

### TMS Quick Start-up Guide



DRAWING NO. 20001 REV. A

### For Use With Factory Preprogrammed TMS Systems

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Note: Separate manuals are available for System Operation and Installation. **TABLE OF CONTENTS** Page Section 1 SYSTEM STARTUP 1.1 1.2 1.3 Section 2 FLOAT OFFSET ADJUSTMENT 2.1 2.2 Entering Float Offsets using Front Panel of TMS with LED Display...... 12 2.3 TMS Front Panel Navigation Flowchart......14 Entering Float Offsets using Front Panel of TMS4000 with LCD Display...... 17 2.4 Section 3 TMS WIRING DIAGRAMS 3.1 3.2 Leak/Point Level Sensors (TMS3000, TMS4000)...... 22 Leak/Point Level Sensors (TMS1000)......25 MP5xxS (WiDAM (TMS2000W/TMS4000W)) ......26 Leak/Point Level Sensors (WiDAM (TMS2000W/TMS4000W))......27 RA100R/RA200KR WIRING AND TMS CONFIGURATION Section 4 4.1 4.2 4.3 

### **INTRODUCTION**

This guide is intended for use as a field help guide for factory-trained technicians when performing a start-up on the Pneumercator TMS Series tank gauging system. This guide may be used for any TMS console. The first part of this guide shows what is needed to perform a start-up on a FACTORY PREPROGRAMMED TMS Series console. The second part has the basic wiring needed for the TMS systems. For detailed installation instructions please refer to the model-specific TMS Installation Manual. For systems NOT factory preprogrammed, please refer to the standard TMS Operations Manual for programming instructions. Please make sure that the Warranty Start-up paperwork is completely filled out by a factory authorized technician and returned to Pneumercator in a timely fashion to qualify the system for warranty consideration.

For information on becoming a factory authorized service/start-up technician, please contact Pneumercator below, or e-mail at training@pneumercator.com. Your local Pneumercator sales representatives may also be of assistance.

This guide is for reference purposes only. Complete installation guidelines are contained in the TMS model-specific Installation manuals.

IT IS THE RESPONSIBILITY OF THE START-UP TECHNICIAN TO VERIFY THE INFORMATION PROGRAMMED INTO THE TMS SYSTEM MATCHES THE SITE REQUIREMENTS. ALL EQUIPMENT MUST MATCH WHAT IS LISTED ON THE PACKING SLIP AND TAGGED FOR THE SPECIFIC SITE. IF ANY INFORMATION IS NOT CORRECT, THEY SHOULD CORRECT THE PROGRAMMING PER THE OPERATIONS MANUAL OR CONTACT THE FACTORY FOR PROGRAMMING ASSISTANCE.

For more information, please contact:

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### SECTION 1 – SYSTEM STARTUP

### **1.1 GENERAL OVERVIEW**

The goal of the startup process is to ensure that the TMS has been installed in accordance with all applicable regulations and Pneumercator requirements. This is important to provide both a safe and reliable TMS system.

The startup process must begin PRIOR TO powering on the TMS and any external devices with wiring connected to the TMS for the first time. If the installer is NOT the person performing the startup, be sure to instruct them to NOT apply power to the system. It is the responsibility of the startup technician to confirm that the TMS can be powered on without causing any safety issues or damage to the equipment.

The topics that follow are divided into the steps to be followed PRIOR to powering on the TMS and AFTER the TMS is powered on. A startup form is provided with the TMS to document all points have been reviewed and verified to be correct.

### **1.2 STARTUP CHECKLIST PRIOR TO POWERING ON TMS**

Locate the Enclosure Rating written on the foil label on the left-hand side of the TMS. Confirm the
TMS is installed in a location supported by the Enclosure Rating as per the below table.
Note: level-gauging probes, leak/point level sensors, and the WiDAM may be installed in a
hazardous area.



- Inspect all wiring to verify proper separation of intrinsically safe and non-intrinsically safe wiring, both in and out of the TMS.
   Note: Separation requirements detailed in Article 504 of the National Electric Code
- Inspect the TMS to verify that it has not been modified from the original factory design.
  - No holes have been drilled in the enclosure including both the exterior walls and the intrinsically safe partition wall.
  - No unapproved hardware is installed in the TMS.
  - No unnecessary wiring is entering the TMS.
- The TMS is on a Dedicated Circuit Breaker. The TMS MAY share a breaker with Pneumercator Remote Alarms and/or Displays controlled by the TMS.
- Confirm that the TMS has the proper grounds all returning to the ground buss bar in the service panel. A total of 3 independent ground wires (1 system and 2 intrinsically safe) are required.
   Note: For non-hazardous applications, 1 intrinsically safe ground wire may be eliminated.

