Tank Monitor System:

The YJ-TMS can monitor up to 4 separate non-pressurized tanks of almost any liquid. The tanks can be of almost any size and shape, any material and up to 64" deep.

Operation:

The Tank Monitor System will "purge" approximately every 5 minutes. This action clears the tank tubes of water and debris. Water then fills back into the tank tube building pressure in the line. This is measured as "inches of water" in the tank.

The system is equip with an Auto-Fill feature that is capable of triggering a solenoid (not included) to automatically fill the fresh water tank. The on and off set points for this feature are adjustable via RS-232 communications. When armed, the solenoid will trigger and fill the tank at 25% low (Default) and shut off at 90% full (Default). These default levels can be set as desired.

During the Auto-Fill process, the tank will purge once per min for a very short time, ~ 1 second. If the system does not see the water level change over time while the tank should be filling, the system will shut the auto-Fill off within 10 minutes. This helps protect the Solenoid from "baking" and becoming stuck in the open or closed position.

Installation:

The YJ-TMS is equip with a Power Connector, Panel Connector, and a RS-232 Port. The unit can be located just about anywhere but usually in the same bay as the tanks. Install in a location that is easily accessible.

Mount the unit using 4 Stainless Steel screws recommended. Follow the instructions for installing the **Tank Tube Kits** and record each tube length from top of tank to bottom of tank tube. These measurements will be used later under **Tank Calibration**.

Power Connector: (See Schematic)
Pin 1: Ground   IMPORTANT: damage may result if miss-wired.
Pin 2: +12volt Power
Pin 3: N/C
Pin 4: N/C
Pin 5: N/C
Pin 6: Auto-Fill Solenoid Ground Output.
Pin 7: ALT OUTPUT (Ground Out)
Pin 8: ALT INPUT (not yet implemented)
Pin 9: Auto-Fill Indicator Ground Output
Pin 10: Auto-Fill Switch input

Panel Connector:

Connects to the optional display panel, Model number YJ-TLED bar graph display or the YJ-TLCD Touch panel display. Multiple Analog panels can be connected using this connection.

      PIN: (See Schematic)
      1. Ground
      2. +12v Output to power panel(s) 600ma max source
      3. Auto-Fill Switch Input from Panel(s)
      4. Auto-Fill Indicator output to Panel(s)
      5. AUX tank analog output, 0 - 5 volts
      6. Black Tank analog output, 0 - 5 volts
      7. Grey Tank analog output, 0 - 5 volts
      8. Fresh Tank analog output, 0 - 5 volts

RS-232 Connector:

The RS-232 port can be connected to a Laptop running any terminal software or connect to the YJ-TLCD touch panel display. Can also be used for a Crestron, AMS or other communications system.
The RS-232 port is also used to set tank limits and calibration.

PIN: (See Schematic)
    1. Ground
    2. RX
    3. TX

Communications:
Communication: 9600, 8, n, 1

Data is returned as a single string separated by Commas once per second.

Format: ffff,ff.f,ff,ff.f,gggg,gg.g,gg,gg.g,bbbb,bb.b,bb,bb.b,aaaa,aa.a,aa,aa.a,x0,x1,x2,x3,vv.v1,vv.v2,ee,ff;

ffff = Fresh Tank raw data NOTE: This value will always be 111
ff.f = Fresh Tank actual inches of water inside tank. (measured from bottom of tank tube)
ff = Fresh Tank % of full
ff.f = Fresh tank set height in inches.

gggg = Grey Tank raw data
gg.g = Grey Tank actual inches of water inside tank.
gg = Grey Tank % of full
gg.g = Grey tank set height in inches.

bbbb = Black Tank raw data
bb.b = Black Tank actual inches of water inside tank.
bb = Black Tank % of full
bb.b = Black tank set height in inches.

aaaa = Aux Tank raw data (Optional)
aa.a = Aux Tank actual inches of water inside tank.
aa = Aux Tank % of full
aa.a = Aux tank set height in inches.

x0 = Auto-fill status LED 0 = off, 1 = on
x1 = Auto-fill solenoid output active 0 = off, 1 = on
x2 = AUX output – Active Ground 1 amp MAX
x3 = not used

vv.v1 = 12 volt supply voltage reading.
vv.v2 = 24 volt voltage reading if used.

ee = Auto-fill trigger empty point 25% default
ff = Auto-fill trigger full point 90% default

Commands:
Commands are a single letter character followed by numerical information if needed and ending in a ";" plus carriage return.

