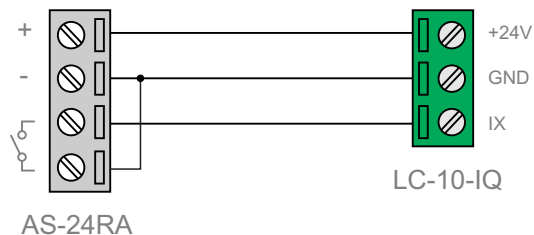
Mounting

light sensor

door sensor

motion sensor
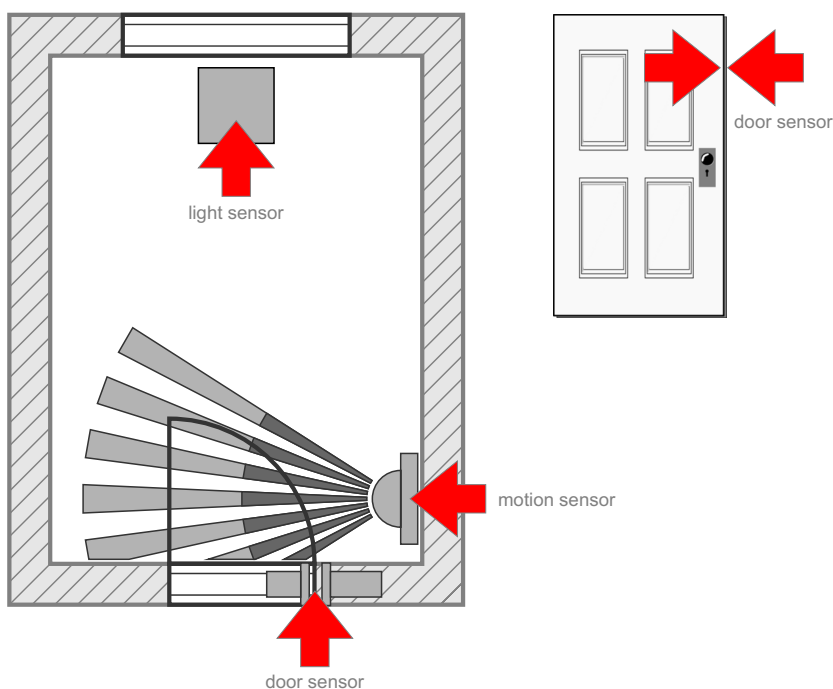
door sensor

IEX-2 © HIQ ▣ CE

Door sensor	-
Switch type:	reed switch, normally open
Dimensions:	25x7mm
Weight:	12g

Motion sensor	
Output type:	NPN o.c. 75mA
Power supply:	24V 10mA
Operating temperature:	20..50°C
Storage temperature:	-20..75°C
Dimensions:	100x60x42mm
Weight:	85g

Light sensor	
Output type:	0..10V
Power supply:	24V 80mA
Operating temperature:	0..50°C
Storage temperature:	-20..75°C
Dimensions:	85x85x27mm
Weight:	65g

AS-24RA touchless switch

no-contact wall mounting switch

AS-24RA

LC-10-IQ

+24V
GND
IX

Operation

Mounting: regular 68mm junction box
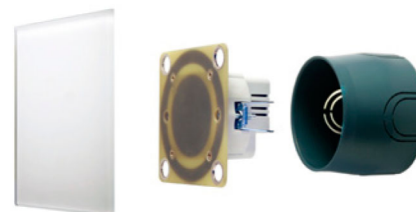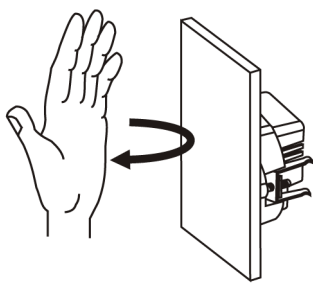
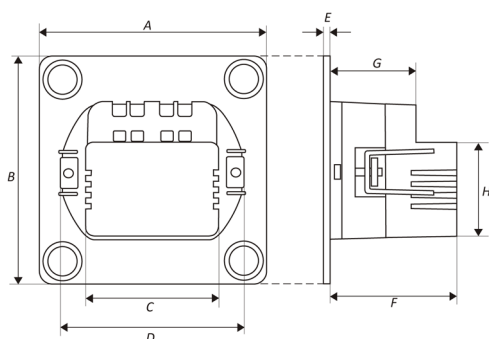## Features

reliable way to detect a hand through most materials
countless decorative switchplates
switchplates attach via magnets and are easily exchanged
range adjusted with potentiometer
low power consumption
excellent noise immunity

