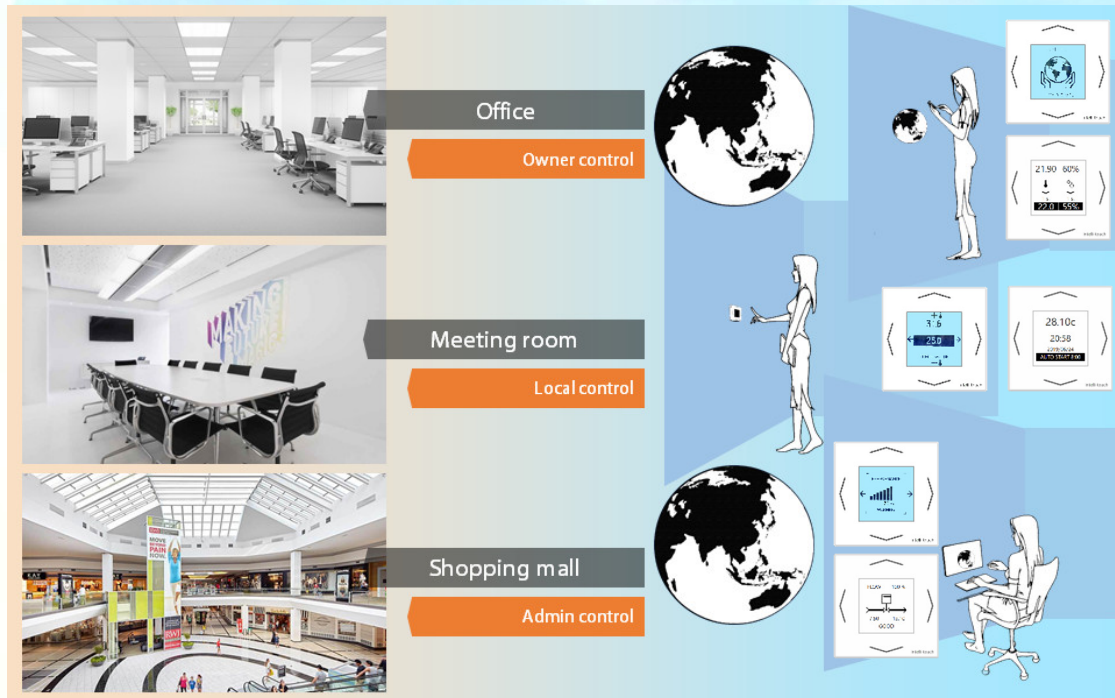


INTELLIGENT THERMOSTAT



NEW ERA OF TEMPERATURE AND HUMIDITY CONTROL

Our Intelligent Thermostat performance and features are beyond your expectations: Energy savings, wireless, intelligent functions and Admin Dashboard. How it works? Let's start. It comprises of 3 main components.



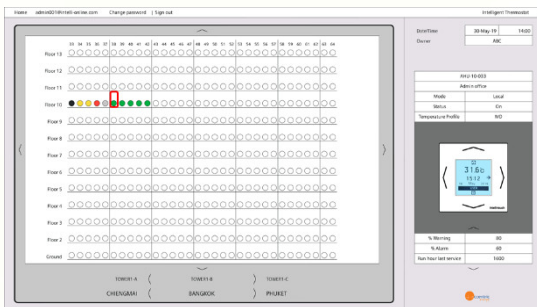
Commander



Intelligent Thermostat

3 components:

- "Commander": for manual control and monitoring
- "Intelligent Thermostat": as controller and networking
- "Admin dashboard": as web base control and monitoring for all of your thermostats in the network



Admin Dashboard

Key features:

- Fit to any types of old thermostats
- Wirelessly control, Native networking
- "Temperature profiles" can be updated for each AHU
- Active performance monitoring scale 1-10
- Admin dashboard for unlimited number of AHU control

