Air Quality System II - Extension of the Features of the Air Quality System

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Laboratory 11 Tasks

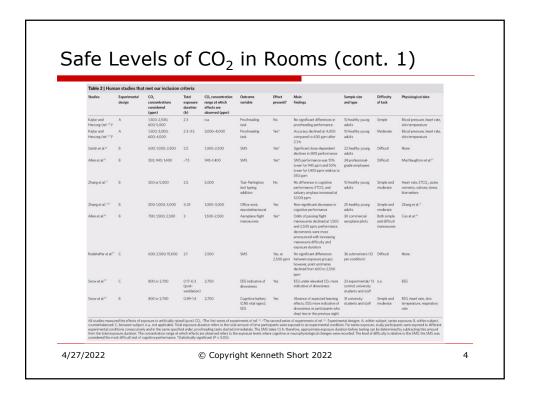
- ☐ Task 1: Sending CO2, Humidity, and Temperature to a Remote Location.
- ☐ Task 2: Simple Display of CO2 Level
- ☐ Task 3: Doxygen Documentation of Your Multi-Module Program.

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hat are safe levels of CO and CO2 in rooms?	
02	
250-400ppm	Normal background concentration in outdoor ambient air
1,000ppm	Concentrations typical of occupied indoor spaces with good air exchange
,000- 2,000ppm	Complaints of drowsiness and poor air.
2,000-5,000 ppm	Headaches, sleepiness and stagnant, stale, stuffy air. Poor concentration, loss of attention, increased heart rate and slight nausea may also be present.
5,000	Workplace exposure limit (as 8-hour TWA) in most jurisdictions.
40,000 ppm	Exposure may lead to serious oxygen deprivation resulting in permanent brain damage, coma, even death.
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Safe Levels of CO₂ in Rooms (cont. 2)

Normal CO2 Levels

The effects of CO2 on adults at good health can be summarized to:

- normal outdoor level: 350 450 ppm
- acceptable levels: < 600 ppm
- · complaints of stuffiness and odors: 600 1000 ppm
- · ASHRAE and OSHA standards: 1000 ppm
- · general drowsiness: 1000 2500 ppm
- adverse health effects may be expected: 2500 5000 ppm
- maximum allowed concentration within a 8 hour working period: 5000 10000 ppm
- · maximum allowed concentration within a 15 minute working period: 30000 ppm

The levels above are quite normal and maximum levels may occasionally happen from time to time. In general - ventilation rates should keep carbon dioxide concentrations below 1000 ppm to create indoor air quality conditions acceptable to most individuals.

Extreme and Dangerous CO2 Levels

- · slightly intoxicating, breathing and pulse rate increase, nausea: 30000 40000 ppm
- · above plus headaches and sight impairment: 50000 ppm
- · unconscious, further exposure death: 100000 ppm

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Using a Multicolor Bar Graph LED to Simply Indicate CO₂ Quality in a Room



Turn ON the bottom LED for CO_2 concentrations from 400 to 499 ppm. Then turn ON the bottom two LEDs for concentrations from 500 to 599 ppm, and so on.

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