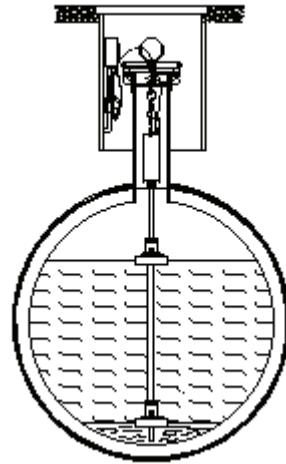


Tank Sentinel[®]
(TS-1001, 2001, 504, 508 & 750)

Setup Programming
Guide

*Automatic Tank Gauge
/
Leak Detection
System*



INCON[®]
INTELLIGENT CONTROLS

Part Number: 000-1053, Rev. C
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Graphic Symbol Conventions



NOTE Important information, tips, and hints are highlighted by the NOTE graphic.



CAUTION messages are highlighted by the CAUTION graphic and contain instructions that must be followed to avoid faulty equipment operation, or hazards. If ignored, equipment damage or personnel injury *could* result!



WARNING messages are highlighted by the WARNING graphic and contain instructions that must be followed to avoid faulty equipment operation, or an explosion or shock hazards. If ignored, severe injury or death *may* result !



DANGER messages are highlighted by the DANGER graphic and contain instructions that **must be followed** to avoid an explosion or electrical shock hazard. If ignored, severe injury or death *will* result !

— ❖ — End of Chapter symbol

Page Numbering Convention – Example:

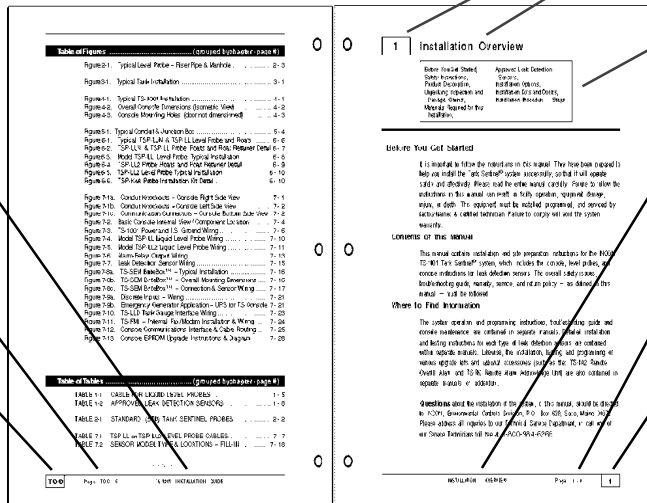
Page 4 - 1 = Chapter 4 page 1

Page Layout Convention – Example:

Manual Name
(EVEN NUMBERED PAGES)

Page Number

Chapter Number



Chapter Number & Name (TOP LEFT FIRST PAGE)

Chapter Contents

Chapter Name (ODD NUMBERED PAGES)

Page Number

Chapter Number

Before You Begin – Read This



CAUTION Leaking underground storage tanks (USTs) and fuel lines cause serious environmental and health hazards. The Tank Sentinel® system is designed to detect leaks in tanks by tank tightness / leak testing with liquid level probes, and/or with leak detection sensors. You must follow the instructions in this manual carefully to ensure that the system is programmed properly and is effective in detecting leaks.

– Site Information Required

- Site Plan? — showing the location, size, and model #s of all tanks, probes and sensors
- Dispenser Manufacturer Documentation?
- Pump Manufacturer Documentation? — Type, Model #s, and suction inlet *distance off the bottom* of each tank (to determine the lowest product level and highest water level)
- Pump Control Required? — enable / disable pumping... TS-IEM Output modules (for TS-2001/508 consoles only), or a TS-ROM1 BriteBox
- Remote Device Control Required? — use TS-IEM (see above), or a TS-ROM2 BriteBox
- Remote Tank Overfill Alarm / Acknowledge Installed? — (TS-RA1 or TS-RA2 / TS-RK) Type, Model, Size and Manufacturer of each Tank
- Tank Manufacturers' Tank Chart / Strapping Table (s)? — for each tank or the diameter and length of each tank
- Are any tanks identical? — (tanks, probe data, and alarm limits can be copied)
- Standard Probe Data? — (model number, shaft length, gradient, serial number)
- Special Probe Data? — (ie RTD / Temperature sensor locations)
- Tank # & Probe # — model number assignments and input channels for each tank
- Leak Detection Sensors? — installed in or near or associated with each tank including input channel number assignments
- Product? — in each tank (API specific gravity) and the type & number of float(s) / probe
- State and Local Regulations? — (testing requirements, reporting requirements, and hotline numbers, and other information that you and/or the customer will need)

– Other Sources of Information

Use the TOC (Table of Contents) to find information within this manual and see the following INCON documentation:

- Installation Guide
- Operator's Guide
- TroubleShooting Guide
- Leak Detection Sensor – Installation Guides (one per type / family of sensor)
- Tech Service Bulletins
- Application Bulletins
- Application Notes

Scope of This Manual

This manual shows the setup-programming of Tank Sentinel system. Each Chapter is dedicated to a specific parent menu (see Parent Menus below).

Menu Conventions

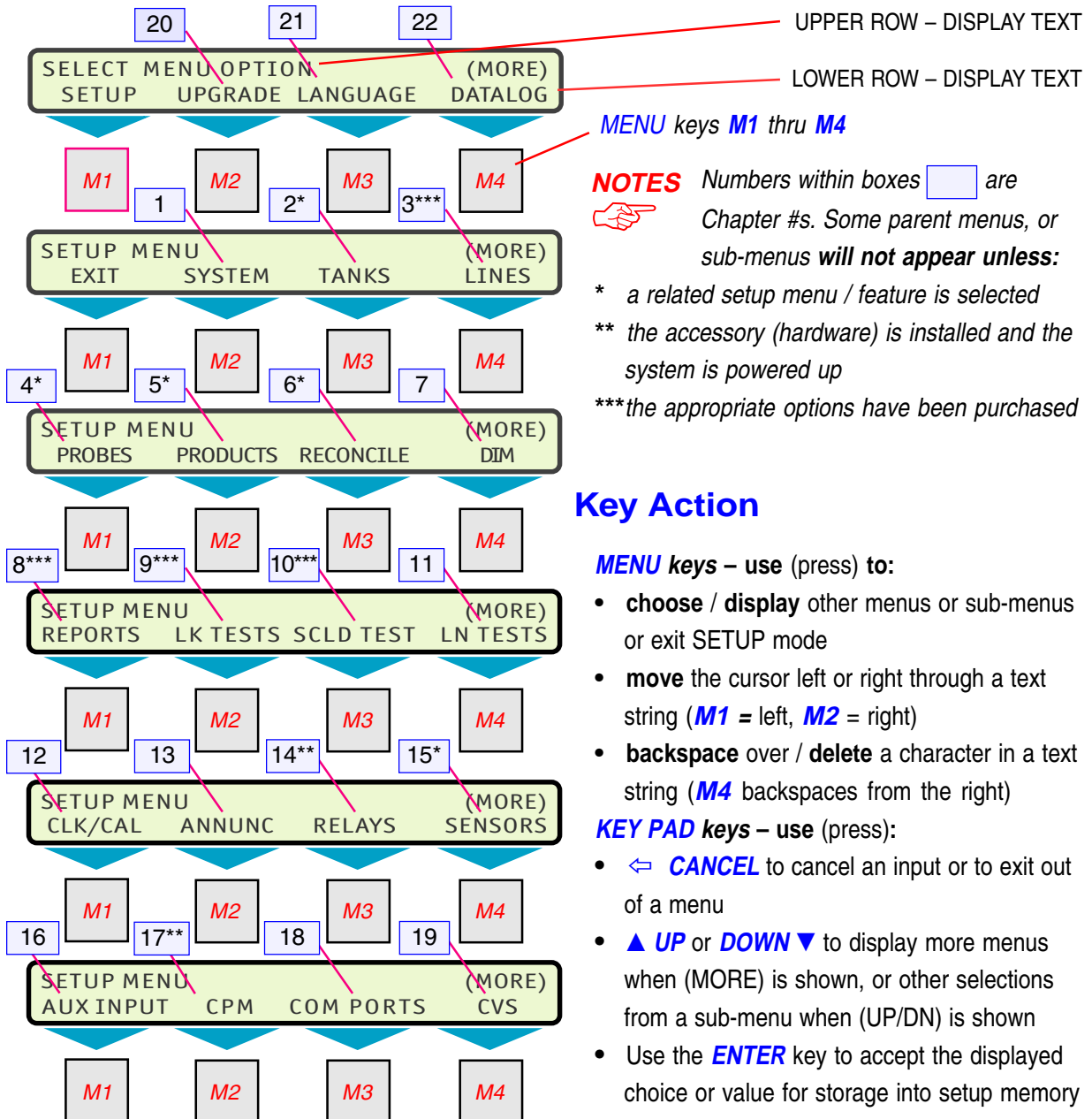
The menu structure in this manual is shown in an indented format:

PARENT MENUS are above and to the left of **sub-menus** and

SUB-MENUS are **below** and to the **right** of parent menus.

Default VALUES, SETPOINTS, & LIMITS are shown first and in ITALIC text.

Parent Menus



Key Action

MENU keys – use (press) to:

- **choose / display** other menus or sub-menus or exit SETUP mode
- **move** the cursor left or right through a text string (**M1** = left, **M2** = right)
- **backspace** over / **delete** a character in a text string (**M4** backspaces from the right)

KEY PAD keys – use (press):

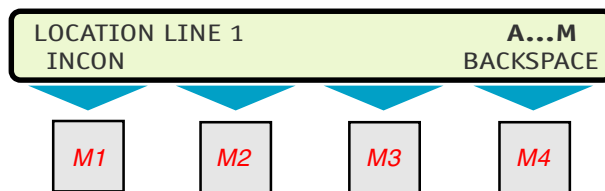
- **CANCEL** to cancel an input or to exit out of a menu
- **UP** or **DOWN** to display more menus when (MORE) is shown, or other selections from a sub-menu when (UP/DN) is shown
- Use the **ENTER** key to accept the displayed choice or value for storage into setup memory

Key Action (CONTINUED FROM PREVIOUS PAGE...)

- ACK SHIFT** key is used to change the preconditioned *input character type*... the display shows either an A...M or the word NUMERIC when an alphanumeric or numeric input is expected. Press the **ACK SHIFT** key **N times** to change the current input character type to another type (look at the upper right corner of display while doing this). See the *Operator's manual about using the ACK SHIFT key to silence and acknowledge alarms, and to start an output grace period (programmable length of time)*.

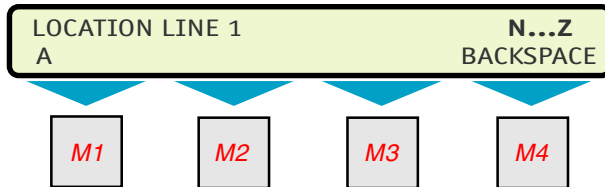
Alpha-Numeric Input (example)

The example below is what you would see when programming SYSTEMID... (press keys: **MENU M1 M2 M2 M1**) to display:



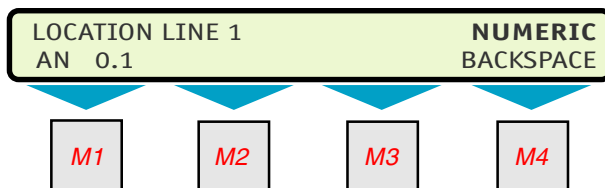
A...M means that the system is conditioned to input the upper left letter of any key (A B C D E F G H I J K L M)... see below:

Press **ACK SHIFT** key once again to display:



N...Z means that the system is conditioned to input the upper left letter of any key (N O P Q R S T U V W X Y Z) – conditions remain until changed – see below:

Press **ACK SHIFT** key once again to display:

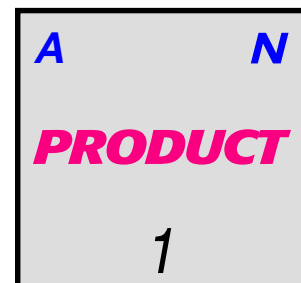
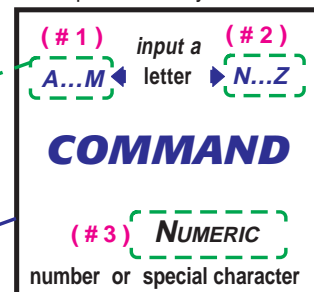


NUMERIC means that the system is conditioned to input the lower character of any key (numbers 1 2 3 4 5 6 7 8 9 0 . + /- or a **SPACE**)... see above.

Upper right
DISPLAY
shows the
input
selection
...shown
here
within
dashed
lines

Typical
Key

Press the **ACK SHIFT** key
N times to **DISPLAY** the
input character type (#_)
then press the Key of choice.



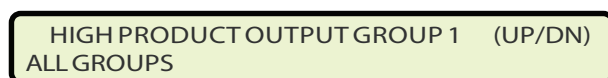
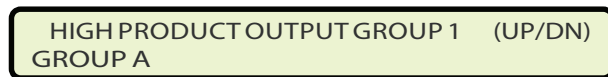
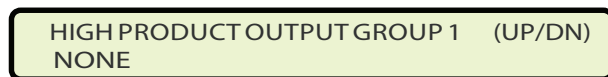
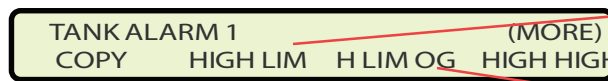
NOTE The shift
function will remain in the
current input character
mode (or position) until
the **ACK SHIFT** key is
pressed again.

Programming Alarms, Limits, or Inputs to Output Groups

The TS-1001/504 / 2001/508 / 750 Tank Sentinels includes a powerful setup feature called *Output Groups* (OGs). Alarms, limits, and inputs (Aux. or I/O Module inputs) can be assigned/programmed to output groups (OUT GROUP or OG). An output device will turn on or off when an alarm is active in any of its assigned output group(s). Up to 32 output group(s) can be assigned or programmed to any output device... also see [Programming Output Devices](#).

The standard output devices are annunciators and relays. Other *output devices* can be **optionally** added to the system. These are: TS-ROM BriteBox *relays*, TS-CIM BriteBox *output modules*, and TS-IEM internal expansion PC Board *output modules*—for TS-2001/508 consoles only.

Example: TANK 1, ALARMS and the H LIM OG (high product level limit) menus:



The HIGH LIM (high product level limit) has an associated H LIM OG – high limit output group near it.

NOTE *In an 8 tank system there are 8 H LIM OG s (one under each tank menu).*

Each **limit, alarm or input** can be assigned to **one** of the 34 Output Group choices — GROUP A thru FF, or to ALL output GROUPS, or to *NONE* (no output group = default).

Record output group assignments for each alarm, limit, or input in the provided OG Worksheets.

Example Output Group Assignment WORKSHEET (partial)

OG = Output Group	- Output Group Assignment	WORKSHEET	Output Group choices -
Example - System:	NONE	= default setting (others are: GROUP A thru FF & ALL GROUPS)	NONE
LEAK OG	A	Tank Leak turns on Modulated Annunciator, Relay 2 for external leak light	A
THEFT OG	T	Sentinel Mode Theft Limit (turns on external product theft light)	B
SYSFL OG	F	System Fail - software or hardware failures - (activates solid annunciator)	C
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			E
			F

Programming Output Devices:

After assigning alarms and limits to output group(s), program the appropriate output devices to respond to any or all output groups (OGs)

Example Applications:

Turn on external Tank Overfill Alarm & solid console annunciator

(when a high or high high product level – alarm limit is reached)

Program the (above) alarm limits for each tank. Assign the associated H LIM OG or HH LIM OG output groups to **one alarm group** for each tank (ie *GROUP O*). Program the solid annunciator (alarm horn) and relay 1 *output devices* to react to any *GROUP O* alarm by assignment... change *GROUP O* – (dash) to a Y. The external TS-RA2 or RA1 alarm unit (wired to relay 1) will turn on / off with relay 1.

This way a high level condition in any tank will activate the solid annunciator and the external alarm connected to relay 1.

To disable a STP & turn on the modulated console annunciator

(when a low low product or high water – alarm limit is reached)

Program the (above) alarm limits for each tank. Assign the associated LL LIM OG and W LIM OG output groups to **a unique alarm group for each tank** (ie *GROUP P* for *TANK 1* & *GROUP S* for *TANK 4*). Program the TS-ROM channel relays *output device* (CHANNEL N – OUT GRPS) to respond to a unique tank alarm *GROUP* __. The line power, that activates the STP motor relay, is wired between the TS-ROM relay contacts. When these alarms occur, the unique output group activates the appropriate TS-ROM channel relay which interrupts the STP power and disables dispensing.

Program the modulated annunciator (alarm horn) *output device* to activate and react to any alarm by assignment... change *GROUP P Q R S* – (dash) to a Y.

Example Output Device – OUTPUT GROUP Assignments (shown filled-in)

Output Device — OUTPUT GROUP Assignment

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	
Y			Y	Y	Y									Y	Y	Y	Y	Y					Y									

OUTPUT GROUP
GROUP X

Y -- YYY ----- YYYYYY ----- Y
The 24TH group (Group X) is shown assigned Y

1
32

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF

Press: M1 to move the cursor left ⇐

NOTE M2 to move the cursor right ⇒ M4 to backspace (delete) one character to the left ⇐

UP / DOWN ▲▼ to select (Y for **yes** assigned, or – (dash) for **no** not assigned)


ENTER to store the setup into the system memory

Standard and *Optional* Output Devices

Standard Output Devices:	<i>Optional (TS-CIM / TS-IEM) Output Devices :</i>
Modulated Annunciator	I/O Module Output 1*
Solid Annunciator	I/O Module Output 2*
Relay 1	I/O Module Output 3*
Relay 2	I/O Module Output 4*
Optional Output Devices:	I/O Module Output 5*
TS-ROM Relay 1	I/O Module Output 6*
TS-ROM Relay 2	I/O Module Output 7*
TS-ROM Relay 3	I/O Module Output 8*
TS-ROM Relay 4	I/O Module Output # 9* I/O Module Output # 10*
TS-ROM Relay 5	I/O Module Output # 11* I/O Module Output # 12*
TS-ROM Relay 6	I/O Module Output # 13* I/O Module Output # 14*
TS-ROM Relay 7	I/O Module Output # 15* I/O Module Output # 16*
TS-ROM Relay 8	I/O Module Output # 17* I/O Module Output # 18*
Note: The TS-2001 will list the TS-CIM Output Modules as I/O Module - Outputs # 17 through # 24 (if installed).	I/O Module Output # 19* I/O Module Output # 20*
	I/O Module Output # 21* I/O Module Output # 22*
	I/O Module Output # 23*
	I/O Module Output # 24*

Programming I/O Module Operation

The TS-CIM/TS-IEM channels * can function either as an input or an output module. The mode menu option allows selection of the channel operation—this must correspond to the type of module that is inserted into the channel. Input mode must be selected for input modules, and output mode must be selected for output modules. *Reference the Chapter about I/O MODULE setup programming.*

NOTE  *Aux. Inputs are always inputs and cannot be changed because the input circuitry is hard-wired. Reference the Chapter about AUX INPUT setup programming.*

Interfacing TS-LLD to Tank Gauge

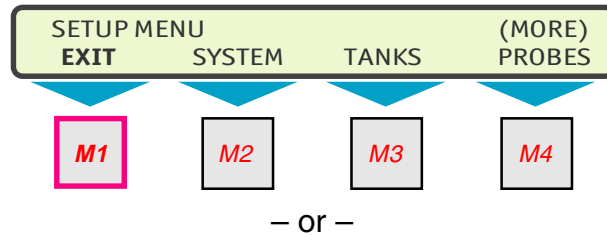
In order to interface the **INCON** TS-LLD line leak detector(s) to the TS-1001/504 / 2001/ 508 / Tank Sentinel consoles —

Use the TS-LLD interface terminals within the console (providing RS-485 bidirectional communication). The first TS-LLD is wired to the tank gauge and the others are connected to each other (1 to 2, 2 to 3...). LLD is available with Tank Sentinel software version # 1.10 and higher (check options – L must be in the part number).

Leaving (Exit) Setup Programming

There are two ways to leave the setup mode. These are:

- 1.) Use (press) the **CANCEL** key until the exit choice appears, then press the **M1** key to exit the setup mode.



- 2.) Wait until the Tank Sentinel console *autoexits*.



The unit will automatically leave/exit the setup mode (*autoexit*) after three or four minutes of inactivity (if no key is pressed). This feature prevents the unit from being left in the setup mode for long periods of time... **leak testing and leak detection are not active while in the setup mode.**

While viewing data in the normal run mode, the display will also revert to the normal display after shorter period of key inactivity (20 or 30 seconds).

After Programming is Done

After the system is custom-programmed and tested, printout or Fax a hard copy of the: system setup report, and a setup report for each tank for your records. Please give a copy of these reports to the customer for his records.

Warranty Reminder

After installation, make sure to sign the completed Warranty Registration form and return it to INCON. This form validates the express warranty stated here !



1

System SETUP PROGRAMMING

Contents:
 System Menu
 Worksheet 1-1 — System Output Groups

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. See the Installation, Operator's, TroubleShooting Guides and Application Notes for other reference sources.

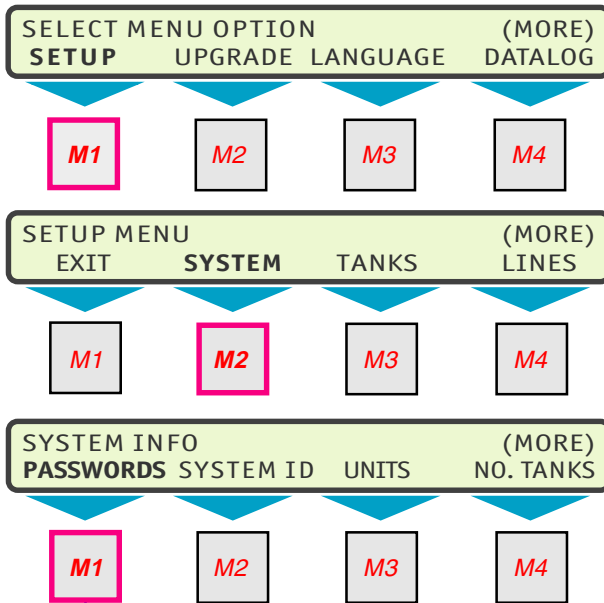
System Menu



NOTE The NO. (of) TANKS set in the **system menu** is shown in the TANKS, PROBES and PRODUCTS menus !



Press this key and follow the highlighted sequence shown below



PASSWORDS
 (none / empty)

_____ enter up to 12 characters max.
 Press **ENTER** to accept this data.

(Secures access to setup mode or acknowledging alarms and/or starting grace periods.
 A setup password is **recommended** for security.)

SETUP
 SETUP PASSWORD

ACK
 ACKNOWLEDGE PASSWORD
 (none / empty)

(also see ANNUNC [IATOR] menu for time-out)

_____ enter up to 12 characters max.
 Press **ENTER** to accept this data.

Remember:

- Use **UP** or **DOWN** ▲ ▼ key to display more menus (MORE shown) or selections (UP/DN shown)
- Press **CANCEL** to cancel data entry
- Use the **ENTER** key to accept data

Character input / editing:

- Press **M1** to move the cursor left ←
- Use **M2** to move the cursor right →
- Press **M4** to backspace (delete) one or more characters to the left ←

— Continued on next page —

SYSTEM Menu (CONTINUED... FROM PREVIOUS PAGE)

SYSTEM ID (enter new 5 line report header, see below)

	INCON LINE 1
Default Report Header ➤	INTELLIGENT CONTROLS INC :
	P. O. BOX 638 :
	SACO ME 04072 :
	1-800-984-6266 LINE 5

LINE 1
LOCATION LINE 1
INCON

_____ enter up to 24 characters max.
Press **ENTER** to accept this data.

LINE 2
LOCATION LINE 2
INTELLIGENT CONTROLS

_____ enter up to 24 characters max.
Press **ENTER** to accept this data.

LINE 3
LOCATION LINE 3
P. O. BOX 638

_____ enter up to 24 characters max.
Press **ENTER** to accept this data.

LINE 4
LOCATION LINE 4
SACO ME 04072

_____ enter up to 24 characters max.
Press **ENTER** to accept this data.

LINE 5
LOCATION LINE 5
1-800-984-6266

_____ enter up to 24 characters max.
Press **ENTER** to accept this data.

UNITS (Units are set in either US Standard or Metric)

MEASUREMENT UNITS

VOLUME

VOLUME UNITS

GALLONS

LITERS

(- change if not using the default US units)
(volume measurement units)
Use **UP/DOWN ▲ ▼** keys to choose units.
Press **ENTER** to accept this data.

LEVEL

LEVEL UNITS

INCHES

CM

(- change if not using the default US units)
(level and length units)
Use **UP/DOWN ▲ ▼** keys to choose.
(Metric - Centimeters)
Press **ENTER** to accept this data.

TEMP

TEMPERATURE UNITS

FAHRENHEIT

CELSIUS

(- change if not using the default US units)
(Prints F for Fahrenheit, or C for Celsius on reports)
Use **UP/DOWN ▲ ▼** keys to choose units.
Press **ENTER** to accept this data.

NO. TANKS (enter total number of tanks in the system)

NUMBER OF TANKS

1

_____ enter number of tanks.
Press **ENTER** to accept this data.

SYSTEM Menu (CONTINUED... FROM PREVIOUS PAGE)

NO.SENSORS NUMBEROFSENSORS 12(forTS-1001,504,750) 24(forTS-2001,508)	(enter the number of Leak Detection Sensors) _____ (0 thru N) enter the total number of Sensors. (also enter all unused channels between the lowest to highest channel (also see SENSORS menu) Press ENTER to accept this data.
NO.METERS NUMBEROFMETERS 0	(devices used with TS-DIM) _____ enter number of meters. Press ENTER to accept this data.
BUSY ENA BUSYENABLED NO YES	(dispenser supports 'busy' signal to ATG) Use UP/DOWN ▲▼ keys to choose setting. Press ENTER to accept this data.
U THRESH USER THRESHOLD +0	(volume allowed pumped before Catastrophic Leak alarm) _____ 1 to +9999 volume units. Press ENTER to accept this data.
LIMITS LIMITS LEAKLIM LEAKLIMIT +2.0	(set leak limits for after hours sentinel mode – also see menu) _____ 0.2 to +10.0 volume units. Use keypad to input sentinel mode leak rate. Press ENTER to accept this data.
LEAK OG LEAKLIMITOUTPUTGROUP NONE GROUP A thru FF ALLGROUPS	(assign leak alarm to an OG (NONE, A to FF, or ALL) (32 OGs available... see Worksheet #1-1) Not assigned to an Output Group (OG) One OG selected (A = 1ST OG, FF = 32ND OG) All OGs selected Use UP/DOWN ▲▼ keys to choose an OG. Press ENTER to accept this data.
THEFT LIM THEFTLIMIT +10.0	(enter theft limit for all tanks) _____ 1 to +9999 volume units. Press ENTER to accept this data.
THEFT OG THEFTLIMITOUTPUTGROUP NONE GROUP A thru FF ALLGROUPS	(assign theft limit alarm to an OG (NONE, A to FF, or ALL Output Groups)(32 OGs available... see Worksheet #1-1) Not assigned to an Output Group (OG) One OG selected (A = 1ST OG, FF = 32ND OG) All OGs selected Use UP/DOWN ▲▼ keys to choose an OG. Press ENTER to accept this data.

SYSTEM Menu (CONTINUED...FROM PREVIOUS PAGE)

SENTINEL (after hours theft monitoring / tank leak detection)

SENTINEL MODE

MODE

SENTINEL MODE

OFF

SCHEDULED

Use **UP/DOWN ▲ ▼** keys to choose mode.

Press **ENTER** to accept this data.

