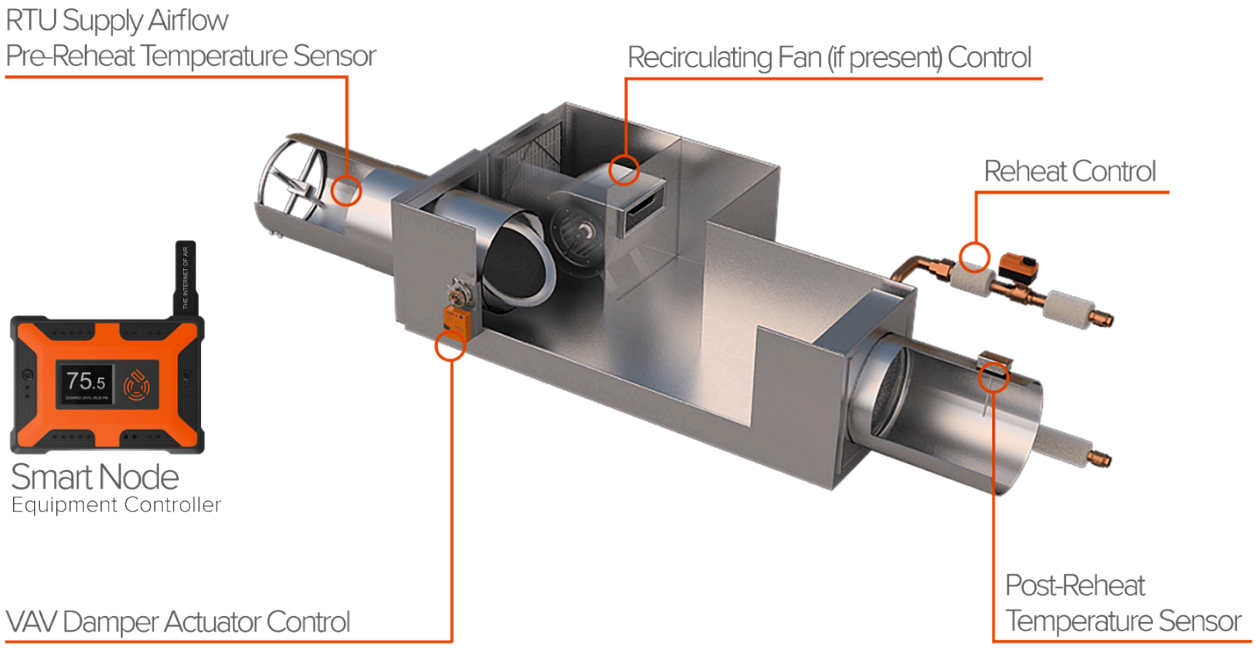
75F® Smart VAV with Reheat™

A unique system-wide approach to maximizing performance



PRODUCT OVERVIEW

The 75F® Smart VAV with Reheat™ wireless control solution reduces install cost, improves energy efficiency and introduces remote control and diagnostic capabilities to Variable Air Volume (VAV) zone control systems. Typical VAV with Reheat systems have inherent inefficiencies when first cooling to 55 degrees and then heating the same air year-round. Rigid outside air temperature reset schedules don't sense and manage to actual demand.

75F offers a smart, cost-effective solution for controlling these systems, improving efficiency and performance in new or existing buildings. 75F adds sensors to measure and record upstream and downstream airflow temperatures, while our smart controls modulate the damper position and reheat controls (available for both electric and water heating coils). This allows for fine-tuning adjustments and remote monitoring of controls performance, as well as preventative diagnostics and insights on your reheat unit performance. 75F takes over the morning warm-up routine and the outside air temperature reset schedule and replaces them with a dynamic system-wide sensing and proactive control to meet actual loads.

The Smart VAV with Reheat control kit includes controller, sensors and sensor cables. It is compatible with 0-10V, 2-10V, 10-0V and 02-2V modulating actuators

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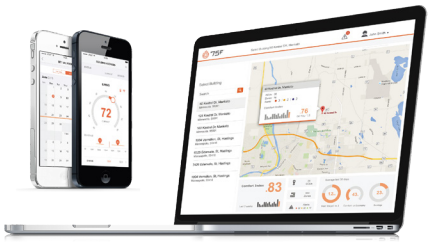
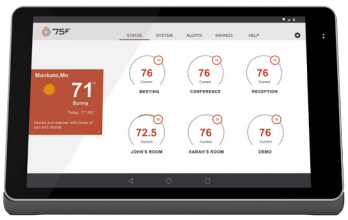
COMPONENTS OF SMART VAV