- Verify all wires are properly terminated in the appropriate terminal blocks as indicated both by the device and TMS configuration. Any damage to the system caused by miswiring will NOT be covered in warranty.
- Confirm the specified cable or approved electrical equivalent has been used for each device. Complete cable details can be found in the respective installation documentation. Select cable part numbers are listed below:
  - o MP4xx: Belden 8441
  - MP5xx: Belden 6501FE
  - 2-wire sensors: Belden 8442
  - 3-wire sensors: Belden 8443
  - o Modbus RTU, ETD1000, RA400, MPX200: Belden 9841
  - TMS to MWR200: Belden 6501FE and Belden 9844

### **1.3 STARTUP CHECKLIST AFTER POWERING ON TMS**

- Validate any Alarms/Events and troubleshoot any unexpected conditions. Example: an empty tank is expected to have a Low Level Alarm but not a High Level Alarm.
   Note: The TMS will display a Power Fail, Warning 21 message on first powerup. This is expected and may be acknowledged by waiting for the message to be displayed, then holding MODE until the TMS beeps once.
- If the probe is easy to remove and handle, manipulate any floats on the stem to simulate a change in Product and/or Bottom Water levels. Various aspects of the TMS may be tested including:
  - Product and Water SetPoint alarms are activating at the expected threshold.
  - Remote Alarms and Displays are functioning and alarming as expected
  - Analog Outputs: The receiving equipment shows the proper data and is consistent with the data shown on the TMS display.
  - Relay Outputs: Verify the correct signals are being received and/or external equipment is being controlled, as expected.
  - Modbus Registers: Confirm the Modbus Master in the Automation system is configured properly to provide proper values and representation of alarm conditions.
- Test each leak/point level sensor to confirm that it is operating properly. **Note:** Testing is not recommended for HS100, HS100D, and HS100ND Leak Sensors.
  - Remote Alarms and Displays are alarming as expected.
     Note: The ETD1000 will only alarm for Leak Sensors that are Associated with a specific Tank Channel.
  - Relay Outputs: Verify the correct signals are being received and/or external equipment is being controlled, as expected.
  - Modbus Registers: Confirm the Modbus Master in the Automation system is configured properly to provide proper representation of sensor statuses.
- Test any features that have not been tested as part of the above steps. These features may include the optional internal printer or communications interfaces (RS-232, Modem, Network, etc.):
- All electrical splices have been properly sealed using the supplied splice kits or other splice kits approved by Pneumercator.

Once the hardware review and functionality testing has been completed as described above, the TMS is ready to be calibrated. Note that there must be adequate product in the tank to all the Product Float to rise on the probe stem. See the next Section for details on performing the calibration.

### SECTION 2 – FLOAT OFFSET ADJUSTMENTS

### 2.1 PRELIMINARY STEPS

All systems are supplied with factory configuration sheets showing what was programmed into the TMS system. Please review these sheets prior to continuing.

 Record probe serial number(s), model number(s), calibration factor(s) (Probe C.F.), and length(s) on the worksheet on the next page. This information must match the factory programming printout provided with the console to avoid reprogramming the console.
 Note: The Probe CF does not apply to MP5xx probes.





Figure 1 – MP45xS Label

Figure 2 – MP46xS Label

- Stick tanks for product level & water level and record on the worksheet on the next page. Note: Stick readings should be taken in the same opening the **TMS** probe is installed for greater accuracy. The Product Float must be floating in the product in order to calibrate the TMS.
- 3. Record the Product and Water level readings (inches or millimeters) displayed on the TMS on the worksheet on the next page. To access the product level readings on the TMS, hold the MODE button until the TMS beeps. Repeat until the level unit LED (IN/mm) is lit. Hold the MODE button until the TMS beeps to access the water level. A "μ" (w) will be displayed to the left of the reading.
- 4. For multi-tank systems, hit the TANK SELECT button and repeat steps 3 & 4 for each tank.
- 5. Calculate float height offsets using the worksheet on the following page.
- 6. Configure the TMS with the calculated float height offsets. Go to the Section Number, listed below, that reflects the programming method of choice.
  - Section 2.2: Programming the TMS using the TMS Communicator software.
  - Section 2.3: Front Panel Programming for TMS Models with LED Display. This includes:
    - o TMS1000
    - o TMS2000
    - o TMS3000
  - Section 2.4: Front Panel Programming for TMS4000 Models using an LCD Touchscreen.