Drawing

Dimensions

A (width)	70mm
B (height)	70mm
C (back housing width)	40mm
D (back housing width)	59mm
E (plate thickness)	1.6mm
F (depth)	34.4mm
G (depth)	25.5mm
H (back housing height)	28.5mm
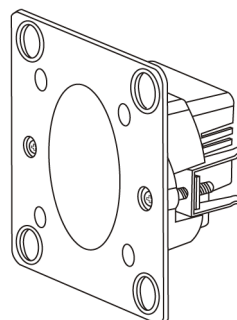
IEX-2 © HIQ ▣ CE

Switch model:	AS-24RA
Detection distance:	2..10cm adjustable
Detection delay:	200ms
Output type:	NPN o.c. momentary
Power supply:	24V 6mA
Operating temperature:	0..50°C
Storage temperature:	-20..75°C
Weight:	85g

Wiring

Switchboard and field modules

switchboard	field modules
100m max.	
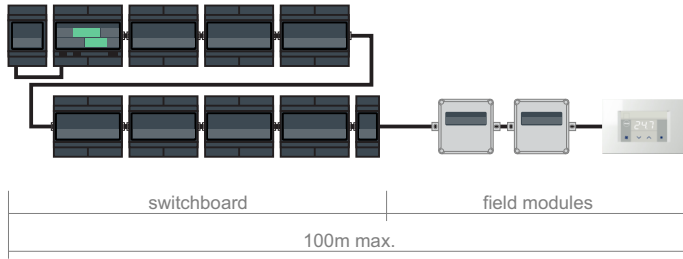
Power supply must be connected to the first (leftmost) device. When devices are connected, autoaddress procedure must be started using HIQ Configurator.
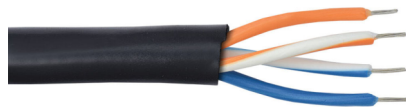
Devices inside switchboard are addressed sequentially, from left to right. Devices outside of switchboard (field modules) are addressed in order of ascending serial numbers - lowest serial number gets the first address, second lowest the second, and so on.

Inside the switchboard, bus is connected with 4x flat cable and RJ9 connectors. Outside the switchboard, bus is connected with a unshielded twisted-pair cable and orange push-wire terminals.
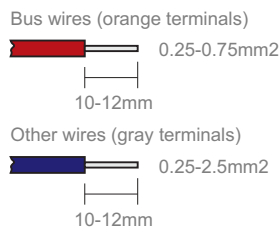
Maximum bus length is 100 meters. Up to that length, bus can be connected with no special rules, branching is allowed. Longer bus (up to 300m) is possible, but cable must be connected in line (no branches/trunks), and last device must be terminated with a 120ohm resistor between CANL and CANH.
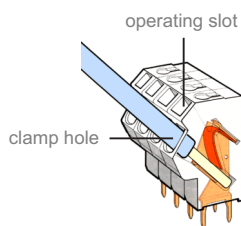
Bus wiring

1. Take one ingoing and one outgoing wire together, and remove insulation for about 10-12mm.

10-12mm
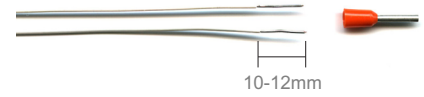
2. Crimp wires together into a ferrule.

3. Wrap wires together for a few centimeters.

50mm

4. Push ferrules into clamps.

Recommended bus cable
unshielded twisted pair 2x2 0.5mm2

Outgoing cable

CAN 24V

GND
CANL
CANH
+24V

CAN 24V

Incoming cable

Wire stripping

Bus wires (orange terminals)

  0.25-0.75mm2

10-12mm

Other wires (gray terminals)

