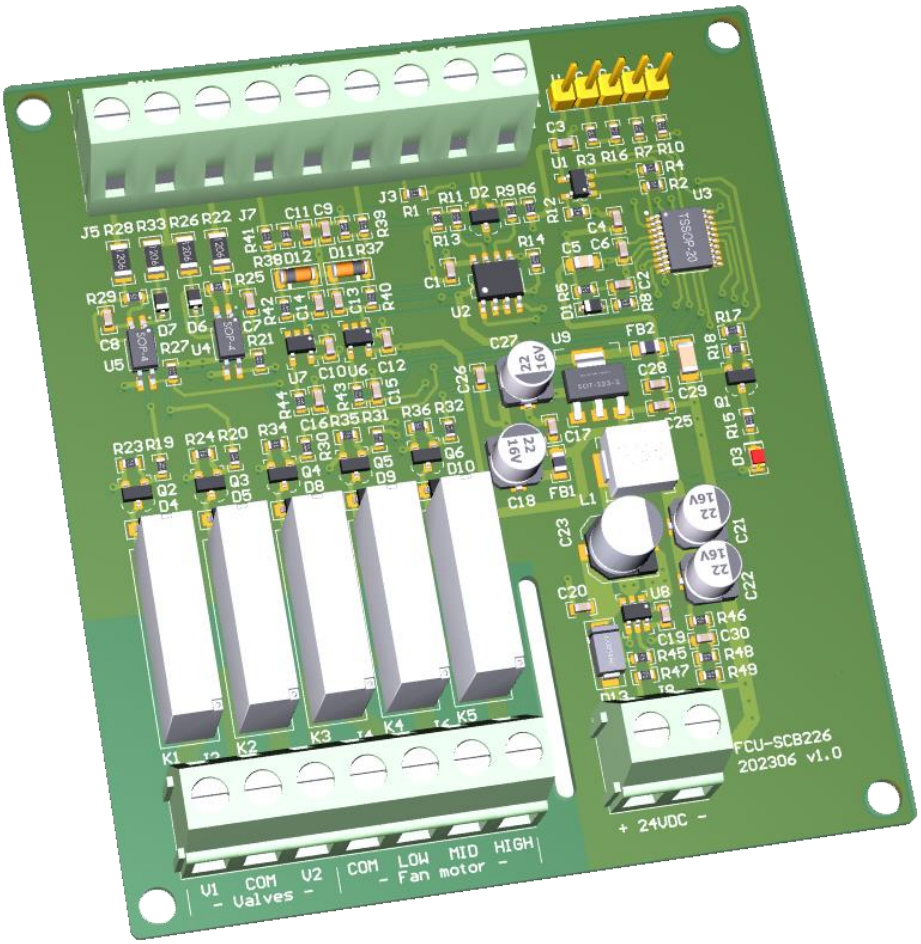
Fan Coil Unit Control Board



User Manual

Model: *FCU-SCB226*

Version: *v1.0*

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1. Description

The FCU-SCB226 control board is designed for remote control (via RS-485 interface) of 2/4-pipe fan coils. Has the ability to measure temperature using an external NTC 10K sensor up to 2 channels.

It can be used in various industries such as home, hotel and greenhouse automation as a fan coil remote control unit from a central control and monitoring station.

Table 1: Specifications

SPECIFICATIONS	
Analog inputs (for NTC 10k Thermistors)	2
Number of discrete digital inputs	2
Number of valve control relay outputs	2
Number of fan control relay outputs	3
RS485 Slave ports	1
Control board supply voltage	12-24V DC
Control board supply current	Max. 1.0A
Operating temperature	-20 / +70 ^{0}C

The fan coil control unit receives commands and sends monitoring data from/to the remote server via the RS485 interface port, where it acts as a slave device and is compatible with the Modbus RTU protocol.

It has possibility to measure temperature on two independent channels through external NTC 10k sensors. Depending on the application, the temperature of the inlet and outlet air, the fan coil heat exchanger and the hot or cold water pipes can be measured.

Digital inputs can be used as limit switches for motorized valves.

Relay outputs are divided into two groups - valve control and fan control. Dual valve control can be used to control two independent solenoid valves, one each for hot and cold pipes, or in combination to control a single motorized proportional valve.

2. Main components

Figure 1 shows a general view of the fan coil control circuit board, and the labels on it show the main components, which will be discussed below.