Probe Worksheet							
	Ex: F1	Probe 1	Probe 2	Probe 3	Probe 4	Probe 5	Probe 6
Probe Information							
Serial #	R1234-1						
Model #	MP450S						
C.F.	9.128						
Length	100"						
		P	roduct Leve	el Informatio	n		
Stick	42.5"						
TMS	43.7"						
Prod HO	-1.2"						
	_	-	– Nater Level	Information		_	_
Stick	0.0"						
TMS	1.7"						
H2O HO*	-1.5"						
	<b>E E</b> 0	<b>D J -</b>					
	EX: F2	Probe /	Probe 8	Probe 9	Probe 10	Probe 11	Probe 12
			Probe Inf	ormation			
Serial #	R1234-2						
Model #	MP463SA						
C.F.	9.104						
Length	446"						
		P	roduct Leve	el Informatio	n		
Stick	242.5"						
TMS	224.7"						
Prod HO	+17.8"						
		I	Nater Level	Information	Ì		
Stick	0.0"						
TMS	5.5"						
H2O HO*	-5.0"						
<b>Note:</b> The f .0" for MPx o allow the adjustments	final bottom w 6xS to allow f MPx6xS Seri . If the TMS	vater level sł for thermal e ies probes to has a nega	nould be set expansion ar o settle for a tive water le	to at least 0 nd/or contract a couple of d evel calculation	2" for MPx5 tion of the sy ays before p on, the Wate	xS, 0.5" for N stem. It is re erforming th er alarm will	MPx6xSC, commende e float offs immediate

The expected value for the offset should not exceed the combination of the float height with the distance between the bottom of the probe and the tank floor. If the calculated value exceeds expectations, check that the float travel is not restricted on the probe stem. Also confirm the TMS has been properly configured.

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### 2.2 ENTERING FLOAT OFFSETS USING TMSCOMM

TMSComm (TMS Communicator) is a Windows-based software program that can be used to reconfigure any supported TMS System using the RS-232 port or optional modem or network interfaces (Standard on TMS4000).

**Note:** If TMSComm is not yet installed, refer to the TMSComm Installation Manual for guidance through the installation process.

- 1) Launch TMSComm. This is located in the Start menu in the Programs or All Programs section. Locate the Pneumercator group and click on TMSComm.
- 2) The TMSComm installation will need to have adequate privileges to "Allow Configuration Write". If this computer has already had the privileges defined, skip to the next Step. Otherwise, sign into the TMSComm Administrator account to become fully authorized for all actions.
  - a. Click on the Options menu and click on the Security tab.
  - b. Click the "Login..." button and enter the User Name and Password. User Name: ADMIN Password: ROBUST Note: the password for TMSComm before version 94 is JONESTOWN.
- 3) Review the Connection Settings for an existing TMSComm Site or Create a new set of Connection Settings as follows:
  - a. Click on the Sites menu and choose Select Sites.
  - b. Review the Site Name column for any defined Sites and proceed as follows:
    - i. No Sites listed: Continue with Step 3c.
    - ii. Desired Site is listed: Review the settings then proceed with Step 3e.
    - iii. One or more Sites are listed but prefer to use new Site record: Click the New Record button then continue with Step 3c.
  - c. Enter a Site Name. This Name identifies the connection settings and any historical Logs/Reports retrieved when connected using that Site.
  - d. For RS-232 connections, verify the settings below Site Name match Figure 3. **Note:** 9600 and N,8,1 represent the TMS defaults.

**Note:** COM Port must be set according to your computer's hardware settings.

e. Click the Close button.

TMS Quick

	Close
Site Name	General Security Prod. Codes Tank IDs Protocol
Field Service	Reference #
	Site Name Field Service
	Site Group
	Connect Type Direct
	Phone #
	Com Port COM1
	COM Settings N,8,1
	Port Speed 9600
	Display Terminal Window on Connect/Disconnect
	New Record Del. Record Find

- 4) Connect to the Site by clicking "Connect To Device" in the Sites menu.
- 5) Read the configuration from the TMS.
  - a. Click on the Configurations menu. Click "Yes" when prompted whether to Read the Configuration from the Connected Device.
     Note: If the prompt is not shown, click on the File menu in the Configurations window and choose "Read Configuration From Connected Device".
- 6) Click on the Tanks tab and select the desired Tank Channel.
- 7) Click on the Probe button.

**Note:** The details shown in the Probe window must match the information recorded on the worksheet. If not, either correct the Worksheet using the data from the corresponding probes or reconfigure the TMS to match the information on the new probes.