  0.25-2.5mm2

10-12mm

Push-wire handling

operating slot

clamp hole

Solid wire insertion

1. Push wire in the clamp hole

Stranded wire insertion

1. Push screwdriver in the operating slot
2. Insert wire in the clamp hole

Solid/stranded wire removal

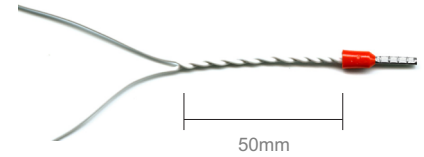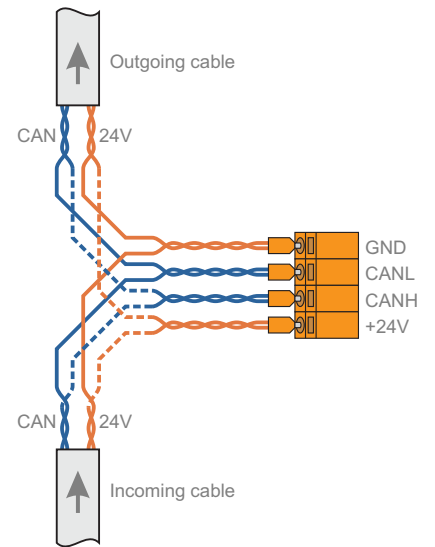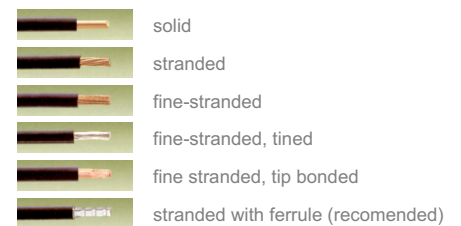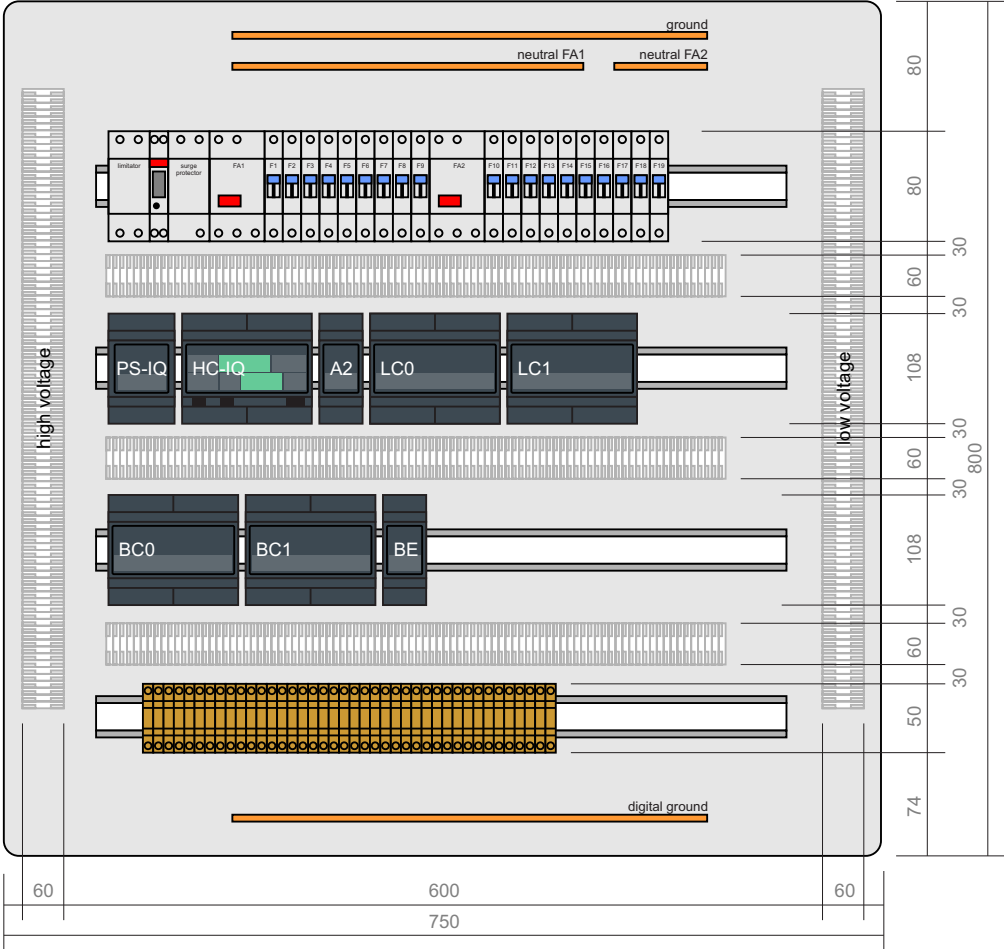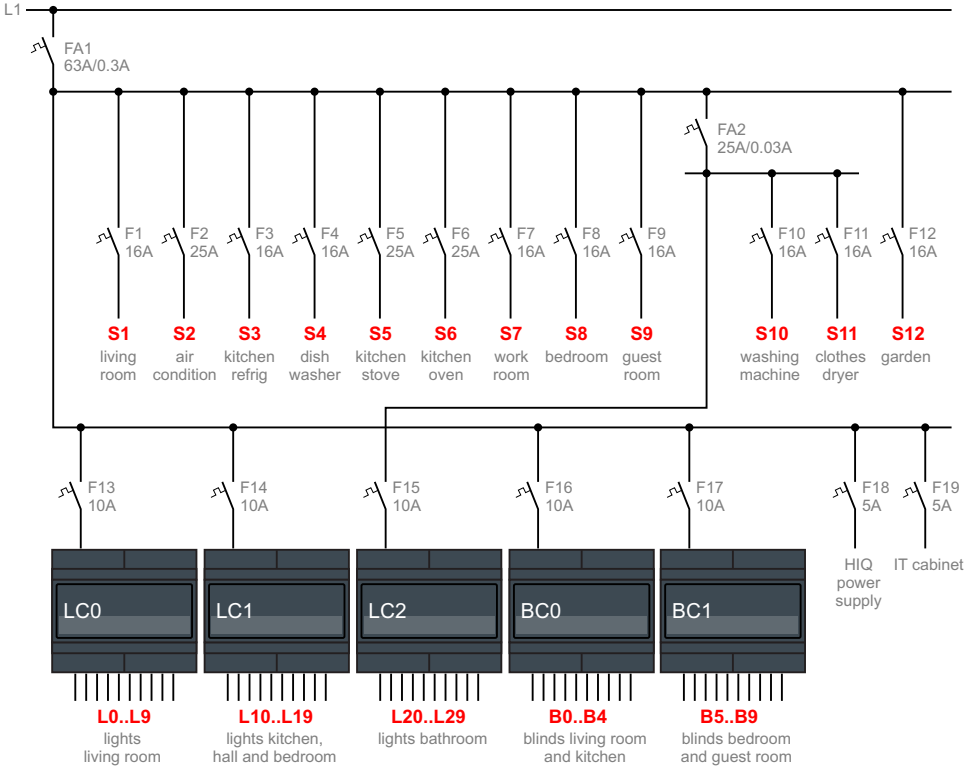1. Push screwdriver in the operating slot
2. Remove wire