TOGGLE_AUTO_FILL: Toggle the Auto-Fill ON or OFF
  Command: A;
  Parameters: none

SET_TANK_SIZE: Specify the tank size for tank calibration
  Command: Stxxx;
  Parameters:
    t = Tank number
      0 = Fresh
      1 = Grey
      2 = Black
      3 = Aux
    xxx = Size of tank in inches from 020 (2.0") to 600 (60.0") inches, do not include the decimal when sending the command.

  Example: To Set the fresh tank size to 25.5" send a command of "S0255;" To set the black tank to 14" send a command of "S2140;"

  Note: the tank size should be set to the length of the tube inserted into the tank. See tank tube installation instructions. Adjust the tank size values as needed for best accuracy.

SET_LOW_FILL: Set the low % level to trigger Auto-Fill ON
  Command: Lxx;
  Parameters:
    xx = Number between 5 and 95 percent. Low point cannot be set higher than the high point.

  Example: Set the low trigger level to 30% send a command of "L30;"

SET_HIGH_FILL: Set the high % level to trigger Auto-Fill OFF
  Command: Hxx;
  Parameters:
    xx = Number between 5 and 95 percent. High point cannot be set lower than the low point.

  Example: Set the high trigger level to 80% send a command of "H80"

ALT OUTPUT: Set ALT Output Active LOW (Ground when Active)
  Command: Rx;
  Parameters: x
    1 = Active
    0 = Inactive
  Will set the output pin 7 on the Power connector to an active ground, send command R1; to activate, R0; to deactivate. Can be used to drive a relay or LED, max 1 amp.

VERSION: Retrieve software version number
>Command: V;
>Parameters: None

>Sending a command of "V;" will return the current version number of the monitor system software.

PURGE: Run air pumps to clear tank tubes or to check tank levels
>Command: Px;
>Parameters:
>>x = a number between 1 and 5 in seconds. Crestron note: if sending this command from Crestron, this number needs to be specified in seconds, i.e. 5s, not decimal.

>Use this command to purge the tank tubes for immediate accurate level reading if the air lines have been disconnected and then reconnected to the system. Otherwise tanks will read correctly after next purge cycle, approximately every 5 min.

Tank Calibration:

The Tank Monitor system can be calibrated a number of ways, with a Laptop, the YJ-TLCD Touch screen or other communication system. The default tank height is set to 25.0". This will need to be set to your actual tank tube height.

Calibration using a Laptop:
1. Connect a Laptop or other communications device to the RS-232 com port.