75® Facilisight™ &
Occupant App



75® Central
Control Unit™

75F® Smart Node™

75F® Remote Temperature
& Humidity Sensor™

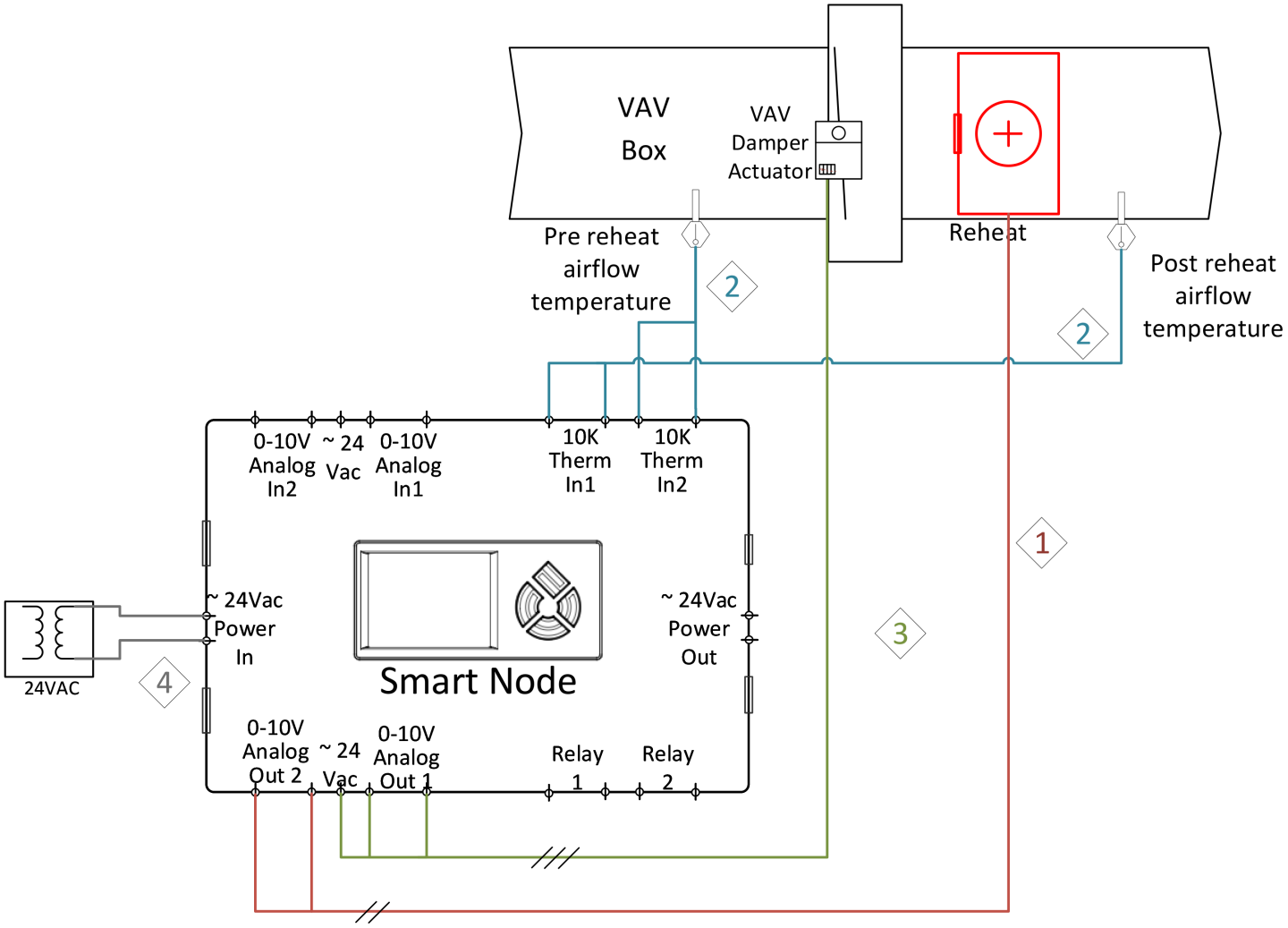
ACI A/CP-DO-4”
Bullet Thermistor

PRODUCT OPTIONS

Standard / Alternate	Product Description	Components	P/N
Standard	Black Cap RTH local sensing with Smart Node for Smart VAV with Reheat	Smart Node, 20’ cable, 2 airflow sensors, RTH (black)	3020-BL
Alternate	White Cap RTH local sensing with Smart Node for Smart VAV with Reheat	Smart Node, 20’ cable, 2 airflow sensors, RTH (white)	3020-WH
Alternate	Flush Mount RTH local sensing with Smart Node for Smart VAV with Reheat	Smart Node, 20’ cable, 2 airflow sensors, RTH (flush mount)	3020-FM
Alternate	Ceiling CTH local sensing Smart Node for Smart VAV with Reheat	Smart Node, 20’ cable, 2 airflow sensors, RTH (ceiling)	3020-CL
Alternate	ITM local control with Smart Node for Smart VAV with Reheat	Smart Node, 20’ cable, 2 airflow sensors, ITM	3025