Select SCHEDULED to enable Sentinel Mode —

START TIM

SENTINEL START TIME

00.00.00

_____ up to 23.59.59

END TIME

SENTINEL END TIME

00.00.00

_____ up to 23.59.59

Input time in 24 hour format:

00.00.00 = midnight

22.00.00 = 10:00:00 pm

+ 12 (add 12 hours to pm times
from 1 pm to 11:59 pm)

02.05.00 = 2:05:00 am

DEL DELAY

DELIVERY DELAY

15 (minutes)

(delay tank delivery reports by ___ minutes)

_____ 1 to 240 minute input range.

Press **ENTER** to accept this data.

REP DELIV

REPORT DELIVERIES

ENABLED

DISABLED

Use **UP/DOWN ▲ ▼** keys to choose.

Press **ENTER** to accept this data.

(enabled = yes, report deliveries)

(disabled = no, don't report deliveries)

REP ALARM

REPORT ALARMS

ENABLED

DISABLED

Use **UP/DOWN ▲ ▼** keys to choose.

Press **ENTER** to accept this data.

(enabled = yes, report alarms)

disabled = no, don't report alarms)

REP LEAK

REPORT LEAK TESTS

ENABLED

DISABLED

Use **UP/DOWN ▲ ▼** keys to choose.

Press **ENTER** to accept this data.

(enabled = yes, report leak test results)

(disabled = no don't report leak test results)

REP SCALD

REPORT SCALD TEST

DISABLED

ENABLED

(Appears only if an S is present in the TS Part Number (press CHECK and M4 to view OPTIONS))

Use **UP/DOWN ▲ ▼** keys to choose.

Press **ENTER** to accept this data.

(disabled = no, don't report SCALD leak tests)

(enabled = yes, report SCALD leak tests)

SYSTEM Menu (CONTINUED... FROM PREVIOUS PAGE)

REP LINES REPORT LINE TESTS <i>ENABLED</i> <i>DISABLED</i>	(Appears only if an L is present in the TS Part Number (press CHECK and M4 to view OPTIONS) Use UP/DOWN ▲ ▼ keys to choose. Press ENTER to accept this data. (enabled = yes, report LINE leak tests) (disabled = no, don't report LINE leak tests)
HIST SIZE HISTORY REPORT LENGTH <i>50</i>	(Max. number of alarms in Alarm History Reports) _____ enter range from 1 to 50 alarms shown. Press ENTER to accept this data.
SYSFLOG SYSTEM FAIL OUTPUT GROUP <i>NONE</i> GROUP A thru FF ALL GROUPS	(assign system fail warnings to Output Group) (32 OGs available... see Worksheet #1) Not assigned to an Output Group (OG) One OG selected (A = 1ST OG, FF = 32ND OG) All OGs selected Use UP/DOWN ▲ ▼ keys to choose an OG. Press ENTER to accept this data.
PRNT INTR STRAPPING TABLE PRINT INTERVAL <i>+1.000</i>	(how many intervals to print) _____ enter strapping table print interval, range = 1 to 100.0 level units. Press ENTER to accept this data.
DATA INTR DATA CAPTURE INTERVAL <i>1</i>	(for diagnostic use) _____ data logging interval, range = 1 to 9999. Press ENTER to accept this data.
DATA TANK TANK TO DATA LOG <i>1</i>	(for diagnostic use) _____ tank(s) to data log, range = 1 to NO. of TANKS. Press ENTER to accept this data.
COLD BOOT IF YOU CONTINUE, ALL SYSTEM PROGRAMMING AND DATA WILL BE LOST...	(Will erase all program data / setup data to the original "factory" default values)
PRESS ENTER IF YOU ARE SURE THAT YOU WANT TO CONTINUE WITH COLD BOOT	Press ENTER to proceed with the 'COLD BOOT'.
ERASING SYSTEM MEMORY ... SYSTEM WILL REBOOT WHEN COMPLETE	(The ATG SETUP programming is returned to the default settings and must be reprogrammed to match the site.)

Worksheet #1-1 – Output Groups – System Limits

Fill-in the work sheet below and compare assignments to uncover conflicts **before** programming output devices.

OG = Output Group	- Output Group Assignment WORKSHEET Output Group choices -		
System Limits:			NONE
LEAK OG			A
THEFT OG			B
SYSFL OG			C
			D
			E
			F
			G
			H
			I
			J
			K
			L
			M
			N
			O
			P
			Q
			R
			S
			T
			U
			V
			W
			X
			Y
			Z
			AA
			BB
			CC
			DD
Example:			EE
LEAK OG	D	Activates Modulated Annunciator & Relay 2 (turns on external tank leak light)	FF
THEFT OG	---	Sentinel Mode Theft Limit: none assigned	ALL
SYSFL OG	A	System Fail (software or hardware failures) Activate solid annunciator horn	
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			

2

Tanks SETUP PROGRAMMING

Contents: Tank Data Menu Tank Alarm Menu Special Tank Menu Worksheet 2-1, 2-2 Tank Output Groups	See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. See the Installation, Operator's, Troubleshooting Guides and Application Notes for other reference sources.
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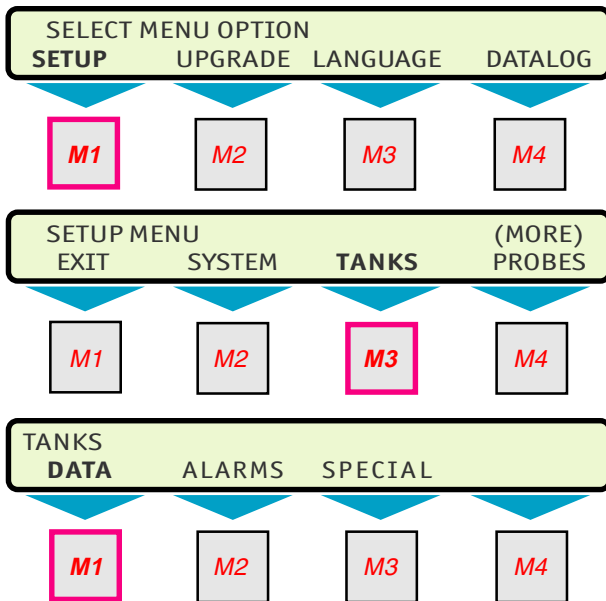
Tanks Menu



Only the NO. (of) TANKS set under the system menu are shown here !



Press this key and follow the highlighted sequence below



Remember:

- Use **▲UP** or **▼DOWN** keys to display more menus (MORE shown) or selections (UP / DN are shown)
- Press **CANCEL** to cancel data entry
- Use the **ENTER** key to accept data

Character input / editing:

- Press menu keys (**M1** to **M4**) to access menus.
- Press **M4** to backspace (delete) one or more characters to the left
- Use **M2** to move the cursor right _
- Press **M1** to move the cursor left _

TANK DATA
TANK 1 TANK 2

N refers to / represents a tank number
Select the tank number to program Data.

TANK DATA N
COPY
COPY FROM TANK DATA X TO N
TANK 1
COPY FROM TANK DATA N TO N
PRESS ENTER IF YOU ARE SURE?

Tank 1 is shown selected (press **M1** key).

Select a tank to copy data from (use **M** key).

Press **ENTER** to accept this data.

Use **UP/DOWN ▲▼** keys to display tanks 5-8.

Tanks–TANKDATAN Menu (CONTINUED...FROM PREVIOUS PAGE)

NAME TANK NAME N TANK N	N refers to / represents a tank number (Use SHIFT to change from A-M to N-Z to NUMERIC.) _____ enter up to 7 characters max. Press ENTER to accept this data. (INCON recommends leaving the tank name as TANK N)
MANIFOLD MANIFOLD FOR TANK N NONE MANIFOLD 1 MANIFOLD 2 : MANIFOLD 4	(select only when tanks are part of a manifold) Use UP/DOWN ▲ ▼ keys to display Manifold 1 thru 4. Press ENTER to accept this data.
SHAPE TANK SHAPE 1 HORIZONTAL VERTICAL (aboveground storage tank)	(distinguishes between underground and aboveground) Use UP/DOWN ▲ ▼ keys to choose shape. Press ENTER to accept this data.
TYPE TANK TYPE N SPECIAL #	(select STANDARD 1 thru XX... see Appendix A) Use UP/DOWN ▲ ▼ keys to choose type. Press ENTER to accept this data. (for Standard Tank types, or SPECIAL 1 thru 8 or program the special tank(s) under the SPECIAL TANK N menu)
PROBE PROBE FOR TANK N PROBE #	Use UP/DOWN ▲ ▼ keys to choose probe#. Press ENTER to accept this data.

Select the correct Probe channel # for TANK N...



NOTE

*Any Probe # (input channel Number) can be used for any Tank. For example, Probe 8 (the probe that is wired to probe input channel #8) can be installed in Tank 1**BUT a Probe can not be used (or programmed or assigned) to more than one tank !** Assigning the same Probe #N to more than one Tank, will display an alarm when exiting SETUP (to warn you that more than one tank is referencing the same probe) ! **The system will remain in setup until this problem is fixed.***

Set Probe data under the PROBE menu (Chpt. 3.)

PRODUCT PRODUCT FOR TANK N PRODUCT #	Use UP/DOWN ▲ ▼ keys to choose product#. Press ENTER to accept this data. (select Product 1 thru 8 ... the PRODUCT menu is not present if a Manifold is selected / changed from NONE) ...Also see PRODUCTS menu for standard products and Special product programming.
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Tanks – TANK DATA N Menu (CONTINUED... FROM PREVIOUS PAGE)

P OFFSET
PRODUCT OFFSET N
+0.00000

(to compensate product readings from tank tilts)

_____ +20 to -20

Use keypad to input level units.
Press **ENTER** to accept this data.
(see Installation Manual for offset values)

(Not available if Manifold or Pressure probe selected)

W OFFSET
WATER OFFSET N
+0.00000

(to compensate product readings from tank tilts)

_____ +20 to -20

Use keypad to input level units.
Press **ENTER** to accept this data.
(see Installation Manual for offset values)

(Not available if Manifold or Pressure probe selected)

DEL THRES
DELIVERY THRESHOLD N
+200.000

(the minimum **volume** before a delivery is reported)

_____ 1.0 to 99999

Use keypad to input level units.
Press **ENTER** to accept this data.
(the Delivery Threshold menu is not present if a Manifold is selected / changed from NONE)

Tanks – TANK ALARM N Menu

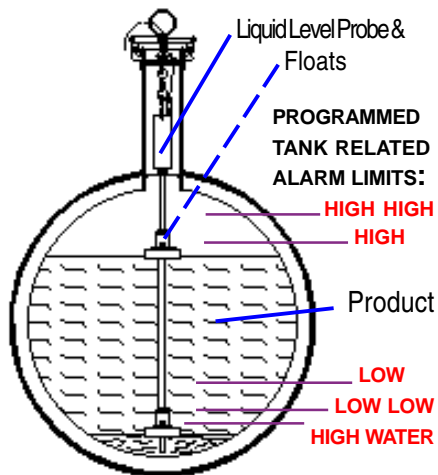


Figure 2 - 1 Typical Tank Limits

See Figure 2 - 1 at left for typical alarm limit settings.

NOTES N refers to / represents a tank number



- The alarm copy function copies all alarm limits from Tank X to the current Tank # N. This is a good function to use for identical sized tanks, and may be adequate for similar sized tanks but limit settings may require editing after the copy operation.

- Also note, Water, High and High High limits are set in length units, inches or centimeters — while Low and Low Low limits are set in volume units, gallons or liters.

ALARMS
TANK ALARMS
TANK 1
TANK 2
:
TANK 8

(To set Tank Alarm Limits)

Use **M2** key.

Select Tank N to program, using **M1 - M4** keys.

Use **UP/DOWN ▲ ▼** keys to display Tanks 5-8.

Tanks–TANKDATAN Menu (CONTINUED...FROM PREVIOUS PAGE)

TANK ALARM N

COPY
COPY FROM TANK ALARMS X TO N
TANK 1
:
TANK 8
COPY TANK ALARMS X TO N
PRESS ENTER IF YOU ARE SURE?

To select Tank N ...

(COPY is optional) Press the **M1** key.

Select a tank to copy data from (use **M** key).
Use **UP/DOWN ▲▼** keys to display tanks 5-8.
(The alarm copy function copies all alarm limits from Tank X to the current Tank # N)
Press **ENTER** to accept this data.

HIGH LIM

HIGH PRODUCT LEVEL LIMIT N
+96.0000

_____ 0.0 to 9999.0

Use keypad to input limit in inches or centimeters.
Press **ENTER** to accept this data.

H LIM OG

HIGH PRODUCT OUTPUT GROUP N
NONE
GROUP A-FF
ALL GROUPS

(assign Alarm Limits to Output Group)
(32 OGs available... see Worksheet #2 or #3)
Not assigned to an output Group (OG)
One OG selected (A = 1ST OG, FF = 32ND OG)
All OGs selected
Use **UP/DOWN ▲▼** keys to choose an OG.
Press **ENTER** to accept this data.

HIGH HIGH N

HI HI PRODUCT LEVEL LIMIT N
+96.0000

N refers to / represents a tank number

_____ 0.0 to 9999. (enter alarm limit)

Press **ENTER** to accept this data.

HH LIM OG N

HI HI PRODUCT OUTPUT GROUP N
NONE
GROUP A-FF
ALL GROUPS

(assign Alarm Limits to Output Group)
(32 OGs available... see Worksheet #2 or #3)
Not assigned to an output Group (OG)
One OG selected (A = 1ST OG, FF = 32ND OG)
All OGs selected
Use **UP/DOWN ▲▼** keys to choose an OG.
Press **ENTER** to accept this data.

LOW LIM N

LOW PRODUCT VOLUME LIMIT N
+0.0000

N refers to / represents a tank number

_____ 0.0 to 50000 (enter alarm limit)

Press **ENTER** to accept this data.

L LIM OG N

LOW PRODUCT OUTPUT GROUP N
NONE (A to FF, or ALL)
GROUP A-FF
ALL GROUPS

(assign Alarm Limits to Output Group)
(32 OGs available... see Worksheet #2 or #3)
Not assigned to an output Group (OG)
One OG selected (A = 1ST OG, FF = 32ND OG)
All OGs selected
Use **UP/DOWN ▲▼** keys to choose an OG.
Press **ENTER** to accept this data.

LOW LOW N

LOW LOW PRODUCT VOLUME LIMIT N
+0.0000

_____ + 0 to 50000 (enter alarm limit)

Press **ENTER** to accept this data.

Tanks–TANKALARMN Menu (CONTINUED...FROM PREVIOUS PAGE)

LL LIM OG N
L L PRODUCT OUTPUT GROUP N
NONE
GROUP A-FF
ALL GROUPS


(assign Alarm Limits to Output Group)
(32 OGs available... see Worksheet #2 or #3)
Not assigned to an output Group (OG)
One OG selected (A = 1ST OG, FF = 32ND OG)
All OGs selected
Use **UP/DOWN ▲ ▼** keys to choose an OG.
Press **ENTER** to accept this data.

WATER LIM N
HIGH WATER LEVEL LIMIT N
+4.0000


_____ 0.0 to 9999.0 (enter alarm limit)
Press **ENTER** to accept this data.

W LIM OG N
HIGH WATER OUTPUT GROUP N
NONE
GROUP A-FF
ALL GROUPS

(assign Alarm Limits to Output Group)
(32 OGs available... see Worksheet #2 or #3)
Not assigned to an output Group (OG)
One OG selected (A = 1ST OG, FF = 32ND OG)
All OGs selected
Use **UP/DOWN ▲ ▼** keys to choose an OG.
Press **ENTER** to accept this data.

NOTE  WATER LIM N and W LIM OG N are not available for PRESSURE probes, since they do not measure water level.

Tanks–SPECIAL TANKN Menu

- NOTE**  • If **STANDARD tanks** are selected, then these menu options will not be available.
- **Correction Tables:** If the Special Tank is not a perfect cylinder or has a domed end, then you must program a correction table (100 correction points can be programmed). Two values are required per point / position (POS #). These are level and volume, which are found in the manufacturers' tank table /chart, input these accurately. Always input 0 level and 0 volume for the first point, and max. level and max. volume for the last point. The number of points in between determines the accuracy of the strapping table.
 - **Cylindrical Tanks:** Select **diameter** and input the internal tank diameter value, and set the **length** to the internal length of the tank (correction tables are usually not needed with cylindrical tanks).
 - **Vertical or Rectangular tanks:** Select **diameter** and input the internal tank diameter or depth, and set its **length** to zero (**0**). Input 0 level and 0 volume for the first point, and max. level and max. volume for the last point.
 - **Correction Points** are automatically sorted from lowest to highest level. The lowest level is closest to the bottom of the tank.

SPECIAL
SPECIAL TANKS
SPECIAL 1
SPECIAL 2
:
SPECIAL 8

Use **UP/DOWN ▲ ▼** keys to display tanks 5-8.

Tanks – SPECIAL TANK N Menu (CONTINUED)

SPECIAL TANK N

COPY

COPY FROM SPECIAL TANK X TO N
SPECIAL 1

COPY SPECIAL TANK N TO N

PRESS ENTER IF YOU ARE SURE?

N refers to / represents a tank number

Press the **M1** key.

Select a tank to copy data from (use **M** key).

Press **ENTER** to accept this data.

Use **UP/DOWN ▲▼** keys to display tanks 5-8.

DIAMETER

TANK DIAMETER N

+96.00

Press the **M2** key.

_____ 0.0 to 999,999

Use the **M4** key to use **BACKSPACE**.

Use the Keypad to input the special tank diameter.

Press **ENTER** to accept this data.

LENGTH

TANK LENGTH N

+324.000

Press the **M3** key.

_____ 0.0 to 999,999

Use the **M4** key to use **BACKSPACE**.

Use the Keypad to input the special tank diameter.

Press **ENTER** to accept this data. (Correction points can be added between inaccurate level positions.)

NOTE (HEIGHT will replace LENGTH when VERTICAL is selected as the TANK DATA SHAPE)



HEIGHT

TANK HEIGHT N

+324.000

Press the **M3** key.

_____ 0.0 to 1999.0

Use the **M4** key to use **BACKSPACE**.

Use the Keypad to input the special tank diameter.

Press **ENTER** to accept this data.

CORR TABL

CORRECTION TABLE N

ADD

Press the **M4** key.

(Position (POS #) ...see **NOTES** in this section)

Press the **M1** key. POS 1 is the lowest value tank.

Two values (LEVEL and VOLUME) are required.

LEVEL +0

_____ Use the Keypad to input level of strapping point.

Press **ENTER** to accept this data.

VOLUME +0

_____ Use the Keypad to input volume at that level point.

Press **ENTER** to accept this data.

Tanks – SPECIALTANK N Menu (CONTINUED)

DELETE

SELECT POSITION WITH UP/DN POS # Select the POS # to delete (**UP/DOWN ▲▼**).
LEVEL +X VOLUME +Y Press **ENTER** to accept this data.

ARE YOU SURE?

Press **ENTER** to accept this data.

EDIT

SELECT POSITION WITH UP/DN POS # Select POS # to edit (**UP/DOWN ▲▼**).
LEVEL +X VOLUME +Y Press **ENTER** to accept this data.

(correct the mistake and press **ENTER** again)

DISPLAY

CORRECTION TABLE N POS N
LEVEL +X VOLUME +Y

Use **UP/DOWN ▲▼** keys to scroll thru list.

Worksheet 2-1 and 2-2 are shown on the next two pages

Worksheet #2-1 – Output Groups – Tanks 1 thru 4

Fill-in the work sheet below and compare assignments with other work-sheets to uncover conflicts **before** programming output devices (for ALL ATG types).

OG = Output Group	- Output Group Assignment WORKSHEET Output Group choices -		
Tank 1			NONE
H LIM OG			A
HH LIM OG			B
L LIM OG			C
LL LIM OG			D
W LIM OG			E
			F
Tank 2			G
H LIM OG			H
HH LIM OG			I
L LIM OG			J
LL LIM OG			K
W LIM OG			L
			M
Tank 3			N
H LIM OG			O
HH LIM OG			P
L LIM OG			Q
LL LIM OG			R
W LIM OG			S
			T
Tank 4			U
H LIM OG			V
HH LIM OG			W
L LIM OG			X
LL LIM OG			Y
W LIM OG			Z
			AA
Example: Tank #1			BB
H LIM OG	C	(High Limit Activates Relay 1 [for programmed timeout] to external Tank Overfill Alarm Acknowledge, & Activates Solid Annunciator)	CC
HH LIM OG	D	(High High Limit Activates Relay 2 [for programmed timeout] to activate external Tank Overfill Alarm, & Activates Solid Annunciator)	DD
L LIM OG	R	(Low Limit Activates Output Module 2, turns on Reorder Product Light & Modulated Annunciator)	EE
LL Limit OG	S	(Low Low Limit Activates TS-ROM Relay 1 to Disable Tank 5 STPump, and Activates Modulated Annunciator)	FF
W LIM OG	S	(Low Low Limit Activates TS-ROM Relay 1 to Disable Tank 5 STPump, and Activates Modulated Annunciator)	ALL
SYSFL OG	A	System Fail (software or hardware failures) Activate solid annunciator horn	
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			

Worksheet #2-2 – Output Groups – Tanks 5 thru 8

Fill-in the work sheet below and compare assignments with other work-sheets to uncover conflicts **before** programming output devices (for TS-2001 / 508 only).

OG = Output Group	- Output Group Assignment <u>WORKSHEET</u> Output Group choices -	
Tank 5 TS-2001 only:		NONE
H LIM OG		A
HH LIM OG		B
L LIM OG		C
LL LIM OG		D
W LIM OG		E
		F
Tank 6 TS-2001 only:		G
H LIM OG		H
HH LIM OG		I
L LIM OG		J
LL LIM OG		K
W LIM OG		L
		M
Tank 7 TS-2001 only:		N
H LIM OG		O
HH LIM OG		P
L LIM OG		Q
LL LIM OG		R
W LIM OG		S
		T
Tank 8 TS-2001 only:		U
H LIM OG		V
HH LIM OG		W
L LIM OG		X
LL LIM OG		Y
W LIM OG		Z
		AA
Example: Tank # 5		BB
H LIM OG	C (High Limit Activates Relay 1 [for programmed timeout] to external Tank Overfill Alarm Acknowledge, & Activates Solid Annunciator)	CC
HH LIM OG	D (High High Limit Activates Relay 2 [for programmed timeout] to activate external Tank Overfill Alarm, & Activates Solid Annunciator)	DD
L LIM OG	R (Low Limit Activates Output Module 2, turns on Reorder Product Light & Modulated Annunciator)	EE
LL Limit OG	W (Low Low Limit Activates TS-ROM Relay 5 to Disable Tank 5 STPump, and Activates Modulated Annunciator)	FF
W LIM OG	W (Low Low Limit Activates TS-ROM Relay 5 to Disable Tank 5 STPump, and Activates Modulated Annunciator)	ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)		

3

Lines SETUP PROGRAMMING

Contents:
 Lines Menu
 Line Data Menu

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

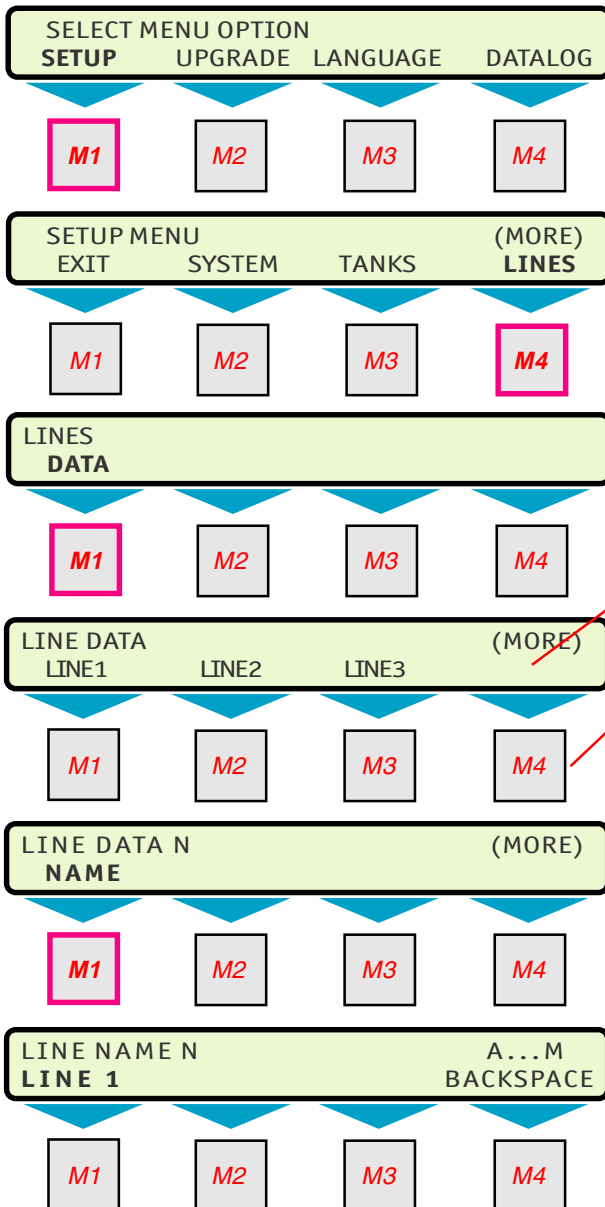
Lines Menu

NOTE


Only the NO. (of) LINES programmed under the **system menu** are shown here! This menu applies to consoles that have a L in the part number (LLDI enabled – CHECK OPTIONS).



Press this key and follow the highlighted sequence below



Disregard this menu when it's not displayed.

The purpose of this menu is to allow renaming of the line to help identify its location. The new line name will appear on reports and at the local tank gauge display.

Changing the Line Name is optional.

Use the ▲UP or ▼DOWN key to display LINE 5 through LINE 8.

Use a menu select keys to choose a line.

Remember:

- Use ▲UP or ▼DOWN key to display more menus or selections (when MORE or UP/DN is shown)
- Press CANCEL to cancel a data entry
- Use the ENTER key to accept data

Character input / editing:

- Press M4 to backspace (delete) one character to the left ←
- Use M2 to move the cursor right →
- Press M1 to move the cursor left ←

4

Probes SETUP PROGRAMMING

Contents:

Probes Menu
 Probe Data Menu
 Special Probes Menu
 TABLE 4.1 Special Probe RTD Positions

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

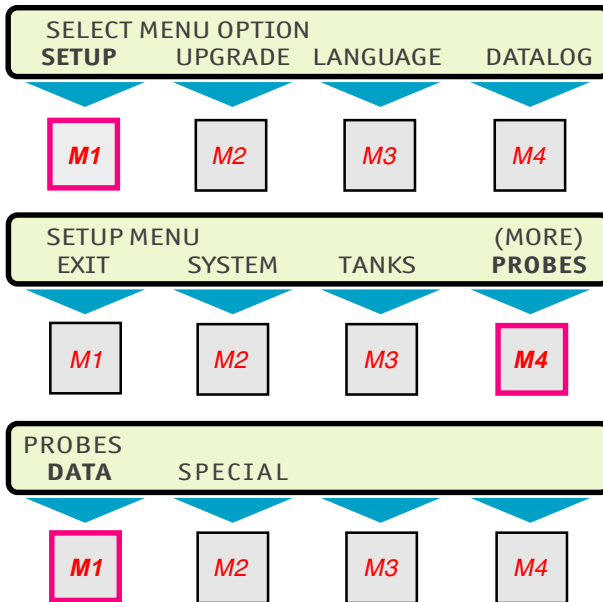
Probes Menu

NOTE


See the Installation Guide – Chapters 6 & 7 for Probe Model & Serial numbers, Gradient values, Float types, and RTD Locations).



Press this key and follow the highlighted sequence below






Only the NO. (of) TANKS programmed under the **system menu** are shown here!

