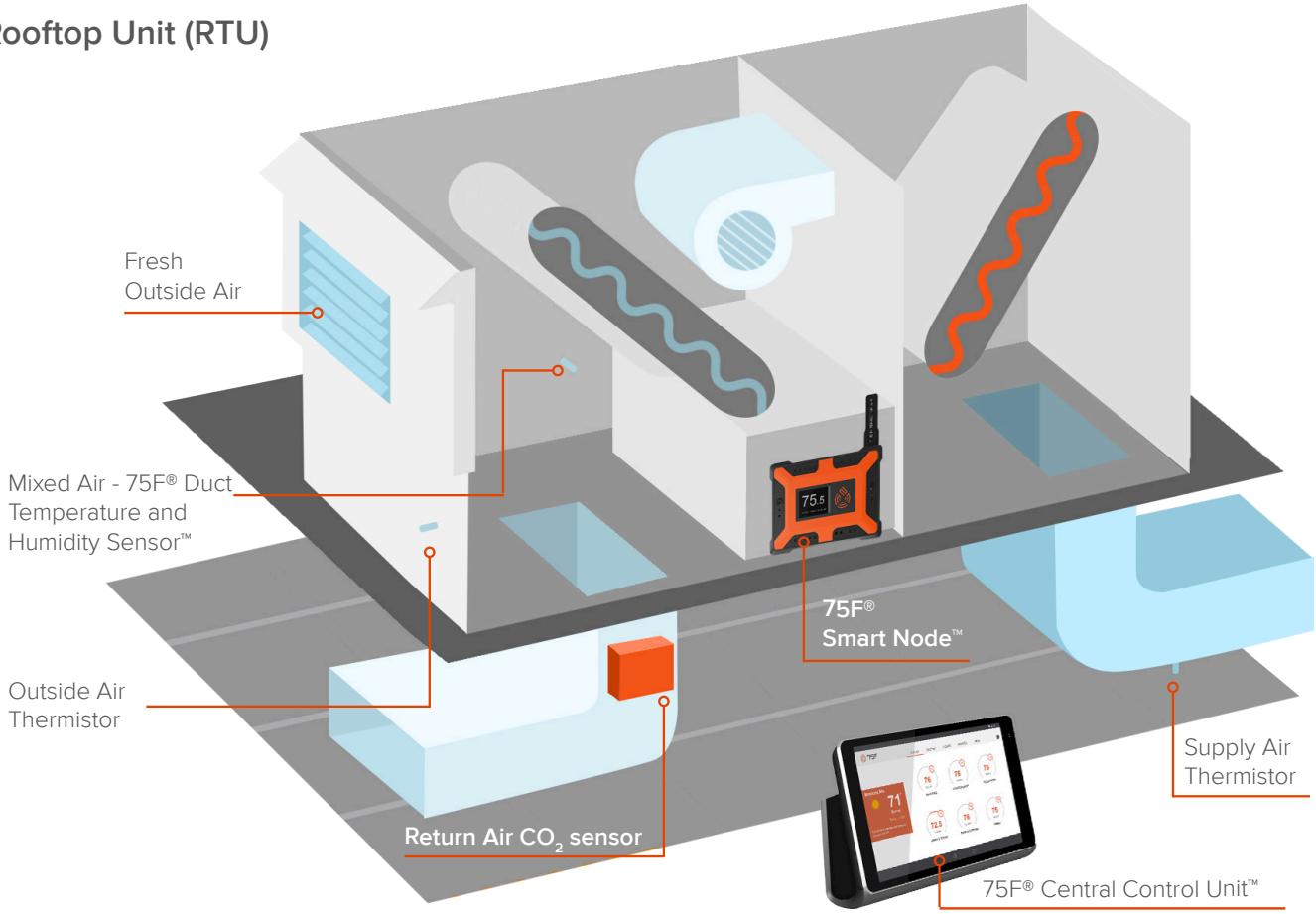
# 75F® Outside Air Optimization™ (OAO)

## Save Energy, Provide Comfort and Improve Indoor Air Quality

### Rooftop Unit (RTU)




## PRODUCT OVERVIEW

75F has reinvented the rooftop unit (RTU) economizer to make it more energy efficient and comfortable for occupants. 75F® Outside Air Optimization™ (OAO) upgrades existing economizers with advanced controls comprised of Demand Control Ventilation (DCV) and Enthalpy Economy strategies boosted by 75F Artificial Intelligence and predictive analytics. Equipped with cloud computing data storage and processing power, the OAO is much more efficient than the standard economizer controller found in existing units. The system senses Outside Air Temperature (OAT). Retrofit your economizer with 75F OAO and save up to 40% of your utility cost! Due to its simplicity and ease of installation, payback is typically only one year. Beyond significant energy savings, 75F OAO can deliver Indoor Air Quality (IAQ) and differential pressure management.