LOGISTICAL DIAGRAM

For comprehensive wiring, see installation guide

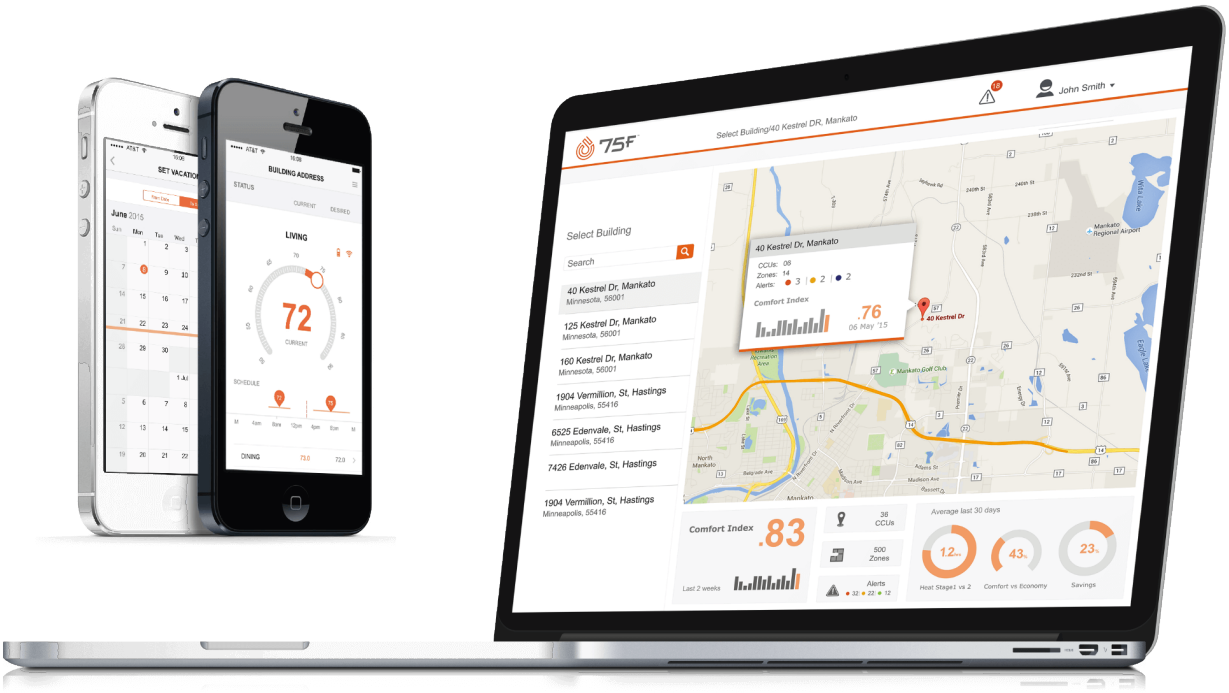


Notes:

1. 18-2 Wire to reheat. Either from Analog-2 for modulating or Relay-1 for non modulating
2. 10k ohm bullet probe and cable (provided by 75F)
3. 18-3 wire for modulating actuator
4. 24v AC power can be daisy chained from one Smart Node to the next.

75F® Facilisight™

SOFTWARE



PRODUCT OVERVIEW

Facilisight, a suite of web and mobile apps, allows for remote monitoring and temperature control of your smart HVAC, lighting and energy system. Simply oversee and manage the 75F system across all your sites. Performance evaluation provides insight into equipment performance, to predict failures and verify service actions. Live heat maps provide instant information into how your building absorbs and distributes thermal loads and energy performance. Click on any zone to see detailed analysis specific to that space and associated equipment.

