

# Air Handling Unit Controller

## US5182



## Overview

The US5182 Advanced Air Handling Unit (AHU) Controller provides advanced control functionality such as air volume control, dehumidification, face and bypass control, and demand ventilation through the use of a CO<sub>2</sub> sensor. The unit is an upgrade from the SZ2182, and can be used as a direct replacement for the SZ2182.

The US5182 AHU Controller's redesigned housing features all connectors on the side rather than on the face, which makes wiring easier and neater. Its large, easy-to-read LCD display can be used for initial setup, monitoring, and for making changes to some settings. The unit also includes additional Input/Output ports, and has the ability to control a digital or analog output directly from an analog input.

The AHU Controller has inputs suitable for temperature, humidity and pressure sensing, and outputs for control of heating and cooling equipment, dampers, VFDs, and other equipment. Control options include hot deck/cold deck control, and economizer control using multiple strategies,

including enthalpy comparison. The US5182 supports outdoor air temperature heating and cooling lockouts, fan proving, and the ability to monitor filter status. It has a setpoint shift feature, which uses a digital input to shift the heating and cooling setpoints.

The US5182 can be programmed with a 365-day time clock with vanishing holidays, two setback intervals per day, and automatic leap year and daylight saving time adjustments. It has adjustable offsets and differentials on digital outputs and PID control algorithms on modulating outputs. The US5182 utilizes non-volatile memory, so that in the event of a power loss, all programmed operating parameters and control functions are unaffected; it does not require the use of a battery backup.

The communications protocol for the US5182 AHU Controller is in accordance with EIA RS-485 standards. The US5182 provides RS-485 communication via BACnet MS/TP or TCSbus, as well as BACnet IP.

## Features

- LCD display with menus for programming, monitoring, and commissioning
- Stand-alone or network operation
- Ethernet port with BACnet IP for power over Ethernet
- 365-day time clock with two holiday schedules, automatic leap year, and daylight savings correction
- Discharge air sensor input with high and low limits and reset
- Hot deck/cold deck control with night zone option
- Outdoor air sensor input with heating & cooling lockouts
- Six stages of heating and cooling
- Quick setup wizard
- Modulating output for heating and cooling
- Configurable modulating economizer output
- Modulating output for fan or damper control
- Programmable minimum run times
- Adjustable delay on power-up for soft starts
- PID control options
- Smart Recovery for anticipatory heating/cooling
- Five multicolor status LEDs
- Remote setpoint capability
- User setpoint adjustment limits
- Local override with remote override capability
- CO<sub>2</sub> demand control ventilation
- Auxiliary time clock output
- Fan interlock safety option
- Equipment monitoring inputs and indication
- External time clock input
- Dehumidification sequences with integrated or external reheat
- Face and Bypass control sequence
- Outdoor air humidity sharing capability
- Pre-occupied purge sequence
- Heat pump control functions

## Configurable Applications

- Economizer control with fault detection
  - Dry bulb
  - Indoor/outdoor enthalpy comparison
- Outdoor enthalpy
- Hot deck/cold deck
- Dehumidification with reheat
- PID control
- Demand ventilation
- Face and bypass control
- Discharge zone control
- Discharge air control
- Heat pump reversing valve control
- Pre-occupancy purge
- Smart recovery
- Hot water, chilled water, mixed valve control
- Modulating output for frequency drive for fan speed control