## WHAT'S INCLUDED

The 75F OAO kit for DCV and Enthalpy economizing includes a 75F® Smart Node™ controller, a CO2 sensor for return air duct mounting, temperature sensors (OAT, SAT, MAT) and the cloud-computing software suite Facilisight. You can opt to extend OAO functionality with adders for differential pressure management, as well as sensing to manage CO and NO2.

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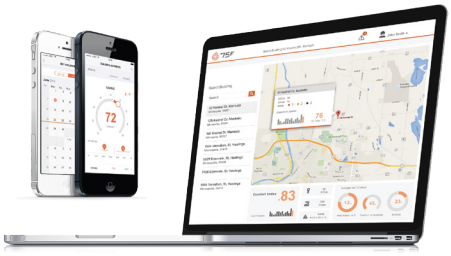
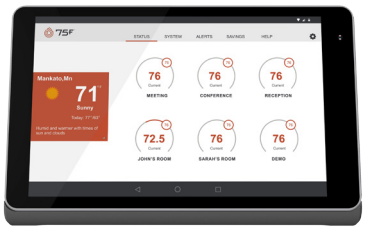
## Save Energy, Provide Comfort and Improve Indoor Air Quality

## COMPONENTS OF OAO



75® Facilisight™ & Occupant App



75® Central Control Unit™


75F® Smart Node™

75F® Duct Temperature & Humidity Sensor™ for MAT

(2) ACI A/CP-DO-4” Bullet Thermistor for OAT and SAT

ACI A/SCTV-50 Current Transformer

ACI ESENSE D $CO_2$ Sensor

## PRODUCT OPTIONS

| Standard/Alternate | Product Description | Components | P/N |
|---|---|---|---|
| Standard | Smart Outside Air Optimizer Kit – DCV and Enthalpy Economizer | Smart Node, C02, DTH, CT, SAT, OAT | 3500 |

### Adders

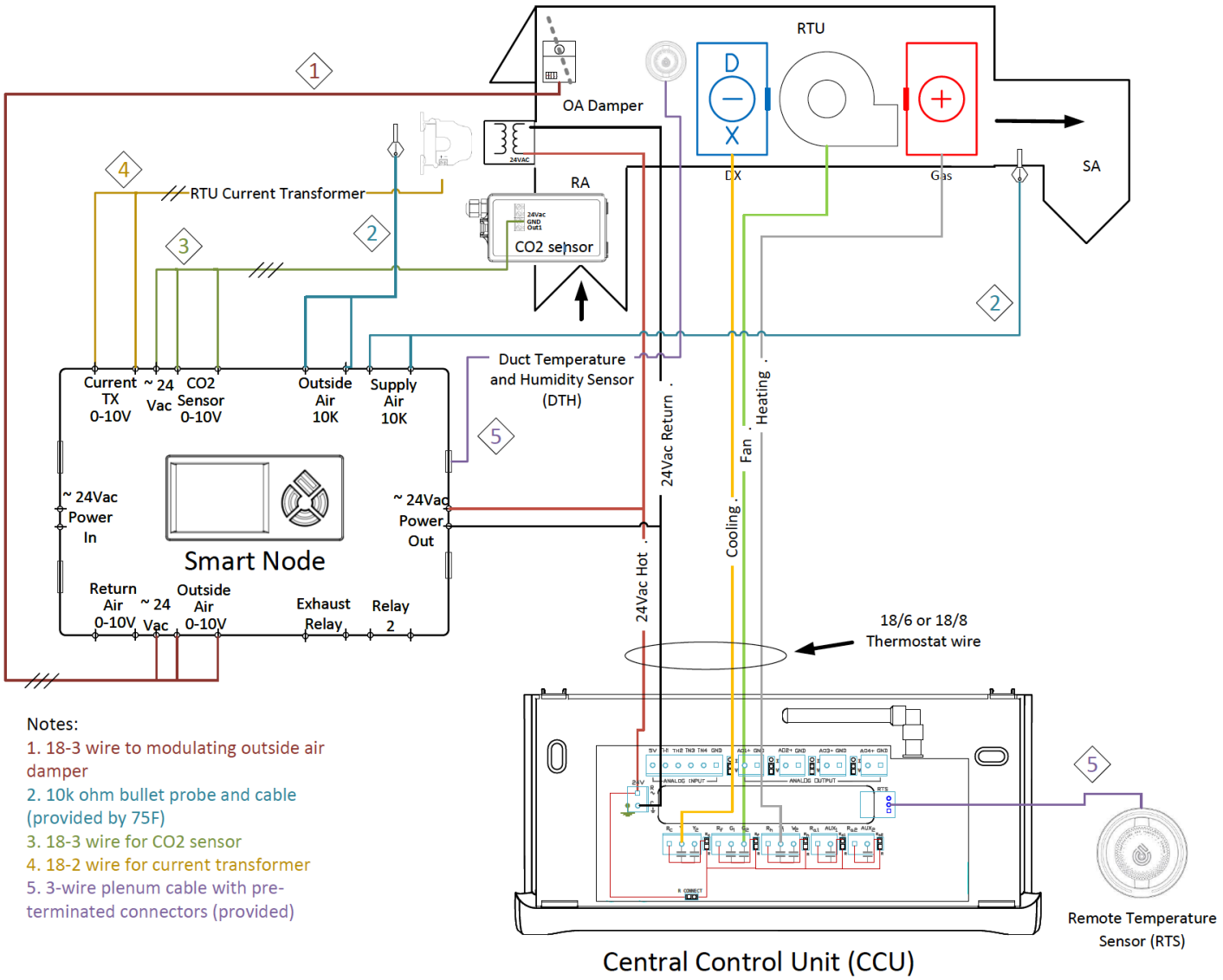
- Smart Differential Pressure Sensor Kit, with Smart Node, 24VAC Power Supply (#3510)
- $N0_2$ sensor
- C0 sensor