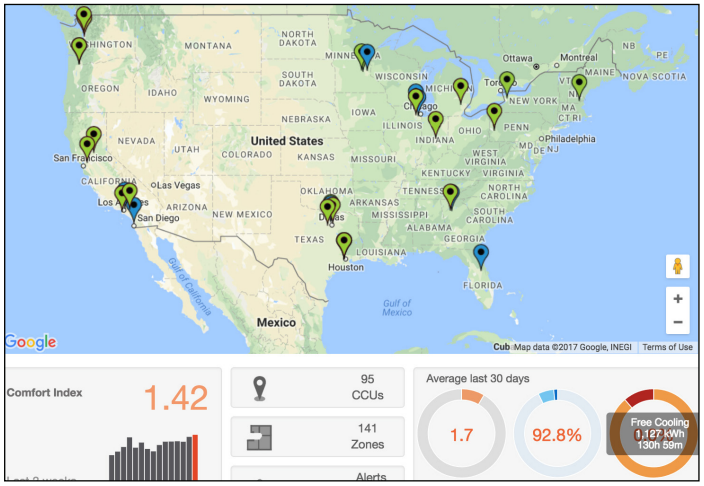
FEATURES

- Compatible with major web browsers, iPhone, iPad and Android
- View all buildings in real-time with Google Map integration
- Heat maps provide instant insight into how your buildings absorb and distribute thermal loads throughout the day; drill in for zone performance
- Policy editor allows you to push complex schedules to hundreds of locations with a single click
- Scheduling feature allows you to mark holidays and implement energy savings across your portfolio
- Google Calendar integration to automatically schedule temperature and lighting changes
- Mange user settings including editing profiles, passwords and editing or removing additional users
- Building performance metrics, now including integrated Arc score

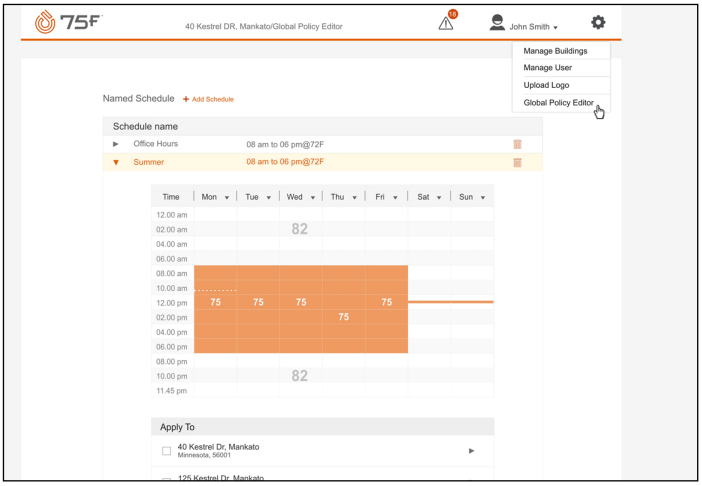
APPLICATIONS

Facilisight is included standard in all our applications, including:

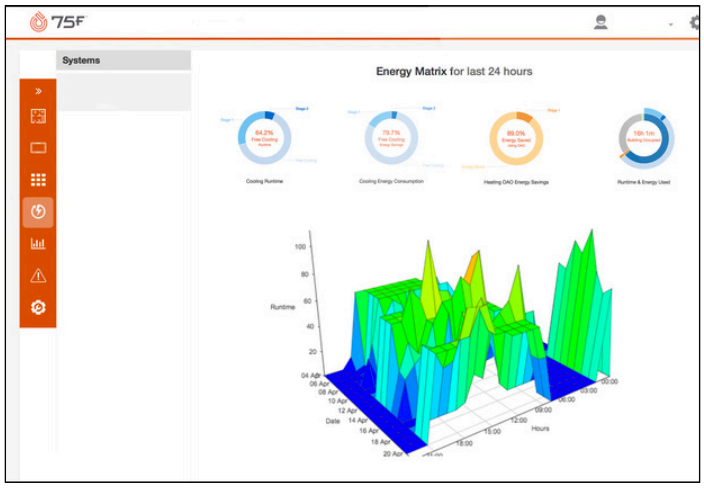
75F® Dynamic Airflow Balancing™
75F® Outside Air Optimization™
75F® Smart VAV with Reheat™
75F® Hydronic Controls™
75F® Single Stage Equipment Controls™
75F® Advanced Lighting™



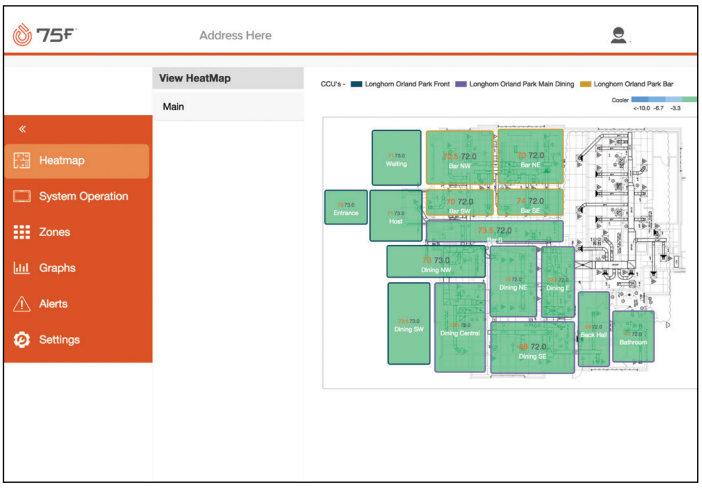
The home page allows you to take in a big picture view of your entire portfolio of buildings, looking at current energy savings, alerts and more.