1. APPLICATIONS

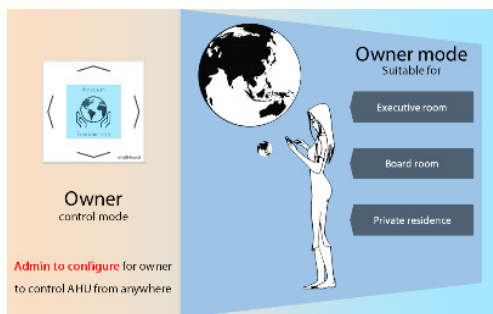
The unit is used as a room thermostat specially designed for any chilled-water air handling units (AHU) with any types of 2 ways valves:

- On/Off control
- Proportional control
- Humidity control (if heater is present)

This intelligent thermostat is designed to be suitable for almost any applications. Such as:

- Executive offices
- Meeting rooms, operation rooms
- Offices, Shopping malls, hall, public area, common areas and etc.

2. MODE OF CONTROLS



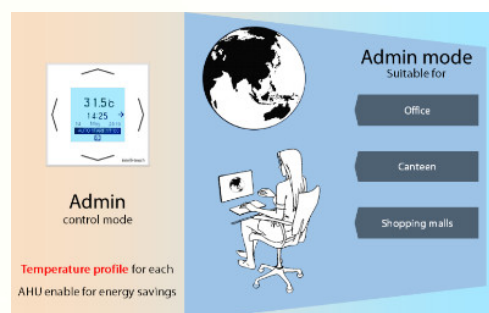
Owner control:

- Owner controls the AHU remotely using web browsers.



Local control:

- User controls the AHU manually via a commander.



Admin control:

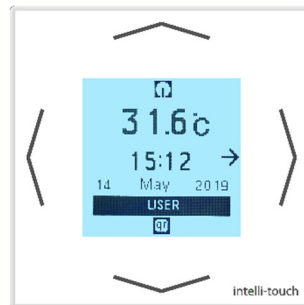
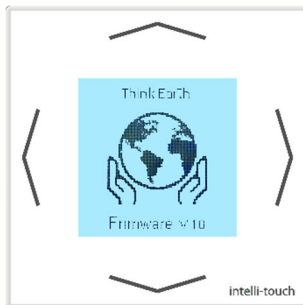
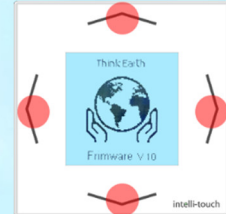
- Admin controls all AHU in the network using preset "Temperature Profile".

3. APPEARANCE

The hardware consists of the “Commander” and the “Intelligent Thermostat”. Both units connected with wire (2 pairs of twisted pair cabling or CAT5 can be used).

3.1 The commander

- Monochrome graphic screen (128x128 dots) with back light and sound
- Elegant design square clear glass-surface, slim commander features 4 points touch control, friendly user interface. The design suits perfectly in harmony with contemporary interior finishes
- The commander connects to the Intelligent Thermostat with control wires and can be interchangeably with any Intelligent Thermostats.