Wire type

  solid

  stranded

  fine-stranded

  fine-stranded, tined

  fine stranded, tip bonded

  stranded with ferrule (recomended)

Switch panel

Schematic diagram

S1 living room	**S2** air condition	**S3** kitchen refrig	**S4** dish washer	**S5** kitchen stove	**S6** kitchen oven	**S7** work room	**S8** bedroom	**S9** guest room	**S10** washing machine	**S11** clothes dryer	**S12** garden	

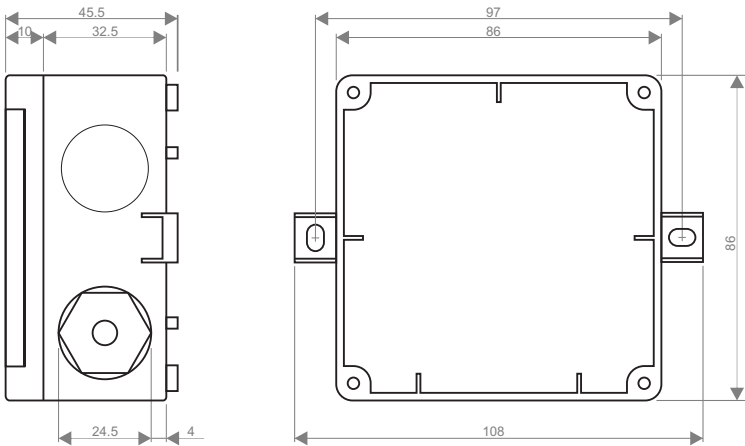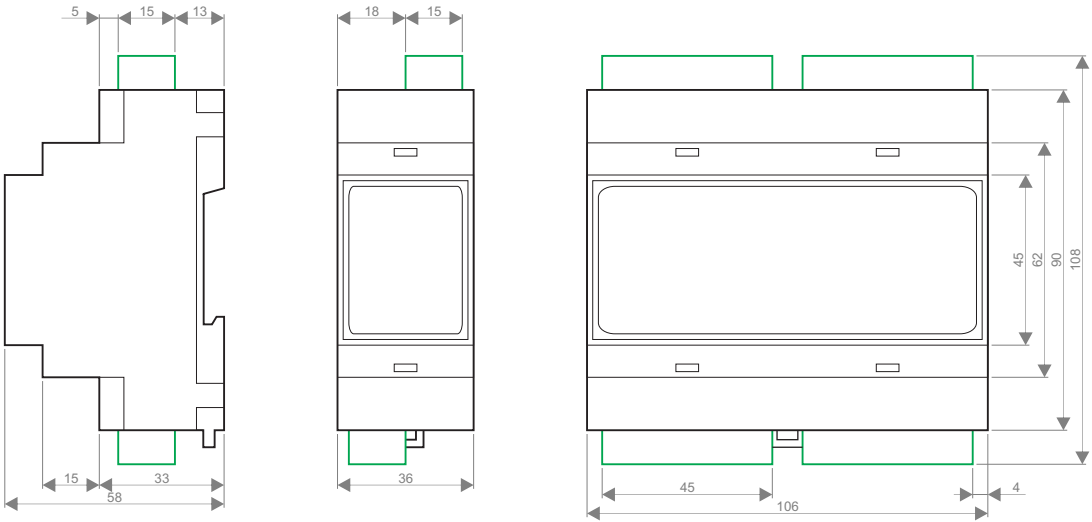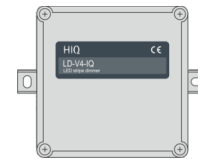| **L0..L9** lights living room	**L10..L19** lights kitchen, hall and bedroom	**L20..L29** lights bathroom	**B0..B4** blinds living room and kitchen	**B5..B9** blinds bedroom and guest room