Schedule your system down to the minute and add vacations to let your system know when the building won't be occupied. Google Calendar integration allows dynamic schedule feed.

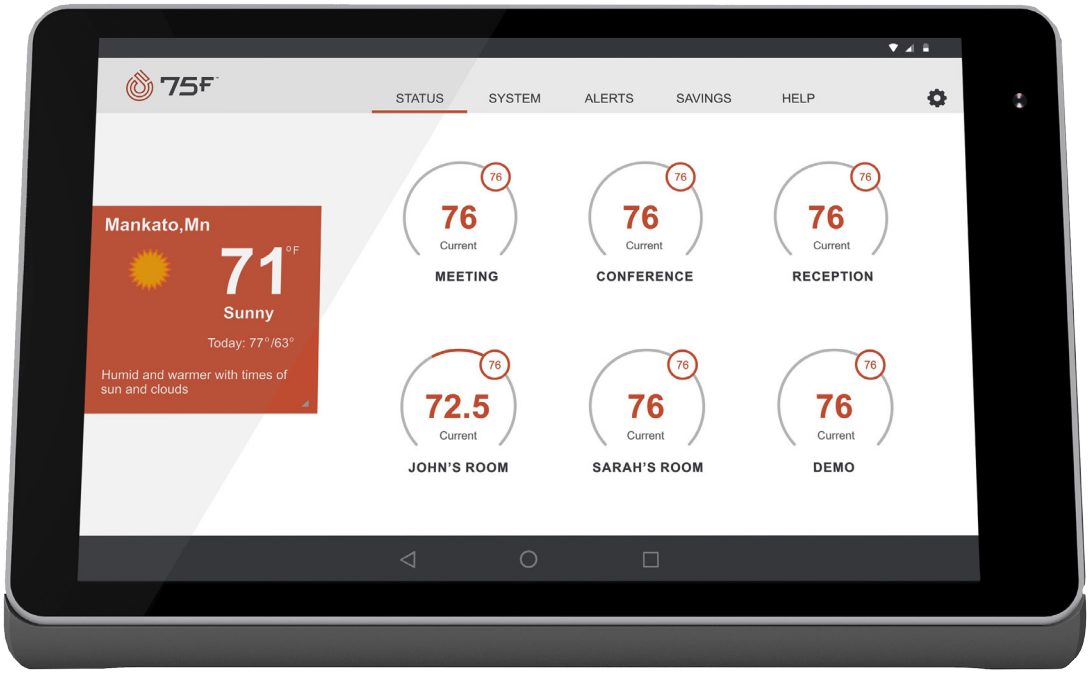


Energy usage analysis provides insight into equipment performance, which can help predict failures and verify service actions.



The heat map view gives at-a-glance color-coded status relative to setpoint, drill-down detail for each zone and corresponding equipment (e.g. RTU), plus an energy dashboard.

75F® Central Control Unit™ (CCU)



PRODUCT OVERVIEW

The 75F® Central Control Unit™ (CCU) acts as a wall-mounted aggregation gateway for 75F's wireless terminal equipment modules in a building. The CCU consists of a tablet running Android and a Control Mote that provides inputs & outputs for connecting to central plant equipment.

FEATURES

- Works with single and multi-stage systems, heat pump systems, fan coil units, air handlers, variable flow hydronic systems and other systems
- Control up to 48 terminal equipment modules per Central Control Unit
- Auto changeover
- Proactive, predictive control in conjunction with 75F cloud servers; able to run program offline
- Intuitive Android-based user interface

75F® FACILISIGHT™

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APPLICATIONS

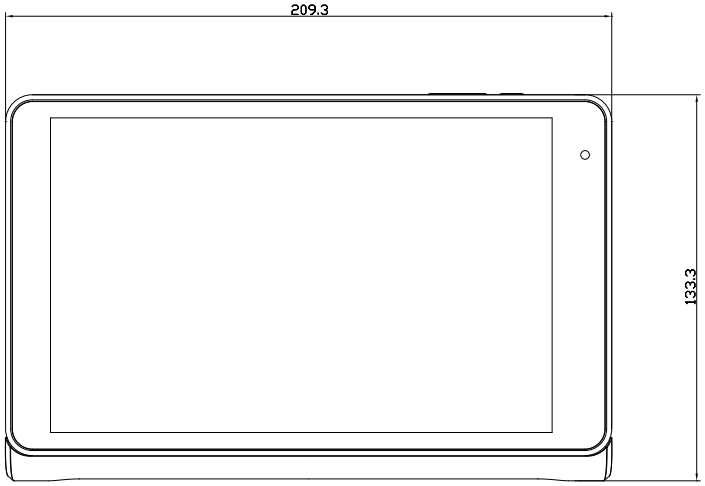
Software-defined hardware enables dynamic application assignment:

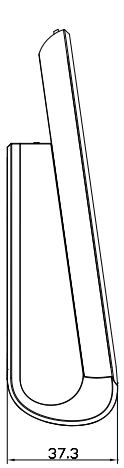
75F® Dynamic Airflow Balancing™
75F® Outside Air Optimization™
75F® Smart VAV with Reheat™
75F® Hydronic Controls™
75F® Single Stage Equipment Controls™
75F® Advanced Lighting™

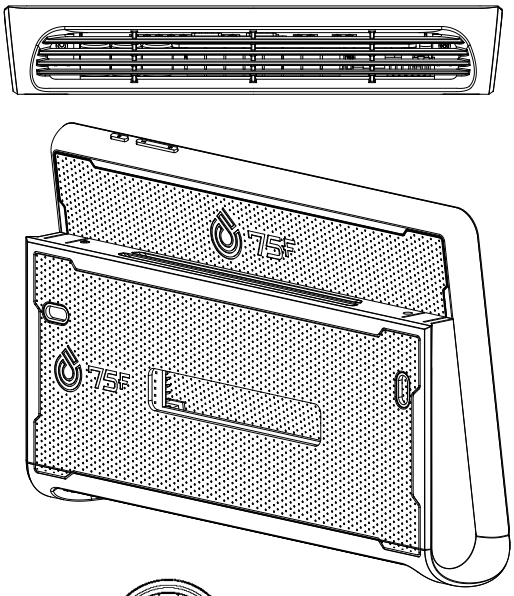
Additional applications can use IFTT logic for processes, with software-defined configurations.

75F® Central Control Unit™ (CCU)

DIMENSIONS (mm)

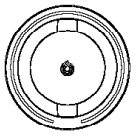






INCLUDED

- (1) Central Control Unit (CCU)
- (1) Remote Temperature Sensor (RTS)
- 18” & 20’ RTS cables
- 24V ac power supply
- Mounting Hardware



RTS Sensor

SPECIFICATIONS

GENERAL	
HVAC controls	2 stage heating & cooling, 2 stage fan, 0-10V modulating output for VFD, heating/cooling hydronics, 1 humidifier
Mounting	(2) #8 screws
Microprocessor	Quad core tegra 3 @1.2GHz
Screen	7.02” 1280x800 (216 PPI)
Termination	Screw-type terminal blocks (16 AWG max)
Dimensions	114 mm x 200 mm (4.5” x 7.9”); 37.3 mm from wall
Operating temp.	0-50˚C (32-122˚F)
ELECTRICAL	
Supply	24V ac/dc or 5V dc. Consumption: 5 VA (typ), 10 VA (max)
Battery	4,325 mAh – 7 hours active display; weeks in standby
Inputs	(2) 0-10V analog inputs, (2) 10k thermistor inputs
Outputs	(4) 0-10V or 4-20V mA analog outputs, (8) 110V ac, 24V dc/1A relays
COMMUNICATIONS	
Wi-Fi	Wi-Fi to connect to internet
Bluetooth	Used for pairing devices (e.g. 75F® Smart Node™ equipment control)
Mesh 900 MHZ	IEEE 802.15.4-compliant; used for device communications on mesh network
Wired	3 wire communication to backup RTH

75F® Smart Node™

LEFT

RIGHT

TOP

BOTTOM

PRODUCT OVERVIEW

The 75F® Smart Node™ is a revolutionary equipment controller with flexible software-defined configurations which can control a range of equipment – from zone dampers, to reheats, to economizer controls. It operates off 24V ac or dc and is designed for daisy chain power, making installation of your power bus simple and fast. The Smart Node is designed with multiple inputs and outputs, plus 900MHz and Bluetooth wireless communications, for a range of sensing measurements and controls capabilities. Hardware defined by software means improvements are included in every software update.