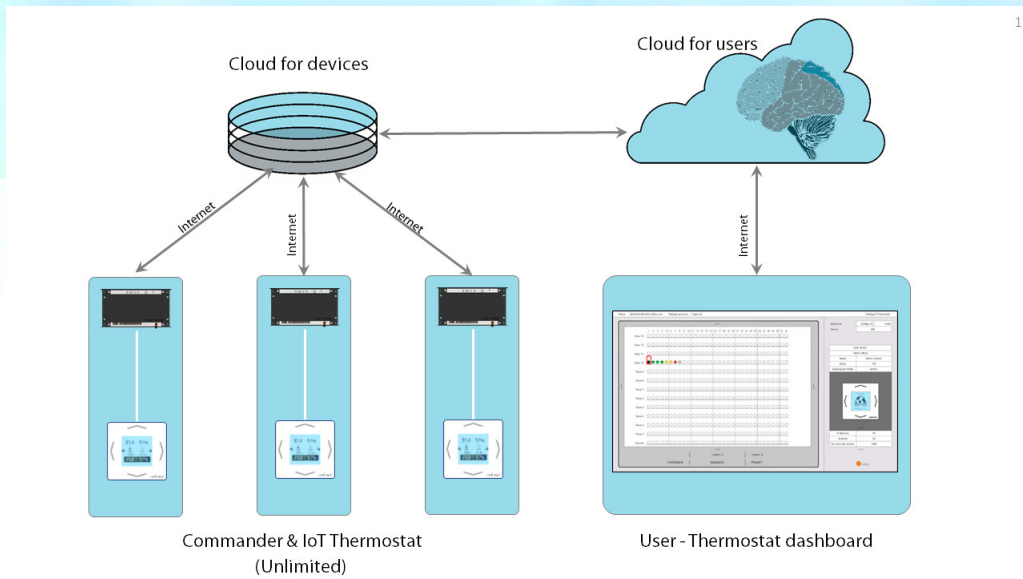


Commander

3.2 Intelligent Thermostat

The unit consisted of a microprocessor circuit with built-in wifi module in plastic enclosure suitable for most indoor applications. It connects to the Commander, 4 temperature sensors, power supply (220VAC or 24VAC/DC), outputs to 2 ways control valves, fan, heaters, and float sensor (option).

An Intelligent Thermostat connects to a device server. Users can access to monitor/control the Intelligent Thermostat using an Admin Dashboard. This admin dashboard, Cloud-users, Device-server and the Intelligent Thermostat are connected respectively. This simple wireless network offers limitless connections between users and their Intelligent Thermostats, from anywhere.



The Intelligent Thermostat Network

3.2.1 Input terminals

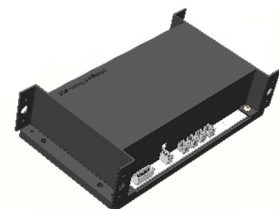
- Power supply (220VAC or 24VAC depend on model selected)
- 4 - 10K PTC thermistors for supply air, return air, chilled water supply and chilled water return
- Water leak terminal (option)

3.2.2 Output terminals

- Fan control relay (1-3 NO depend on model selected)
- Humidity control relay (1 NO)
- Valve/compressor control relay (1-2 NO depend on model selected)
- Proportional valve control (0-10V depend on model selected)

3.2.3 Network communication

- Wifi terminal for external antenna (included)



Intelligent Thermostat

4. FEATURES

4.1 Advance thermostat functions:

- Temperature resolutions 0.2°C incremental offers more precise comfort levels
- Fan and fan speed control
- Humidity control (heater control)

4.2 Networking

- Wireless network control by Wifi
- 3 modes operation (Owner, Local and Admin) changeable by admin
- Desirable “Temperature Profile” weekday, weekends, public holidays can be uploaded to each thermostat in admin control mode
- A web-based dashboard is provided for remote AHU control, unlimited numbers
- Cloud platform support for special functions and future services


Temperature profile for each AHU enable for energy savings 9

Office											
07:00	08:01	09:01	10:01	11:01	12:01	13:01	14:01	15:01	16:01	17:01	
08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	
OFF	25.0C				29.0C	25.0C				OFF	

Canteen											
07:00	08:01	09:01	10:01	11:01	12:01	13:01	14:01	15:01	16:01	17:01	
08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	
25.0C	OFF				25.0C	OFF					