# 75F® Outside Air Optimization™ (OAO)

## Save Energy, Provide Comfort and Improve Indoor Air Quality

### LINE DRAWING

For comprehensive wiring, see installation guide

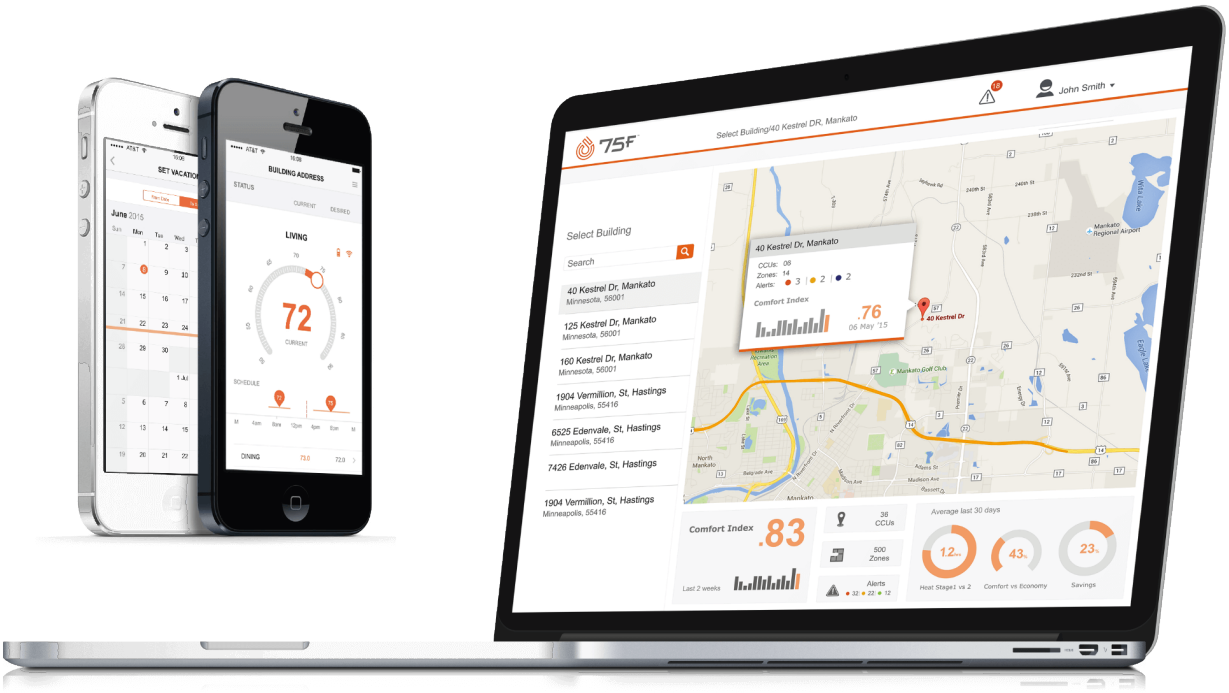



Notes:

1. 18-3 wire to modulating outside air damper
2. 10k ohm bullet probe and cable (provided by 75F)
3. 18-3 wire for CO2 sensor
4. 18-2 wire for current transformer
5. 3-wire plenum cable with pre-terminated connectors (provided)

# 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.

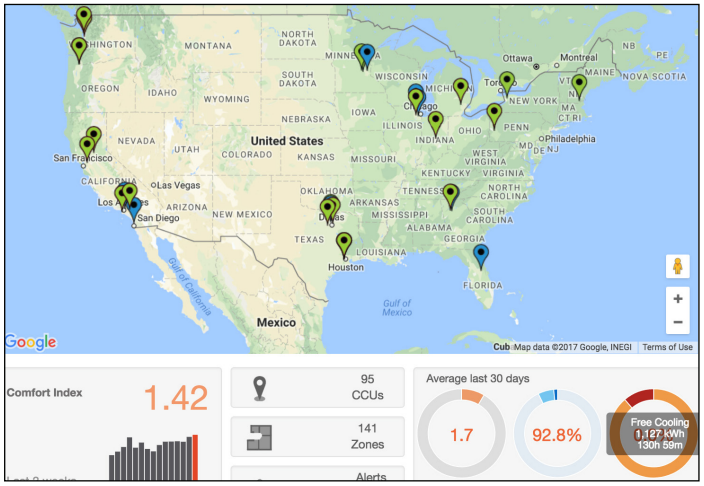
## FEATURES

- 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

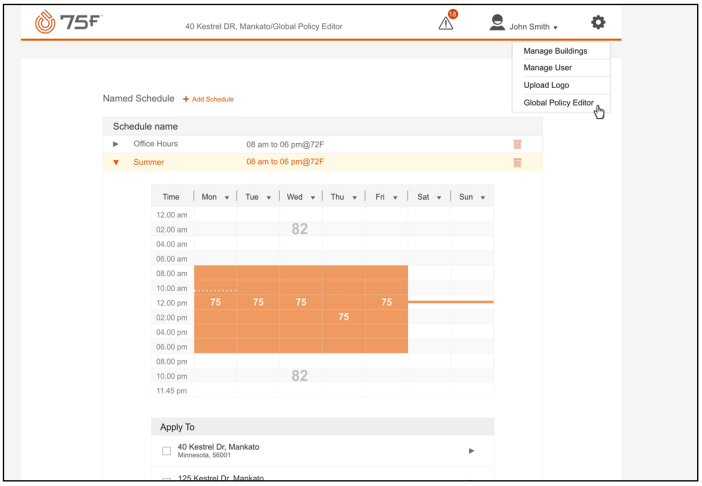
## APPLICATIONS

Facilisight is included standard in all our applications, including:

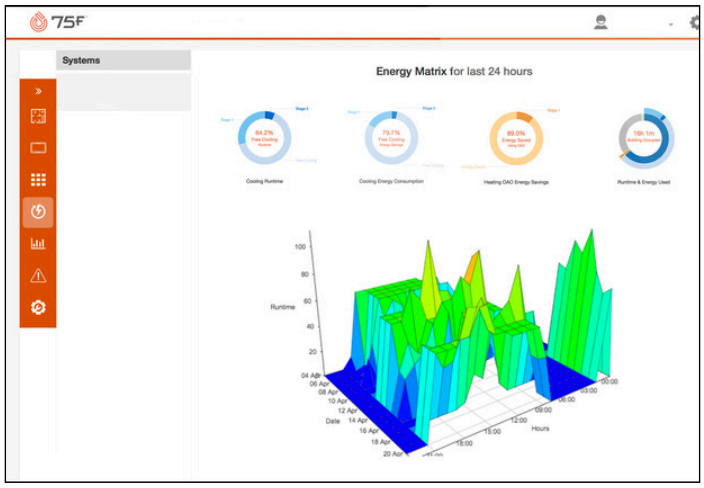
75F® Dynamic Airflow Balancing™
75F® Outside Air Optimization™
75F® Smart VAV with Reheat™
75F® Hydronic Controls™
75F® Single Stage Equipment Controls™
75F® Advanced Lighting™