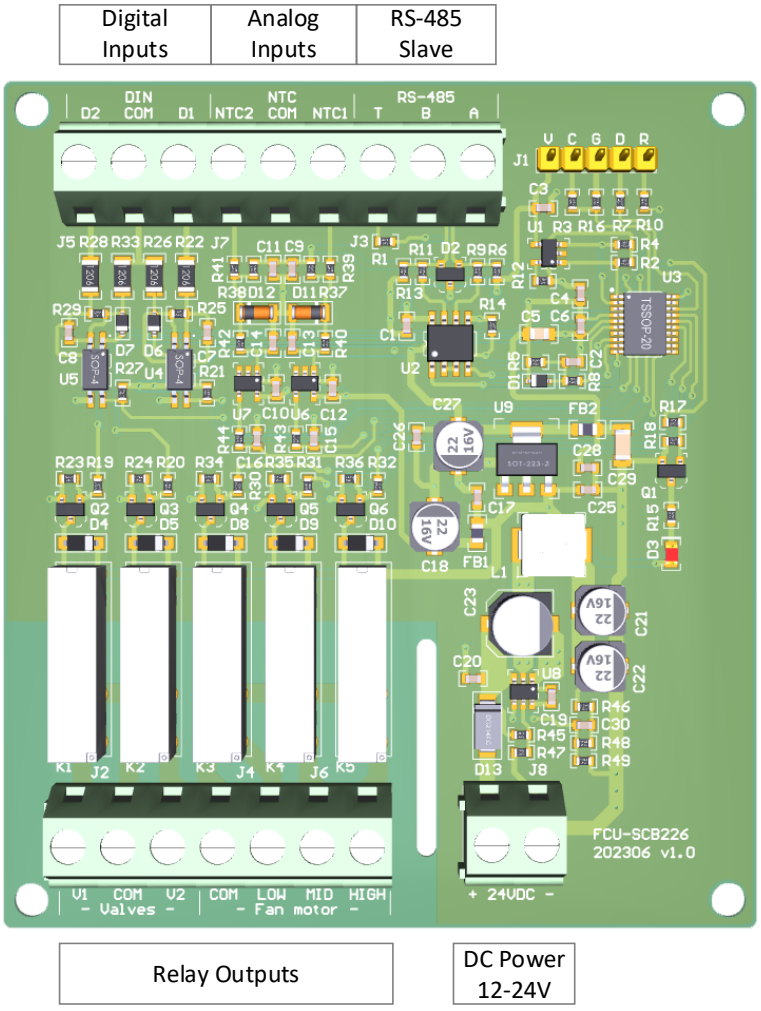

Figure 1: General view of the control board

Table 2: Connection points

Number	*Connector*	*Description*
1	J8	DC power supply connector: 12-24V DC up to 1.0A
2	J7	Dual analog input connector for NTC thermistors
3	J3	RS485 interface connectors
4	J5	Digital inputs connectors
5	J2, J4	Relay outputs connectors

3. Wiring connections

The board is powered by a 12-24V DC source using a 2-wire circuit – VDD and GND. Figure 2 shows power supply connection points.

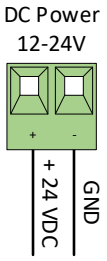

Figure 2: DC power supply connector

Two analog inputs measure temperature using an ADC with 12-bit accuracy. The connection diagram for analog channels is shown in Figure 3.

Both analog channels are intended for temperature measurement using an NTC-10K remote thermistor. The accuracy of temperature measurement depends on the parameters of the NTC-10K thermistor.

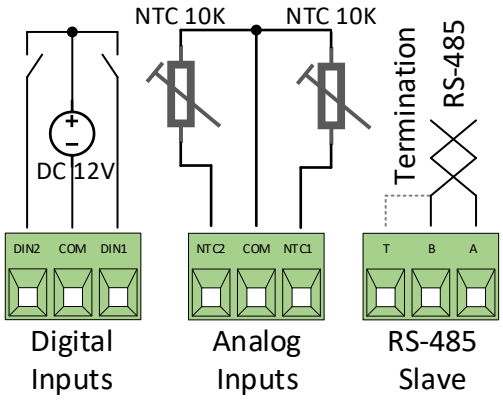

Figure 3: Digital, Analog and RS485 connectors

There is one RS485 connectors to which wires A and B of the RS485 bus are connected, and in the case when the device is at the end of the bus, by shorting the T terminal to the B terminal we add a 120 Ohm bus terminator. The connection diagram is shown in Figure 3.

The FCU control board has one pair of optically isolated digital inputs. The digital input requires an external power source. The digital input connections are shown in Figure 3.

The FCU control board has 2 groups of NO relay outputs to control external devices such as valves and fan motor. Each relay contact has a switching capacity of 5.0 A at 250 VAC. In fact, there are 5 independent relays with NO contacts on the board. The V1-VCOM-V2 pins are for connecting to motorized or solenoid valves, and the FCOM-LOW-MID-HIGH pins are for connecting to a fan motor and controlling the fan speed. The relay connections are shown in Figure 4.

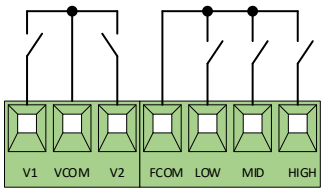

Figure 4: Relay outputs connectors