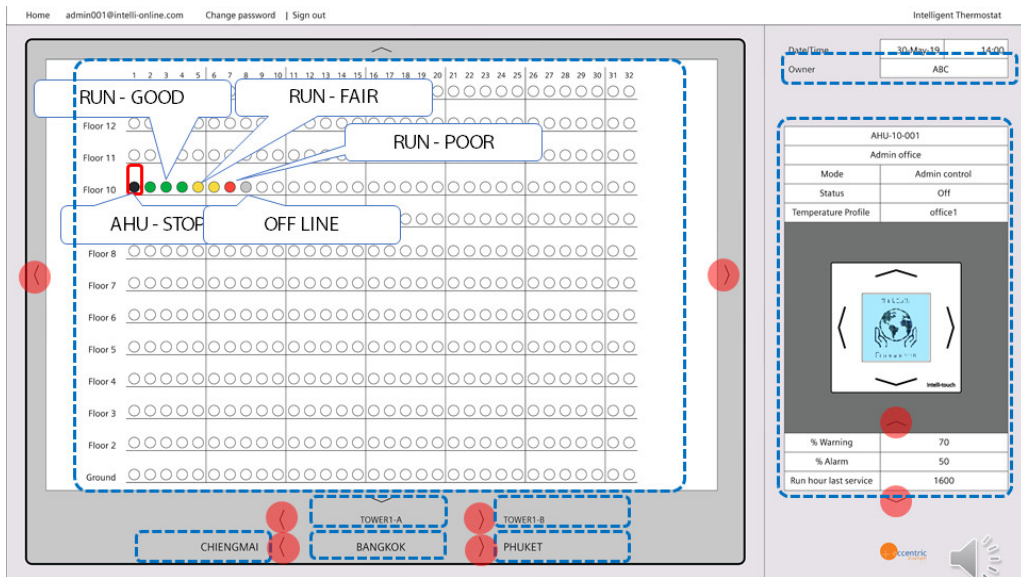
Shopping mall – Week days												
24:01	10:01	11:01	12:01	13:01	14:01	15:01	16:01	17:01	18:01	19:01	20:01	21:01
10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	24:00
OFF	27.0C	25.0C	27.0C			25.0C			27.0C	OFF		

Shopping mall - Holiday												
24:01	10:01	11:01	12:01	13:01	14:01	15:01	16:01	17:01	18:01	19:01	20:01	21:01
10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	24:00
OFF	27.0C	25.0C					27.0C	OFF				



4.3 Monitoring/Service/Maintenance functions

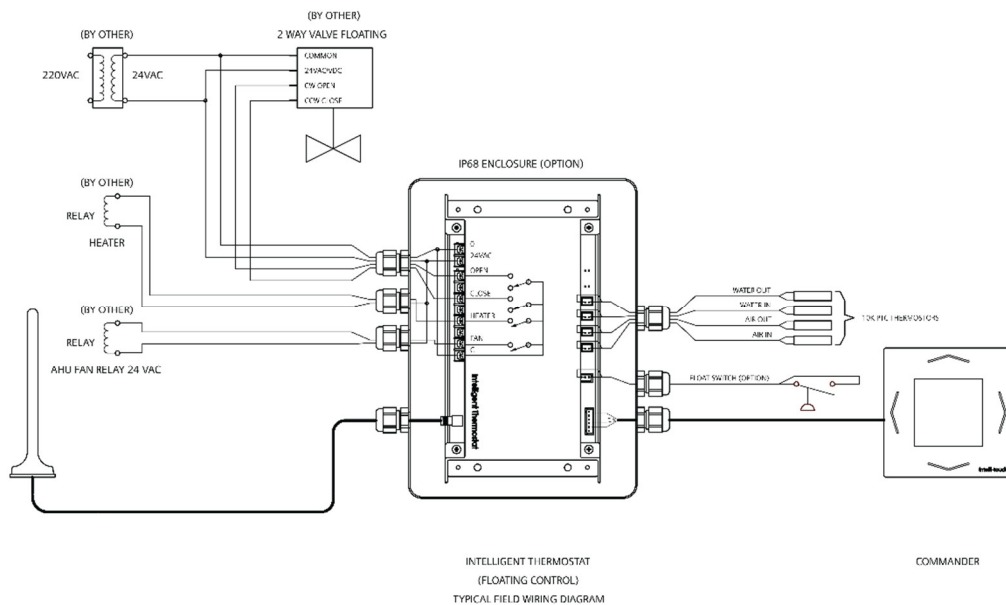
- Fans status (Run/Stop/Failed), Valve positions, chilled water temperatures/flowrate
- AHU real-time airflow/performance indicator enable performance base services
- Smart dashboard features an overview multiple AHU screen showing 3 levels of real-time performances (Stop, Run (Green, Yellow, Red), offline)
- Customs design dashboard is available upon request