2. Using a terminal program, establish connection at 9600, 8, 1, none

3. Once communication is established, you should see a string of data start to display in the terminal window once per second, similar to the following.
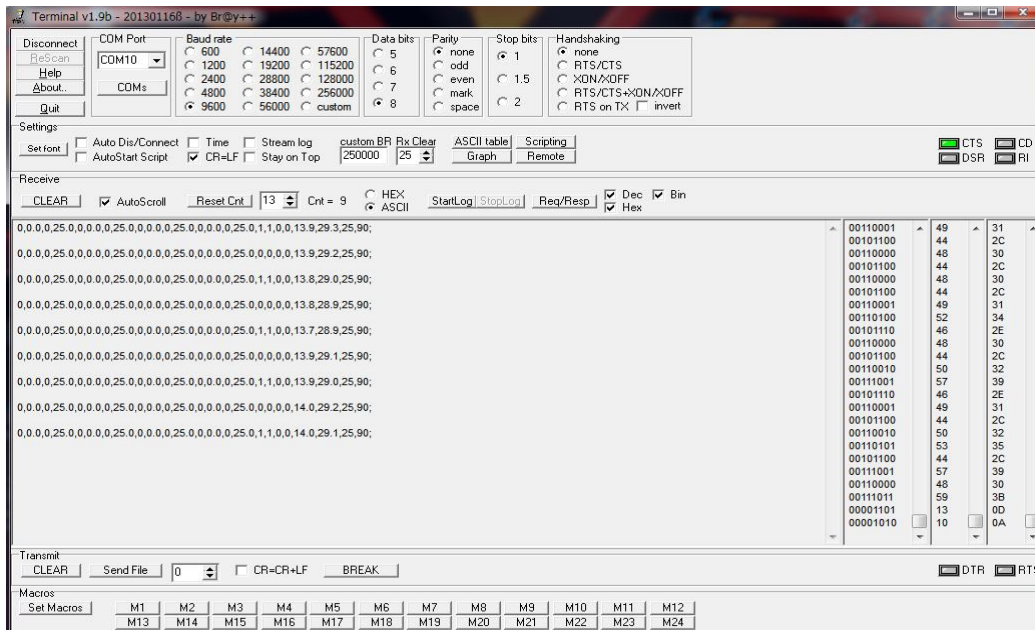
Each value is separated by a comma. The first 4 values are the Fresh Tank, the next set of 4 values are the Grey Tank, the next set of 4 is the Black tank, and then the Auxiliary tank, if used.

Fresh   Grey   Black   AUX

0,0.0,0,25.0, 0,0.0,0,25.0,0,0.0,0,25.0,0,0.0,0,25.0,0,0,0,0,13.9,28.9,25,90;

Notice the 25.0 in each section, fresh, grey, black, and aux. This is the default height of 25.0 inches. This is the number you will be changing for each tank.

4. The Command to calibrate the Fresh tank is **S0** followed by the tank tube length in inches and ending with a semicolon ; . For example, if your Tank tube is 32.0" you would enter **S0320;** in the send command line as shown,

| S0320; | | ☑ +CR | -> Send |

and click SEND. The 25.0 in the fresh column should then change to 32.0. If not, be sure you have entered the command correctly and try again.

5. Do the same for each tank using the command **S1** for the grey tank, **S2** for the black tank and **S3** for the AUX tank if used.

NOTE: **DO NOT** include the decimal point when setting the tank tube height.
Examples:
      Set the fresh tank to 26.7 inches > Enter command S0267; <enter>
      Set the Grey tank to 35.0 inches > Enter command S1350; <enter>
      Set Black Tank to 12.4 inches > Enter command S2124; <enter>

Additional Notes and Information:

A - Using the PURGE command while the Auto-Fill is on may cause the Auto-fill to reset to off, this is normal.

B - A leek in the air line between the Monitor system and the tank will cause the display to drop between purge cycles. If the tank levels drop more than 5% between purge cycles (approx every 5 min) make sure all tube connections are secure and fully inserted.

LED INDICATION
PURGE: The PURGE LED will illuminate when the purge pumps run.

ATF ACTIVE: The ATF Active LED will illuminate any time the auto-fill solenoid is energized. This LED should only be illuminated in conjunction with the ATF ENABLED LED.

ATF ENABLED: The ATF Ready LED will illuminate whenever the Auto-Fill switch is turned on. If the fresh tank level is below the LOW point (default 25%) the ATF Active LED will also illuminate and the auto-fill solenoid should be energized. If the fresh tank is greater than the LOW point (default 25%) or the water fills to over the HIGH point (Default 90%) then the ATF Active LED should go off and the ATF ready LED will stay illuminated. IF both the ATF Ready and ATF Active LEDS are illuminated and the Tank level does not rise after 6 to 8 minutes, the system will shut down the Auto-Fill and both LEDs will turn off.
POWER: A blue LED should illuminate to indicate power.