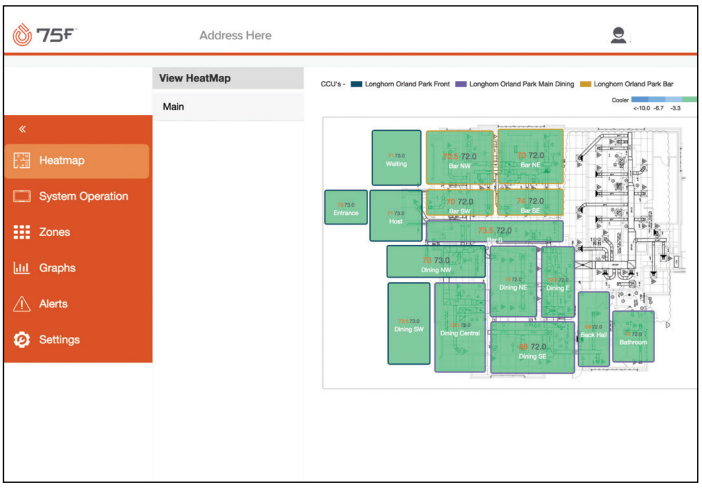

The home page allows you to take in a big picture view of your entire portfolio of buildings, looking at current energy savings, alerts and more.




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.

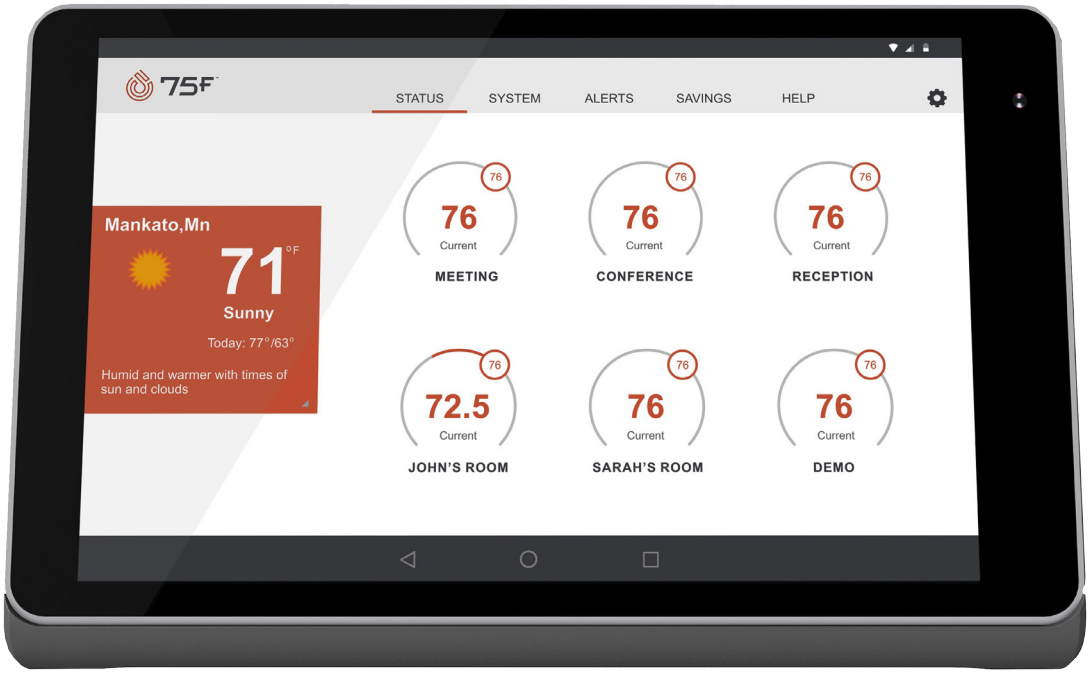



Energy usage analysis provides insight into equipment performance, which can help predict failures and verify service actions.




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™

Facilisight, our suite of web and mobile apps, allows for remote monitoring and control of your smart HVAC or lighting system. Oversee and manage the 75F system across all your sites. Compatible with iPhone, iPad, Android phones and all major web browsers. User app enables occupants to personalize temperature and lighting.