- 8) Enter the Height Float Offset (HO) information from the worksheet as shown in Figure 4 below for both the Product and Water floats.
- 9) Click the close button.
- 10) If there is more than one tank enabled, click on the next enabled tank tab and return to Step 7.
- 11) Click on the File menu and select the Write configuration to Connected Device option.

Trobe Calibration Factor 9.000 Trobe Type MP452 ▼ Trobe Length (In.) 0.0 Troduct Height Float Offset (In.)	
Probe Calibration Factor 9.000 Probe Type MP452 Tobe Length (In.) 0.0 Toduct Height Float Offset (In.)	
9.000 Yobe Type MP452 ▼ Yobe Length (In.) 0.0 Yoduct Height Float Offset (In.)	
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Vater Height Float Offset (In.)	
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webstration Office (In )	
0.0	
'robe Rep Rate	
0.00	
iser Vol/In.	
0.0	
0.0	
THE A THE Comments Produce Comfirment in	

### 2.3 ENTERING FLOAT OFFSETS USING FRONT PANEL OF TMS WITH LED DISPLAY Note: Includes all TMS1000, TMS2000, and TMS3000 models.

Refer to the Figure 5 below for the relative locations of the buttons. Note that each button has three labels depending upon your display status. Without entering programming mode, the main labels printed on the buttons are used. Once in programming mode, a nonflashing display represents Review Mode where a flashing display represents Edit Mode. Note that this represents the latest front panel button configuration available. Earlier systems maintained the same labeling system but had physically different buttons.



**Note:** See Figure 7 at the end of this Section for a TMS Navigation Flowchart

Figure 5 - TMS Front Panel Keys Layout (TMS3000 colors shown)

- 1) Enter programming Mode by pressing and holding the TEST button and then pressing the MODE button at the same time until Log (Log) appears. Release both buttons.
- 2) Press the EDIT (TEST) button repeatedly until Lon F '3 (Config) appears flashing.
- 3) Press the ► (MODE) button one time. *HERdEr* (Header) appears.
- 4) Press the EDIT (TEST) button repeatedly until ProbE (Probe) appears flashing.
- 5) Press the ► (MODE) button one time. The first setting for the Probe for Tank Channel 1 is displayed.
- 6) Press the GROUP SELECT (TANK SELECT) button until the desired Tank Channel number is displayed over the TANK ID label on the display.
- 7) Press and hold the STEP (MODE) button until the TMS beeps ONE TIME and immediately release the button. Repeat this until Prod HD (Prod HO) appears briefly. The current value for the Product Float Height Offset will appear. Note that this number will start with a + (+) or a (-) sign indicating a positive or negative number.

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8) Press the EDIT ENABLE/THEFT ALARM ACKNOWLEDGE button on the inside of the front door up one time. This will NOT cause the display to change but will authorize you to make programming changes to the TMS for the duration of the programming session. TMS1000 Note: DIP Switch 1 on the Main Board must be OPEN to enable editing.



Figure 6 - Edit Enable Button

- DWG NO. 20045 REV. N/C
- 9) Press the EDIT (TEST) button one time and the first digit (cursor) will start flashing. This digit indicates a positive or negative number. Use the ▼ (GROUP SELECT) and/or ▲ (TEST) buttons to change the value of what's flashing. Use the ► (MODE) button to move the cursor to the right. Once the last digit is flashing the correct value, enter by pressing the ► (MODE) button. It will stop flashing and show you the current value for the Product Float Height Offset.
- 10) Press and hold the STEP (MODE) button until the TMS beeps ONE TIME and immediately release the button. *h∂*<sub>0</sub> *H*<sup>0</sup> (H<sub>2</sub>O HO) will appear briefly then the current value for the Water Float Height Offset will appear. Note that this number will start with a *≺* (+) or a *-* (-) sign indicating a positive or negative number.
- 11) Press the EDIT (TEST) button one time and the first digit (cursor) will start flashing. This digit indicates a positive or negative number. Use the ▼ (GROUP SELECT) and/or ▲ (TEST) buttons to change the value of what's flashing. Use the ► (MODE) button to move the cursor to the right. Once the last digit is flashing the correct value, enter by pressing the ► (MODE) button. It will stop flashing and show you the current value for the Water Float Height Offset.
- 12) If there is more than one tank enabled, go to Step 6 to calibrate the next tank.
- 13) Press and hold the STEP (MODE) button until the TMS beeps TWO TIMES and immediately release the button. rEturn (Return) appears.
- 14) Press the EDIT (TEST) button two times. ProbE (Probe) will appear flashing on the display.
- 15) Press the GROUP SELECT (TANK SELECT) button until ELuro (Return) appears flashing.
- 16) Press the ► (MODE) button one time. LonF '9 (Config) appears.
- 17) Press the EDIT (TEST) button until rEturn (Return) appears flashing.
- 18) Press the ► (MODE) button one time. The system returns to normal operating mode.