FEATURES

- OLED display with software-defined relevance
- Backlit text indicates which inputs/outputs are enabled for confidence in installation
- Robust construction with machined metal studs for mounting
- Wireless mesh networking

75F® FACILISIGHT™

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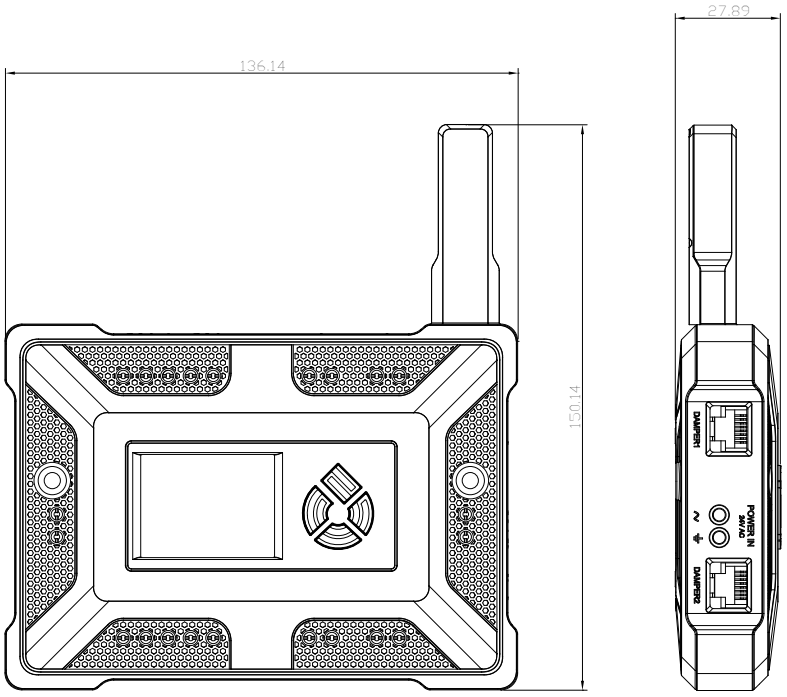
APPLICATIONS

Software-defined hardware enables dynamic application assignment:

- 75F® Dynamic Airflow Balancing™
- 75F® Outside Air Optimization™
- 75F® Smart VAV with Reheat™
- 75F® Hydronic Controls™
- 75F® Single Stage Equipment Controls™
- 75F® Advanced Lighting™

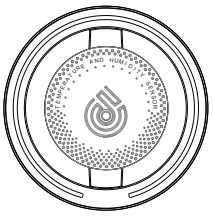
Additional applications can use IFTT logic for processes, with software-defined configurations.

DIMENSIONS (mm)



INCLUDED IN DEFAULT CONFIGURATION

- (1) Smart Node
- (1) Remote Temperature Humidity Sensor (RTH)
- (1) 20’ cable



RTH Sensor

SPECIFICATIONS

GENERAL	
Screen	OLED
Termination	WAGO2061 series poke-in connectors. 3 and 4-wire Molex connectors. RJ-45 for dampers.
Dimensions	114 mm x 200 mm (4.5” x 7.9”)
ELECTRICAL	
Supply	24V ac/dc
Inputs	(2) 10k thermistor inputs, (2) 0-10V dc analog inputs
Outputs	(2) 0-10V dc analog outputs, (2) dry contact relays rated at 110V ac, 24V dc, (2) RJ-45 for Smart Dampers
COMMUNICATIONS	
Bluetooth	Used during commissioning and wireless triangulation
Mesh 900 MHZ	IEEE 802.15.4-compliant; used for device communication on mesh network
Wired	4 wire RS-485 interface, 3 pin connector for RTS. BACnet support coming soon.

75F® Remote Temperature & Humidity Sensor™ (RTH)

PRODUCT OVERVIEW

The 75F Remote Temperature and Humidity Sensor (RTH) offers high-precision measurement pre-calibrated from the factory for measuring comfort factors of temperature and humidity. The RTH is easily mounted on a wall by a single toggle bolt.

A Remote Temperature and Humidity (RTH) sensor paired with a 75F® Smart Node™ results in a clean aesthetic in your space while minimizing installation times. The RTH provides accurate temperature and humidity values from your space and the Smart Node reports these values to the 75F® Central Control Unit™ (CCU) for zone monitoring and control.