Remember:

- Use **▲UP** or **▼DOWN** key to display more menus or selections (MORE or UP/DN shown)
- Press **CANCEL** to cancel data entry
- Use the **ENTER** key to accept data

Character input / editing:

- Press **M4** to backspace (delete) one character to the left 
- Use **M2** to move the cursor right 
- Press **M1** to move the cursor left 

N refers to / represents any probe #

```

PROBE DATA
PROBE 1
PROBE 2
:
PROBE 8
PROBE DATA N
COPY
COPY FROM PROBE DATA X TO N
PROBE 1
PROBE 2
:
PROBE 8
COPY FROM PROBE DATA X TO N
PRESS ENTER IF YOU ARE SURE?
    
```

Press (**M**) key to select probe # for setup.

Press **UP/DOWN ▲ ▼** keys to display probes 5 – 8 (for TS-2001/508 only).

(Optional - used to copy probe data)

Press **M1** key.

Press (**M**) key to select a probe # to copy.

Press **UP/DOWN ▲ ▼** keys to display probes 5 – 8 (for TS-2001/508 only).

Press **ENTER** to accept this data.

Probes—PROBE DATA Menu (CONTINUED...FROM PREVIOUS PAGE)

PROBE DATA N TYPE

PROBE TYPE FOR PROBE N

STD 101
STD 107
STD 113
:
STD 149
SPEC PROBE 1
SPEC PROBE 2
:
SPEC PROBE 8

PRESSURE

STD 29
:
STD 89

GRADIENT

GRADIENT FOR PROBE N

+9.03000

NO. FLOATS

NUMBER OF FLOATS FOR PROBE

2 FLOATS
1 FLOAT

FLT TYPE

FLOAT TYPE FOR PROBE N

GASOLINE
OIL

PROBE # N shown typical for any probe # 1 – # 8

Press **M2** key.

Press **UP/DOWN ▲ ▼** keys to choose.

Press **ENTER** to accept this data.

STD # probe is a **STANDARD** probe.

(menus differ depending on choices)

Select **SPEC PROBE N** (special probe) if it is not a **Standard TSP-LL2** model / type of probe listed in this menu...see **SPECIAL** menu.

Select **PRESSURE** (pressure probe) when programming TSP-LLP or TSP-LPG probes. See following section on Pressure probes.

(enter the GRADIENT from the probe label)

_____ 8 to 9.90000

(See *Installation Guide* or *Probe label* for this data. **Also see Chapter 2** of this manual for: **Probe # — Tank # assignments**)

Press **ENTER** to accept this data.

Use **UP/DOWN ▲ ▼** keys to choose a #.

Press **ENTER** to accept this data.

Use **UP/DOWN ▲ ▼** keys to choose a type.

Press **ENTER** to accept this data.

Probe #	Model #	Probe Gradient #	Product in Tank (Float type)	Number of Probe Floats (1 or 2)	
					Tank 1
					Tank 2
					Tank 3
					Tank 4
					Tank 5
					Tank 6
					Tank 7
					Tank 8

Probes – PRESSURE PROBE DATA Menu



This grayed out section is a duplicate of the STANDARD menu - use it to assist in following the PRESSURE PROBE DATA MENU.

PROBE DATA N
COPY
PROBE DATA N
TYPE
PROBE TYPE FOR PROBE N

PROBE # N shown typical for any probe # 1 – # 8.
Press **M1** key.
PROBE # N shown typical for any probe # 1 – # 8.
Press **M2** key.
Press **UP/DOWN ▲ ▼** keys to choose probe type.

PRESSURE

**Select PRESSURE (pressure probe).
when programming TS-ISCB or TSP-LLPT probes.**

MODEL
PROBE MODEL FOR PROBE N

Press **M3** key. (instead of GRADIENT for STANDARD)
Press **UP/DOWN ▲ ▼** keys to choose either (TS-ISCB or TSP-LLPT)
Press **ENTER** to accept this data.

SCALE (TS-ISCB)
SCALE N
+9.03000

Press **M4** key. (instead of NO.FLOATS for STANDARD)

_____ Use the keypad to enter the PSI as printed on the probe.
Press **ENTER** to accept this data.

OFFSET(TSP-ISCB)
PROBE OFFSET N
+0

Press **M1** key. (instead of FLOAT TYPE for STANDARD)

_____ Use the keypad to enter the OFFSET level.
Press **ENTER** to accept this data.

CONFIG (TSP-LLPT)
CONFIGURING PROBE

Press **M4** key. (instead of SCALE for ISCB)
(ATG will check the addresses for all probes)

SCALE (TSP-LLPT)
SCALE N
+9.03000

Press **M1** key. (instead of OFFSET for ISCB)

_____ Use the keypad to enter the PSI as printed on the probe.
Press **ENTER** to accept this data.

ENA TEMP (TSP-LLPT)
TEMPERATURE ENABLE N
NO
YES

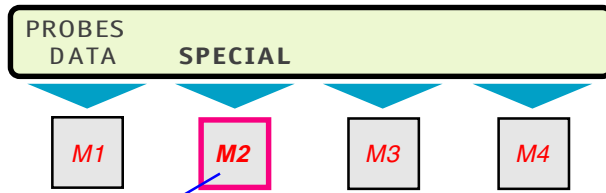
Press **M2** key.
Press **UP/DOWN ▲ ▼** keys to choose either (NO or YES)
Press **ENTER** to accept this data.

OFFSET(TSP-LLPT)
PROBE OFFSET N
+0

Press **M3** key.

_____ Use the keypad to enter the OFFSET level.
Press **ENTER** to accept this data.

Probes – SPECIAL Menu



The **SPECIAL** menu appears when at least one **SPECIAL PROBE N** was selected from the **PROBES – DATA – TYPE** menu (above).

This menu shows all possible choices **BUT** only the selected **SPECIAL PROBES N** are displayed.

SPECIAL
SPECIAL PROBES
 SPECIAL 1
 SPECIAL 2
 :
 SPECIAL 8
 SPECIAL PROBE N

COPY
 COPY FROM SPECIAL PROBE X TO N
 PROBE 1
 PROBE 2
 :
 PROBE 8
 COPY FROM SPECIAL PROBE X TO N
 PRESS ENTER IF YOU ARE SURE?

LENGTH
 SENSOR LENGTH N
 53

RTD POS
 RTD POSITION TABLE N
 ADD
 RTD POSITION TABLE N
 +0

DELETE
 SELECT POSITION WITH UP/DN **POS X**
 +NN.NNNN or TABLE IS EMPTY
 ARE YOU SURE?

EDIT
 SELECT POSITION WITH UP/DN **POS X**
 +NN.NNNN or TABLE IS EMPTY

DISPLAY
 RTD POSITION TABLE N **POS X**
 +NN.NNNN or TABLE IS EMPTY

Press (**M**) key to select a **SPECIAL #** probe.

N = Special Probe # 1 thru # 8 and may or may not agree with the actual Tank number or Probe input channel number.

(Optional - used to copy probe data)
 Select a probe to copy data from (use **M** key).

Press **UP/DOWN ▲ ▼** keys to choose a probe #.
 Press **ENTER** to accept this data.

Press **ENTER** to accept this data.
 (press **CANCEL** to prevent copying the POS#)

_____ 0 to 999 (Use keypad to enter probe length.)
 Press **ENTER** to accept this data.

(RTD Temperature sensor positions are printed on the probe label on the probe head)
 Press **M1** key.

_____ Use the keypad to enter each RTD number.
 Press **ENTER** to accept this data.
 (input all 6 RTD positions as printed on the label.)

Press **M2** key.
 Press **UP/DOWN ▲ ▼** keys to choose a POS #.
 Press **ENTER** to Delete an RTD POS #.
 Press **ENTER** to accept this data.
 (press **CANCEL** to prevent deleting the POS#)

Press **M3** key.
 Press **UP/DOWN ▲ ▼** keys to choose a POS #.
 Press **ENTER** to reset the POS # to (+0).
 Use keypad to EDIT RTD POS#.
 Press **ENTER** to accept this data.

Press **M4** key.
 Press **UP/DOWN ▲ ▼** keys to scroll POS #.
 Press **CANCEL** to return to the menu.

Probes—SPECIAL Menu (CONTINUED... FROM PREVIOUS PAGE)

Steps:

- 1.) Accurately fill-in **TABLE 4.1**
(ref. Install. Guide / Probe head / cable)
- 2.) Add RTD position accurately
- 3.) Repeat step 2 until all positions are added
- 4.) Display / check RTD table N positions
- 5.) Edit / Delete positions as required
- 6.) Repeat step 5 to confirm accuracy

RTD POSITION TABLE N 6.10	POS 1
RTD POSITION TABLE N 16.63	POS 2
RTD POSITION TABLE N 24.69	POS 3
RTD POSITION TABLE N 32.64	POS 4
RTD POSITION TABLE N 41.69	POS 5

TABLE 4.1 SPECIAL PROBE RTD POSITIONS

RTD:	Probe 1	Probe 2	Probe 3	Probe 4	Probe 5	Probe 6	Probe 7	Probe 8
# 6								
# 5								
# 4								
# 3								
# 2								
# 1								

5

Products SETUP PROGRAMMING

Contents:
 Products Menu
 Product Data Menu
 Special Product Menu

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

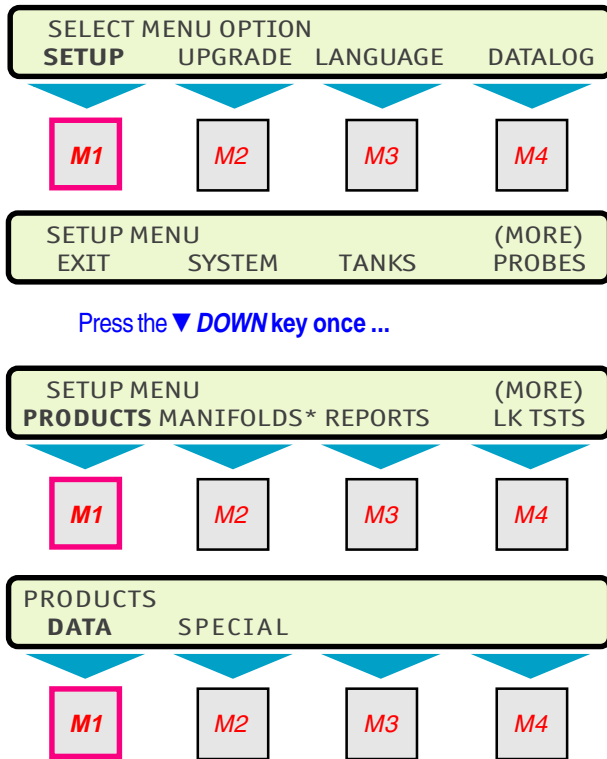
Products Menu

NOTE


Use this menu to specify the product contained in each tank. **See Appendix B for API Gravity information** – required for Special Products programming. *Only the NO. (of) TANKS set under the **System menu** are shown !*



Press this key and follow the highlighted sequence below






Press the **DOWN** key once ...

PRODUCT DATA
 PRODUCT 1
 PRODUCT 2
 :
 PRODUCT 8
 PRODUCT DATA 1
 COPY

Remember:

- Use **UP** or **DOWN** keys to display more menus (MORE shown) or selections (UP/DN shown)
- Press **CANCEL** to cancel data entry
- Use the **ENTER** key to accept data

Character input / editing:

- Press menu keys (**M1** to **M4**) to access menus.
- Press **M4** to backspace (delete) one character to the left 
- Use **M2** to move the cursor right 
- Press **M1** to move the cursor left 

N refers to / represents a product number.
 Press (**M**) key to select a PRODUCT #.
 Press **UP/DOWN** **▲ ▼** to display product in tanks 5 – 8.
 ** Manifold Tanks will share a Product name, which will cause a gap to appear in product #'s.

(Optional - used to copy product data)
 Press **M1** key.

Product Data Menu (CONTINUED... FROM PREVIOUS PAGE)

COPY FROM PRODUCT DATA X TO N	Press (M) key to select a PRODUCT # to copy.
PRODUCT 1	
PRODUCT 2	Press UP/DOWN ▲ ▼ to display product in tanks 5 – 8.
:	
PRODUCT 8	
COPY PRODUCT DATA X TO N	Press ENTER to accept this data.
PRESS ENTER IF YOU ARE SURE?	(press CANCEL to prevent copying product data)
NAME	(rename product if necessary) Press M2 key.
PRODUCT NAME N	
PROD N	_____ 9 characters (ie. 87 Octane/Cetane)
	(optional input a new name of the PRODUCT in Tank N)
	Use keypad to enter product names.
	Press ENTER to accept this data.
TYPE	Press M3 key.
PRODUCT TYPE N	(Select a Standard or Special product type in tank N)
UNLEADED REG	Press UP/DOWN ▲ ▼ to choose a product type.
UNLEADED PLS	
UNLEADED XTR	
UNLEADED SUP	
DIESEL	
KEROSENE	
#2 FUEL OIL	
ETHANOL	
SPECIAL 1	
:	
SPECIAL 8	
LEADED REG	

(N = tank Number... 5 – 8 for TS-2001/508)

Select a special product (SPECIAL N) when the product in the tank does not match choices here.
See SPECIAL PRODUCTS menu for programming.

Press **ENTER** to accept this data.

SPECIAL PRODUCTS Menu

NOTES



Program SPECIAL PRODUCTS when this menu appears (*The SPECIAL PRODUCTS menu * appears only after a SPECIAL product TYPE is selected from the Product Data Menu*).
To access this menu, go back to the parent PRODUCTS menu, and choose SPECIAL (M2).

SPECIAL PRODUCTS	
SPECIAL 1	Press the (M) key to select a Special product#.
SPECIAL 2	
:	
SPECIAL 8	(N = 1 – 8... 5 – 8 for TS-2001/508)
SPECIAL PRODUCT N	(Optional - used to copy product data)
COPY	Press M1 key.
COPY FROM SPECIAL PRODUCT X TO N	Press (M) key to select a product to copy.
SPECIAL 1	
SPECIAL 2	Press UP/DOWN ▲ ▼ to display special products
:	5 – 8 (TS-2001/508 only).
SPECIAL 8	

Special Products Menu (CONTINUED...FROM PREVIOUS PAGE)

COPY SPECIAL PRODUCT X TO N
PRESS ENTER IF YOU ARE SURE?

Press **ENTER** to accept this data.
(press **CANCEL** to prevent copying data)

TMP CTYPE
TEMPERATURE COMPENSATION TYPE N

(Temperature Compensation Type) Press **M2** key.
Press **UP/DOWN ▲ ▼** to choose a type.

API 6B/54B
API 6C/54C
API 6A/54A

(changes API GRAV to DENSITY)
Press **ENTER** to accept this data.

API GRAV
API GRAVITY N
+63.5000

Press **M3** key.

_____ 0.0 to 100.0
Use keypad to enter the API gravity.
Press **ENTER** to accept this data.

DENSITY
DENSITY N
+63.5000

Press **M3** key.

_____ 500 to 2000
Use keypad to enter the DENSITY.
Press **ENTER** to accept this data.

API ALPHA
API ALPHA N
+600.000

Press **M4** key.

_____ 270 to 930.0
Use keypad to enter the API alpha.
Press **ENTER** to accept this data.

NOTE



The following menu items appear only with the optional: **SCALD (Statistical Continuous Automatic Leak Detection)** tank leak testing program – **WHEN** – a special product type is selected, otherwise disregard the items below.

VAPOR A
VAPOR A N
+12.1010

Press **M1** key.

_____ 5.0 to 20.0
Use keypad to enter Vapor A *in degrees Rankine*.
Press **ENTER** to accept this data.

VAPOR B
VAPOR B N
+8907.00

Press **M1** key.

_____ 2000.0 to 15000.0
Use keypad to enter Vapor B *in degrees Rankine*.
Press **ENTER** to accept this data.

MOLE WGHT
MOLE WEIGHT N
+130.000

Press **M3** key.

_____ 50.0 to 200.0
Use keypad to enter mole weight *in degrees Rankine*.
Press **ENTER** to accept this data.

6

Manifolds SETUP PROGRAMMING

Contents:	See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.
Manifolds Menu	
Manifold Data Menu	
Manifold Alarms Menu	
Worksheet 6-1 – Manifolds 1 thru 4	

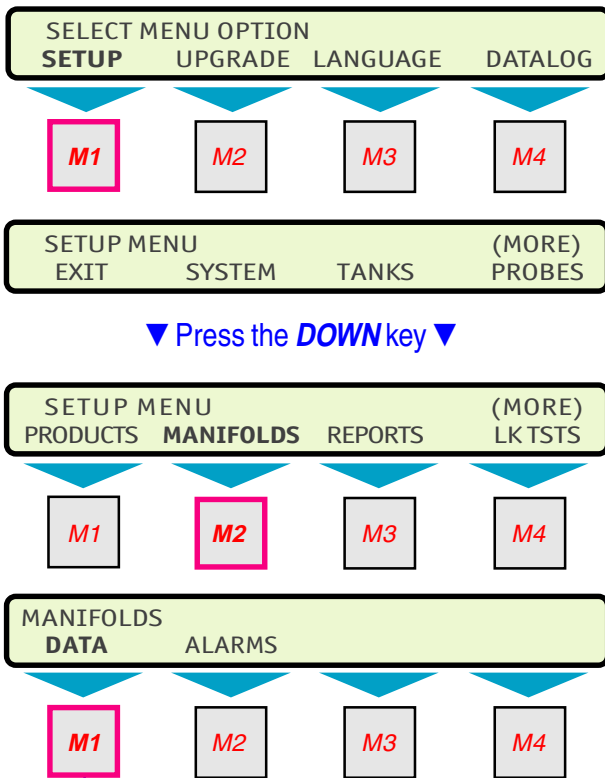
Manifolds Menu

NOTE


* This menu appears only after a MANIFOLD has been selected from the TANK – DATA – MANIFOLD menu.



Press this key and follow the highlighted sequence below



```

MANIFOLD DATA
MAN 1
:
MAN 4
MANIFOLD DATA N
COPY
COPY FROM MANIFOLD DATA X TO N
MAN 1
:
MAN 4
COPY MANIFOLD DATA X TO N
PRESS ENTER IF YOU ARE SURE?
    
```

Press (**M**) key to select MAN 1-4 to setup.
 (manifolds 3 & 4 available with TS-2001/508 only)

N = manifold number (1 or 2, or 1 thru 4)
 (Optional - used to copy manifold data) Press **M1** key.

Press (**M**) key to select a manifold to copy data from.

Press **ENTER** to accept this data.

Manifolds are used to physically connect tanks together and to expand the total capacity by the sum of all tanks connected (see next page).

- Tanks that are physically manifolded must:
- 1) have identical product (programmed here for manifold tanks)
 - 2) use the same manifold number (1,2,3 or 4)
 ...ref. Chapter 2 (TANKS – DATA – TANK N – MANIFOLD menu).

Manifold numbers must not be reused to connect different (other) tanks & products.

Example: Tanks 1, 2 & 3 contain 87 Octane gasoline and are physically manifold together and each are programmed to use Manifold #1. Tanks 4 & 5 store 93 Octane gas and are manifold together with Manifold #2. **All tanks that are physically manifold together must use the same (logical) manifold number.**

Manifolds Data Menu (CONTINUED... FROM PREVIOUS PAGE)

NAME MANIFOLD NAME N MAN N	Press M2 key. _____ 9 characters Use keypad to input a name for the Manifold. Press ENTER to accept this data.
PRODUCT PRODUCT FOR MANIFOLD N PRODUCT 1 : PRODUCT 8	Press M3 key. Press UP/DOWN ▲ ▼ to select a product #. Press ENTER to accept this data. (If tanks are set to manifold, then the product section of the tank menu disappears)
DEL THRES DELIVERY THRESHOLD N +200.000	Press M4 key. _____ 1 to 99999.0 Use keypad to input value in volume units... per total capacity. Press ENTER to accept this data.

Manifolds ALARMS Menu

NOTE Use this menu to input the Manifold Product Volume Limits (optional). Access the ALARMS menu; go back to the parent menu and then choose ALARMS (press **M2**).



ALARMS MANIFOLD ALARMS MANIFOLD MAN 1 : MAN 4 COPY COPY MANIFOLD ALARMS X TO N MAN 1 : MAN 4 COPY MANIFOLD ALARMS X TO N PRESS ENTER IF YOU ARE SURE?	Press M2 key. Press the (M) key to select the MAN# for alarm setup. (Manifold # 3 and 4 are for TS-2001/508 only) (Optional - used to copy alarm data) Press M1 key. Press (M) key to select MAN# to copy alarm data from. Press ENTER to accept this data.
LOW LIM LOW PRODUCT VOLUME LIMIT N +0	Press M2 key. _____ 0 to 50000.0 Use keypad to input alarm limits. Press ENTER to accept this data.
L LIM OG LOW PRODUCT LIMIT OUTPUT GROUP N NONE GROUP A-FF ALL GROUPS	Press M3 key. (Output Group = OG) Press UP/DOWN ▲ ▼ to assign alarm to (OG) N Not assigned to an OG One OG selected (A=1st OG, FF=32nd OG) All OGs selected (see WORKSHEET #6-1) Press ENTER to accept this data.

ManifoldsALARMSMenu (CONTINUED... FROM PREVIOUS PAGE)

LOW LOW
LOW LOW PRODUCT VOLUME LIMIT N
+0.0000

Press **M4** key.

_____ + 0 to 50000

Use keypad to input alarm limits.

Press **ENTER** to accept this data.

LL LIM OG
LOW LOW PRODUCT LIMIT OUTPUT GRP
NONE
GROUP A-FF
ALL GROUPS

Press **M1** key.

Press **UP/DOWN ▲ ▼** to assign alarm to (OG) N

Not assigned to an OG

One OG selected (A=1st OG, FF=32nd OG)

All OGs selected (see WORKSHEET #6-1)

Press **ENTER** to accept this data.

Worksheet # 6 - 1 appears on the following page

Worksheet # 6-1 – Output Groups – Manifolds 1 thru 4

Fill-in the work sheet below and compare the assignments with other work-sheets to uncover conflicts **before** programming output devices.

OG = Output Group	- Output Group Assignment <u>WORKSHEET</u> Output Group choices -		
Manifold 1:			NONE
			A
			B
L LIM OG			C
LL LIM OG			D
			E
			F
Manifold 2:			G
			H
			I
L LIM OG			J
LL LIM OG			K
			L
			M
Man 3 TS-2001 only:			N
			O
			P
L LIM OG			Q
LL LIM OG			R
			S
			T
Man 4 TS-2001 only:			U
			V
			W
L LIM OG			X
LL LIM OG			Y
			Z
			AA
			BB
Example: Man # 1			CC
			DD
			EE
L LIM OG	R	(Low Limit Activates Output Module 2, turns on Reorder Product Light & Modulated Annunciator)	FF
LL Limit OG	W	(Low Low Limit Activates TS-ROM Relay 5 to Disable Tank 5 STPump, and Activates Modulated Annunciator)	ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			

7

Reconciliation SETUP PROGRAMMING

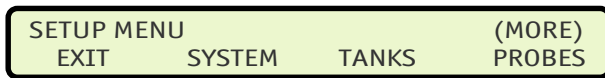
Contents:	See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.
Reconciliation Menu	

Reconciliation Menu

Reconciliation Notes



Press this key and follow the highlighted sequence below



Press the **DOWN** key one or two times ...



RECONCILIATION SCHEDULE

Press **M1** key.

This menu only appears when two conditions exist:

- The ATG configuration displays an 'R'
- The number of **Meters** is greater than zero

The 'R' stands for 'Reconciliation' and is part of the configuration when a TS-DIM unit is interfaced with the ATG. This option is programmed into the ATG at the factory, only when ordered and specially purchased.

The number of Meters is setup under the SYSTEM menu as described in Chapter 1 of this guide.

The purpose of this menu is to setup a schedule to tell the ATG when and at what time to start Reconciliation.

INCON recommends the times coincide with either the time a site closes (end of day) or at the time each shift ends (end of shift).

— Continued on next page —

Reconciliation menu (Continued... FROM PREVIOUS PAGE)

RECONCILIATION SCHEDULE

NONE
SHIFT
DAILY

Use **UP/DOWN ▲ ▼** keys to choose SHIFT or DAILY.
(nothing scheduled)
(set times for a three-shift working day)
(set the one time during the day to start)
Press **ENTER** to accept this data.

(if SHIFT)
RECONCILIATION

SCHEDULE SHIFT 1 ...
RECONCILIATION SHIFT 1
10:00:00
(24-hour format)

Press **M2** key.

(this equals 10 O'clock AM)
Use keypad to input the SHIFT 1 start time.
Press **ENTER** to accept this data.

(The Reconciliation Menu is displayed - set SHIFT 2 and SHIFT 3)

— Press the **CANCEL** key to display the main SETUP Menu —

(if DAILY)
RECONCILIATION

SCHEDULE TIME
RECONCILIATION TIME
10:00:00
(24-hour format)

Press **M2** key.

(this equals 10 O'clock AM)
Use keypad to input the start time.
Press **ENTER** to accept this data.

— The Reconciliation Menu is displayed —

— Press the **CANCEL** key to display the main SETUP Menu —

— Your Notes —



8

Dispenser Interface Module (DIM) SETUP PROGRAMMING

Contents:

DIM Menu
DIM Notes

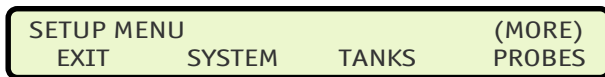
See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

DIM Menu

[DIM Notes](#)



Press this key and follow the highlighted sequence below



Press the **DOWN** key one or two times ...



METERS
METER 1
METER N
FUEL PT

Press **M1** key.

Press **M1** key.

Reference the TS-DIM Quick Installation Guide (pn: 000-1058); especially use section 6 to assist in generating the data to input into this SETUP menu.

The purpose of this menu is to program the ATG to translate sales information from the TS-DIM unit. This is used to automate the task of Reconciliation.

In order to generate the input data, run the Win Tester Program from a laptop computer and collect the site data. Use the results as displayed as settings for this menu.

— Continued on next page —

DIM menu (Continued... FROM PREVIOUS PAGE)

FUEL PT ASSOCIATION N

1

_____ 1 - 16

Enter the fuel point number.
Use keypad to input an Association number.
Press **ENTER** to accept this data.

GRADE NO.
GRADE NUMBER - METER N

1

Press **M2** key.

_____ 1 - 8

(reference the Win Tester Program display)
Use keypad to input an Association number.
Press **ENTER** to accept this data.

TANK A
TANK A ASSOCIATION N

1

Press **M3** key.

_____ Enter the tank number that contains the product
that is being sold through this meter.
Use keypad to input an Association number.
Press **ENTER** to accept this data.

TANK B
TANK A ASSOCIATION N

0

Press **M4** key.

_____ 1 - 8

(only used if this meter is selling a 'Blended' product)
Use keypad to input an Association number.
Press **ENTER** to accept this data.

BLEND
BLENDING RATIO N

100

Press **M1** key.

_____ 0 - 100

(Input the percentage (%) of product from Tank A used in
the 'Blended' product)
Use keypad to input an Association number.
Press **ENTER** to accept this data.

— Press the **CANCEL** key to display the METERS Menu —

— Repeat the above setup steps for all Meter Numbers —

— Press the **CANCEL** key to display the DISPENSER INTERFACE Menu —

DIM menu (Continued... FROM PREVIOUS PAGE)

(In most applications using one TS-DIM unit, keep these default settings)

FUEL PTS	Press M2 key.
FUELING POINTS	
FUEL P N	Press M1 key.
FUELING PT N	
DIM UNIT	Press M1 key.
DIM UNIT NUMBER - FUEL PT N	
1	_____ Enter the TS-DIM unit number connected to this fueling point. Use keypad to input a number. Press ENTER to accept this data.
DIM FL PT	Press M2 key.
DIM FUELING POINT - FUEL PT N	
1	_____ 1 - 16 Use keypad to input a number. Press ENTER to accept this data.