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### **TMS NAVIGATION FLOWCHART**

### Menus

### Review Mode (Display NOT Blinking)

**Display Parent Menu Title:** 

Press and release STEP (MODE)

Enter Menu Navigation Mode (EDIT MODE): Press and release EDIT (TEST)

### Edit Mode (Display Blinking)

Navigate Down Menu List: Press and release ▼ (TANK SELECT)

Navigate Up Menu List: Press and release ▲ (TEST)

RETURN

CLOCK

LOG

**INITialize DATA** 

**CONFIGuration** 

TEST scheduling

While holding the Test button, hold the Mode button until LOG is displayed.

Note Capital Letters represent TMS display.

Lower case letters added for clarity.

Reverse text indicates the name of

the menu entered to view values. Group ID defined above menu name.

Closed shapes indicate names of

names of Values.

Menus while open brackets indicate

in-tank I FAK

Accept Flashing Menu (Review Mode in Child Menu): Press and release ► (MODE)

Note: Pressing > (MODE) while RETURN is displayed returns you to the previous menu.

RETURN

EVENTS

ALARMS

(8 - 1 per line)

(14 per tank)

(1 per tank)

(1 per tank) THEFTS

bulk SALES

DELIVERY

WATER removal (1 per tank) product ORDERS

(6 - 1 tank per entry)

(24 - 1 tank per entry)

(12 - 1 tank per entry) INVENTORY

(36 - 1 tank per entry)

LINE LEAK test results

in-tank LEAK test HISTory

in-TANK LEAK test results

(8)

(24)