FEATURES

- Accurate temperature readings
- Accurate humidity readings
- Sleek design, low impact aesthetics

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APPLICATIONS

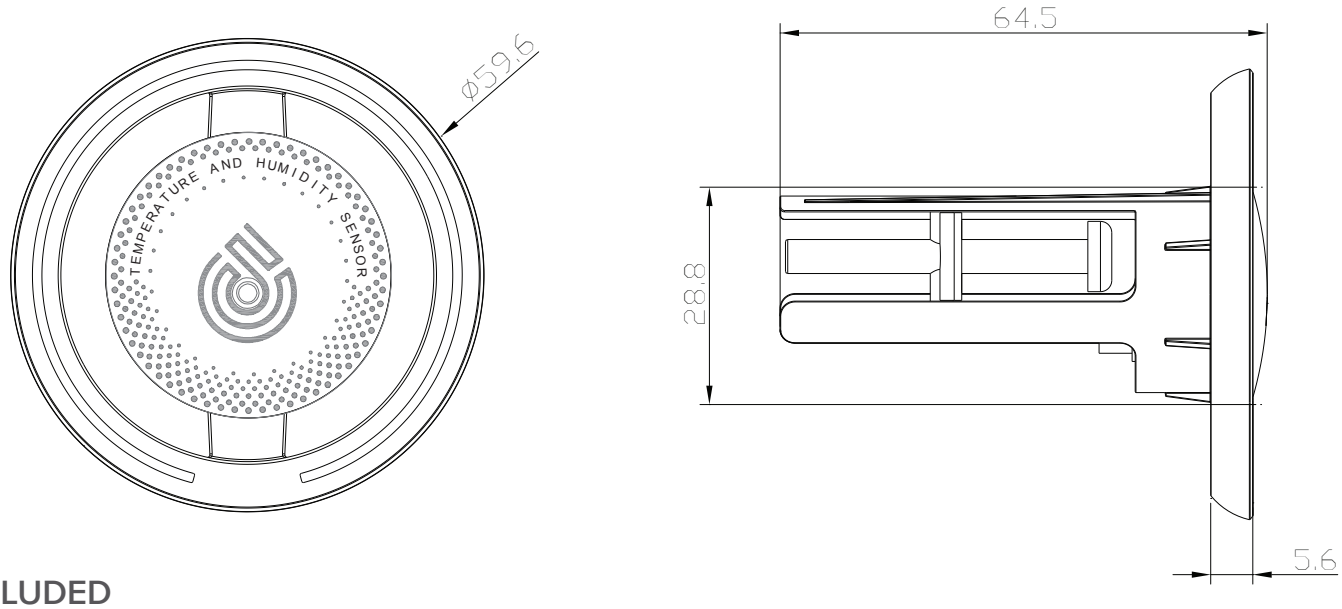
Software-defined hardware enables dynamic application assignment:

- 75F® Dynamic Airflow Balancing™
- 75F® Outside Air Optimization™
- 75F® Smart VAV with Reheat™
- 75F® Hydronic Controls™
- 75F® Single Stage Equipment Controls™
- 75F® Advanced Lighting™

Additional applications can use IFTT logic for processes, with software-defined configurations.

75F® Remote Temperature & Humidity Sensor™ (RTH)

DIMENSIONS (mm)



INCLUDED

- (1) Remote Temperature Humidity Sensor (RTH)

SPECIFICATIONS

GENERAL	
Mounting	(1) Toggle bolt, requires 1” hole in drywall
Termination	3 pin connector
Dimensions	59.6mm circumference, 5.6mm surface depth, 64.5mm total length, 28.8mm backplate diameter
Operating temp.	Operating Environment: 0°F – 122°F
Accuracy	Humidity (typical +/- 2% RH), Temperature (typical +/- 0.2C)
ELECTRICAL	
Power	6.5V dc provided by Smart Node via 3 pin connectors
COMMUNICATIONS	
Wired	3 wire interface for power and communication; proprietary 1 wire protocol to communicate with a master device

PRODUCT OVERVIEW

10K Ohms @ 77 Deg F (25 Deg C) Type II Thermistor. The standard duct without box configuration has a mounting flange for quick installation and etched-teflon leads. The sensing element is double encapsulated to avoid sensor failures caused by moisture infiltration. Additional options include: plenum rated cable and quick connects for direct termination to male VAV-Controller inputs. ACI duct temperaure sensors are designed for HVAC, Building Automation, and light industrial sysetms. Specific applications include: zone control, air handling units, and temperature monitoring.

Sensor Specifications

Sensor Output	10k Ohms @ 77°F (25°C) (Type II)
Accuracy	+/-0.36°F (0.2°C) from 32 to 158°F (0 to 70°C)
Stability	+/-0.23°F (+/-0.13°C)
Interchangeability	+/-0.36°F (+/-0.2°C)
Operating Temperature Range	-40 to 302°F (-40 to 150°C)
Power Dissipation Constant	3mW/°C
Operating Humidity	10 to 95% RH non-condensing

NTC (Negative Temperature Coefficient) Thermistor

Wire Specifications

Wire Rating	MIL-W-16878/4 Type E
Wire Description	22 AWG Etched Teflon
Wire Temperature Range	-67 to 392°F (-55°C to 200°C)