— Press the **CANCEL** key to display the FUELING POINTS Menu —

— Repeat the above setup steps for each FUELING POINT —

— Press the **CANCEL** key to display the DISPENSER INTERFACE Menu —

DIMS	Press M3 key.
DIMS	
DIM N	Press M1 key.
DIM N	
ADDRESS	Press M1 key.
DIM ADDRESS - DIM N	
1	_____ 1 - 8 Enter the same number as the jumper location found inside the TS-DIM unit. Use keypad to input a number. Press ENTER to accept this data.

— Press the **CANCEL** key to display the DIMS Menu —

— Repeat the above setup steps for each DIM number —

— Press the **CANCEL** key 2 times to display the main SETUP Menu —

9

Reports SETUP PROGRAMMING

Contents:

- Tank - Product - Delivery
- Alarm - SCALD - Sensor
- Regulatory - Line
- Reconcile & - Sales Reports

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, Troubleshooting Guides, and Application Notes for other reference material.

Reports Menu

NOTES



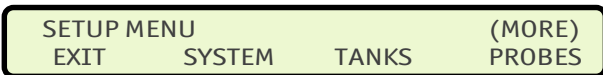
Use this menu to program reports to print or FAX automatically on a schedule (*faxing requires an optional Fax/Modem device*).

See Chapters 1, 10, 11 and 12 about Tank and Line Test Reports & Scheduling.

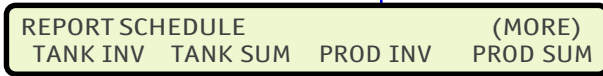
See TABLE 9.1 – The SHIFT selection allows 2 or 3 scheduled reports to print or Fax per day ...only one report will print if two report-times are duplicated/identical.



Press this key in the highlighted sequence shown below



Press the DOWN key...



Press the DOWN key to show more menus...



TABLE 9.1 Typical Report Schedule

NONE (no schedule)	
SHIFT	1ST DAY
DAILY	:
MONDAY	30TH DAY
:	LAST DAY
SUNDAY	(Feb. does not have 30 days)

TABLE 9.2 24 Hour Time Input Format

HH:MM:SS
00:00:00 = midnight
22:00:00 = 10 pm + 12 (hours)
(add 12 hours to pm times starting at 1 pm to 11:59 pm)
02:05:00 = 2:05 am

The asterisk (*) menus are hardware or software dependent and may/may not appear.

Push UP/DOWN ▲ ▼ keys to show more menus or menu selections.

To access menus, press the corresponding (M) key below each menu name.

Reports Schedule Menu

Tank Inventory Detail Report:

TANK INV
TANK INVENTORY DETAIL
SCHEDULE
 NONE
 TIME 1
 00.00.00 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 TIME 2
 00.00.00 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 TIME 3
 00.00.00 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 FAX
 NO _____ or YES (yes requires *optional* fax / modem)
 PRINTER
 YES _____ or NO Press **ENTER** to accept this data.

Use **UP/DOWN ▲ ▼** to show choices.
(select schedule – see **TABLE 9.1**)

Tank Inventory Summary Report:

TANK SUM
TANK INVENTORY SUMMARY
SCHEDULE
 NONE
 TIME 1
 00.00.00 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 TIME 2
 00.00.00 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 TIME 3
 00.00.00 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 FAX
 NO _____ or YES (yes requires *optional* fax / modem)
 PRINTER
 YES _____ or NO Press **ENTER** to accept this data.

Use **UP/DOWN ▲ ▼** to show choices.
(select schedule – see **TABLE 9.1**)

Product Inventory Detail Report:

PROD INV
PRODUCT INVENTORY DETAIL
SCHEDULE
 NONE
 TIME 1
 00.00.00 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 TIME 2
 00.00.00 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 TIME 3
 00.00.00 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 FAX
 NO _____ or YES (yes requires *optional* fax / modem)
 PRINTER
 YES _____ or NO Press **ENTER** to accept this data.

Use **UP/DOWN ▲ ▼** to show choices.
(select schedule – see **TABLE 9.1**)

Reports Schedule Menu (CONTINUED... FROM PREVIOUS PAGE)

Product Inventory Summary Report:

PROD SUM
PRODUCT INVENTORY SUMMARY Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Product Usage Detail Report:

PROD USE
PRODUCT USAGE DETAIL Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Product Usage Summary Report:

USE SUMRY
PRODUCT USAGE SUMMARY Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Reports Schedule Menu (CONTINUED... FROM PREVIOUS PAGE)

Delivery Detail Report:

DEL DETAI
DELIVERY DETAIL Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Delivery Summary Report:

DEL SUMRY
DELIVERY SUMMARY Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Delivery History Report:

DELIV HST
DELIVERY HISTORY Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Reports Schedule Menu (CONTINUED... FROM PREVIOUS PAGE)

Active Alarm Report:

ACT ALRM
ACTIVE ALARM Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
NO
PRINTER _____ or NO Press **ENTER** to accept this data.
YES

Cleared Alarm Report:

CLR ALRM
CLEARED ALARM Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
NO
PRINTER _____ or NO Press **ENTER** to accept this data.
YES

Alarm History Report:

ALARM HST
ALARM HISTORY Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
NO
PRINTER _____ or NO Press **ENTER** to accept this data.
YES

Reports Schedule Menu (CONTINUED... FROM PREVIOUS PAGE)

SCALD Leak Test: Report

SCALD * Only with SCALD Tank Leak Test program
SCALD TEST Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
NO
PRINTER _____ or NO Press **ENTER** to accept this data.
YES

Sensor Status Report

SENS STAT * Only if No. of Sensors > 0
SENSOR STATUS Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
NO
PRINTER _____ or NO Press **ENTER** to accept this data.
YES

Vapor Sensor:

VAPOR * Only with TSP-DVS Vapor Sensor(s)
VAPOR SENSOR Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
NO
PRINTER _____ or NO Press **ENTER** to accept this data.
YES

Reports Schedule Menu (CONTINUED... FROM PREVIOUS PAGE)

Regulatory Report:

REGULATORY
REGULATORY SCHEDULE Use **UP/DOWN ▲ ▼** to show choices.
 NONE (select schedule – see **TABLE 9.1**)
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Line Compliance Report:

LINE COMP * **Only with Line Leak Detector(s)**
LINE COMPLIANCE SCHEDULE Use **UP/DOWN ▲ ▼** to show choices.
 NONE (select schedule – see **TABLE 9.1**)
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Line Diagnostics Report:

LINE DIAG * **Only with Line Leak Detector(s)**
LINE DIAGNOSTIC SCHEDULE Use **UP/DOWN ▲ ▼** to show choices.
 NONE (select schedule – see **TABLE 9.1**)
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Reports Schedule Menu (CONTINUED... FROM PREVIOUS PAGE)

Line Test History Report:

LINE HIST * **Only with Line Leak Detector(s)**
LINE TEST HISTORY Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Line Test Report:

LINE TEST * **Only with Line Leak Detector(s)**
LINE TEST Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Shift Reconciliation Report:

RECONCILE Press the (**M**) key below this menu item.
— Reconciliation Report Schedules (5) —
SHIFT REC * **Only with Reconciliation / DIM**
SHIFT RECONCILIATION Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Reports Schedule Menu (CONTINUED... FROM PREVIOUS PAGE)

Daily Reconciliation Report:

DAILY REC * **Only with Reconciliation / DIM**
DAILY RECONCILIATION Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Monthly Reconciliation Report:

MONTH REC * **Only with Reconciliation / DIM**
MONTH RECONCILIATION Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Shift Reconciliation History Report:

SHIFT HST * **Only with Reconciliation / DIM**
SHIFT RECONCILIATION HISTORY Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Reports Schedule Menu (CONTINUED... FROM PREVIOUS PAGE)

Daily Reconciliation History Report:

DAILY HST * Only with Reconciliation / DIM
DAILY RECONCILIATION HISTORY Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Shift Sales Report:

SALES Press the (**M**) key below this menu item.
— Sales Report Schedules (5) —
SALES REPORT SCHEDULE * Only with Reconciliation / DIM
SHIFT SAL Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Daily Sales Report:

SALES REPORT SCHEDULE * Only with Reconciliation / DIM
DAILY SAL Use **UP/DOWN ▲ ▼** to show choices.
SCHEDULE (select schedule – see **TABLE 9.1**)
 NONE
TIME 1 _____ to 23.59.59 (input time – see **TABLE 9.2**)
 00.00.00
TIME 2 _____ to 23.59.59 (input shift # 2 time... N/A if not SHIFT)
 00.00.00
TIME 3 _____ to 23.59.59 (input shift # 3 time... N/A if not SHIFT)
 00.00.00
FAX _____ or YES (yes requires *optional* fax / modem)
 NO
PRINTER _____ or NO Press **ENTER** to accept this data.
 YES

Reports Schedule Menu (CONTINUED... FROM PREVIOUS PAGE)

Monthly Sales Report:

SALES REPORT SCHEDULE			
MONTH SAL			
SCHEDULE			
NONE			(select schedule – see TABLE 9.1)
TIME 1			
00.00.00	_____	to 23.59.59	(input time – see TABLE 9.2)
TIME 2			
00.00.00	_____	to 23.59.59	(input shift # 2 time... N/A if not SHIFT)
TIME 3			
00.00.00	_____	to 23.59.59	(input shift # 3 time... N/A if not SHIFT)
FAX			
NO	_____	or YES	(yes requires <i>optional</i> fax / modem)
PRINTER			
YES	_____	or NO	Press ENTER to accept this data.

Shift History Report:

SALES REPORT SCHEDULE			
SHIFT HST			
SCHEDULE			
NONE			(select schedule – see TABLE 9.1)
TIME 1			
00.00.00	_____	to 23.59.59	(input time – see TABLE 9.2)
TIME 2			
00.00.00	_____	to 23.59.59	(input shift # 2 time... N/A if not SHIFT)
TIME 3			
00.00.00	_____	to 23.59.59	(input shift # 3 time... N/A if not SHIFT)
FAX			
NO	_____	or YES	(yes requires <i>optional</i> fax / modem)
PRINTER			
YES	_____	or NO	Press ENTER to accept this data.

Daily History Report:

SALES REPORT SCHEDULE			
DAILY HST			
SCHEDULE			
NONE			(select schedule – see TABLE 9.1)
TIME 1			
00.00.00	_____	to 23.59.59	(input time – see TABLE 9.2)
TIME 2			
00.00.00	_____	to 23.59.59	(input shift # 2 time... N/A if not SHIFT)
TIME 3			
00.00.00	_____	to 23.59.59	(input shift # 3 time... N/A if not SHIFT)
FAX			
NO	_____	or YES	(yes requires <i>optional</i> fax / modem)
PRINTER			
YES	_____	or NO	Press ENTER to accept this data.

Contents:

Tank Leak Test Menu
 (Standard Static Test)
 Output Group Assignments
 Worksheet 10-1

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

LeakTest Menu (StaticTank)



Press this key and follow the highlighted sequence below

SELECT MENU OPTION
SETUP UPGRADE LANGUAGE DATALOG

M1 M2 M3 M4

SETUP MENU (MORE)
 EXIT SYSTEM TANKS PROBES

Press the **DOWN ▼** key

SETUP MENU (MORE)
 PRODUCTS MANIFOLDS* REPORTS LK TESTS

M1 M2 M3 M4

LEAK TESTS (MORE)
 CONFIDENCE PRECISION MIN LK TM SCHEDULE

M1 M2 M3 M4

Press the **DOWN ▼** key

LEAK TESTS (MORE)
 ALARM ON TST FL OG*

M1 M2 M3 M4

Only the number of tanks that were programmed under the SYSTEM menu will be displayed here (Ø = No tank-related menus).

Static tank leak tests require 2 to 8 hours of uninterrupted **quiet-time** to finish **with no** dispensing, deliveries or line leak tests running during the test.

Wait at least 2 hours after a dispense or line leak test, and 6 hours after a delivery for valid test results. The occurrence of any of these events will cause the test to produce failed, or indeterminate test results.

Before programming see State and Local Regulations about leak testing (frequency, minimum volume / capacity, and leak test precision) and reporting requirements... adhere to these requirements.

* Appears only if **alarm on = yes** (see following page).

Begin programming with the CONFIDENCE menu. Follow the sequences on the next page.

Tank Leak Test Menu

N = Tanks 1 – 8 (only the number of tanks programmed in the System menu will appear)

Setup the confidence percentage

CONFIDENC
LEAK TEST CONFIDENCE
99.0(%)
90.0%
95.0%
97.5%

Press **M1** key.

Use **UP/DOWN ▲ ▼** keys to show choices.
Press **ENTER** to accept this data.

Setup the percision of the leak test

PRECISION
LEAK TEST PRECISION
TANK 1
TANK 2
:
TANK 8
LEAK TEST PRECISION
+0.20000

Press **M2** key.

Select tank number using (**M**) key.

(NOTE: 5 – 8 TS-2001/508 only)

_____ 0.05 to 2.0
Use keypad to input a precision number.
Press **ENTER** to accept this data.

	Monthly Compliance	Yearly Test
Static Leak Test:	0.2 gph	0.1 gph
Precision Tank # 1		
Precision Tank # 2		
Precision Tank # 3		
Precision Tank # 4		
Precision Tank # 5		
Precision Tank # 6		
Precision Tank # 7		
Precision Tank # 8		

Threshold = 1/2 of Leak Test value

Setup a minimum amount of time to test for leaks per local regulations —

MIN LK TM
MINIMUM LEAK TEST TIME
2

Press **M3** key.

_____ 2 to 8.0 hours
Use keypad to input minimum leak test time.
Press **ENTER** to accept this data.

— Continued next page —

Tank Leak Test Menu (CONTINUED ... FROM PREVIOUS PAGE)

Setup automatic leak test schedules for all tanks —

SCHEDULE	Press the M4 key.
LEAK TEST SCHEDULE	
TANK 1	Press an (M) key to select a tank to scedule.
TANK 2	
:	
TANK 8	
LEAK TEST SCHEDULE FOR TANK N	
COPY	(Optional - used to copy schedules) Press the M1 key.
COPY FROM LEAK SCHEDULE X TO N	Press an (M) key to select a tank to copy.
TANK 1	
TANK 2	
:	
TANK 8	Press UP/DOWN ▲ ▼ to display Tanks 5 – 8 for TS-2001/508 only.
COPY LEAK SCHEDULE X TO N	
PRESS ENTER IF YOU ARE SURE?	Press ENTER to accept this data.
SCHEDULE	Press the M4 key.
LEAK TEST SCHEDULE FOR TANK N	
NONE	Use UP/DOWN ▲ ▼ to show choices (see TABLE 10.1).
:	
LAST DAY	Press ENTER to accept this data.

TABLE 10.1 TYPICAL TEST SCHEDULE	
NONE (no schedule)	
DAILY	1ST DAY
MONDAY	:
:	30TH DAY
SUNDAY	LAST DAY
<i>February does not have 30 days.</i>	

TABLE 10.2 24 Hour Time Input Format
HH:MM:SS
00:00:00 = midnight
22:00:00 = 10 pm + 12 (hours)
<i>(add 12 hours to pm times starting at 1 pm to 11:59 pm)</i>
02:05:00 = 2:05 am

Start time for Tank N (can be the same for all)

TIME	Press the M3 key.
00:00:00	_____ 24 HOUR FORMAT
	Use keypad to input time (see TABLE 10.2).
	Press ENTER to accept this data.
ALARM ON	Press the M3 key.
ALARM ON TEST FAIL	
NO	Use UP/DOWN ▲ ▼ to show choices.
YES	YES = generate an alarm if a tank leak test fails
	Press ENTER to accept this data.

— Continued next page —

Worksheet # 10-1 – Output Groups – Tank Leak Tests

for **Static & SCALD Tank Leak Tests** Fill-in the worksheet below. Compare assignments with other worksheets to uncover conflicts **before** programming output devices.

See the Chapter on SCALD tank leak testing...

Annunciators or external relay output in this example flag the test fail alarm

OG = Output Group	▼	- Output Group Assignment WORKSHEET Output Group choices -	▼
Tank Leak Test:			NONE
TST FL OG Tank 1			A
TST FL OG Tank 2			B
TST FL OG Tank 3			C
TST FL OG Tank 4			D
TST FL OG Tank 5			E
TST FL OG Tank 6			F
TST FL OG Tank 7			G
TST FL OG Tank 8			H
			I
			J
			K
SCALD Test:			L
TST FL OG Tank 1			M
TST FL OG Tank 2			N
TST FL OG Tank 3			O
TST FL OG Tank 4			P
TST FL OG Tank 5			Q
TST FL OG Tank 6			R
TST FL OG Tank 7			S
TST FL OG Tank 8			T
			U
			V
			W
			X
			Y
			Z
Example:			AA
Tank Leak Test:			BB
TST FL OG 1	G	Activates Modulated Annunciator & Relay 2 (turns on external tank leak light)	CC
			DD
			EE
SCALD Test:			FF
TST FL OG 3	G	Activates Modulated Annunciator & Relay 2 (turns on external tank leak light)	ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			



SCALD® Tank Leak Test SETUP PROGRAMMING

Contents:

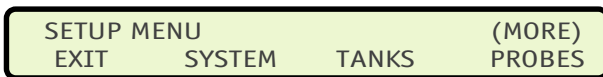
SCALD Tank Leak Test Menu
Output Group Assignments
see Worksheet 8-1

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, Troubleshooting Guides, and Application Notes for other reference material.

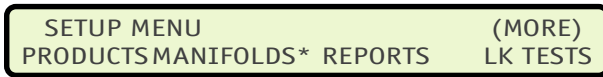
SCALDTankLeakTest Menu



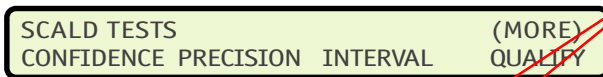
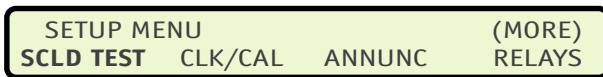
Press this key and follow the highlighted sequence below



Press DOWN



Press DOWN



Disregard this Chapter if the SCLD TEST menu does not appear (the position of this menu can also be displaced by other menus).

SCALD® is an acronym for INCON's optional Statistical Continuous Automatic Leak Detection program. It runs volumetric leak tests during the quiet-times between dispenses. It is suited for 24 hour dispense sites that are too busy to run static leak tests.

The system is pre-configured with default setup that will give you the best results for most situations — keep the default settings. The exceptions to this are: ENABLE Vapor Recovery when a Stage II Vapor Recovery is used at the site and, when a SCALD leak test failure alarm is needed, program ALARMON and TST FLOG (test fail output group) menus.

Push the UP/DOWN keys ▲ ▼ to show more menus or menu selections.

Press menu keys (M1 to M4) to access menus.

Push ENTER to accept a selection or input a value into the setup configuration memory.

* TST FL OG appears only if YES has been programmed for ALARM ON (see next page).

Only the number of tanks that were programmed under the SYSTEM menu will be displayed here (Ø = No tank-related menus).

SCALD (tank leak) Test Menu

N = Tanks 1 – 8 (only the NO. of TANKS programmed in the System menu will appear)

SCALD TESTS

CONFIDENCE

SCALD CONFIDENCE

99.0%

Keep the default 99.0% value

90.0%

95.0%

97.5%

Press **ENTER** to accept this data.

PRECISION

SCALD TEST PRECISION

+0.2

Keep the default 0.2 gph monthly test value

Press **ENTER** to accept this data.

	Monthly Compliance	Yearly Test
SCALD Leak Test:	0.2 gph	0.1 gph
Precision:		

Threshold = 1/2 of Leak Test value

INTERVAL

SCALD INTERVAL

18

Keep the default value (18)

Press **ENTER** to accept this data.

QUALIFY

SCALD VOLUME QUALIFY

+0

(minimum volume percent before starting a test)

_____ 0.0 to 99.0%

Use keypad to input a percentage.

Press **ENTER** to accept this data.

NOTE



Reference Local codes (and/or State / Province / Federal codes) for the minimum percentage of tank-volume-capacity before a leak test results can, or will, be considered acceptable. Input the minimum-acceptable volume based on these regulations.

ENABLE

SCALD ENABLE

TANK 1

TANK 2

:

TANK 8

SCALD ENABLE

ENABLED

DISABLED

(select tanks to be SCALD leak tested)

Keep the default – all tanks **ENABLED**

Use **UP/DOWN ▲ ▼** keys to show more choices.

Press the (**M**) key to select a TANK #.

Use **UP/DOWN ▲ ▼** keys to change the setting.

Press **ENTER** to accept this data.

Press the **CANCEL** key to return to the SCALD TESTS menus.

— CONTINUED ON NEXT PAGE —

SCALD (tank leak) Test Menu (CONTINUED FROM PREVIOUS PAGE)

<p>VAPOR RECOVERY SCALD VAPOR RECOVERY <i>DISABLED</i> ENABLED</p>	<p>(select ENABLED when Vapor Recovery is present)</p> <p>Use UP/DOWN ▲ ▼ keys to show choices. Press ENTER to accept this data. (Enable for vapor recovery systems)</p>
<p>ALARM ON ALARM ON SCALD FAIL <i>NO</i> YES</p>	<p>(change to YES if you want an alarm when a SCALD leak test fails)</p> <p>Use UP/DOWN ▲ ▼ keys to show choices. Press ENTER to accept this data.</p>
<p>TST FL OG SCALD FAIL OUTPUT GROUP TANK 1 TANK 2 : TANK 8</p>	<p>(* This menu appears only when ALARM ON SCALD FAIL – YES was chosen above)</p> <p>Press the (<i>M</i>) key to select a TANK #. Use UP/DOWN ▲ ▼ keys to show more choices.</p>
<p>SCALD TEST FAIL OUTPUT GROUP N <i>NONE</i> GROUP A-FF ALL GROUPS</p>	<p>(32 OGs available ... see <i>WORKSHEET # 8-1.</i>) Not assigned to an output group (OG). One OG selected (A=1st OG, FF=32nd OG) All OGs selected</p> <p>Use UP/DOWN ▲ ▼ keys to show more choices. Press ENTER to accept this data.</p>

— Your Notes —



Line Tests SETUP PROGRAMMING

Contents:

LN (Line) leak Test Menu
Line Leak Test Requirements
TABLE 12.1 Time Input
Output Group Assignments
Worksheet 12 - 1

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

LN (Line) Tests Menu

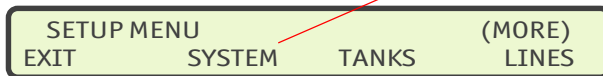
NOTE



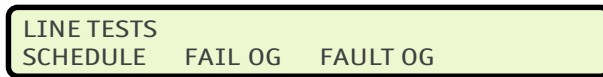
Disregard this Chapter if the LN TESTS menu does not appear. Note that the position of this menu can be displaced by other menus.



Press this key and follow the highlighted sequence below



Press the **DOWN ▼** key until the LN TESTS menu is displayed



The LN TESTS and LINES menu, only appear if one or more NO. LINES are entered under the *SYSTEM setup menu*.



The TS-LLD Line Leak Detector automatically performs a 0.2 gph (monthly compliance) test every 24 hours.

With this menu you may control the time this happens or schedule it to happen at a different time or day than tank leak tests run (to avoid affecting tank leak test results).

Character input / editing:

- Push **UP/DOWN ▲ ▼** keys to show more menus or menu selections.
- Use menu keys (**M1** to **M4**) to access menus.
- Press **ENTER** to accept a selection or input a value into the setup configuration memory.
- Press **CANCEL** to cancel data entry
- Press **M1** to move the cursor left **←**
- Use **M2** to move the cursor right **→**
- Press **M4** to backspace (delete) one character to the left **⌫**

— Continued on next page —

Line Leak Test Requirements & Notes:

- 1) Inform the Site Personnel to: (If the store closes at night - not 24-hour) **Leave the Pump Controllers power on at night with dispenser power off.** The Submerged Turbine Pump (STP) must be able to turn on to run the pressurized line leak tests.
- 2) It is recommended that Line Leak Tests and Tank Leak Tests should not be scheduled to run at the same time. See Chapter 8 for Tank Leak Test scheduling.
- 3) **Note:** The 0.2 gph Line Leak Test will normally finish during **quiet-times** between product dispensing. (The line leak detector may start the pump at any time to run pressurized line leak tests.)
- 4) **The 0.1 precision line leak test requires 4 hours of quiet-time** (after the final dispense) **before it will run successfully.** Make sure to take this into account when scheduling a Annual precision 0.1 Line Leak Test.
- 5) **Note:** See the TS-LLD Manual or consult INCON Technical Service for Special Applications (for example: manifolded lines, nonstandard pumps, etc.).
- 6) Before programming, reference the State and Local Regulations about line leak testing, type / precision of the tests, test frequency, and reporting requirements... adhere to these requirements.

Type / Precision	Monthly Compliance	Annual / Yearly
Line Leak Test	0.2 gph	0.1 gph

TABLE 12.1 24 Hour Time Input Format

HH:MM:SS

00:00:00 = midnight 22:00:00 = 10 pm + 12 (hours)

(add 12 hours to pm times starting at 1 pm to 11:59 pm)

02:05:00 = 2:05 am

— Your Notes —

LN Line (leak) Tests Menu (Continued from page 1)

* Only the No. of lines that are programmed in System menu are displayed

SCHEDULE

SELECT A LINE

LINE 1
LINE 2 *
:
LINE 8 *

Press the **M1** key.

Use (**M**) keys to select a LINE#.

Use **UP/DOWN ▲ ▼** keys to show more choices.

LINE TEST SCHEDULE N

Program a Schedule and Time for each Line#

SCHED 0.1

NONE
DAILY
MONDAY
:
SUNDAY
1 ST DAY
:
30 TH DAY
LAST DAY

0.1 = Precision Annual Line Leak Test

No schedule / not scheduled

Use **UP/DOWN ▲ ▼** keys to show more choices.

Press **ENTER** to accept this data.

No Dispensing is allowed during this schedule*

NOTE: February does not have 30 days !

TIME 0.1

0.1 GPH LINE TEST TIME N
00:00:00 24 HOUR FORMAT

See Test Requirements and Notes !

See TABLE 12.1

Use keypad to input 24-hour time data.

Press **ENTER** to accept this data.

NOTE



Both the 0.1 & 0.2 gph line leak tests can be programmed for a particular Line or all Lines. But, the schedule and times must be different ! Also see Test Requirements and Notes.

SCHED 0.2

NONE
DAILY
MONDAY
:
SUNDAY
1 ST DAY
:
30 TH DAY
LAST DAY

0.2 = Monthly Compliance Line Leak Test

No schedule / not scheduled

Use **UP/DOWN ▲ ▼** keys to show more choices.

Press **ENTER** to accept this data.

Dispensing allowed during this schedule.

NOTE: February does not have 30 days !

TIME 0.2

0.1 GPH LINE TEST TIME N
00:00:00 24 HOUR FORMAT

See Test Requirements and Notes !

See TABLE 12.1

Use keypad to input 24-hour time data.

Press **ENTER** to accept this data.

— CONTINUED ON NEXT PAGE —

LN Line (leak) Tests Menu (Continued...)

* Only the No. of lines that are programmed in System menu are displayed

FAIL OG	(Will go Active when any (3 gph, 0.2 gph, and 0.1 gph) Line Leak Test fails)
LINE TEST FAIL OUTPUT GROUP	
LINE 1	
LINE 2 *	Press (M) key to select a LINE#.
:	Use UP/DOWN ▲ ▼ keys to show more choices.
LINE 8 *	
LINE TEST FAIL OUTPUT GROUP N	(32 Output Groups (OGs) available...See Worksheet 12-1)
NONE	Not assigned to an Output Group (OG).
GROUP A-FF	One OG selected (A=1st OG, FF=32nd OG)
ALL GROUPS	All OGs selected
	Use UP/DOWN ▲ ▼ keys to choose an OG.
	Press ENTER to accept this data.
FAULT OG	(Will go active when a fault (TS-LLD flashing alarm error-code) occurs)
LINE TEST FAIL OUTPUT GROUP	
LINE 1	
LINE 2 *	Press (M) key to select a LINE#.
:	Use UP/DOWN ▲ ▼ keys to show more choices.
LINE 8 *	
LINE TEST FAULT OUTPUT GROUP N	(32 Output Groups (OGs) available...See Worksheet 12-1)
NONE	Not assigned to an Output Group (OG).
GROUP A-FF	One OG selected (A=1st OG, FF=32nd OG)
ALL GROUPS	All OGs selected
	Use UP/DOWN ▲ ▼ keys to choose an OG.
	Press ENTER to accept this data.