Values



### Figure 7A - TMS Front Panel Navigation Chart - Legend

VIEW

View

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ACCESS

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### TMS SERIES



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### RETURN RETURN RETURN RETURN RETURN RETURN TELephone LINE PAUSE length DIAL TYPE BAUD RATE FaCSimile AREA code FaCSimile LOCAL phone MODEM type RETURN SUNday CLOSE SUNday OPEN SATurday OPEN Monday - Friday CLOSE Monday - Friday OPEN THEET FAILed 3.0 gph test FAILed 0.2 gph test action TIME DELAY RISER Gallons Per Inch<sup>†</sup> RISER Gallons Per Inch<sup>T</sup> LOG MINimum volume MOTion height BAND TEMPerature ENable PROBE LOCation offset<sup>†</sup> PROBE LOCation offset<sup>†</sup> H2O float Height Offset PRODEL float Height Offset PRODEL Float Height Offset LOGIC ENable NORMALLY NORMALLY USER-defined input NAME<sup>†</sup> INPut NAME CC ENABLE GROUP ID=LINE LEAK CHANNEL # RELaY Line Leak Panel Т GROUP ID CC INPUT # MODEM type MODEM L RETURN PROBE LENgth PROBE TYPe PROBE Calibration Factor • GROUP ID=TANK CHANNEL # RETURN SATurday ENABLe FRIday ENABLe THUrsday ENABLe WEDnesday ENABLe TUEsday ENABLe MONday ENABLe SUNday ENABLe HOUR 3 PRinT T GROUP ID=SE RELaY SENSO NSOR # RETURN INVentory HOUR<sup>†</sup> INVentory DIAL system ERRor DIAL SENSor DIAL CC DIAL THEFT DIAL RETURN SENSOR OFF latch<sup>†</sup> SetPoint 3 OFF latch<sup>†</sup> SetPoint 2 OFF latch<sup>†</sup> SetPoint 1 OFF latch<sup>†</sup> 1 OBE RETURN RETURN LATCH ENable DELAYed shutoff CC INPUT # Line Leak channel SELECT GROUP ID RELaY CC H2O DIAL Т Т HOUR 3 PRinT Front Panel ACKnowledge GENerator TANK leak test mode UNGAuGEABLe product SetPoint 3 DIAL SetPoint 2 DIAL NORMALLY GROUP ID=RELAY # RELaY MODE HOUR 3 1 1 1 HOUR 3 HOUR 2 PRinT UNUSEABLE product THEFT ENable Т SetPoint 1 DIAL HOUR 2 L RETURN SetForm 1 DIAL LEAK test DIAL phone LINE TYPE TELephone AREA code 2 TELephone AREA code HOUR 1 PRinT RETURN H2O TRIGger SelPoint 3 TRIGger SelPoint 2 TRIGger SelPoint 1 TRIGger LEAK TRIGger GROUP DE-TANK CHANNEL # RELAY TANK VOLUME #1 Т VOLUME #T HEIGHT #† CONE HeighT† TANK LENgth† TANK RISE† TANK RISE† TANK RADius† MANIFOLD quantity TANK CAPacity Т INVENTORY Т 1 RETURN ELEPHONE LOCAL phone GROUP ID=DIAL OUT RECORD # DIAL OUT Т SYStem ERROR POWER FAIL Т 1 RETURN Т RETURN ASSOCIATE with dispensor ASSOCIATE with tank NORMALLY FAULT detect ENable USER-defined input NAME<sup>†</sup> INPut NAME sensor MODE<sup>†</sup> sensor TYPE SENSOR ENable RELaY SITE 1 1 1 1 TANK CAPacity TANK TYPE RETURN ReLaY CoNTRoL<sup>†</sup> PUMP-GENerator<sup>†</sup> AUTO MODE pass/fail select<sup>†</sup> THRESHOLD<sup>†</sup> SetPoint H2O<sup>+</sup> Т H2O ENABLE 1 SetPoint 3 HORN SetPoint 2 HORN \_ \_ \_ \_ \_ Т T SetPoint 1 HORN SetPoint 1 HORN SetPoint 3 NAME SetPoint 2 NAME SetPoint 1 NAME SetPoint 3 setting SetPoint 2 setting PRODuct CODE PRODuct TYPE 1 LEAK LIMIT R ENabl T T GROUP ID=SENSOR # SENSoR INPut TEST MODE \_ \_ \_ T EST ENab Т I GROUP ID=TANK CHANNEL # in-TANK LEAK test I 1 1 1 1 I l \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ PRODuct TYPE RETURN 1 1 VOLume MODE 1 GAIN 1 TANK ID DATA SELect 1 1 USER-defined tank NAME<sup>†</sup> TANK NAME TANK ENable 1 OG ENable I GROUP ID=ANALOG OUTPUT # ANALOG OUTputs 1 1 1 1 1 1 GROUP D=TANK CHANNEL # 1 TANK 1 1 1 1 1 1 I 1 ι 1 RETURN TMS PROTOCol Daylight Savings Time ENABLe percent ULLage LIMIT MONTHLY status report LEAK PRINT mode AUTOPRINT enable HORN studte DELAY bulk SALEs ENable SelPoint UNITS TANK QuanTitY SERIAL ForMAT serial port b BAUD RATE serial port a DSFIaV, MODE 1 TMS PROTOcol 1 1 1 RETURN 1 1 1 T 1 1 1 ANALOG OUTputs 1 1 1 1 in-TANK LEAK test Т \_ \_ \_ Т 1 1 Т 1 1 DIAL OUT 1 1 1 1 MODEM I 1 Т 1 Т I THEFT 1 1 1 I DiSPlay MODE Т 1 SITE ID UNIT ID INVENTORY I 1 Т 1 1 communciations SECURITY SENSoR INPut I ACCess CODE I 1 I CC INPUT 1 RETURN 1 1 RELaY MODE 1 **RELaY SITE** 1 **INITialize DATA** 1 **RELaY Line Leak Panel RELaY SENSor** I CLOCK **RELaY CC** 1 **RELaY TANK** CONFIGuration PROBE in-tank LEAK TANK **TEST** scheduling HEADER LOG ACCESS VIEW SYSTEM TEST While holding the Test button, hold the Mode button until LOG is displayed. While holding the Test button, all internal visual and audible annunciators are tested. context sensitive parameter Excludes TMS2000W TMS Navigation Flowchart V2x0056. V3x0056. V4x0057 Figure 7C - TMS Front Panel Navigation Chart - Configuration menu only

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### 2.4 ENTERING FLOAT OFFSETS USING FRONT PANEL OF TMS WITH LCD DISPLAY Note: Includes all TMS4000 models.



Note: Tap the Down Arrow in the bottom left corner to access the additional buttons shown to the left of the LCD Screen.

- 1) Tap the Setup button in the top left corner of the screen.
- 2) Tap Config to the right of the Setup button as shown below.





- 3) Tap the Tanks button.
- 4) Tap the Probe button on the right edge of the screen as shown below.