## APPLICATIONS

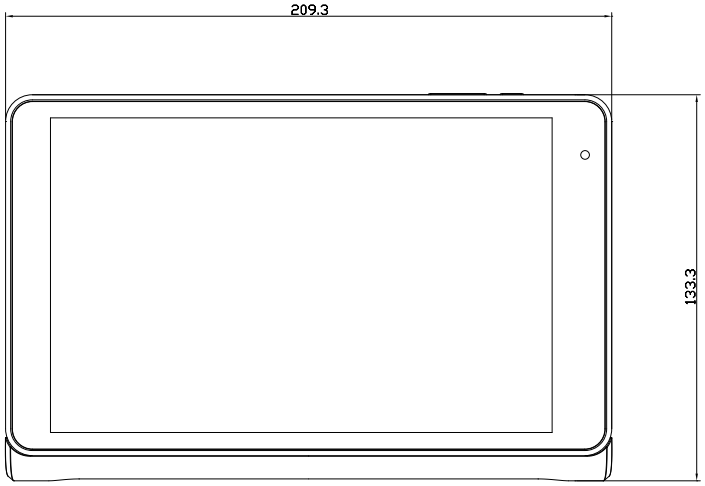
Software-defined hardware enables dynamic application assignment:

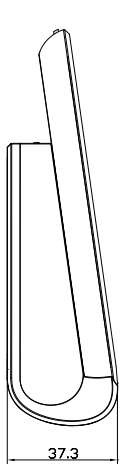
75F® Dynamic Airflow Balancing™
75F® Outside Air Optimization™
75F® Smart VAV with Reheat™
75F® Hydronic Controls™
75F® Single Stage Equipment Controls™
75F® Advanced Lighting™

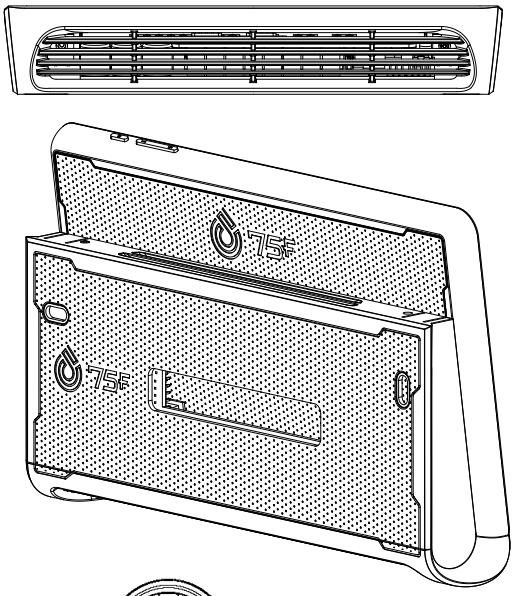
Additional applications can use IFTT logic for processes, with software-defined configurations.

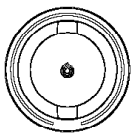
# 75F® Central Control Unit™ (CCU)

## DIMENSIONS (mm)





RTS Sensor

## INCLUDED

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

## 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™

Facilisight, our suite of web and mobile apps, allows for remote monitoring and control of your smart HVAC or lighting system. Oversee and manage the 75F system across all your sites. Compatible with iPhone, iPad, Android phones and all major web browsers. User app enables occupants to personalize temperature and lighting.