— Your Notes —

Worksheet # 12-1 – Output Groups – Line Leak Tests

Fill-in the worksheet below. Compare assignments with other worksheets to uncover conflicts **before** programming the output devices.

OG = Output Group	▼ - Output Group Assignment <u>WORKSHEET</u> Output Group choices - ▼	
Line Leak Test:		NONE
FAIL OG Line 1		A
FAIL OG Line 2		B
FAIL OG Line 3		C
FAIL OG Line 4		D
FAIL OG Line 5		E
FAIL OG Line 6		F
FAIL OG Line 7		G
FAIL OG Line 8		H
		I
		J
TS-LLD		K
Line Leak Detector:		L
FAULT OG Line 1		M
FAULT OG Line 2		N
FAULT OG Line 3		O
FAULT OG Line 4		P
FAULT OG Line 5		Q
FAULT OG Line 6		R
FAULT OG Line 7		S
FAULT OG Line 8		T
		U
		V
		W
		X
		Y
		Z
Example:		AA
Line Leak Test:		BB
FAIL OG Line 2	L Activates Modulated Annunciator & Relay 2 (turns on line leak light)	CC
		DD
		EE
Line Leak Detector:		FF
FAULT OG Line 2	F Activates Solid Annunciator (for 20 seconds)	ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)		



Clock / Calendar SETUP PROGRAMMING

Contents:

Clock Calendar Menu
TABLE 13.1 24 Hour Time
Input Format

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

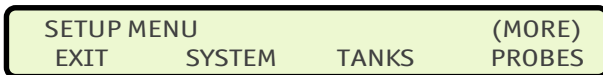
Clock/Calendar Menu



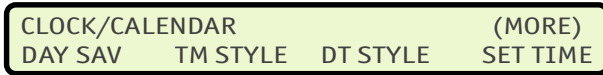
The Clock and Calendar menu must be set—**DO NOT skip this menu.** Program the Date and Time accurately.



Press this key and follow the highlighted sequence below



Press **DOWN** key a few times or until the CLK/CAL menu is displayed



Remember:

- Push **UP/DOWN** keys ▲ ▼ to show more menus or menu selections.
- Use menu keys (**M1** to **M4**) to access menus.
- Press **ENTER** to accept a selection or input a value into the setup configuration memory.
- Press **CANCEL** to cancel data entry.

Character input / editing:

- Press **M1** to move the cursor left ←
- Use **M2** to move the cursor right →
- Press **M4** to backspace (delete) one character to the left ←

Press the (**M**) key under each of these menu items to enter the proper settings.

— Continued on next page —

Clock / Calendar Menu

CLOCK/CALENDAR

DAY SAV

DAYLITE SAVINGS

ENABLED

DISABLED

Press **M1** key.

Use **UP/DOWN ▲ ▼** keys to show choices.

Enable = allows daylight savings time changes

Disable = does not

Press **ENTER** key to accept this data.

TM STYLE

TIME STYLE

12 HOUR

24 HOUR

(Select the time style - (12 or 24 hour) for display, reports and faxes)

Use **UP/DOWN ▲ ▼** keys to show choices.

Press **ENTER** key to accept this data.

DT STYLE

DATE STYLE

MM/DD/YY

DD/MM/YY

YY/MM/DD

(Select the date style - (Month/Day/Year) for display, reports and faxes.)(YY = Year, MM = Month, DD = Day)

Use **UP/DOWN ▲ ▼** keys to show choices.

Press **ENTER** key to accept this data.

SET TIME

SET SYSTEM TIME

HH:MM:SS

(Input current time in 24-hour format)

2 digits are required for hours, minutes, seconds –

use leading zeros before single digits,

(for example input '05' not '5')

Use keypad to input time data.

Press **ENTER** key to accept this data.

TABLE 13.1 24 Hour Time Input Format

HH:MM:SS

00:00:00 = midnight

22:00:00 = 10 pm + 12 (hours)

(add 12 hours to pm times starting at 1 pm to 11:59 pm)

02:05:00 = 2:05 am

SET DATE

SET SYSTEM DATE

YYYY:MM:DD

(Input current DATE)

(YYYY = year, MM = Month, DD = Day)...

2 digits are required for month and day –

use leading zeros before single digits,

(for example input '04' not '4')

Use keypad to input DATE data.

Press **ENTER** to accept this data.

SET DAY

SET SYSTEM DAY OF WEEK

SUNDAY

MONDAY

TUESDAY

WEDNESDAY

THURSDAY

FRIDAY

SATURDAY

(Select the current day of the week)

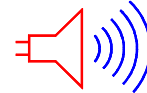
Use **UP/DOWN ▲ ▼** keys to show choices.

Press **ENTER** to accept this data.

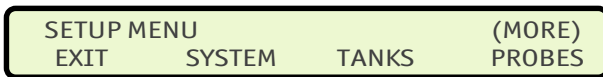
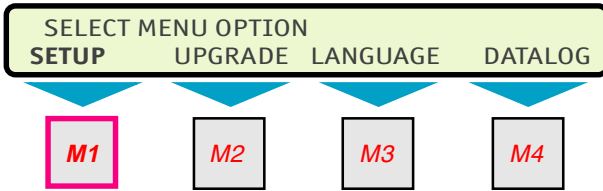
Annunciator SETUP PROGRAMMING

Contents:	See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.
Annunciator Menu	
Annunciator Timeout	
Modulated & Solid Annunciator Output Groups and Alarm Assignments	

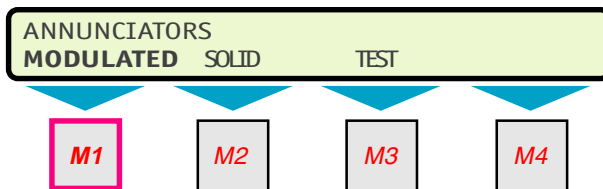
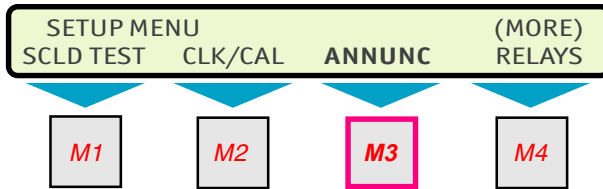
Annunciator Menu (Console Alarm Horn)



Press this key and follow the highlighted sequence below



Press **DOWN ▼** key twice (2X)



MODULATED ANNUNCIATOR
TIMEOUT
MODULATED ANNUNCIATOR TIMEOUT
0



_____ 0 to 3600
Use keypad to input a value.
Press **ENTER** to accept this data.

The annunciator menu must be set (**DO NOT skip this menu**). The annunciator *is an Output Device that produces* an audible alarm to alert attendants of a problem (flashing warning or alarm lights on the console also provide visual indications).

Two sounds can be produced: a modulated (beeping) or a continuous (solid) tone. Any Alarm **Output Group** can be programmed to sound the annunciator horn.

NOTE See Worksheets for applicable **Output Group** assignments. Use the Table of Contents (TOC) to locate Worksheets.

Remember:

- Push **UP/DOWN ▲ ▼** keys to show more menus or menu selections.
- Use menu keys (**M1 to M4**) to access menus.
- Press **ENTER** to accept a selection or input a value into the setup configuration memory.
- Press **CANCEL** to cancel data entry

Annunciator Time-out

Input a considerable alarm time-out value (i.e. 10 seconds) – especially if an acknowledge password is required before an alarm can be silenced. Also see the Relays Setup Chapter and input relay time-outs if external alarm annunciators are used.

(Input an automatic time-out / turn-off value in seconds... Ø = no time-out, the attendant must press **ACK** to silence alarms, 3600 = 60 minutes or 1 hour time-out)

Annunciators Menu (CONTINUED... FROM PREVIOUS PAGE)

Modulated Annunciator Output Group (alarm assignment)

MODULATED

MODULATED ANNUNCIATOR OUT GRPS - Continued - Select / assign output group(s) to activate the modulated annunciator on alarm.

MODULATED ANNUNCIATOR OUTPUT GROUPS GROUP
 ----- A
 1 32
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A A B B C C D D E E F F

Fill-in Modulated Annunciator Output – Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

Example Output Device — OUTPUT GROUP Assignment (shown filled-in)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF
Y			Y	Y	Y																		Y								

OUTPUT GROUP GROUP

Y -- YYY ----- Y ----- X

1 32

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A A B B C C D D E E F F

The 24TH group (Group X) is shown assigned Y

Press: **M1** to move the cursor left ⇐

NOTE **M2** to move the cursor right ⇨ **M4** to backspace (delete) one character to the left ⇐
UP / DOWN ▲▼ to select (Y for **yes** assigned, or – (dash) for **no** not assigned)
ENTER to store the setup into the system memory

SOLID

SOLID ANNUNCIATOR TIMEOUT
 TIMEOUT
 0

(Go back to ANNUNCIATORS menu and push the **M2** menu key (under SOLID) to access this menu)

_____ 0 to 3600

(Input an automatic time-out / turn-off value in seconds...
 0 = no time-out, the attendant must press **ACK** to silence alarms, 3600 = 60 minutes or 1 hour time-out)... **see note on first page of this chapter.**

Solid Annunciator Output Group (alarm assignment)

OUT GRPS Select / assign output group(s) to activate the solid tone annunciator on alarm.

SOLID ANNUNCIATOR OUTPUT GROUPS GROUP
 ----- A
 1 32
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A A B B C C D D E E F F

Fill-in Solid Annunciator Output – Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

Annunciator Testing

TEST 

HIT ANY KEY TO QUIT



NOTE

INCON Recommends that you program one of the annunciators to react to system fail warnings and any leak detection sensors and leak test fail alarms.

- Test the **Modulated** ALARM HORN ANNUNCIATOR

Go back to the ANNUNCIATORS menu and push the **M3** menu key (under TEST) to activate the horn. The horn will stop when the modulated annunciator timeout value is reached – or – when any other key is pressed.

- Test the **Solid** ALARM HORN ANNUNCIATOR



NOTE

The solid alarm horn annunciator can be tested from the front panel by exiting **SETUP** and pressing the **ALARM TEST** key (only in the normal Run Mode). The horn will stop when the solid annunciator timeout value is reached – or – when any other key is pressed.

— Your Notes —



Contents:

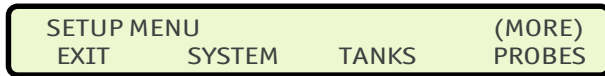
Relay Menu
 Relay Timeout
 Relay 1 & 2 Output Groups
 Alarm Assignments

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

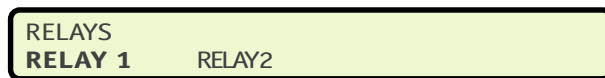
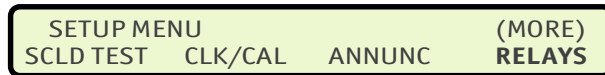
Relay Menu



Press this key and follow the highlighted sequence below

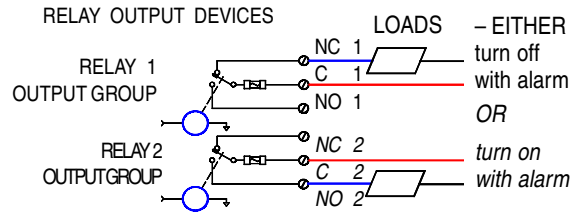


Press the **DOWN** key once ...



RELAY 1
 TIMEOUT
 RELAY TIMEOUT 1
 15

Press **M1** key.
 Press **M1** key.
 _____ 0 to 3600



The relay menu provides the means to control external devices, such as a Remote Alarm unit that alerts attendants of a problem (alarm or limit). Two available **output** relays can be used for this purpose.

The loads will switch on / off in response to alarms that are assigned to **output groups** (depending on how they are wired)... see the diagram above.

NOTE See Worksheets for applicable **Output Group** assignments. Use the Table of Contents (TOC) to locate Worksheets.

Character input / editing:

- Push **UP/DOWN** ▲ ▼ keys to show more menus or menu selections.
- Use menu keys (**M1** to **M4**) to access menus.
- Press **ENTER** to accept a selection or input a value into the setup configuration memory.
- Press **CANCEL** to cancel data entry

! Relay Timeout Note #A !

Input a considerable automatic relay time-out value – especially when the relay controls an external alarm device.

(Input an automatic relay time-out / switch-off value in seconds... 0 = no time-out, the attendant must press **ACK** to switch the relay off, 3600 = 60 minutes or 1 hour time-out)

— Continued on next page —

Relay Menu (CONTINUED... FROM PREVIOUS PAGE)

Relay 1 Output Group (alarm assignment)

Select / assign output group(s) to activate RELAY 1 on alarm / limit.

```
RELAY 1
OUT GRPS
RELAY OUTPUT GROUPS 1
-----
1                                     32
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF
```

Fill-in RELAY 1 Output – Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

TEST Relay 1
TESTING...
HIT ANY KEY TO QUIT

Press **M3** key.
RELAY switches on and off...listen for clicking sound.
Press any key to stop the test or wait for the time-out to switch the relay off if the time-out value is greater than 0.

Example Output Device – OUTPUT GROUP Assignment (shown filled-in)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF
Y			Y	Y	Y																		Y								

```

Y---YYY-----Y-----
1                                     32
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF
GROUP X
The 24TH group (Group X) is shown assigned Y
```

Press: **M1** to move the cursor left ←
M2 to move the cursor right → **M4** to backspace (delete) one character to the left ←
Use **UP / DOWN ▲ ▼** to select (Y for yes assigned, or – (dash) for no not assigned).
Press **ENTER** to store the setup into the system memory.



! Relay Timeout Note #B !

When using a relay output in combination with a TS-RK (Remote alarm Acknowledge unit) and a TS-RA1 or TS-RA2 (Remote Alarm unit) to monitor overflow of multiple tanks, you must set a reasonable relay time-out value. Do this so the relay will react to overflow alarms from each tank without the need for someone to press the **ACK** key after each overflow.

Relay Menu (CONTINUED... FROM PREVIOUS PAGE)

RELAY 2
 TIMEOUT
 RELAY TIMEOUT 2
 15

Go back to RELAYS menu and push **M2** under RELAY 2 to access this menu.

_____ 0 to 3600
 (Input an automatic relay time-out / switch-off value in seconds... 0 = no time-out, the attendant must press **ACK** to switch the relay off, 3600 = 60 minutes or 1 hour time-out)... **Input a considerable automatic relay time-out value – especially when the relay controls an external alarm device.**

Relay 2 Output Group (alarm assignment)

Select / assign output group(s) to activate RELAY 1 on alarm / limit.

OUT GRPS
 RELAY OUTPUT GROUPS 1
 ----- A
 1 32
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF

Fill-in RELAY 2 Output – Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

TEST Relay 2
 TESTING...
 HIT ANY KEY TO QUIT

Press **M3** key.
RELAY switches on and off... listen for clicking sound.
 Press any key to stop the test or wait for the time-out to switch the relay off *if the time-out value is greater than 0.*

TS-ROM Relay Output Module SETUP PROGRAMMING

Contents:

TS-ROM Menu
Grace Period
TS-ROM Channel 1–8 Output
Groups Alarm Assignments

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

TS-ROM Menu



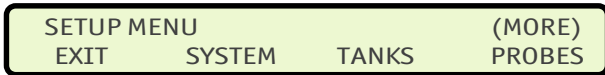
This menu appears only after the TS-ROM BriteBox™ is installed, and after console power is turned on (disregard this Chapter if a TS-ROM is not installed).

The TS-ROM relay menu provides the means to control external devices (such as STPs). The TS-ROM has 4 or 8 **output** channel relays that can be used for this purpose.

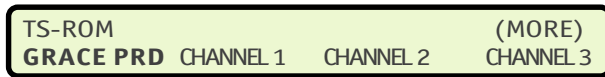
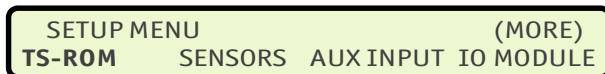
Channel relays (and the external devices wired to these) will switch on / off in response to alarms that are assigned to the relay **output groups**.



Press this key and follow the highlighted sequence below



Press **DOWN** ▼ key two or three times...



TS-ROM
TS-ROM GRACE PERIOD
0

NOTE *The installer must document the use for each channel-relay, the device that each controls, proper action or operation, and the power source.*

See Worksheets for applicable Output Group assignments. Use the Table of Contents (TOC) to locate Output Group Worksheets.

Grace Period

Grace Period is an alarm override for a programmed interval of time (in minutes). Input the smallest possible grace period.

Consider the actions for all external devices that are wired to the TS-ROM relays. *If one external device cannot have an override grace period, then leave the grace period at 0 for no override.*

If used to disable dispensing when product levels are low or water levels high, then be sure to set the grace period to a minimum (to prevent the pump from running dry and overheating, or to prevent pumping water).

Allows normal operation for a short time

0 to 120 minutes

(Input time for relay to remain closed) Pressing **ACK** starts the grace period and overrides the alarm-lockout on the TS-ROM channel relay.

TS-ROM Menu (CONTINUED... FROM PREVIOUS PAGE)

Example Output Device — OUTPUT GROUP Assignment (shown filled-in)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	
			Y	Y	Y																		Y									

OUTPUT GROUP GROUP X
 Y--YYY-----Y----- The 24TH group (Group X) is shown assigned Y
 1 32
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A A B B C C D D E E F F

Press: **M1** to move the cursor left ←

NOTE **M2** to move the cursor right ⇒ **M4** to backspace (delete) one character to the left ←
UP / DOWN ▲▼ to select (Y for yes assigned, or – (dash) for no not assigned)
ENTER to store the setup into the system memory

TS-ROM Channel 1 Output Group (alarm assignment)

CHANNEL 1

TS-ROM CHANNEL 1

Select / assign output group(s) to activate the TS-ROM Channel Relay 1 on alarm

OUT GRPS

TS-ROM OUTPUT GROUPS 1

GROUP

----- A
 1 32

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A A B B C C D D E E F F

Fill-in TS-ROM Channel Relay 1 Output – Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

TS-ROM Channel 2 Output Group (alarm assignment)

CHANNEL 2

TS-ROM CHANNEL 2

Select / assign output group(s) to activate the TS-ROM Channel Relay 2 on alarm

OUT GRPS

TS-ROM OUTPUT GROUPS 2

GROUP

----- A
 1 32

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A A B B C C D D E E F F

Fill-in TS-ROM Channel Relay 2 Output – Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

TS-ROM Channel 3 Output Group (alarm assignment)

CHANNEL 3

TS-ROM CHANNEL 3

Select / assign output group(s) to activate the TS-ROM Channel Relay 3 on alarm

OUT GRPS

TS-ROM OUTPUT GROUPS 3

GROUP

----- A
 1 32

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z A A B B C C D D E E F F

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

TS-ROM Channel 4 Output Group (alarm assignment)

CHANNEL 4

TS-ROM CHANNEL 4

Select / assign output group(s) to activate the TS-ROM Channel Relay 4 on alarm

OUT GRPS

TS-ROM OUTPUT GROUPS 4

GROUP

----- A

1 32

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF

Fill-in TS-ROM Channel Relay 4 Output – Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

TS-ROM Channel 5 Output Group (alarm assignment)

CHANNEL 5

TS-ROM CHANNEL 5

Select / assign output group(s) to activate the TS-ROM Channel Relay 5 on alarm

OUT GRPS

TS-ROM OUTPUT GROUPS 5

GROUP

----- A

1 32

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF

Fill-in TS-ROM Channel Relay 5 Output – Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

TS-ROM Channel 6 Output Group (alarm assignment)

CHANNEL 6

TS-ROM CHANNEL 6

Select / assign output group(s) to activate the TS-ROM Channel Relay 6 on alarm

OUT GRPS

TS-ROM OUTPUT GROUPS 6

GROUP

----- A

1 32

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF

Fill-in TS-ROM Channel Relay 6 Output – Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

TS-ROM Channel 7 Output Group (alarm assignment)

CHANNEL 7

TS-ROM CHANNEL 7

Select / assign output group(s) to activate the TS-ROM Channel Relay 7 on alarm

OUT GRPS

TS-ROM OUTPUT GROUPS 7

GROUP

----- A

1 32

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF

Fill-in TS-ROM Channel Relay 7 Output – Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

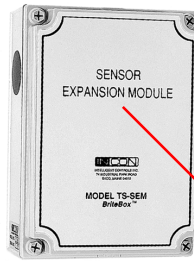
Sensors (Leak Detection) SETUP PROGRAMMING

Contents:	See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.
Sensors Menu	
Naming Sensors	
Standard Sensors (ID)	
BriteSensor (ID)	
Output Groups Assignments	
Worksheets 17-1 & 17-5	

Sensors Menu



Press this key and follow the highlighted sequence below



Internally, the TS-1001/504 has 12 and the TS-2001/508 has 24 IS (intrinsically safe) leak detection sensor input channels. Optionally — with the addition of 1 or 2 external/TS-SEM Sensor Expansion Module(s)—the total number of sensors can be increased to 28 for the TS-1001/504 or to 40 for the TS-2001/508.

SELECT MENU OPTION
 SETUP UPGRADE LANGUAGE DATALOG

M1 M2 M3 M4

SETUP MENU (MORE)
 EXIT SYSTEM TANKS PROBES

Press **DOWN** ▼ key two or three times...

SETUP MENU (MORE)
 TS-ROM **SENSORS** AUX INPUT IO MODULE

M1 **M2** M3 M4

SENSORS (MORE)
AUTO CFG SENSOR1 SENSOR2 SENSOR3

M1 M2 M3 M4

NOTE This menu will appear only when the No. of Sensors is greater than zero (as defined in the system setup menu). The installer must document the type, the location, and the input sensor channel of each leak-detection sensor.

Sensor alarms can be setup to print, or send alarm reports, and to energize output groups that can be programmed to activate annunciator warning horns, indicator lights, relays, or various other external devices.

Fill-in the Worksheets that are provided in this chapter with **Output Group** assignments for each sensor. Use the Table of Contents (TOC) to locate and compare with other Output Group Worksheets.

Naming Sensors

Sensors can be renamed to help identify the location and type on Reports and Displayed Alarms. For example: a TSP-DIS sensor is installed at Tank 1, to sensor channel 3. It was renamed from - SENSOR 3 to - T1 DIS 3.

```

ALARM REPORT
1/1/1998 11:35 PM
WATER PRESENT
T1 DIS 3
SENSOR NO. 3
    
```

```

SENSOR ALARMS    ACTIVE    1-1-1998
WATER T1 DIS 3               11:35:02PM
    
```


Sensors Menu (CONTINUED... FROM PREVIOUS PAGE)

SENSORS
 AUTO CFG Press (**M**) key.
 (Automatically identify the sensors) Press **M1** key.

SENSOR 1 Press (**M**) key.
 SENSOR 2 Use **UP/DOWN ▲ ▼** keys to show more choices.
 : (SENSORS 13 – 28 are *optional* with the TS-1001/504)
 SENSOR 40 (SENSORS 25 – 40 are *optional* with the TS-2001/508)

NAME Press **M1** key.
 SENSOR NAME N **N = SENSOR channel Number**
 SENSOR N _____ 9 characters
 Use keypad to input / change sensor name (*optional*)
 Press **ENTER** to accept this data.

TYPE Press **M2** key.
 STD Use **UP/DOWN ▲ ▼** keys to show more choices.
 (or TSP-DIS, TSP-DDS, TSP-DTS, Press **ENTER** to accept this sensor ... **do not change**
 TSP-HIS, TSP-MWS, TSP-DVS) **any sensor type - use AUTO CFG instead**)

NOTE  Depending on which sensors are installed will determine which of the following alarm Output Groups (OG) choices will appear. OGs can be assigned to activate annunciators, or control relays / devices on alarm. OGs are sensor and channel dependant. Document the Sensor and Output Group Assignments on the Worksheets provided on the following pages.

STD OG **(only for standard sensors)**
 STANDARD OUTPUT GROUP N
 NONE (A to FF or ALL) assign alarm to Output Group N

PROD OG **(with TSP –DIS, DDS, DTS or MWS sensors)**
 PRODUCT OUTPUT GROUP N
 NONE (A to FF or ALL) assign alarm to Output Group N

WATER OG **(with TSP–DIS, DDS, DVS or DTS sensors)**
 WATER OUTPUT GROUP N
 NONE (A to FF or ALL) assign alarm to Output Group N

SMP FL OG **(with TSP–DDS or DTS sensors)**
 SUMP FULL OUTPUT GROUP N
 NONE (A to FF or ALL) assign alarm to Output Group N

DRY WL OG **(with TSP–MWS sensor)**
 DRY WELL OUTPUT GROUP N
 NONE (A to FF or ALL) assign alarm to Output Group N

HGH BR OG **(with TSP-HIS sensor)**
 HIGH BRINE OUTPUT GROUP N
 NONE (A to FF or ALL) assign alarm to Output Group N

LOW BR OG **(with TSP-HIS sensor)**
 LOW BRINE OUTPUT GROUP N
 NONE (A to FF or ALL) assign alarm to Output Group N

VAPOR OG **(TSP-DVS sensors only... other DVS sensor menus items on next page)**
 VAPOR OUTPUT GROUP N
 NONE (A to FF or ALL) assign alarm to Output Group N

Typical Output Group Choices

UP/DN ▲ ▼ to show choices
ENTER to select

NONE

A	B	C	D	E	F
G	H	I	J	K	L
M	N	O	P	Q	R
R	T	U	V	W	X
Y	Z				
AA	BB	CC	DD	EE	FF
ALL					

Special Vapor Sensor Menu (Continued...)

VAP THRSH
SENSOR VAPOR THRESHOLD N
+2000.0

(see TSP-DVS install manual)

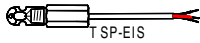
_____ 0.0 to 65535.0 (Enter vapor threshold to 1000 RVUs above normal in-well reading)

VAP OFFST
SENSOR VAPOR OFFSET
+0

(see TSP-DVS install manual)

_____ 0.0 to 65535.0 (Enter vapor offset)

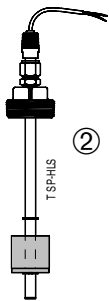
Leak Detection Sensors



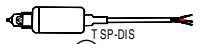
①

Standard Sensors (below... all Alarms = STD N)

- ① **TSP-EIS** Electro-optic Interstitial (3 wire, infrared) **Standard Sensor** detects liquids in spaces between the walls of DWTs
- ② **TSP-HLS** High product Level (2 wire, float switch) **Standard Sensor** used inside of tanks as an overflow alarm detector (or in addition to the HIGH, and HIGH HIGH probe limits)
- ③ **TSP-ULS** Universal Liquid Sensor (2 wire, float switch) **Standard Sensor** detects liquids in: spaces between the walls of DWTs or Dispenser sumps



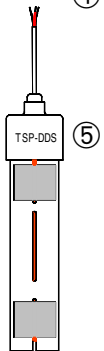
②



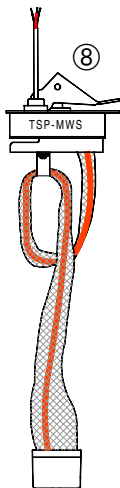
④

BriteSensors & ALARMS (all 3 wire – below)

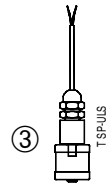
- ④ **TSP-DIS** Discriminating Interstitial (infrared & conductivity sensor) **BriteSensor** detects liquid **WATER** or **PRODUCT** in spaces between the walls of DWTs
- ⑤ **TSP-HIS** Hydrostatic Interstitial (float switches) **BriteSensor** detects **HIGH BRINE** or **LOW BRINE** levels in hydrostatic reservoirs of DWTs
- ⑥ **TSP-DDS** Discriminating Dispenser Sump (conductivity strip & floats) **BriteSensor** detects liquid **PRODUCT** or **WATER** or **SUMP FULL** in dispenser sumps
- ⑦ **TSP-DTS** Discriminating Turbine Sump (conductivity strip & floats) **BriteSensor** detects liquid **PRODUCT** or **WATER** or **SUMP FULL** in STP containment sumps
- ⑧ **TSP-MWS** Discriminating ground water monitoring well (float & conductivity strip) **BriteSensor** – detects **DRY WELL** (no water in well) or **PRODUCT** floating on ground water in monitoring wells
- ⑨ **TSP-DVS** Discriminating Vapor Well (vapor & conductivity strip) **BriteSensor** detects liquid **WATER** or product **VAPOR** in vapor monitoring wells



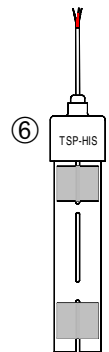
⑤



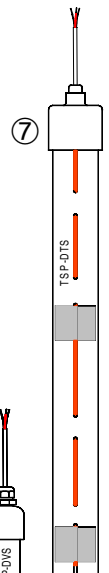
⑧



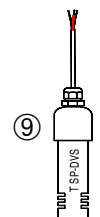
③



⑥



⑦



⑨

Worksheet # 17-1 – Output Groups – Sensor Channels 1 to 8

Fill-in the work sheet below and compare assignments with other work-sheets to uncover conflicts **before** programming output devices.