Dimensions
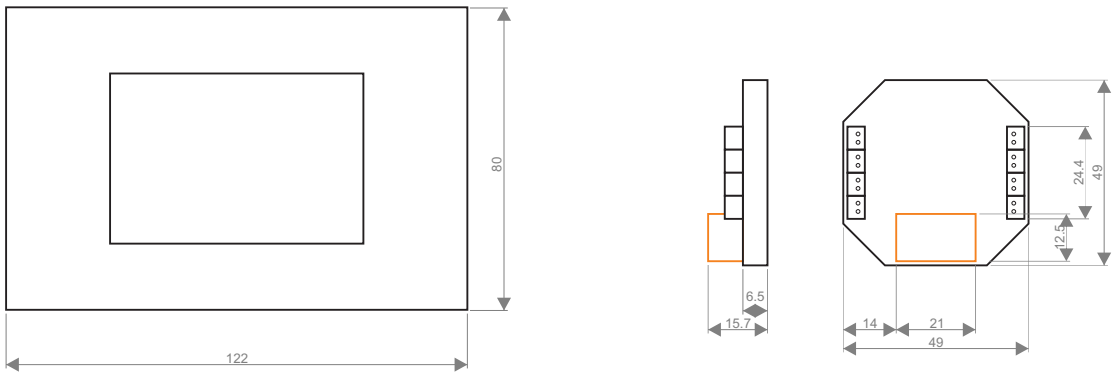
Order code

devices and sensors

LC-10-IQ
light controller
with 10 outputs

LD-P4-IQ
4-channel
universal dimmer

LUD-12
power driver

LD-V4-IQ
4-channel
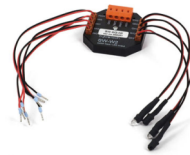LED strip
dimmer

BC-5-IQ
5-channel
blinds controller

LD-D8-IQ
8-channel
DALI dimmer

SC-4T-IQ
touch screen
scene controller

SC-4S-IQ
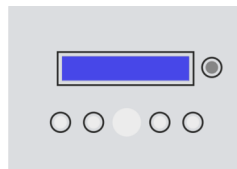scene controller for
standard buttons

TH-1T-IQ
thermostat with
touch buttons

TH-2-IQ
blind thermostat

TH-1M-IQ
thermostat with
mechanical buttons

TH-3-IQ
thermostat with
scene buttons

FC-1-IQ
fan-coil
actuator

HC-IQ
home controller

PS-IQ
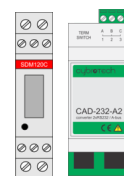power supply 24V

BE-PROT
bus adapter +
surge protector

IR-580-IQ
motion sensor

REED-SW
door sensor

RHKF-U
light sensor

SDM120C
power meter

CAD-232-A2
232/485 converter
(including cable)

Order code

cables and accessories

RE-2
IR remote controller

ES
temperature sensor

ES-A
temperature sensor

CAD-P0
bus cable 2.5cm, RJ9/RJ9
connecting devices in switchboard

CAD-2-BUT
2x mini-button

CAD-P2
bus cable 2m, RJ9/RJ9
connecting rows in switch panel

CAD-232-P0
cable for 232/485 converter

OL30-PW
3M decorative cover

SM11-PW-NT
push button 1M

NM30
mounting frame for
3M rectangular box

SM41-PW-NT
push button 1M
up/down

AS-24RA
touchless switch