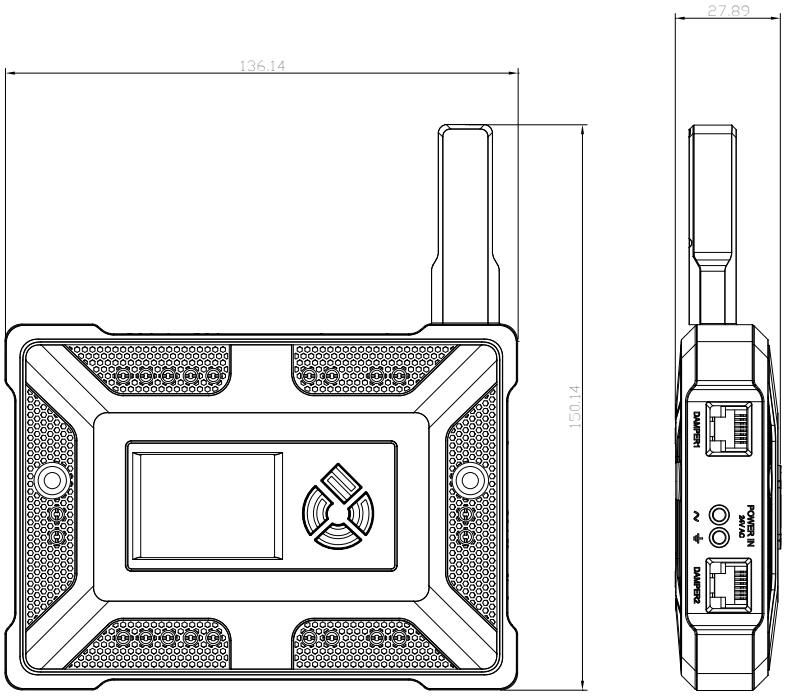
## APPLICATIONS

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™

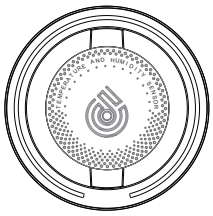
Additional applications can use IFTT logic for processes, with software-defined configurations.

## 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® Duct Temperature & Humidity Sensor™ (DTH)

## PRODUCT OVERVIEW

The 75F® Duct Temperature and Humidity Sensor™ (DTH) offers high-precision measurement pre-calibrated from the factory for measuring comfort factors of temperature and humidity. The DTH is easily mounted on an RTU duct by self-drilling screws.

The DTH uses a proprietary 1-wire protocol to communicate with other devices such as the 75F® Smart Node™.

## FEATURES

- Accurate temperature readings
- Accurate humidity readings
- Sleek design, low impact aesthetics
- 4 side venting holes on pipe
- Variable pipe length

## 75F® FACILISIGHT™

Facilisight, our suite of web and mobile apps, allows for remote monitoring and control of your smart HVAC or lighting system. Oversee and manage the 75F system across all your sites. Compatible with iPhone, iPad, Android phones and all major web browsers. User app enables occupants to personalize temperature and lighting.

## APPLICATIONS

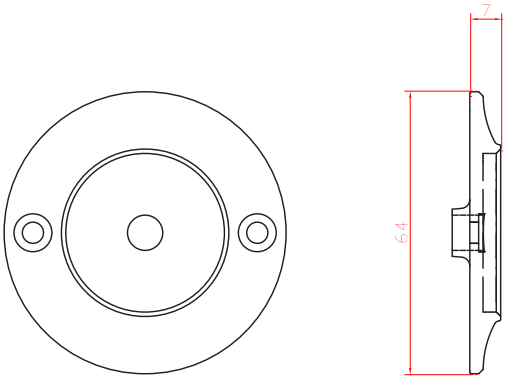
Software-defined hardware enables dynamic application assignment:

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

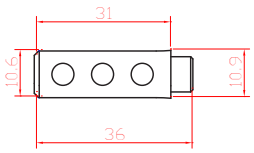
Additional applications can use IFTT logic for processes, with software-defined configurations.

# 75F® Duct Temperature & Humidity Sensor™ (DTH)

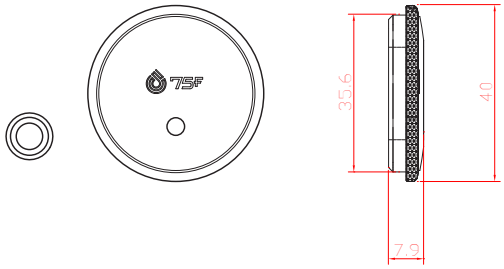
## DIMENSIONS




DTH - Back Plate




DTH - Pipe




DTH - Front Plate

## INCLUDED

- (1) Duct Temperature & Humidity Sensor (DTH)

## DTH SPECIFICATIONS

| GENERAL | |
|---|---|
| Mounting | Self-drilling screws, requires 1/2" hole in duct |
| Termination | 3 pin connector |
| Dimensions | Back plate: 64mm diameter, 7mm depth; Pipe: 36mm length, 10.6mm 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 |

# A/CP-DO-4”

## 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) |

# A/SCTV-50


## PRODUCT OVERVIEW

The A/SCTV series current sensors monitor the current flowing to electrical equipment or buildings. The magnitude of this current is then converted into a linear 0 to 10 VDC output signal, which can be monitored by your Building Management, DDC, or PLC controller. In addition, they offer jumper selectable input ranges. The A/SCTV series current sensors are fast acting and extremely accurate from 5% to 10% up to 100% of the FSO (Full Scale Output) depending on the model being ordered. They are factory calibrated using a NIST Traceable standard and shipped with the jumper placed in the largest jumper selectable range. The power for the A/SCTV series current transmitter is induced from the conductor being monitored. This means that no external power supply is necessary for the installation of these sensors. Since these units have a split-core design, they make an excellent choice for existing installations because you will not have to power down the unit and disconnect any wires during the installation process. The A/SCTV-50 current transmitter has jumper selectable ranges of 0-10, 0-20, and 0-50Amps.