10:07:26 PM 9/7/2016	Tank Probe - Channel #1				
CLOSE	Calibration Factor:	9.000	5		
$\square$	Probe Type:	MP452	$\square$		
PREVIOUS	Probe Length (In):	0.0	GENERAL		
$\succ$	Product Height Float Offset (In):	0.0	$\succ$		
INIT	Water Height Float Offset (in):	0.0	DIMENSIONS		
	Motion Height Band (In):	0.20			
	Minimum Log Volume (gal):	50	POINTS		
	Volume Rise/Inch:	0.0			
	Probe Location Offset (In):	0.0	PROBE		
SAVE	-		$\bigtriangledown$		

- 5) Press + or at the bottom of the screen until the desired Tank Channel number is displayed.
- 6) Enter the Float Offsets one at a time by tapping the Offset value and using the displayed keypad.
- 7) If there is more than one tank enabled, go to Step 5 to calibrate the next tank.
- 8) Tap the Save button in the bottom left corner to save the changes.

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	U.S.	INE	AINC OUP? MEERINC OUP MEERINC
	GRE	40	Che Mn, Che Mn,
	C PROBE		C PROBE C PROBE
	H SENSOR 1	17	H   SENSOR 1   9   H   SENSOR 1   1
	<b>1</b> SENSOR 2	18	<b>1</b> SENSOR 2 10 <b>1</b> SENSOR 2 2
	C PROBE		C PROBE
(3)	H SENSOB 1	19	H SENSOB 1 11 H SENSOB 1 3
A-PROBE/		20	
		20	
8-SENSUR	C PROBE		
CARDS	H SENSOR 1	21	H SENSOR 1 13 H SENSOR 1 5
	3 SENSOR 2	22	<b>3</b> SENSOR 2 14 <b>3</b> SENSOR 2 6
	C PROBE		C PROBE C PROBE
	H SENSOR 1	23	H   SENSOR 1   15   H   SENSOR 1   7
	4 SENSOR 2	24	4         SENSOR 2         16         4         SENSOR 2         8
	SENSOR 1	17	
	SENSOR 2	18	
	SENSOR 3	19	
(2)	SENSOR 4	20	I SENSOR 2 10 I SENSOR 2 2
4-PROBE/	SENSOR 5	21	C PROBE C PROBE
8-SENSOR	SENSOR 0	22	H   SENSOR 1   11   H   SENSOR 1   3
CAPDS	SENSOR 8	24	<b>2</b> SENSOR 2 12 <b>2</b> SENSOR 2 4
CANDS	SENSOR 9	25	C PROBE C PROBE
(1)	SENSOR 10	26	H SENSOR 1 13 H SENSOR 1 5
16-SENSOR	SENSOR 11	27	<b>3</b> SENSOR 2 14 <b>3</b> SENSOR 2 6
CARD	SENSOR 13	29	
OAND	SENSOR 14	30	
	SENSOR 15	31	
	SENSOR 16	32	4 SENSOR 2 16 4 SENSOR 2 8
	SENSOR 1	25	SENSOR 1 9 C PROBE
	SENSOR 2	26	SENSOR 2 10 H SENSOR 1 1
(1)	SENSOR 4	28	SENSOR 4 12 1 SENSOR 2 2
	SENSOR 5	29	SENSOR 5 13 C PROBE
	SENSOR 6	30	SENSOR 6 14 H SENSOR 1 3
8-SENSOR	SENSOR 7	31	SENSOR 7 15 2 SENSOR 2 4
CARD	SENSOR 8	32	SENSOR 8 16 2 SENSOR 2 4
(2)	SENSOR 10	34	SENSOR 10 18 C PROBE
(4)	SENSOR 11	35	SENSOR 11 19 H SENSOR 1 5
16-SENSOR	SENSOR 12	36	SENSOR 12         20         3         SENSOR 2         6
CARDS	SENSOR 13	37	SENSOR 13 21 C PROBE
	SENSOR 14	38	SENSOR 14         22           SENSOR 15         23
	SENSOR 15	40	SENSOR 16 24 4 SENSOR 2 8

### Figure 11B - TMS3000/TMS4000 Sensor Wiring

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# SECTION 4 RA100R/RA200KR WIRING AND TMS CONFIGURATION

## 4.1 RA200KR WIRING









### 4.3 TMS CONFIGURATION SUPPORTING RA100R/RA200KR

Note: For wiring, refer to: Section 4.1, Figure 14 for RA200KR. Section 4.2, Figure 15 for RA100R

The configuration shown below corresponds to the wiring locations shown on the previous pages. Any changes to be made would need to be reflected in both the TMS wiring and configuration. **Note:** The TMS4000 programming details begin on the next page.