## Specifications

### General

**Accuracy:** +/- 0.5%

**Communications:** RS-485, half duplex, or Ethernet

**Memory backup:** Flash, no battery required

**Override:** Programmable from 0 – 168 hours

**Certifications:** Compliant with / FCC / RoHS / directives.  
Listed by BACnet International/BTL.

### Environmental

**Operating temperature:** 32–131°F (0–55°C) Operating  
humidity: 0–100% RH, non-condensing

**Storage temperature:** 14–140°F (-10–60°C)

### Electrical

**Supply voltage:** 24VAC +15%, -5%, 50/60 Hz

**Inputs:** Six 1000  $\Omega$  PRTD, six 4-to-20mA analog, six digital  
(dry contact), one 0–5V, one 0–10V

**Range:** Space and Return: 20 to 120°F Discharge Air Temp:  
20 to 220°F Mixed Air Temp: 20 to 220°F

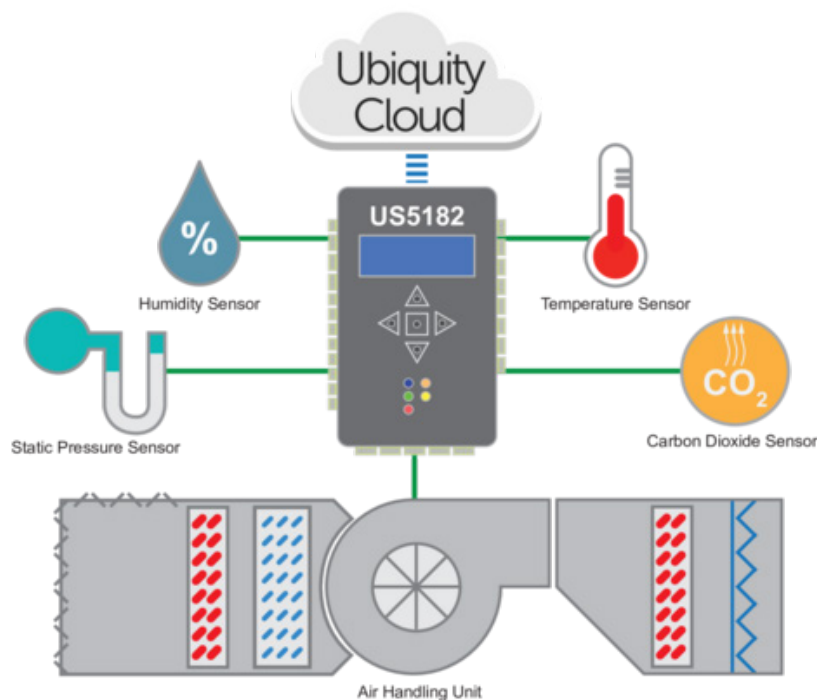
**Outdoor Air Temp:** -40 – 160°F

**Outputs:** Eight digital (SPST dry contact, 24VAC @ 2A), six  
4-to-20mA analog, one 0–5V, one 0–10V

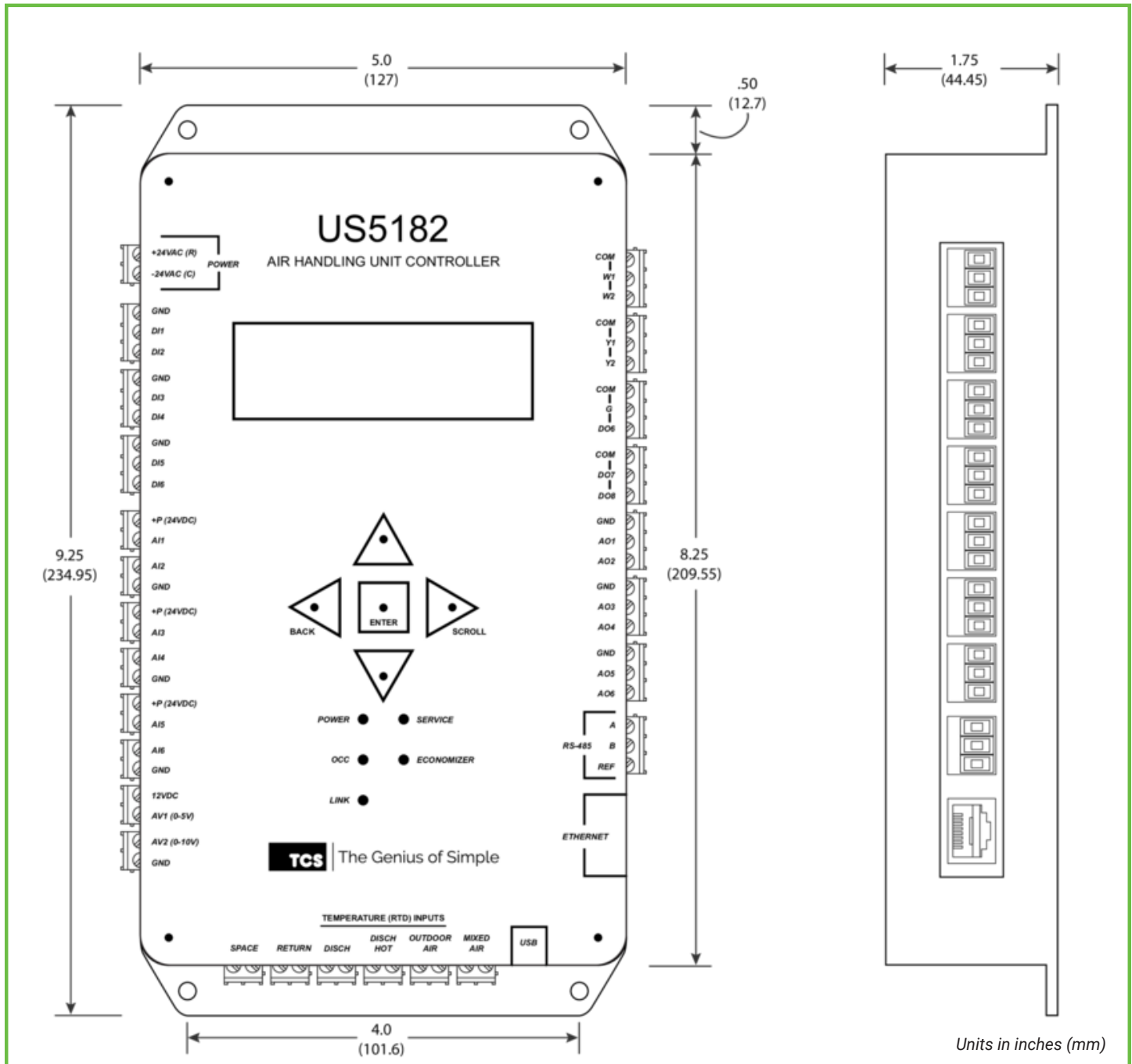
**Max Load Resistance (analog output):** 1000  $\Omega$  Common  
mode rejection: 100 db @ 60 Hz Power Consumption:  
15VAC max.