A maximum of 3 alarm Output Groups (OG) can appear per channel # N... TSP-DDS & TSP-DTS sensors have 3 alarms: water, product & sump full.

Alarm OGs are:
 STD (standard)
 PROD (product)
 WATER OG
 SMP FL (sump full)
 DRY WL (dry well)
 HGH BR (high brine level)
 LOW BR (low brine level)
 VAPOR OG

Write-in all alarm OGs for each sensor channel #.

OG = Output Group	▼	- Output Group Assignment WORKSHEET Output Group choices -	▼
Sensor Chnl #1:			NONE
			A
			B
			C
			D
			E
			F
			G
			H
			I
			J
			K
			L
			M
			N
			O
			P
			Q
			R
			S
			T
			U
			V
			W
			X
			Y
			Z
			AA
			BB
			CC
			DD
			EE
			FF
example: WATER OG 1	W	Could activate the annunciator when water is detected	
PROD OG 1	P	Could activate the annunciator and a ROM relay (output) to disable dispensing if product is detected (TSP-DIS shown)	ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			

Worksheet # 17-2 – Output Groups – Sensor Channels 9 to 16

Fill-in the work sheet below and compare assignments with other work-sheets to uncover conflicts **before** programming output devices.

A maximum of 3 alarm Output Groups (OG) can appear per channel # N... TSP-DDS & TSP-DTS sensors have 3 alarms: water, product & sump full.

Alarm OGs are:
 STD (standard)
 PROD (product)
 WATER OG
 SMP FL (sump full)
 DRY WL (dry well)
 HGH BR (high brine level)
 LOW BR (low brine level)
 VAPOR OG

Write-in all alarm OGs for each sensor channel #.

OG = Output Group		- Output Group Assignment <u>WORKSHEET</u> Output Group choices -	
Sensor Chnl #9:			NONE
			A
			B
			C
Sensor Chnl #10:			D
			E
			F
			G
Sensor Chnl #11:			H
			I
			J
			K
Sensor Chnl #12:			L
			M
			N
			O
Sensor Chnl #13:			P
			Q
			R
			S
Sensor Chnl #14:			T
			U
			V
			W
Sensor Chnl #15:			X
			Y
			Z
			AA
Sensor Chnl #16:			BB
			CC
			DD
			EE
<i>example:</i> WATER OG 10	W	Could activate the annunciator when water is detected (TSP-DTS)	FF
PROD OG 10	P	Could activate the annunciator and a ROM relay (output) to disable dispensing if product is detected (TSP-DIS shown)	ALL
SMP FL OG 10	R	Could activate the annunciator and a ROM relay (output) to warn that the sump is full and to be pumped out (into a containment tank)	
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			

Worksheet # 17-3 – Output Groups – Sensor Channels 17 to 24

Fill-in the work sheet below and compare assignments with other work-sheets to uncover conflicts **before** programming output devices.

A maximum of 3 alarm Output Groups (OG) can appear per channel # N... TSP-DDS & TSP-DTS sensors have 3 alarms: water, product & sump full.

Alarm OGs are:
 STD (standard)
 PROD (product)
 WATER OG
 SMP FL (sump full)
 DRY WL (dry well)
 HGH BR (high brine level)
 LOW BR (low brine level)
 VAPOR OG

Write-in all alarm OG for each sensor channel #.

OG = Output Group	- Output Group Assignment WORKSHEET Output Group choices -		
Sensor Chnl #17:			NONE
			A
			B
			C
Sensor Chnl #18:			D
			E
			F
			G
Sensor Chnl #19:			H
			I
			J
			K
Sensor Chnl #20:			L
			M
			N
			O
Sensor Chnl #21:			P
			Q
			R
			S
Sensor Chnl #22:			T
			U
			V
			W
Sensor Chnl #23:			X
			Y
			Z
			AA
Sensor Chnl #24:			BB
			CC
			DD
			EE
<i>example:</i>			FF
STD OG 22	P	Could activate the annunciator and a ROM relay (output) to disable dispensing if a liquid is detected (standard sensor shown)	ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			

Worksheet # 17-4 – Output Groups – Sensor Channels 25 to 32

Fill-in the work sheet below and compare assignments with other work-sheets to uncover conflicts **before** programming output devices. (For TS-2001/508 only).

A maximum of 3 alarm Output Groups (OG) can appear per channel # N... TSP-DDS & TSP-DTS sensors have 3 alarms: water, product & sump full.

Alarm OGs are:
 STD (standard)
 PROD (product)
 WATER OG
 SMP FL (sump full)
 DRY WL (dry well)
 HGH BR (high brine level)
 LOW BR (low brine level)
 VAPOR OG

Write-in all alarm OG for each sensor channel #.

OG = Output Group		- Output Group Assignment WORKSHEET Output Group choices -	
Sensor Chnl #25:			NONE
			A
			B
			C
Sensor Chnl #26:			D
			E
			F
			G
Sensor Chnl #27:			H
			I
			J
			K
Sensor Chnl #28:			L
			M
			N
			O
Sensor #29 (TS-2001):			P
			Q
			R
			S
Sensor #30 (TS-2001):			T
			U
			V
			W
Sensor #31 (TS-2001):			X
			Y
			Z
			AA
Sensor #32 (TS-2001):			BB
			CC
			DD
			EE
<i>example:</i>			FF
STD OG 32	P	Could activate the annunciator to indicate a liquid was detected (standard sensor shown)	ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			

Worksheet # 17-5 – Output Groups – Sensor Channels 33 to 40

Fill-in the work sheet below and compare assignments with other work-sheets to uncover conflicts **before** programming output devices. (For TS-2001/508 only).

A maximum of 3 alarm Output Groups (OG) can appear per channel # N... TSP-DDS & TSP-DTS sensors have 3 alarms: water, product & sump full.

Alarm OGs are:
 STD (standard)
 PROD (product)
 WATER OG
 SMP FL (sump full)
 DRY WL (dry well)
 HGH BR (high brine level)
 LOW BR (low brine level)
 VAPOR OG

Write-in all alarm OG for each sensor channel#.

OG = Output Group		- Output Group Assignment <u>WORKSHEET</u> Output Group choices -	
Sensor #33 (TS-2001):			NONE
			A
			B
			C
Sensor #34 (TS-2001):			D
			E
			F
			G
Sensor #35 (TS-2001):			H
			I
			J
			K
Sensor #36 (TS-2001):			L
			M
			N
			O
Sensor #37 (TS-2001):			P
			Q
			R
			S
Sensor #38 (TS-2001):			T
			U
			V
			W
Sensor #39 (TS-2001):			X
			Y
			Z
			AA
Sensor #40 (TS-2001):			BB
			CC
			DD
			EE
ex.: HGH BR OG 40	P	Could activate the annunciator when a high brine level is detected ... see below also	FF
LOW BR OG 40	P	Could disable product dispensing when a low brine level is detected ...see above also (TSP-HIS shown)	ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			

Auxiliary Inputs Menu (CONTINUED... FROM PREVIOUS PAGE)

AUXILIARY INPUTS	Press (M) keys to select INPUT#s.
INPUT 1	
INPUT 2	
AUXILIARY INPUT 1	
MODE	Press M1 key.
AUXILIARY INPUT MODE 1	Use UP/DOWN ▲ ▼ keys to show choices.
ACTIVE CLOSED	(normally open input)
REMOTE ACKNOWLEDGE	
CLOSED TO OPEN EDGE	(normally closed input active on voltage drop)
OPEN TO CLOSED EDGE	(normally open input active on rising voltage)
ACTIVE OPEN	(normally closed input)
	Press ENTER to accept this data.
NAME	
AUXILIARY INPUT NAME 1	Press M1 key.
AUXILIARY 1	_____ 9 characters
	Use keypad to input / change sensor name (optional)
	Press ENTER to accept this data.
OUT GROUP	Press M2 key.
AUXILIARY INPUT OUTPUT GROUP 1	(32 OGs available ... see Worksheet # 18-1)
NONE	Not assigned to an Output Group (OG)
GROUP A-FF	One OG selected (A=1st OG, FF=32nd OG)
ALL GROUPS	All OGs selected
	Use UP/DOWN ▲ ▼ keys to show choices.
	Press ENTER to accept this data.
AUXILIARY INPUT 2	
MODE	Press M1 key.
AUXILIARY INPUT MODE 2	Use UP/DOWN ▲ ▼ keys to show choices.
ACTIVE CLOSED	(normally open input)
REMOTE ACKNOWLEDGE	
CLOSED TO OPEN EDGE	(normally closed input active on voltage drop)
OPEN TO CLOSED EDGE	(normally open input active on rising voltage)
ACTIVE OPEN	(normally closed input)
	Press ENTER to accept this data.
NAME	
AUXILIARY INPUT NAME 2	Press M1 key.
AUXILIARY 1	_____ 9 characters
	Use keypad to input / change sensor name (optional)
	Press ENTER to accept this data.
OUT GROUP	Press M2 key.
AUXILIARY INPUT OUTPUT GROUP 2	(32 OGs available ... see Worksheet # 18-1)
NONE	Not assigned to an Output Group (OG)
GROUP A-FF	One OG selected (A=1st OG, FF=32nd OG)
ALL GROUPS	All OGs selected
	Use UP/DOWN ▲ ▼ keys to show choices.
	Press ENTER to accept this data.

Worksheet #18-1 – Output Groups – Aux. Inputs 1 and 2

Output groups (OG / Out Group) can be assigned to activate annunciators, or control relays / devices on alarm. Fill-in the work sheet below and compare the assignments with other work-sheets to uncover conflicts **before** programming output devices.

OG = Output Group	- Output Group Assignment WORKSHEET Output Group choices -	
Aux. Inputs:		NONE
Input #1:		A
OUT GROUP		B
Input #2:		C
OUT GROUP		D
		E
		F
		G
		H
		I
		J
		K
		L
		M
		N
		O
		P
		Q
		R
		S
		T
		U
		V
		W
		X
		Y
		Z
Example --		AA
Aux. Inputs:		BB
Input #1:	(Site open for business / front door unlocked):	CC
OUT GROUP	--- none assigned Faxed to _____ with other Alarms	DD
Input #2:	Back door open	EE
OUT GROUP	A Sound Modulated alarm horn	FF
		ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)		

Cathodic Protection Monitor (CPM) SETUP PROGRAMMING

Contents:

CPM Menu
Worksheet #19-1
Output Groups -
Line Leak Tests

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

CPM Menu



Press this key and follow the highlighted sequence below

SELECT MENU OPTION (MORE)
SETUP UPGRADE LANGUAGE DATALOG

M1

M2

M3

M4

SETUP MENU (MORE)
EXIT SYSTEM TANKS PROBES

Press the **DOWN** key two or three times ...

SETUP MENU (MORE)
TS-ROM SENSORS AUX INPUT CPM

M1

M2

M3

M4

CATHODIC PROTECTION
DATA ALARM

M1

M2

M3

M4

— CONTINUED ON NEXT PAGE —

Remember:

The TS-CPM is programmed from the CPM menu, which is under Setup. To reach this menu, press the **Menu** key > **M1** then the **Down** key until CPM is displayed.

Press the menu key (**M1** thru **M4**) that is below the text: CPM. Two sub-menus are shown under the Cathodic Protection Menu. Press **M1** to access the DATA menu and **M2** for the ALARM menu.

Push **M1** under the DATA menu and select ENABLE. Then select YES under the CPM ENABLE menu, only when a CPM unit is/will be attached to the Tank Sentinel tank gauge. Press **M2** under the ALARM menu and select AMPS.

CPM Menu Notes:

- 1) Before programming, reference the State and Local Regulations about the interval of Cathodic Protection Monitoring / Survey Reporting and requirements.
- 2) Enter 80% of the output amperage level that was documented on the last UST 3-6 Month (ly) Survey Report and use this value as the current limit (amp) alarm setpoint.

For Example: 80% of 4.2 amps = 3.36 (used for the current alarm set-point)

CPM Menu (Continued ... FROM PREVIOUS PAGE)

CATHODIC PROTECTION DATA	Press M1 key.
CATHODIC PROTECTION DATA ENABLE	Press M1 key.
CPM ENABLE	Use UP/DOWN ▲ ▼ keys to show choices.
NO	(select YES if a TS-CPM unit is installed)
YES	Press ENTER to accept this data.
ADDRESS	Press M2 key.
CPM SENSOR ADDRESS	(accessing this menu is not required for SETUP)
112	Keep the default value (112)
CONFIG	Press M3 key.
CPM SENSOR SETUP	(accessing this menu is not required for SETUP)
CHECKING ADDRESS ...	(the system is searching for the current address)

— Press the **CANCEL** key to display the CATHODIC PROTECTION Menu —

ALARM	Press M2 key.	(input 80% of the output amperage level that was documented on the last UST Survey Report)
CATHODIC PROTECTION ALARM AMPS	Press M1 key.	
CPM CURRENT LIMIT		_____ 0.0 to 10 amps
+10.0000		Use keypad to input a current limit number. Press ENTER to accept this data.
AMPS OG	Press M2 key.	
CPM CURRENT LIMIT OUTPUT GROUP	(32 OGs available ... see Worksheet #19-1)	
NONE	Not assigned to an Output Group (OG)	
GROUP A-FF	One OG selected (A=1st OG, FF=32nd OG)	
ALL GROUPS	All OGs selected	
	Use UP/DOWN ▲ ▼ keys to choose an OG.	
	Press ENTER to accept this data.	

— Press the **CANCEL** key two times to display the SETUP Menu —

Worksheet #19-1 – Output Groups – Line Leak Tests

Fill-in the worksheet below. Compare assignments with other worksheets in the Setup Programming Manual/Addenda to uncover conflicts **before** programming the output devices.

OG = Output Group	▼ - Output Group Assignment WORKSHEET Output Group choices - ▼	
CPM:		NONE
AMPS OG		A
(Current Limit OG)		B
		C
		D
		E
		F
		G
		H
		I
		J
		K
		L
		M
		N
		O
		P
		Q
		R
		S
		T
		U
		V
		W
		X
		Y
		Z
		AA
		BB
		CC
		DD
Example:		
AMPS OG	A	Activates Solid Annunciator (same as System Fail)
		EE
		FF
		ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)		

I/O (Input/Output) Module SETUP PROGRAMMING

Contents:
 I/O Module Menu
 Output Module – OG
 Assignments
 Input Module – OG
 Worksheets

See the Table of Contents. See the Preface for key action and see the Installation, Operator's, TroubleShooting Guides, and Application Notes – for other data.

I/O Module Menu



Press this key and follow the highlighted sequence below

```
SELECT MENU OPTION
SETUP  UPGRADE  LANGUAGE  DATA...
```

M1 M2 M3 M4

```
SETUP MENU (MORE)
EXIT  SYSTEM  TANKS  PROBES
```

Press the **DOWN** key two or three times

```
SETUP MENU (MORE)
TS-ROM  SENSORS  AUX INPUT  IO MODULE
```

M1 M2 M3 M4

```
IO MODULES (MORE)
GRACE PER MODULE1  MODULE2  MODUL
```

M1 M2 M3 M4

The I/O Module menu appears when an *optional* 8 channel, external TS-CIM BriteBox™ is connected to the console.

```
BRITEBOX/I/O MODULE
CHANNELS
TS-1001/504:
12345678
TS-2001/508:
1718192021
222324
```

For TS-2001/508 consoles only: an expanded version of this menu can appear if 1 or 2 **optional**, & **internal TS-IEM** I/O module PC boards are installed — for an additional 8 or 16 I/O channels.

```
TS-2001/
508
TS-IEM
I/O
MODULE
CHANNELS
#1 #2
1 9
2 10
3 11
4 12
5 13
6 14
7 15
8 16
```

NOTE Solid state Input / Output modules can be installed in any channel. The installer must provide you with the module type, mode, name, and purpose of each channel number before you can program it !

Input-alarms can be assigned to activate output groups (and devices such as output modules, annunciators, and relays) and can also be setup to printout or send alarm reports. Output modules (and devices) will turn on/off in reaction to whatever output groups they are programmed to monitor.

NOTE: The **External Input** alarms are displayed along with **SENSOR ALARMS**.

Example:

```
ALARMREPORT
3/1/1998 08:35 AM
EXTERNAL INPUT
OPEN BD 4
CHANNEL NO. 4
```

Report and Alarm-display for input channel 4, which was renamed as **OPEN BD**
 4
 (BD = Back Door).

```
SENSORALARMS ACTIVE 3-1-1998
EXTERNAL INPUT OPEN BD 4 08:35:02 PM
```

— Continued on next page —

I/O Module Menu (CONTINUED... FROM PREVIOUS PAGE)

IO MODULES

GRACE PER

I/O MODULE GRACE PERIOD

0

0 = NO GRACE PERIOD (Outputs ON until alarm clears)

0 to 120 minutes (enter an acceptable alarm-override time).
Pressing **ACK** will override the alarm-activated **output module** and start the grace period. An alarm-activated **output module** will then return to a no-alarm condition for the grace period. After the grace period is over, the module will reactivate if the alarm condition is still present. Set the grace period to a minimum amount of time (that is okay for all devices connected to an output). If no grace period is acceptable even to one device, then enter a **0 for no alarm override**).

You must know what type of module is in each channel, what device it's wired from / to, it's intended purpose, and what should happen on alarm before you begin to program.

MODULE 1

:

MODULE 8

MODULE 9

:

MODULE 16

:

MODULE 24

I/O MODULE N

MODE

MODE

I/O MODULE MODE N

Choose an I/O module channel (menu key).

Use **UP/DOWN ▲ ▼** keys to show choices.

(Up to 8 I/O MODULEs with TS-CIM BriteBox)

(For TS-2001/508 only: 8 or 16 internal I/O MODULEs can be optionally added to TS-IEM PC boards)

Press **ENTER** to accept this data.

Select I/O Module Mode of Operation

Use **UP/DOWN ▲ ▼** keys to show choices.

N = I/O MODULE channel Number

Line Leak Detector (input) DOES NOT appear with TS-LLDI consoles.

(option **L** in the partnumber ... press **CHECK** then **M4**)

Typical MODE Sub-menu

INPUT ACTIVE HIGH (default)
INPUT ACTIVE LOW
OUTPUT NORMALLY OPEN
OUTPUT NORMALLY CLOSED
LINE LEAK DETECTOR (input)

1

INPUT ACTIVE HIGH

MODE

NAME

I/O MODULE NAME N

EXTERNAL N

OUT GROUP

I/O MODULE OUTPUT GROUP N

NONE (A to FF or ALL)

For input modules only

(Change mode if incorrect)

(optional – input new name)

Assign alarm to Output Group N.

(document assignments in Worksheet # 20-1)

2

INPUT ACTIVE LOW

MODE

NAME

I/O MODULE NAME N

EXTERNAL N

OUT GROUP

I/O MODULE OUTPUT GROUP N

NONE (A to FF or ALL)

For input modules only

(Change mode if incorrect)

(optional – input new name)

Assign alarm to Output Group N.

(document assignments in Worksheet # 20-1)



CAUTION DO NOT use Leak Detection Sensors (i.e. TSP-ULS) with these assemblies or input modules. These are not Intrinsically Safe (I.S.) or approved for this use.

- 3** LINE LEAK DETECTOR
 MODE
 LN NAME N
 LINE N
 FAIL OG
 LINE TEST FAIL OUTPUT GROUP N
 NONE (A to FF or ALL)

For input modules only
 (Change mode if wrong)
 _____ (input line #)
 (N may not equal the channel number)
 Assign alarm to Output Group N.
 (document the assignment in Worksheet # 20-2)

- 4** OUTPUT NORMALLY OPEN
 MODE
 OUT GRPS

(output module closes on alarm)
 (Change mode if wrong)
Select / assign output group(s) to activate Channel N output module on alarm.

I / O	MODULE	OUTPUT GROUPS N	GROUP	A
		-----	-----	
	1		32	
		A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF		

Fill-in Output Module Channel N – Alarm Group Assignments in following page(s)

- 5** OUTPUT NORMALLY CLOSED
 MODE
 OUT GRPS

(output module opens on alarm)
 (Change mode if wrong)
Select / assign output group(s) to activate Channel N output module on alarm.

I / O	MODULE	OUTPUT GROUPS N	GROUP	A
		-----	-----	
	1		32	
		A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF		

Fill-in Output Module Channel N – Alarm Group Assignments in following page(s)

Example I/O Output Module — OUTPUT GROUP Assignment (shown filled-in)

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	
Y			Y	Y	Y																		Y									

I / O MODULE OUTPUT GROUPS N GROUP
 Y--YYY-----Y----- X The 24TH group (Group X) is shown assigned Y
 1 32
 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA BB CC DD EE FF

Press: **M1** to move the cursor left ←
M2 to move the cursor right → **M4** to backspace (delete) one character to the left ⇐
UP / DOWN ▲ ▼ to select (Y for yes assigned, or – (dash) for no not assigned)
ENTER to store the setup into the system memory



— Continued on next page —

Channel N Output Groups – Output Module Alarm Assignments

NOTE For modules assigned as Output Modules (output mode) only.



Select/assign output group(s) to activate Channel N output module on alarm.

- 1 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

- 2 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

- 3 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

- 4 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

- 5 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

- 6 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

- 7 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

- 8 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

NOTE



N = Output Module Channel Number (typical both pages)

9 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

10 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

11 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

12 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

13 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

14 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

15 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

16 Fill-in Output Module Channel N = _____, Alarm Group Assignments Below:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF	

Fill-in MODE: Output Normally _____ OPEN or CLOSED (when not in alarm)

Worksheet #20-1 – Output Groups – For External Inputs only

Fill-in the work sheet below and compare the assignments with other worksheets to uncover conflicts **before** programming output devices. (Fill in the Input modules CHANNEL number, MODE: Active HIGH or LOW and output Group assignments below).

OG = Output Group	▼ - Output Group Assignment WORKSHEET Output Group choices -	▼
IO MODULE (Input		NONE
modules only !)...		A
...External Inputs:		B
Chnl #__ OUT GROUP		C
Chnl #__ OUT GROUP		D
Chnl #__ OUT GROUP		E
Chnl #__ OUT GROUP		F
Chnl #__ OUT GROUP		G
Chnl #__ OUT GROUP		H
Chnl #__ OUT GROUP		I
Chnl #__ OUT GROUP		J
Chnl #__ OUT GROUP		K
Chnl #__ OUT GROUP		L
Chnl #__ OUT GROUP		M
Chnl #__ OUT GROUP		N
Chnl #__ OUT GROUP		O
Chnl #__ OUT GROUP		P
Chnl #__ OUT GROUP		Q
Chnl #__ OUT GROUP		R
Chnl #__ OUT GROUP		S
Chnl #__ OUT GROUP		T
Chnl #__ OUT GROUP		U
Chnl #__ OUT GROUP		V
Chnl #__ OUT GROUP		W
Chnl #__ OUT GROUP		X
Chnl #__ OUT GROUP		Y
Chnl #__ OUT GROUP		Z
		AA
		BB
Example --		CC
I/O Input Modules:		DD
Chnl # 3 OUT GROUP	G Could activate the Modulated Annunciator	EE
		FF
Chnl # 4 OUT GROUP	A Could activate Relay 2	ALL
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)		

Worksheet #20-2 – Output Groups – Line Inputs only

Fill-in the work sheet below and compare the assignments with other worksheets to uncover conflicts **before** programming output devices. (Fill in the Input modules CHANNEL number, and LINE number output Group assignments below).

Not with TS-LLD consoles
(which have a L in the software part number...
Press **CHECK + M4** { OPTIONS })

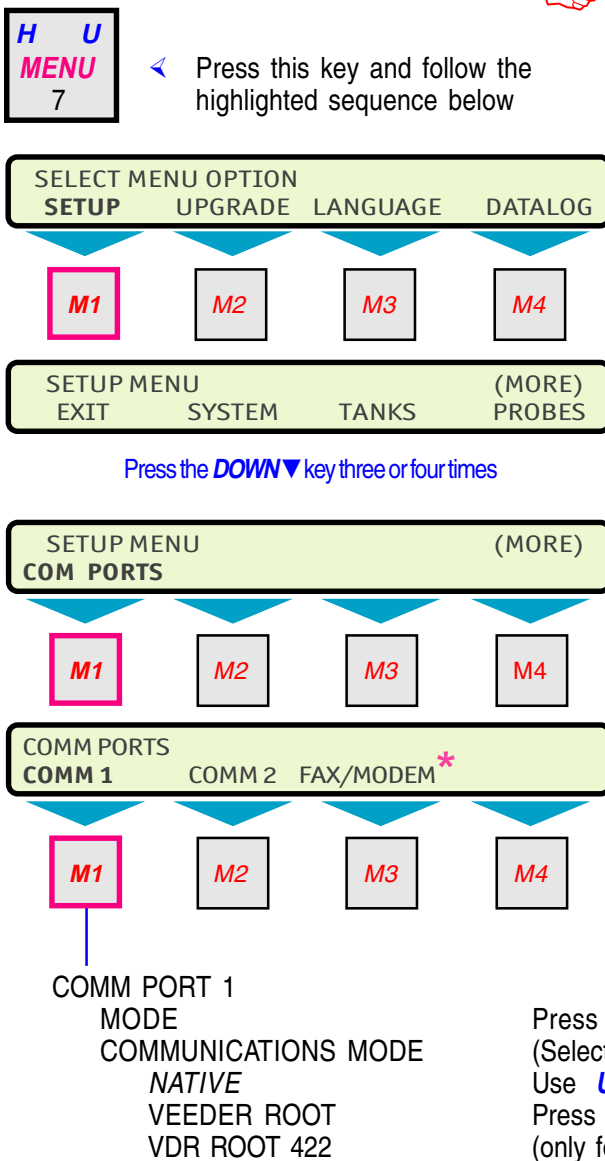
OG = Output Group	- Output Group Assignment WORKSHEET Output Group choices -		
IO MODULE (Input modules only !)...			NONE
...Line Leak			A
Detector Inputs:			B
Chnl / Line #:			C
Chnl # ___ FAIL OG			D
Chnl # ___ FAIL OG			E
Chnl # ___ FAIL OG			F
Chnl # ___ FAIL OG			G
Chnl # ___ FAIL OG			H
Chnl # ___ FAIL OG			I
Chnl # ___ FAIL OG			J
Chnl # ___ FAIL OG			K
Chnl # ___ FAIL OG			L
			M
			N
			O
			P
			Q
			R
			S
			T
			U
			V
			W
			X
			Y
Example:			Z
Chnl # 1 FAIL OG	L	Could activate the Solid Annunciator & Relay 2 on a Line Leak / test fail	AA
Chnl # 2 FAIL OG	I	Could activate the Solid Annunciator & Relay 2 on a Line Leak / test fail	BB
Chnl # 3 FAIL OG	N	Could activate the Solid Annunciator & Relay 2 on a Line Leak / test fail	CC
Chnl # 4 FAIL OG	E	Could activate the Solid Annunciator & Relay 2 on a Line Leak / test fail	DD
Chnl # 5 FAIL OG	T	Could activate the Solid Annunciator & Relay 2 on a Line Leak / test fail	EE
Chnl # 6 FAIL OG	E	Could activate the Solid Annunciator & Relay 2 on a Line Leak / test fail	FF
Chnl # 7 FAIL OG	S	Could activate the Solid Annunciator & Relay 2 on a Line Leak / test fail	ALL
Chnl # 8 FAIL OG	T	Could activate the Solid Annunciator & Relay 2 on a Line Leak / test fail	
Output Devices: Modulated Annunciator, Solid Annunciator, Relay 1, Relay 2, I/O Output Module Channel # 1 to # __ (record all OG Assignments in the vertical column)			

Communication Ports SETUP PROGRAMMING

Contents:	The Tank Sentinel console can communicate directly to a POS terminal, or with an <i>optional</i> fax/data modem to IBM PCs or Fax machines. See the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.
Com Ports Menu	
Comm Port 1 Menu	
Comm Port 2 Menu	
Data Mode Menu	
Fax Mode Menu	

Comm Ports Menu

NOTE * The FAX/MODEM menu appears only when the **optional** hardware is installed and enabled. With the fax/modem feature and a dedicated telephone line, the Tank Sentinel can be programmed to automatically dial and send information off-site. Up to four different numbers can be auto-dialed in response to alarms.