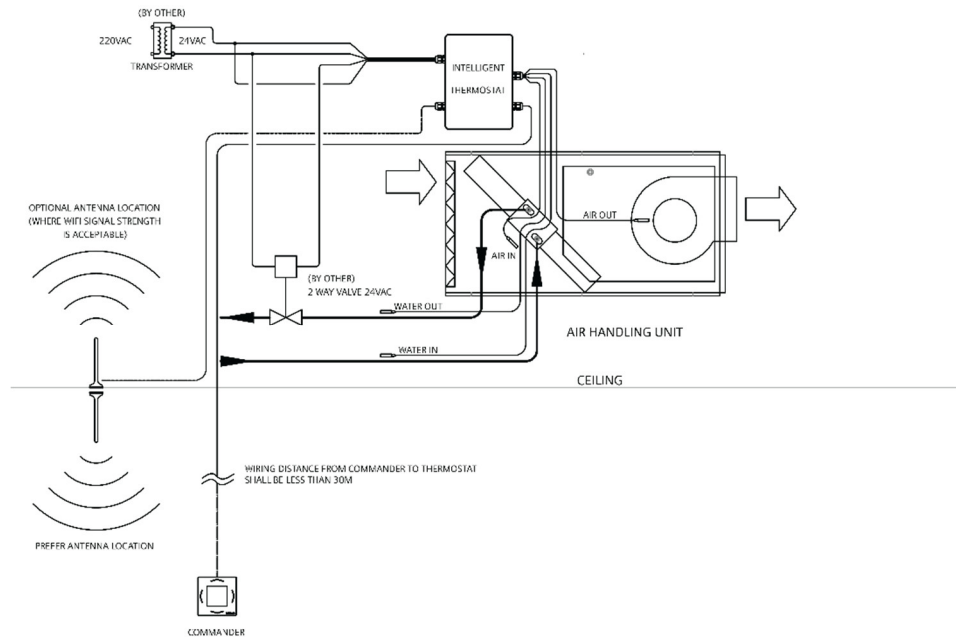
Smart Dashboard

5. WIRING DIAGRAM

The Intelligent Thermostat is designed for next generation room temperature control for commercial and industrial uses. Thanks to intelligent algorithms, only 4 thermistors are required for the algorithm to determine various status of each AHU.