*Specifications subject to change without notice.*

## Sample Installation



## Dimensions



## US5182 Programming

The features and applications for the US5182 AHU Controller are fully programmable via the Internet through the TCS Ubiquity Cloud platform. Alternatively, you can connect the unit directly to a laptop computer via the built-in USB-C Port and using a service software tool, such as TCS Insight.

When the US5182 controller is connected to a BACnet network, the BACnet objects are displayed in Ubiquity Cloud

or in another BACnet explorer environment, through which you can configure the desired parameters.

Utilizing the LED display and selection buttons, you can view menus for controller operation including system status, functions, control points, and setpoints. In addition, the face of the US5182 AHU Controller has colored LED status lights that visually indicate occupancy, economizer, and service status.

The built-in quick setup wizard guides you through the basic settings and network configuration.

The BACnet object list is extensive. You can configure the US5182 AHU Controller using different modes for managing the operation of more complex HVAC systems. For enhanced needs and supplemental operation, you can add additional control loops and functions.

## Accessories

The US5182 is a highly versatile controller which can be programmed to accommodate a wide range of applications. Below are some of the most commonly ordered accessories (if you don't see an accessory to suit your specific application, contact TCS (800.288.9383):

Descriptions of object properties are understandable, plainly written, and available for use in Ubiquity Cloud or other integrated BACnet networks. Setpoints, schedules, and overrides are all set via BACnet communications or through the TCSbus communications.



**QD2040c Building Manager**  
*TCSbus & Modbus Communication*



**QD3041 Building Manager**  
*BACnet Communication*



**QD1010b Converter**  
*USB to RS-485*



**PC2002 CO2 Sensor**  
*Indoor Wall Mount*



**P01124 Occupancy Sensor**  
*Indoor Wall Mount*



**TS2000 Temperature Sensor**  
*Indoor Wall Mount*



**PHR1000 Humidity Sensor**  
*Indoor Wall Mount*



# Accessories



**TS3000 Temperature Sensor**  
Indoor Wall Mount



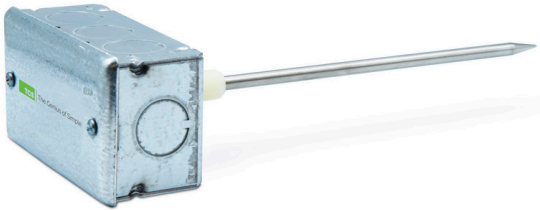
**PHO1000 Humidity Sensor**  
Outdoor Sensor



**PHD1000 Humidity Sensor**  
Indoor Duct Mount



**PS2001 Current Switch**  
Split Core



**TS1002 Discharge Air Sensor**  
Duct Mount



**TT2000a Photocell**  
Outdoor Analog



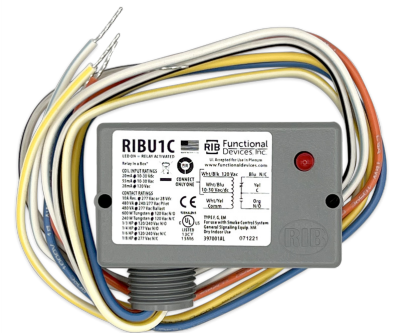
**TS1005 Temperature Sensor**  
Pipe Strap On



**TX1140 Remote Sensor**  
Setpoint Adjustment & Override



**PI3100 BAS Router**  
BACnet IP to MS/TP



**PR1121 Encased Relay**  
SPDT, Manual Override

Products shown are not to scale