Press **CHECK** & **M4** OPTIONS to determine what is enabled or installed. When the data/fax modem is present ('M' on the hardware side, 'D' or 'F' on the software side), press **CHECK** & **M3** DIALTONE to see if a dial tone is detected. Features can often be enabled by entering a specific upgrade code(s). (See Chapter 23)

Whenever changing any **COMPORTS** setting/programming to make the new settings current, cycle console power **off**, and then wait 5 seconds before switching the console power back **on**.

Use COMM PORT 1 for local connections to communications software programs on IBM PCs. Follow these steps to setup/program COMM PORT 1...

— CONTINUED ON THE NEXT PAGE —

COMM PORT 1 Menu (Continued...)

BAUD	Press M2 key.
BAUD RATE	
9600 BAUD	Use UP/DOWN ▲ ▼ keys to show choices.
300 BAUD	Press ENTER to accept this data.
:	
19,200 BAUD	
DATA BITS	Press M3 key.
DATA BITS	
8 BITS	Use UP/DOWN ▲ ▼ keys to show choices.
7 BITS	Press ENTER to accept this data.
STOP BITS	Press M4 key.
STOP BITS	
1 STOP BIT	Use UP/DOWN ▲ ▼ keys to show choices.
2 STOP BITS	Press ENTER to accept this data.
— Press DOWN ▼ key to show more menu items —	
PARITY	Press M1 key.
PARITY	
NO PARITY	Use UP/DOWN ▲ ▼ keys to show choices.
ODD PARITY	Press ENTER to accept this data.
EVEN PARITY	
ECHO TEST	Press M2 key.
ECHO TEST ACTIVE...	
HIT ANY KEY TO QUIT	
SECURITY	Press M3 key.
SECURITY CODE	
(blank)	_____ 6 characters
	Use keypad to input a maximum of six characters.
	Press ENTER to accept this data.

(used to limit access to the Tank Sentinel console (highly recommended))

— CONTINUED ON THE NEXT PAGE —

COMM PORT 2 Menu

NOTE



Cycle console power **on** and **off** after programming is done, or after any **COM PORTS** setting is changed. Also, when the data / fax modem is present, press **CHECK & M3** DIALTONE to see if a dial tone is detected.



Use COMM PORT 2 for remote connection to a POS terminal, or external modem, or to a Computer system / IBM PCs (this may require a null modem cable).

Go back to display this menu and press **M2** to access the Comm Port 2 menu.

COMM PORT 2
MODE
COMMUNICATIONS MODE
NATIVE
VEEDER ROOT

Press **M1** key.

Use **UP/DOWN ▲ ▼** keys to show choices.
Press **ENTER** to accept this data.

BAUD
BAUD RATE
9600 BAUD
300 BAUD
:
19,200 BAUD

Press **M2** key.

Use **UP/DOWN ▲ ▼** keys to show choices.
Press **ENTER** to accept this data.

DATA BITS
DATA BITS
8 BITS
7 BITS

Press **M3** key.

Use **UP/DOWN ▲ ▼** keys to show choices.
Press **ENTER** to accept this data.

STOP BITS
STOP BITS
1 STOP BIT
2 STOP BITS

Press **M4** key.

Use **UP/DOWN ▲ ▼** keys to show choices.
Press **ENTER** to accept this data.

— Press the **DOWN ▼** key to show more menu items —

PARITY
PARITY
NO PARITY
ODD PARITY
EVEN PARITY

Press **M1** key.

Use **UP/DOWN ▲ ▼** keys to show choices.
Press **ENTER** to accept this data.

ECHO TEST
ECHO TEST ACTIVE...
HIT ANY KEY TO QUIT

Press **M2** key.

ACCESS CODE or PHONE No. AT Command
Characters: D = (,) comma = dial delay

— CONTINUED ON THE NEXT PAGE —

COMM PORT 2 Menu (Continued...)

AUTODIAL (Automatically dials up to 4 numbers when Deliveries, Alarms or Leaks occur)
COMM 2 AUTODIAL Program numbers below:
NUMBER 1
NUMBER 2
NUMBER 3
NUMBER 4 (N = number 1, 2, 3, or 4)
COMM 2 NUMBERS N
ACCESS CD (Use the Access Code field when phone number is longer than 12 characters - see example)
ACCESS CODE N _____ 12 characters
blank Use keypad to input access code.
Press **ENTER** to accept this data.

PHONE NUM (Input the phone number to autodial)
PHONE NUMBER N _____ 12 characters
blank (if more than 12 characters - see example)
Use keypad to input phone number.
Press **ENTER** to accept this data.

ACCESS CODE or PHONE No. AT Command Characters:

D = (,) comma = Dial Delay

Example — **88DD88DD91**2072830156 (20 character phone number)

'Switching code'=**88** Dial Delays=**DD**
"to dial out"=**9** "long distance"=**1**

Access Code: **88DD88DD91** (10) Phone Number:**2072830156** (10)

REDIAL EN (Enabled allows re-dialing of the phone number)
REDIAL ENABLE N
DISABLED Press **UP/DOWN ▲ ▼** keys to show choices
ENABLED Press **ENTER** to accept this data.

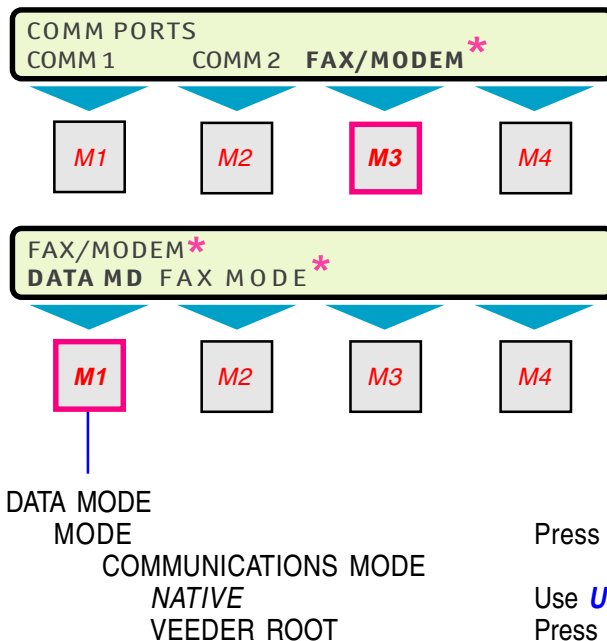
— Press the **CANCEL** key to return to the COMM 2 AUTODIAL Menu —
— Press the **DOWN ▼** key to show more menu items —

— CONTINUED ON THE NEXT PAGE —

COMM PORT 2 Menu (Continued...)

DELIVERY DELIVERY DIAL STRING <i>blank</i>	(Report Deliveries to:) _____ up to 4 numbers	___ Dial Strings reference sets of remote access and phone numbers (NUMBERS 1 thru 4) that are programmed in the AUTODIAL menu. For example: <i>Input a 1 2 to automatically call and send data to phone numbers 1 and 2.</i>
ALARMS ALARM DIAL STRING <i>blank</i>	(Report Alarms to:) _____ up to 4 numbers	
LEAKS LEAK DIAL STRING <i>blank</i>	(Report Tank Leaks to:) _____ up to 4 numbers	
LINES LINE DIAL STRING <i>blank</i>	(Report Line Leaks to:) _____ up to 4 numbers	
— Press the DOWN ▼ key to show more menu items —		
SCALD SCALD DIAL STRING <i>blank</i>	(Report SCALD Tank Leaks to:) _____ up to 4 numbers	
SECURITY SECURITY CODE <i>blank</i>	(Input a security code to limit access to the Tank Sentinel console data base ...highly recommended) _____ up to 6 characters	

DATA MODE Menu



NOTE

Cycle console power **on** and **off** after programming is done, or after any **COM PORTS** setting is changed. Also, when the data / fax modem is present, press **CHECK & M3** DIALTONE to see if a dial tone is detected.

Use the DATA MODE – internal Tank Sentinel modem – for remote connection to IBM PCs.

Go back / display these menus (at left) and press **M3** and then **M1** to access Data Mode.

Press **M1** key.

Use **UP/DOWN ▲ ▼** keys to show choices.
Press **ENTER** to accept this data.

— CONTINUED ON THE NEXT PAGE —

DATA MODE Menu (Continued...)

AUTODIAL	Press M2 key.
DATA AUTODIAL	
NUMBER 1	(Automatically dials up to 4 numbers
NUMBER 2	when Deliveries, Alarms or Leaks occur.)
NUMBER 3	Program numbers below:
NUMBER 4	
	(N = number 1, 2, 3, or 4)
DATA NUMBERS N	
ACCESS CD	(Use the Access Code field when
ACCESS CODE N	phone number is longer than 12
	characters - see example)
<i>blank</i>	_____ 12 characters
	Use keypad to input access code.
	Press ENTER to accept this data.
PHONE NUM	(Input the phone number to autodial)
PHONE NUMBER N	
<i>blank</i>	_____ 12 characters
	(if more than 12 characters - see example)
	Use keypad to input phone number.
	Press ENTER to accept this data.

ACCESS CODE or PHONE No. AT Command Characters:

D = (,) comma = Dial Delay

Example — **88DD88DD91**2072830156 (20 character phone number)

'Switching code'=**88** Dial Delays=**DD**
"to dial out"=**9** "long distance"=**1**

Access Code: **88DD88DD91** (10) Phone Number:2072830156 (10)

REDIAL EN	(ENABLED allows re-dialing of the phone number)
REDIAL ENABLE N	
<i>DISABLED</i>	Use UP/DOWN ▲ ▼ to show choices.
ENABLED	Press ENTER to accept this data.

— Press the **CANCEL** key to return to the DATA AUTODIAL Menu —
— Press the **DOWN ▼** key to show more menu items —

— continued on the next page —

DATA MODE Menu (Continued...)

DELIVERY DELIVERY DIAL STRING <i>blank</i>	(Report Deliveries to: ____ up to 4 numbers Use keypad to input string. Press ENTER to accept this data.	___ Dial Strings reference sets of remote access and phone numbers (NUMBERS 1 thru 4) that are programmed in the AUTODIAL menu. Example: <i>Input a 1 2 to automatically call and send data to phone numbers 1 and 2.</i> Duplicates (ie 11) are not allowed.
ALARMS ALARM DIAL STRING <i>blank</i>	(Report Alarms to: ____ up to 4 numbers Use keypad to input string. Press ENTER to accept this data.	
LEAKS LEAK DIAL STRING <i>blank</i>	(Report Tank Leaks to: ____ up to 4 numbers Use keypad to input string. Press ENTER to accept this data.	___ Dial Strings reference sets of remote access and phone numbers (NUMBERS 1 thru 4) that are programmed in the AUTODIAL menu. For example: <i>Input a 1 2 to automatically call and send data to phone numbers 1 and 2.</i> Duplicates (ie 11) are not allowed.
LINES LINE DIAL STRING <i>blank</i>	(Report Line Leaks to: ____ up to 4 numbers Use keypad to input string. Press ENTER to accept this data.	
SCALD SCALD DIAL STRING <i>blank</i>	(Report SCALD Tank Leaks to: ____ up to 4 numbers Use keypad to input string. Press ENTER to accept this data.	
SECURITY SECURITY CODE <i>blank</i>	(Input a security code) ____ up to 6 characters Use keypad to input security code. Press ENTER to accept this data. (access code – limit – access to the Tank Sentinel console data base ...this is highly recommended)	
AUTO ANS NUMBER OF RINGS TO AUTO ANSWER <i>1</i>	(Input a number of rings to try before hang up) ____ 1 - 9 rings Use keypad to input a number. Press ENTER to accept this data.	

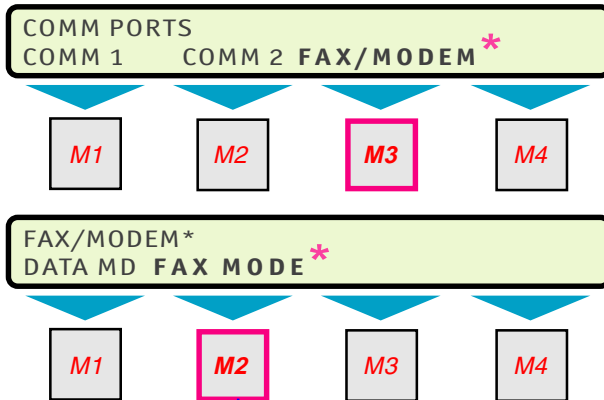
— FAX MODE Menu on next page —

FAX MODE Menu

NOTE



Cycle console power **on** and **off** after programming is done, or after any **COM PORTS** setting is changed. Also, when the data / fax modem is present, press **CHECK & M3** DIALTONE to see if a dial tone is detected.



Use the optional internal fax/modem to send reports to remote Fax machines.

Go back / display this menu (at left) and press **M3** and **M2** to access these menus.

FAX MODE
AUTODIAL
FAX AUTODIAL
NUMBER 1
NUMBER 2
NUMBER 3
NUMBER 4

Automatically FAX up to 4 numbers when Deliveries, Alarms, Reports, Line Tests or Leak Test occur

FAX NUMBERS N
ACCESS CD
ACCESS CODE N

blank

(N = number 1, 2, 3, or 4)

(Use the Access Code field when phone number is longer than 12 characters - see example)
_____ 12 characters
Use keypad to input access code.
Press **ENTER** to accept this data.

PHONE NUM
PHONE NUMBER N
blank

(Input a FAX phone number)
_____ 12 characters
(if more than 12 characters - see example)
Use keypad to input FAX number.
Press **ENTER** to accept this data.
(Fax/Modem retries several times when busy)

ACCESS CODE or PHONE No. AT Command Characters:

D = (,) comma = Dial Delay

Example — **88DD88DD91**2072830156 (20 character phone number)

'Switching code'=**88** Dial Delays=**DD**
"to dial out"=**9** "long distance"=**1**

Access Code: **88DD88DD91** (10) Phone Number:2072830156 (10)

— CONTINUED ON THE NEXT PAGE —

FAX MODE Autodial menu (CONTINUED...)

— Press the **CANCEL** key to return to the FAX AUTODIAL Menu —
— Press **DOWN ▼** key to show more menu items —

DELIVERY DELIVERY FAX STRING <i>blank</i>	(Fax Deliveries to) _____ up to 4 numbers Use keypad to input a FAX string. Press ENTER to accept this data.
ALARM ALARM FAX STRING <i>blank</i>	(Fax Alarms to) _____ up to 4 numbers Use keypad to input a FAX string. Press ENTER to accept this data.
LEAK LEAK FAX STRING <i>blank</i>	(Fax Tank Leaks to) _____ up to 4 numbers Use keypad to input a FAX string. Press ENTER to accept this data.
LINE LINE FAX STRING <i>blank</i>	(Fax Line Leaks to) _____ up to 4 numbers Use keypad to input a FAX string. Press ENTER to accept this data.

— Press **DOWN ▼** key to show more menu items —

SCALD SCALD FAX STRING <i>blank</i>	(Fax SCALD Tank Leaks to) _____ up to 4 numbers Use keypad to input a FAX string. Press ENTER to accept this data.
REPORTS REPORT FAX STRING <i>blank</i>	(Send Manual Reports – from the keypad – or Automatic <i>Scheduled</i> Reports to) _____ up to 4 numbers Use keypad to input a FAX string. Press ENTER to accept this data.

— Press the **CANCEL** key 4 times to return to the main SETUP Menu —

_____ FAX Strings
reference sets of
remote access
and phone
numbers
(NUMBERS 1 thru
4) that are
programmed in the
AUTODIAL menu.
For example:
*Input a 1 2 to
automatically FAX
to phone numbers
1 and 2.*
**Duplicates (ie 11)
are not allowed.**

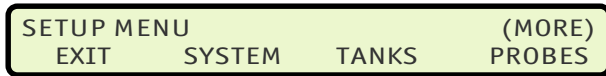
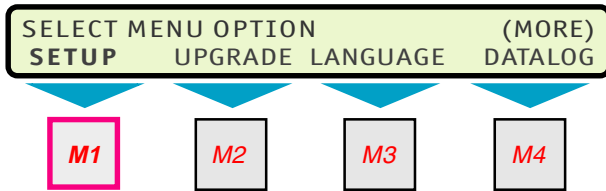
Compliance Via Sensors (CVS) SETUP PROGRAMMING

Contents:	See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.
CVS Menu	
Before Programming	
CVS Tanks Menu	
CVS Lines Menu	

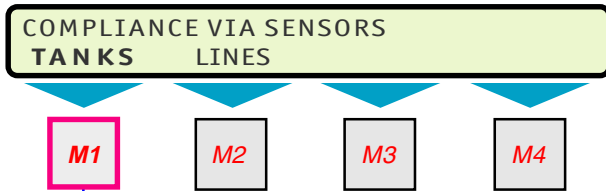
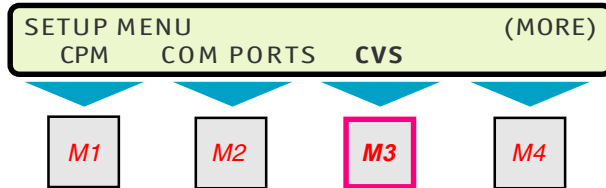
CVS Menu



Press this key and follow the highlighted sequence below



Press the **DOWN** key until **CVS** is displayed - alignment with menu keys depends on the programming of other features.



CVS TANKS
TANK 1

Press the **M1** key.

Before Programming:

- Have the power switched ON at the Tank Sentinel Console and at the power panel.
- Reference the INCON CVS Manual (INCON PN: 000-1095) for details about this feature.
- From the SETUP>SYSTEM menu – program the units of measure, correct number of tanks, and correct number of leak detection sensors. Also, program the: sentinel mode limits, delivery delay, report delivery and alarm, and the max size of the historical records that will be used in reports.

Character input / editing:

- Push **UP/DOWN** keys **▲ ▼** to show more menus or menu selections.
- Use menu keys (**M1** to **M4**) to access menus.
- Press **ENTER** to accept a selection or input a value into the setup configuration memory.
- Press **CANCEL** to cancel data entry
- Press **M1** to move the cursor left **_←**
- Use **M2** to move the cursor right **⇒_**
- Press **M4** to backspace (delete) one character to the left **□←**

— CONTINUED ON NEXT PAGE —

CVS Tanks Menu

After programming the maximum number of sensors from the SYSTEM menu, access the CVS Tanks menu and program each sensor to associate it with a particular tank.

- The default programming is 0 (**no sensor** is associated with a Tank)
- SCALD or Standard Monthly tank leak testing is not disabled by CVS for tanks
- A sensor can be associated with single or multiple (compartmental) CVS tank(s)
- *The maximum number of sensors is determined by No. Sens[ors] (number of sensors) specified-programmed in the SYSTEM menu*
- *A sensor that is associated to a CVS tank must be physically present (wired to the Tank Sentinel Console – at sensor channel number N). See the console I.S. Sensor PC Board to verify which channels are used/wired-to, and TABLE 2 at the back of this manual...*
- *A sensor cannot be associated to both a line and tank (sensors must be associated to either a Tank or Line)*
- A SENSOR UNAVAILABLE *error message* is displayed if any of the above error conditions (*italic*) are present


Press the MENU key and press:

SETUP Press the **M1** key under the word SETUP
Press the **M** key under the word CVS
Press the **M1** key under the word TANKS at the Compliance Via Sensors menu

CVS TANKS (MORE)
TANK 1 TANK 2 TANK 3 TANK 4 ◀ First display menu
TANK 5 TANK 6 TANK 7 TANK 8 ◀ Second display menu
Press the **Menu Select key** under the Tank N, or press the **DOWN** Key if (MORE) is shown in the second display menu for TANKS 5 to 8 (only on consoles that accept more than 4 tanks)

COMPLIANCE SENSOR CVS TANK N (N = Tank number)
0 _____ 1 - 32

Use keypad to input the sensor number that is associated with this particular tank.
Press **ENTER** to accept this data.

NOTE  **A sensor may be enabled for more than one tank. The CVS feature is enabled when a sensor is associated with a CVS tank or line under the CVS menu.**

— Repeat for each TANK number —

— Press the **CANCEL** key to return to the previous menu —

CVS Lines Menu

After programming the maximum number of sensors from the SYSTEM menu, access the CVS Lines menu and program each sensor to associate it with a particular line.

- The default programming is 0 (**no sensor** is associated with a Line)
- The TS-LLD (line leak detector) is not disabled by CVS for lines
- Up to 4 different sensors (Sensor A – D) can be associated with a single line
- *Sensors can only be associated to one line*
- *The maximum sensor number is determined by No. Sens[ors](number of sensors) under the SYSTEM menu*
- *A sensor that is associated to a CVS line must be physically present (wired to the Tank Sentinel Console – at sensor channel number N). See the console I.S. Sensor PC Board to verify which channels are used/wired-to*
- *A sensor **cannot** be associated to both a Tank and Line*
- A SENSOR UNAVAILABLE *error message* is displayed if any of the above error conditions (*italic*) are present

Press the MENU key and press:

SETUP Press the **M1** key under the word SETUP

Press the **M** key under the word CVS

Press the **M2** key under the word LINES at the Compliance Via Sensors menu

CVS LINES

(MORE)

LINE 1

LINE 2

LINE 3

LINE 4

◀ First display menu

LINE 5

LINE 6

LINE 7

LINE 8

◀ Second display menu

Press the **Menu Select key** under the LINE N, or press the **DOWN** Key if (MORE) is shown in the second display menu for LINES 5 to 8 (only on consoles that accept more than 4 lines)

COMPLIANCE SENSOR CVS LINE N (N = Line number)

SENSOR A SENSOR B

COMPLIANCE SENSOR A

Press the **M1** key.

COMPLIANCE SENSOR A CVS LINE 1

0

_____ 1 - 32

Use keypad to input the sensor number that is associated with this particular line.

Press **ENTER** to accept this data.

— Repeat for each SENSOR letter and for each Line number —

— Press the **CANCEL** key to return to the previous menu —

Contents:

Enable TPI Menu
 TPI Pump Menu
 Auto-Config Note
 Number of Pumps Menu
 Pump Menu

TPI Group Menu
 Mode Configuration Note
 Reserve Configuration Note
 Mode Type and Reserve Note
 Exiting Setup Mode

TPI Menu**NOTE**

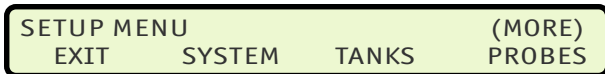
Prior to Enabling TPI, the System configuration for Number of Tanks is required.



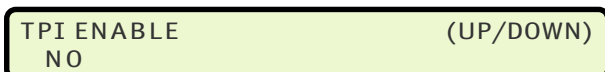
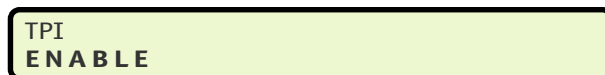
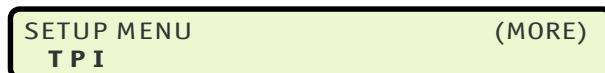
← Press this key and follow the highlighted sequence below



Press the **M1** key to display the SETUP menu.



Press the **DOWN ▼** key several times....

**Character input / editing:**

- Use **▲ UP** or **DOWN ▼** keys to display more menus - (MORE) or selections (UP /DN)
- Press the **CANCEL** key to cancel data entry
- Press the **ENTER** key to accept data entry
- Press menu keys (**M1** to **M4**) to access menus.
- Press **M4** to backspace (delete) one or more characters to the left ←

TPI ENABLE (user entry)

TPI may be aligned with any of the menu keys (**M1** — **M4**), depending on what other features are programmed or enabled. For this example, TPI is aligned with the **M1** key

Press the **M1** key to display the TPI menu.

Here is the main TPI menu display.

Press the **M1** key to display the TPI ENABLE user entry field. The default selection is **NO**.

Use the **UP / DOWN ▲ ▼** keys to change the selection to **YES**. Choose **YES** to enable TPI programming and subsequent menus.

Press the **ENTER** key to accept data entry.

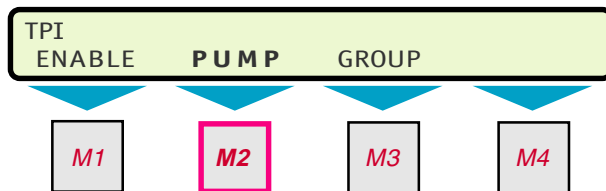
The display returns to the TPI menu, which now shows the PUMP and GROUP menus.

TPI PUMP Menu(s)

- AUTO CFG (user entry)
- NO. PUMPS “READ ONLY”
- PUMP N Menu(s) (both)

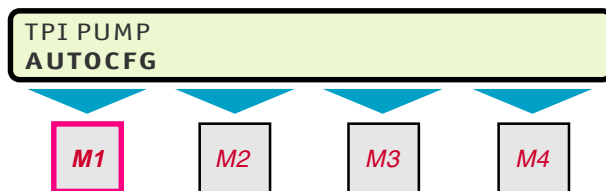
AUTO CFG (user entry)

The main TPI menu shows ENABLE, PUMP and GROUP



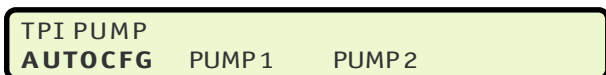
Press the **M2** key to display the PUMP menu.

The TPI PUMP menu only shows AUTO CFG



Press the **M1** key to start the AUTO CFG process.

The TPI PUMP menu now shows AUTO CFG, PUMP 1, PUMP 2,



- Please confirm the system recognized the correct number of pumps —
- Press the **CANCEL** key three times to return to the System Menu —
- Use the “**Number of Pumps**” menu, which is described on the next page —

AUTO-CONFIGURATION NOTE

The AUTO CFG function is used to invoke the routines which query the TPI for the number of pump controllers attached to the TPI and other controller and pump related information.

When AUTO CFG is started, the tank gauge scans the TPI for all pump controllers attached to the TPI. For each controller found, a corresponding pump number will be displayed (e.g. if the TS-TPI finds two controllers, there will be a Pump 1 and a Pump 2). Their types will be stored in the TYPE menu configuration variable and the number of controllers will be stored in the NO. PUMPS configuration variable.