Intelligent Thermostat wiring with valve - Floating control



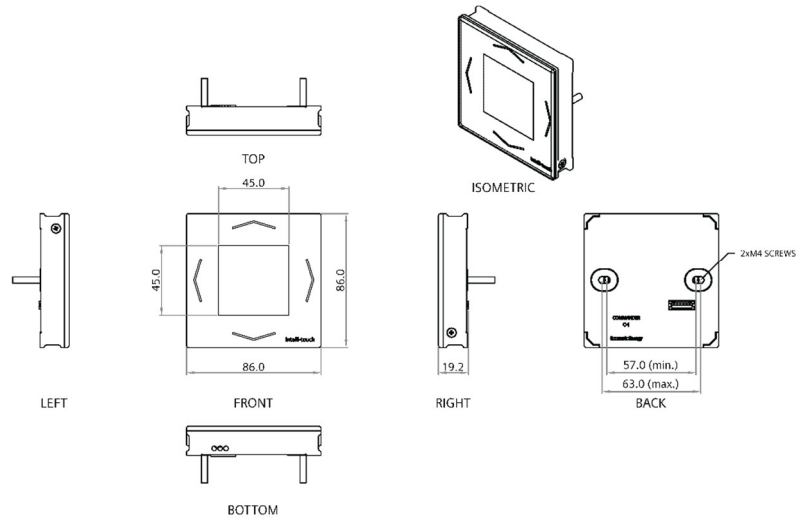
Intelligent Thermostat wiring with AHU

6. SPECIFICATIONS

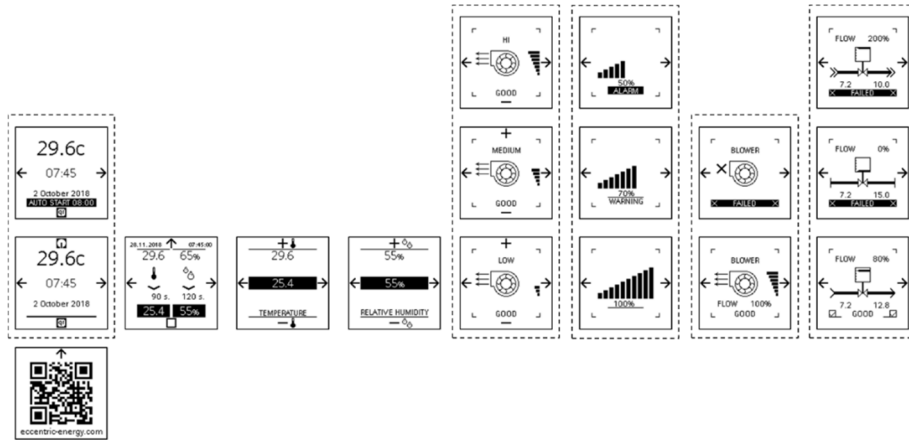
Intelli Thermostat CPU	
Power Supply	12 V
Communication	2x RS-485
Input/Output	1x Float Switch 4x Temperature sensors (NTC Thermistor 10K) 2x Relay NO-NC Contact 3x Relay NO Contact
Wifi	Frequency range 2.4 GHz ~ 2.5 GHz 802.11 b/g/n (802.11n up to 150 Mbps) A-MPDU and A-MSDU aggregation and 0.4 μs guard interval support
CPU and Memory	Xtensa® single-/dual-core 32-bit LX6 microprocessor(s), up to 600 MIPS (200 MIPS for ESP32-S0WD, 400 MIPS for ESP32-D2WD) 448 kB ROM 520 kB SRAM 16 KB SRAM in RTC QSPI supports multiple flash/SRAM chips

Intelli Commander	
Power Supply	12 V
Communication	2x RS-485
Display	Diagonal Size 2.5" Display Format 128x128 Dots
Touch Sensor	4x Touch pad
CPU and Memory	32-bit ARM Cortex-M3 microcontroller up to 256 kB flash and 64 kB SRAM

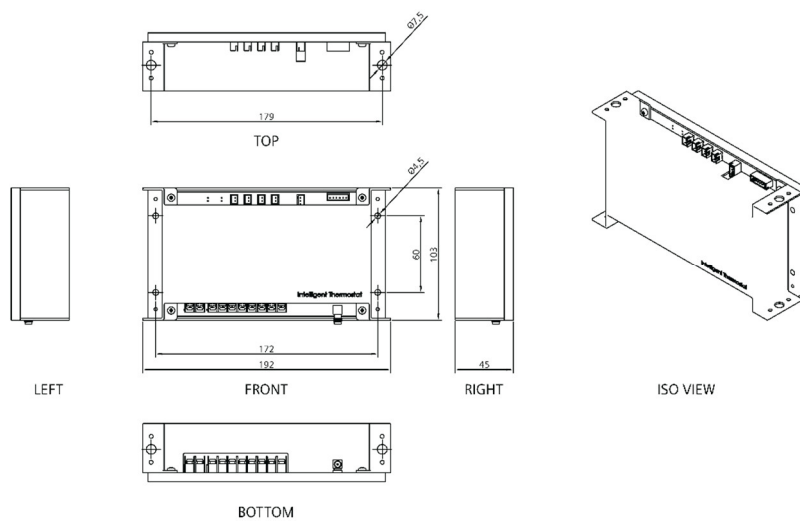
7. DIMENSIONS



Commander



Full standard graphic menu pages



Intelligent Thermostat