## SPECIFICATIONS

| | | |
|---|---|---|
| **Sensor Power** | Induced from monitored conductor | |
| **Output Voltage** | A/CTE & A/SCTE Series: 0 to 5 VDC | A/CTV & A/SCTV Series: 0 to 10 VDC |
| **Amperage Ranges** | 0 to 250A (See ordering information) | |
| **Accuracy** | A/CTE & A/SCTE: +/- 1.0% (2 to 100% FSO) | A/CTV & A/SCTV: +/- 1.0% (5 to 100% FSO) |
| **Response Time** | A/CTE & A/SCTE: <100 mS | A/CTV & A/SCTV: <100 mS |
| **Operating Frequency Range** | 50 to 600 Hz | |
| **Isolation Voltage** | 2,200 VAC | |
| **Maximum Sensing Current Voltage** | 600 VAC | |
| **Aperture (Hole) Size** | 0.75" DIA (insulated conductors required) | |
| **Din-Rail Size** | 35mm | |
| **Operating Temperature Range** | -15 to 40ºC (5 to 104ºF) | |
| **Operating Humidity Range** | 0 to 95% RH, non-condensing | |
| **Product Dimensions** | Split Core: (L) 3.33" (W) 1.08" (H) 2.70" | Solid Core: (L) 3.38" (W) 0.98" (H) 2.27" |

## PRODUCT OVERVIEW

The ESENSE room and duct transmitters monitor the carbon dioxide (CO2) levels in industrial, school, and office type environments. The concentration of CO2 is a good indication of the overall indoor air quality. The ESENSE Series is based on a single beam non-dispersive infrared technology and is a cost-optimized solution for the climate control of buildings and other processes. In addition, ABC software eliminates the need for manual calibration. The ESENSE Series measures the CO2 concentration in the ambient air up to 2,000 ppm and converts the data into an analog output. This data can be used in conjunction with a Building Automation or Demand Control Ventilation System to decrease energy consumption while creating a healthier indoor climate. Units come with combined outputs of 0-5VDC and 4 to 20mA or 0-10VDC and 4 to 20mA.

## SPECIFICATIONS

| | |
|---|---|
| **Accuracy (0-70ºC)** | Single Point: +/-0.2ºC (+/-0.36ºF) |
| **Stability** | +/-0.13ºC (+/-0.23ºF) |
| **Interchangeability** | +/-0.2ºC (+/-0.36ºF) |
| **Operating Temperature Range** | -40 to 302ºF (-40 to 150ºC) |
| **Sensor Output [A/AN]** | 10KΩ @ 77°F (Type III) |
| **Sensor Output [A/CP]** | 10KΩ @ 77°F (Type II) |
| **Sensor Output [A/3K]** | 3KΩ @77°F (25°C) |
| **Sensor Output [A/1.8K]** | 1.8KΩ @77°F (25°C) |
| **Sensor Output [A/20K]** | 20KΩ @77°F (25°C) |
| **Sensor Output [A/100KS]** | 100KΩ @77°F (25°C) |

| | |
|---|---|
| **Sensor Output [A/10KS]** | 10KΩ @77°F (25°C) |
| **Sensor Output [A/2252]** | 2252Ω @77°F (25°C) |
| **Sensor Output [A/CSI]** | 10KΩ @77°F (25°C) |
| **Sensor Output [A/AN-BC]** | 10KΩ with 11K Shunt |
| **Sensor Output [A/10K-E]** | 10KΩ @77°F (25°C) |
| **Sensor Output [A/10K-E1]** | 10KΩ @77°F (25°C) |
| **Power Dissipation Constant** | 3 mW/ºC |
| **Operating Humidity** | 10 to 95% RH non-condensing |
| **Product Dimensions** | Please reference pages 5, 6, 7 & 8 |