Techmark, Inc.
SOP M303-2 Techmark CO2 Trouble Shooting
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The Techmark GMD-20 CO2 analyzer is used in mushroom farms for monitoring the CO2 inside a room. The F765 takes the signal from the analyzer and converts it parts per million (ppm) and then uses the reading for control. At times, there are issues with CO2 readouts so it is always best to start with the fundamentals of trouble shooting.

The GMD-20 is powered with 24vac and it sends out a 0-10vdc signal via 4 conductor shielded wire (Red=24vac Hot, Black=24vac Common, White=Positive DC output, Green=Negative DC output). When powered correctly (Red and Black wires), the GMD-20 has a flashing white light being emitted from the lance area.

For mushrooms, the GMD-20 is calibrated to 10,000ppm which correlates with the 0-10vdc. For instance, 1,000ppm ~ 1.0vdc, 5,000ppm ~ 5.0vdc and 10,000ppm ~ 10.0vdc. The F765 receives this signal on an analog input via the White wire (+) and the Green wire (-), typically 0.6, 0.12, 0.18 or 0.24 (depending on the programming, please refer to installer codes and drawings). The F765 input has to be programmed, both hardware and software, to accept this 0-10vdc input.

1. Check to see if the white light is blinking on the GMD-20 lance.
    a. If not blinking, then check the 24vac power supply
        i. Check voltage inside transformer box at left side of terminal strip for either 120vac/208vac/240vac.
            1. Check breaker and connections to restore power.
        ii. Check voltage inside transformer box at right side of terminal strip for 24vac between the Red and Black wire for room with problem.
            1. Check voltage directly at the transformer on right side.
        iii. Check 2 amp fuse in transformer box for room with problem.
            1. Check fuse is good and inserted properly into holder.
        iv. Check voltage inside GMD-20 between the Red and Black wire at terminal per wiring diagram.
            1. Carefully remove cover and check power on terminals: Red, Black
            2. If no power, check electrical connections inside both electrical connector at the RH box. Rust affects these male/female connectors and may corrode. Red=1, White=2, Black=3, Green=_⏚_ (ground sign).
    b. If blinking, and 24vac power is measured, then check 0-10vdc output signal at GMD-20 at terminals: White, Green. Note, white light on lance may still blink even though no signal is measured.
        i. If no 0-10vdc signal at GMD-20, then remove White and Green wires and measure 0-10vdc signal at GMD-20. If ok, then wire is bad.
        ii. If no 0-10vdc signal at GMD-20 with wire disconnected, then turn power off and replace GMD-20.
        iii. If 0-10vdc signal is measured at GMD-20, check electrical connections inside both electrical connectors at the RH box. Red=1, White=2, Black=3, Green=_⏚_ (ground sign).
    c. If electrical connectors are okay, then measure the 0-10vdc at the corresponding Analog Input of the F765.
        i. If you do not know which input it assigned to, then:
            1. Go to System button 22, enter password, default is button 20.
            2. Go to Assign Inputs with > arrow selection.
            3. Go to Room RH/CO2 with > arrow selection.
            4. Press v arrow until you see CO2.
            5. Type should be DIRECT.
            6. Switch Point should be 20000
            7. CO2 Low should be 0._6 or 0.12 or 0.18 or 0.24
                a. If programmed is not correct, then verify with As Built prints provided.
        ii. If no 0-10vdc signal is measured at F765, then inspect wire for damage.
        iii. If 0-10vdc signal is measured at F765, make sure White wire is on the AI# terminal and Green is on the GND terminal of the assigned input.

1. Check Analog Input JUMPER settings.
    a. For F765 IMC714, the jumpers are located on the top center. 2 rows. Bottom row right jumper is for Input 0._6. Top row right jumper is Input 0.12. The jumper should be in the top two pins (middle pin and top pin).
    b. For ISM.12, the jumpers are directly above the inputs on the terminal strip. The bottom jumper connecting the two bottom pins should be REMOVED.
        i. Remove jumper and reconnect on to only one pin. This is so the actual jumper is not lost.

d. If ALL above is okay but still no proper display, then to Analog Meas to check input setting.
    i. Go to System button 22, enter password, default is button 20.
    ii. Go to Assign Inputs with > arrow selection.
    iii. Go to Analog Meas with v arrow and select with > arrow.
    iv. Go to corresponding input found in Point 7 above.
    v. Type input should be Linear
    vi. Calibration Value should be 10,000
    vii. Zero Value should be 0
    viii. Span Value should be 11,000
e. If ALL above is okay but still no display on CO2 button 4.
    i. The F765 also has to be in a controlling phase (ie. Harvest 1) for the readout to appear in the CO2 readout.