### Programming:

1. Sets the tank conditions that must occur to activate the relays. Factory default conditions shown below activate for SP1 (95% and higher volume) and SP2 (90% and higher volume).

Front Panel		
Config ⇔ Rely Tank		
Relays		
Leak Trig	no.no.no	
SP1 Trig	01.02.no	
SP2 Trig	01.02.no	
SP3 Trig	no.no.no	
H2O Trig	no.no.no	

TMS Communicator		
Configuration ⇒ Relays ⇒ Tank Triggers		
Relays		
Leak Trigger	None - None - None	
Set Point #1 Trigger	Relay #1 - Relay #2 - None	
Set Point #2 Trigger	Relay #1 - Relay #2 - None	
Set Point #3 Trigger	None - None - None	
Water Trigger	None - None – None	

2. Chooses the CC Inputs (wired to RS2) that the relays will react to.

Front Panel		TMS	TMS Communicator		
Config ⇒ Rely cc		Configuration ⇒ Relays ⇒	Non-Hazardous Contact Closure Inputs		
cc Trig	Relays	CC Trigger	Relay Selects		
1	02.no.no	#1	Relay #2 – None – None		
2	01.02.no	#2	Relay #1 – Relay #2 – None		

3. Controls the behavior of a relay.

Front Panel				
Config ⇔ Rely Mode				
Relay	Normally	FP Ack	Delay	Latch En
1	Off	No	None	No
2	Off	Yes	None	No

TMS Communicator					
	Configuration ⇔ Relays ⇔ Relay Mode				
Relay	Normal Contact State	Allow Front Panel Acknowledgements	Delayed Shutoff	Latch Enable	
#1	Off		None		
#2	Off	$\square$	None		

4. Controls the behavior of a Contact Closure Input. Note: Only settings used for supporting the RS2 are listed below. Do not change the factory default values for other unlisted settings.

Front Panel			
Config ⇔ cc Input			
CC Input	cc Enable	Normally	
1	Ack	Open	
2	Relay	Open	

TMS Communicator			
Configuration ⇔ Contact Closure Inputs ⇔ Non-Hazardous Contact Closure Inputs			
CC Input	Contact Closure Enable	Normally	
#1	Acknowledge	Open	
#2	Relay	Open	

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 Contact Closure 1
 Reset

 Contact Closure 2
 Test

 Relay 1
 Strobe

 Relay 2
 Horn

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- 3) Tap the CC Inputs button.
- 4) Change CC Enable for Input 1 to Acknowledge and the Normal State to Open as shown below.
- 5) Tap on the + to advance to CC Input 2.
- 6) Change CC Enable for Input 2 to Relay and the Normal State to Open
- 7) Tap on the Back Arrow in the Top Right corner to return to the Main Config Screen.

	2:50:14 PM 8/2/2018		Contact Closure Input #1		
	CLOSE	CC Enable:	Acknowledge	5	
	$\square$	Input Name:	Input		
	PREVIOUS CONFIG	CC Tag			
	$\bowtie$	Normal State:	Open		
	INIT	Logic Enable Group:	OFF		
		Delay Timer:			
		Delay Time:	None		
		Apply to Input Going:	Active		
	SAVE		- 1 <b>+</b>		
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- 8) Tap the Relays button.
- 9) Change the Product SetPoint Relay Selects as shown below. This will result in the Remote Annunciator activating for both the High and High High Product conditions for Tank Channel 1. If additional Tank Channels should be activated, click the + to advance to the next Tank Channel and repeat the below programming for each intended Tank Channel.

10) Tap the CC Inputs button on the right side of the screen.



2:48:28 PM 8/2/2018					
CLOSE	Trigger	C Relay #2	ontact Closure <sub>None</sub>	Relay Selects None	<b>-</b>
PREVIOUS CONFIG					TANK
INIT					CC INPUTS
					SENSORS
					LINE LEAK TRIGGERS
SAVE		-	1 INPUT	+	$\bigtriangledown$

- 11) Change the Contact Closure Input Selects for CC Input 1 as shown above.
- 12) Tap on the + to advance to CC Input 2.
- 13) Change the Triggers for CC Input Selects for CC Input 2 to Relay #1, Relay #2, None.
- 14) Tap the Down Arrow in the bottom right corner, then Tap on Relay Mode.
- 15) Tap the + to advance to Relay 2. Check the Front Panel Ack box.
- 16) Tap Save to complete the changes.