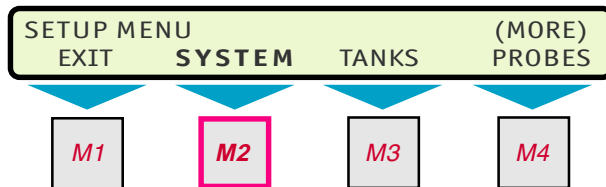
The Auto-Configuration process will automatically update the following **READ ONLY** configuration settings:

- NO. PUMPS (in System Menu)
- PUMP TYPE
- PUMP GROUP
- PUMP ADDRESS
- GROUP TYPE

Number of Pumps Menu

The number of pumps information is displayed under the SYSTEM menu.

Return to the main SETUP MENU display, which shows



READ ONLY NOTE

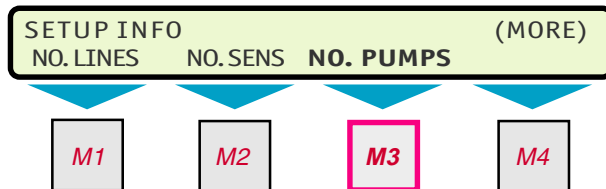
Fields that display the words “READ ONLY” in the upper right corner have been automatically updated by the Auto-Configuration process. These fields are not editable. The next Auto-Configuration process will over-write these fields and values.

NO. PUMPS “READ ONLY”

Here is the main SETUP MENU display.


Press the **M2** key to display the SYSTEM menu.

Press the **DOWN ▼** key to until NO.PUMPS is displayed

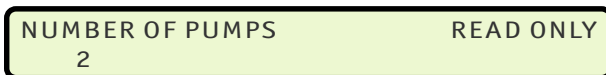


Here is the SETUP INFO display.

Press the **M3** key to display the number of pumps information

NOTE  NO. PUMPS may be aligned with any of the menu keys (**M1** — **M4**), depending on what other features are programmed or enabled. For this example, the menu is aligned with the **M3** key.

The number displayed represents the number of pump controllers that the TPI device has detected, therefore, it is also the number of pumps.



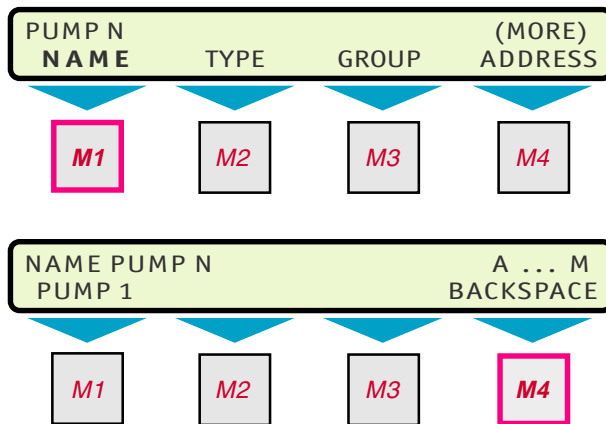
The data on display (“2”) was generated from Auto - Configuration. This is a ‘READ ONLY’ field. The data cannot be edited.

— Press the **CANCEL** key twice, to return to the SETUP MENU menu —

— Proceed to the **Pump N Menu(s)** section, which is described on the next page —

Pump N Menu(s)

- **NAME** (user entry)
- **TYPE** “READ ONLY”
- **GROUP** “READ ONLY”
- **ADDRESS** “READ ONLY”
- **TANK** (user entry)
- **HEIGHT** (user entry)



The pump name can be up to 8 alpha/numeric characters. This alias is used throughout the system in the display and reports. An example name would be UNLEADED. The name is not automatically updated or over-written by an AUTO CFG operation.

READ ONLY NOTE

Fields that display the words “READ ONLY” in the upper right corner have been automatically updated in by the Auto-Configuration process. These fields are not editable. The next Auto-Configuration process will over-write these fields and values.

In the following examples, “N” represents any pump number - 1, 2, 3 and so on.

NAME (user entry)

The PUMP N menu displays six subsequent fields, including TANK and HEIGHT (scroll down)....

Press the **M1** key to display the NAME PUMP N user entry field

The default name of ‘PUMP 1’ is displayed

Press the **M4** key to backspace and erase the ‘PUMP 1’ default name.

Use the keypad to enter a unique name for each pump, up to 8 characters long.

Remember:

- Use the *SHIFT* key to change the keypad from A...M to N...Z and to (numeric) 1-9, 0, ., +/-, and SPACE (a blank space)

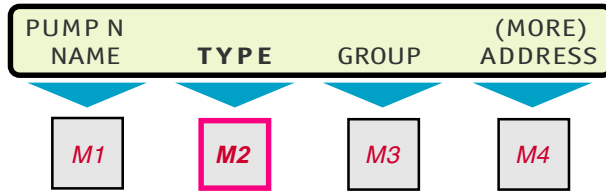
Press the **ENTER** key to accept data entry.

The display returns to the PUMP N menu.
 Repeat these steps for each pump.

— Proceed to the next menu - **TYPE** —

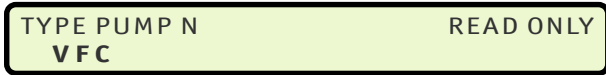
— PUMP N Menu **continued** —

TYPE “READ ONLY”



Here is the PUMP N menu.

Press the **M2** key to display the TYPE PUMP N “READ ONLY” field



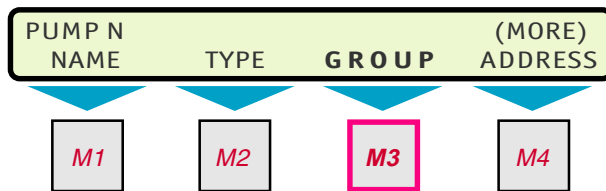
In this example, type ‘VFC’ is displayed

There are five types of controllers- VFC, SC, SCIII, SCI and VFCIV.

— Press the **CANCEL** key to return to the PUMP N menu —

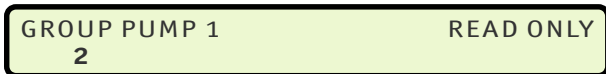
— Proceed to the next menu - **GROUP** —

GROUP “READ ONLY”



Here is the PUMP N menu.

Press the **M3** key to display the GROUP PUMP N “READ ONLY” field



In this example, group “2” is displayed

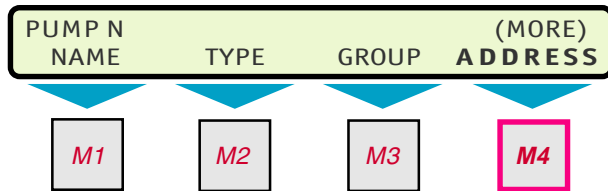
The group value may be 1 to 4. This menu item defines which group or TS-TPI port number is attached to which pump. A value of 1, 2, 3 or 4 will indicate that the controller is on that port. Any Line Leak Detectors will be on Group 1, therefore the first pump group is 2.

— Press the **CANCEL** key to return to the PUMP N menu —

— Proceed to the next menu - **ADDRESS** —

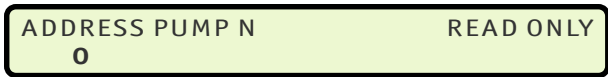
— PUMP N Menu **continued** —

ADDRESS “READONLY”



The PUMP N menu shows NAME, TYPE, GROUP and ADDRESS menus....

Press the **M4** key to display the ADDRESS PUMP N “READ ONLY” field



In this example, address “0” is displayed The address range is from 0-31.

— Press the **CANCEL** key to return to the PUMP N menu —

— Proceed to the next menu - **TANK** —

— Press the **DOWN ▼** key to display the TANK and HEIGHT user entry menus —

TANK (user entry)



Here is the PUMP N menu, showing TANK and HEIGHT menus....

Press the **M1** key to display the TANK ASSOCIATION PUMP N user entry field



The default TANK ASSOCIATION number ‘0’ is displayed

This will allow a pump to be associated with a tank. If the pump is not associated with a tank (i.e. for level monitoring by the tank gauge), then NONE may be chosen, but this will disable some features of the pump controller interface for that controller. If a tank has multiple pumps in it, more than one controller may be associated with the tank.

The user selects the tank number associated with PUMP N. The values range from 0 - 8 (0=none, or the maximum number of tanks available for this ATG type).

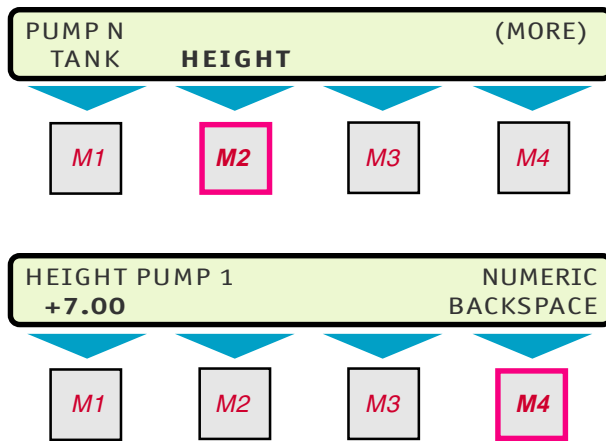
Use the keypad to enter the tank number.

Press the **ENTER** key to accept data entry.

The display returns to the PUMP N menu. Repeat the user entry steps for each tank.

— Proceed to the next menu - **HEIGHT** —

— PUMP N Menu **continued** —



HEIGHT (user entry)

Here is the PUMP N menu, showing TANK and HEIGHT menus....

Press the **M2** key to display the HEIGHT PUMP N user entry field

The default HEIGHT of '+7.0' (inches) is displayed

Press the **M4** key to backspace and erase the '+7.00000' default height number.

Use the keypad to enter the height value.

Press the **ENTER** key to accept data entry.

The display returns to the PUMP N menu showing TANK and HEIGHT.

The value is the distance (in inches or centimeters) between the bottom of the PUMP to the bottom of the TANK. This allows the pump height to be set by the user, which affects the handling of the DRY TANK, BLOCKED INTAKE, and PUMP IN WATER alarms. This variable defaults to 7 inches and is user-programmable. The range allowed is 0 to 65.

To repeat these steps for the next pump:

- Press the **CANCEL** key to display the TPI PUMP menu, which displays AUTO CFG, PUMP 1, PUMP 2
- Repeat each Pump N Menu step for every PUMP number.

When these entries are completed

- Press the **CANCEL** key to display the main TPI menu, which displays ENABLE, PUMP and GROUP.

— Proceed to the next menu - **TPI Group** —

TPI Group Menu

- TYPE “READ ONLY”
- MODE (user entry)
- RESERVE (user entry)

TPI
ENABLE PUMP **GROUP**

M1 M2 **M3** M4

TPI GROUP
GROUP 1 **GROUP 2** GROUP 3 GROUP 4

M1 **M2** M3 M4

GROUP 2
TYPE MODE

M1 M2 M3 M4

TYPE GROUP 2 READ ONLY
MAST SLAV

TYPE “READ ONLY”

The main TPI menu displays ENABLE, PUMP and GROUP

Press the **M3** key to display the TPI GROUP menu

Here is the TPI GROUP menu displaying GROUP numbers 1 to 4

Press the (**M**) key of the group number to be displayed. For this example, press **M2** to display the GROUP 2 menu

Here is the GROUP 2 menu displaying TYPE and MODE

Press the **M1** key to display the TYPE of group as detected during Auto-Configuration. This is a READ ONLY field.

In this example, the type ‘MAST SLAV’ is displayed

Press the **CANCEL** key to return to the GROUP 2 menu.

To repeat the user entry steps for each group, press **CANCEL** again to display the TPI GROUP menu.

— Proceed to the next menu - **MODE** —



NOTE Please read the Notes on the following page to gain a better understanding of the Mode and Reserve features.

Mode “User Entry” Note

MODE allows the operator to select which Level Management mode to use for a particular group. The choices are NONE, LEVELING, and PRIORITY:

- Selecting NONE sets NO level management mode for the Group.
(no Reserve to enter) This is used for Stand Alone Groups.
- Selecting the LEVELING mode seeks to maintain an equal level of fuel in each tank by placing pump controllers associated with the tank containing the most amount of fuel to a high priority. This will force the pump with the highest level of fuel to activate when the dispenser switch is activated.
(no Reserve to enter)
- Selecting the PRIORITY option enables a mode that seeks to drain one tank before the other tank(s). Only when the PRIORITY mode is selected will the RESERVE menu appear.

Reserve Configuration Note

RESERVE is set after choosing the PRIORITY MODE. This entry sets the reserve level of fuel remaining in the tank. The programming defines this percentage as an ‘empty’ tank and is programmed in % full.

For example, setting the Reserve to 20% means, when the tank is 20% full it is considered ‘empty’.

This will trigger two events; the ATG will command a different pump to start pumping fuel from a different tank and disables the pump in the tank that has reached its Reserve. This helps to prevent the faults Dry Run and Pump in Water.

Mode Type and Reserve Note

The STND ALON “type” designates the GROUP as a Stand Alone Group without any Master/Slave associations. The group consists of only one pump and one controller. The menus MODE and RESERVE are not enabled for Stand Alone TYPE. This completes Setup Programming for this type.

The MAST SLAV “type” designates the GROUP as a Master/Slave configuration. The group consists of more than one pump controller. This “type” is further defined by the kind of Level Management “mode” - either Leveling or Priority. If Priority is selected, the user is required to enter a value for RESERVE.

— TPI Group continued —

MODE GROUP 2 (UP/DN)
NONE

MODE (user entry)

Here is the MODE GROUP 2 user entry field display. *NONE* is the default setting

Use the **UP / DOWN ▲ ▼** keys to change the default mode and scroll through the other modes - LEVELING and PRIORITY

Press the **ENTER** key to accept data entry. This entry returns the display to the GROUP N menu.

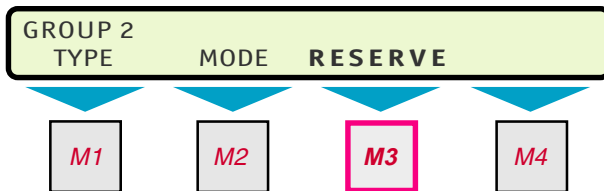
MODE GROUP 2 (UP/DN)
PRIORITY

If PRIORITY is selected, Proceed to the RESERVE menu, which is described next

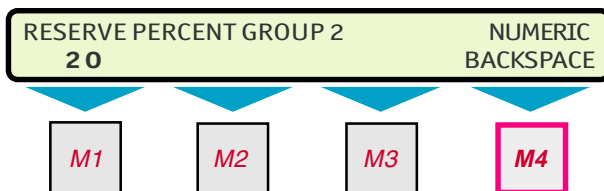
GROUP 2
TYPE MODE RESERVE

RESERVE (user entry)

Here is the GROUP 2 main menu, displaying TYPE, MODE and RESERVE



Press the **M3** key to display the RESERVE menu



The RESERVE user entry field displays the “percent full” value for GROUP 2 (in Priority mode). The default setting is 20.

Press the **M4** key to backspace and erase the default percent value. This will clear the field.

— continued on the next page —

Use the keypad to enter a percent value for each group.

Press the **ENTER** key to accept data entry.

This entry returns the display to the GROUP N menu, displaying TYPE, MODE and RESERVE.

Press the **CANCEL** key to return to the TPI GROUP menu, displaying GROUP 1 to GROUP 4.

Proceed to the next group number menu.

Repeat the steps above to set the reserve percent for each group that is in Priority Mode.

When setup programming is completed, follow the Exiting Setup Mode steps (next) to return the Tank Sentinel back to the Run Mode.

Exiting Setup Mode

EXIT SETUP (user entry)

Press the **CANCEL** key to return to the main TPI menu, which displays ENABLE, PUMP and GROUP.

This completes the Setup Programming for the TPI device.

Press the **CANCEL** key to return to the TPI SETUP MENU menu, which displays TPI.

Press the **CANCEL** key to return to the main SETUP MENU menu, which displays EXIT, SYSTEM, TANKS and PROBES.

Press the **M1** key under the word EXIT to return the Tank Sentinel to RUN MODE.

Contents:
 TS-UPGRADE
 Upgrade Menu

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. And see the Installation, Operator's, TroubleShooting Guides, and Application Notes for other reference material.

TS-UPGRADE

Additional hardware and/or software features can be added to the Tank Sentinel system by ordering a **TS-UPGRADE**. Read this entire chapter before attempting to upgrade the Tank Sentinel system. Setup programming is required after the upgrade is performed.



WARNINGS —

- **Do not attempt an upgrade without the correct upgrade password and 3 upgrade strings (codes)!**
- **Repeated upgrade attempts that fail will damage the equipment!**
- **Avoid unauthorized upgrade attempts!**
- **Upgrade codes can be used only once!**

Exact instructions and a unique upgrade password and upgrade strings will be sent to you on receipt of:

- 1) Your Purchase Order number
- 2) Console Serial Number (verify that it is correct)
- 3) Hardware requirement(s)
- 4) Software requirement(s)
- 5) Your Name and Shipping Address

A FAX-transmittal can be sent upon request... provide your Fax number

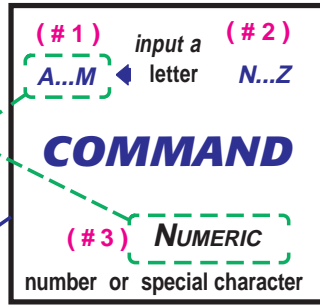
*The upgrade instructions that are sent to you are both console and serial-number specific. **The upgrade will, therefore, not work with any other console!***

Verify that the input password is correct before pressing the **ENTER key.**

See the next page for a keypad key review.

The upper right corner of the display shows the input selection ...shown here within dashed lines

Press the **ACK SHIFT** Key to toggle between **input character type (#1) & (#3)** then press the Key of choice.



Keypad Key Use – Review:

- Press **CANCEL** to cancel an input
- Press **M4** to **backspace** over / delete one character to the left of the cursor █ ←
- Press **M2** to **move the cursor right** ⇨ _
- Press **M1** to **move the cursor left** _ ⇨
- Use the **ENTER** key to accept / enter data
- Press the **ACK SHIFT** key to toggle between the input types: an A...M letter (#1) and numeric (#3). Hexadecimal letters A thru F – or – numeric inputs 0 thru 9 are allowed.

NOTE (0=zero).



Upgrade Menu



Press this key and follow the highlighted sequence below

SELECT MENU OPTION
SETUP **UPGRADE** LANGUAGE DATALOG



WARNING – ILLEGAL UPGRADE ATTEMPTS
WILL DAMAGE THE SYSTEM !

This message is displayed briefly, before the next message.



Upgrade Steps:

1) Use the keypad to input and enter the upgrade password that was provided.

(Note: spaces are inserted automatically)

ENTER UPGRADE PASSWORD CODE NUMERIC



ENTER UPGRADE PASSWORD NUMERIC
51C1 51C2 51C3 51C4 BACKSPACE

See this *example* at left, and the next display (if an upgrade code is incorrect)



example UPGRADE password

Language Menu

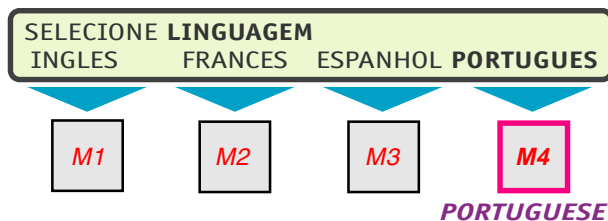
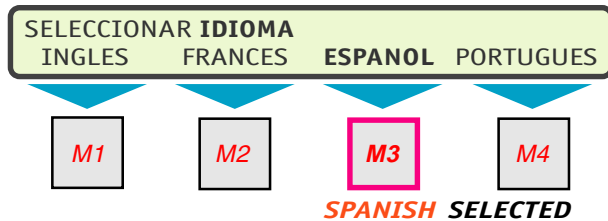
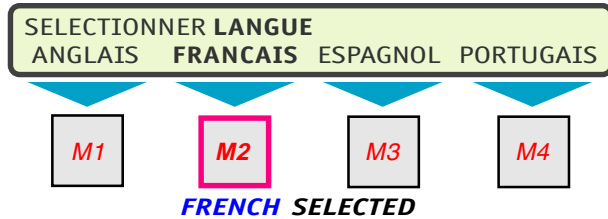
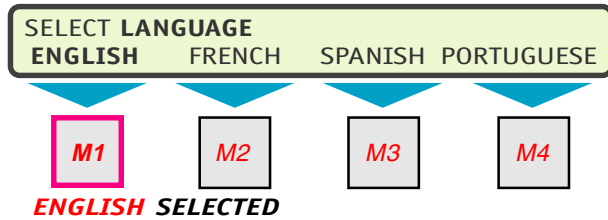
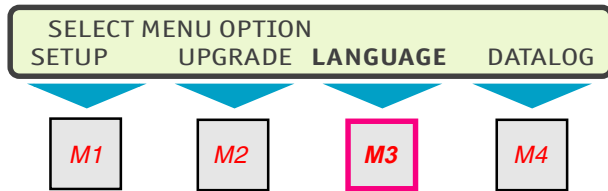
Contents:
Language Selection Menu
Language Selection Notes

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. See the Installation, Operator's, TroubleShooting Guides and Application Notes for other reference sources.

Language Menu



Press this key and follow the highlighted sequence below



Language Notes

- English is the Factory Default language for the Tank Sentinel® system.
- Press a menu key **M1 — M4** to select another language for the system to use
- The System language is used for all Reports, Faxes, and Displays
- A language selection **is used immediately** by the system
- To change the Language used by the system back again, access this menu and press the appropriate menu key **M1 — M4** (the position of the languages are fixed... *English* is above the **M1** menu key).

Data Log Menu

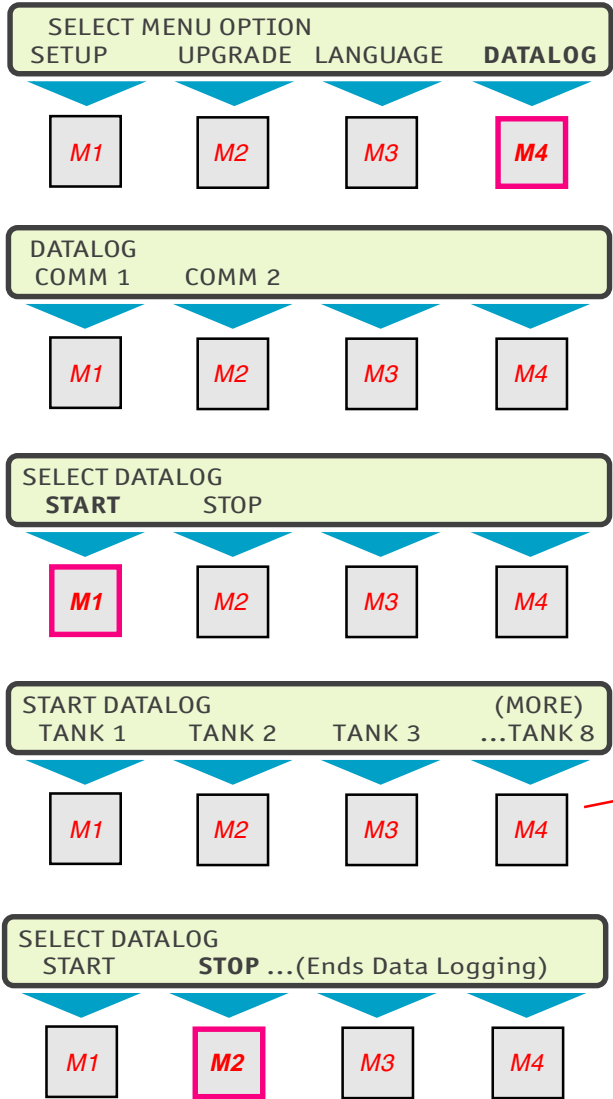
Contents:
 Data Log Menu
 Data Logging Notes

See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. See the Installation, Operator's, TroubleShooting Guides and Application Notes for other reference sources.

Data Log Menu



Press this key and follow the highlighted sequence below



Data Logging Notes

This menu can be ignored **unless** diagnostic **tank data** is required.

- In order to access this menu: a 9 pin communications cable must be plugged into Comm Port 1 or Comm Port 2 at the Tank Sentinel console (the other end plugs into a serial communications port of a IBM compatible computer).

This must be done with power off at the computer and Tank Sentinel console.

- Instructions and requirements about this feature will be supplied by INCON Technical Service.

Press a menu select key (M1 thru M4) to choose a tank. Use UP / DOWN for more tanks (TS-2001/508 consoles can monitor up to 8 tanks).

Display Menu

Contents: Display Menu Display Navigation & Descriptions Display Notes	See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. See the Installation, Operator's, TroubleShooting Guides and Application Notes for other reference sources.
--	---

Display Menu

NOTE * The **DISPLAY** menu appears *only* when one or more of the following optional features is enabled: CPM, AST, SCALD, TPI and/or AL-LLD.



Press this key and follow the highlighted sequence below

DISPLAY Navigation & Descriptions

Navigation —



Follow these navigation steps to show the DISPLAY menu of your choice:

Press the **DOWN ▼** key once



Press the (**M**) key below the word DISPLAY to show enabled menu options: CPM, AST, SCALD, PUMPS and/or AL-LLD.

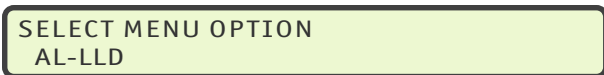


(each menu appears only when an individual feature is enabled **)



Press the **M1 - M4** key under any of these menu options to display the data and information you are seeking.

Press the **DOWN ▼** key once



Display Notes

- The **DISPLAY** menu shows a variety of updated information, which may be viewed at any time
- The information is used to assist technicians and INCON Tech Services in diagnosing problems
- **DISPLAY** information may also be found on reports
- * The **DISPLAY** menu only appears if one or more listed individual features is enabled
- ** Enabled individual features are :
 - CPM - enable CPM under the SETUP MENU, enter "YES"
 - AST - enable one or more Pressure probes under the PROBES menu
 - SCALD - enabled by I.D.Chip as a software option (see "S" in part number)
 - PUMPS - enable TPI and perform AUTO CFG to "find" one or more pumps
 - AL-LLD - enable LLD under the SYSTEM menu, enter one or more "NO. LINES" and enable TPI

DISPLAY Navigation/Descriptions (CONTINUED...FROM PREVIOUS PAGE)

Descriptions —

Please read the following descriptions of each DISPLAY menu:

CPM — shows the current state of the system: VOLTS, AMPS and STATUS

CPM	VOLTS	AMPS	STATUS
	15.4	8.7	OK

AST — shows current pressure reading for each pressure probe: PSI

AST	PROBE N
PSI	0.54

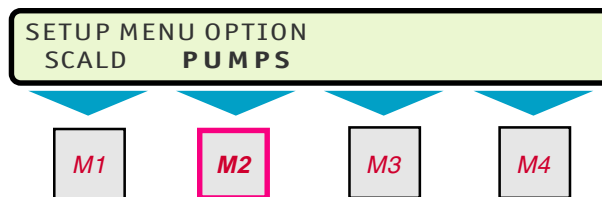
SCALD — shows the current status and algorithm version

SCALD	TANK1	TANK2
STATUS	0.02	0.02

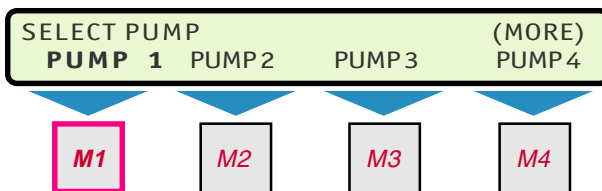
PUMPS — shows many readings from a Turbine Pump Controller

Special PUMPS navigation —

- Press the (**M**) key aligned below the word PUMPS,



- Press the (**M**) key under each pump number,



(In this example, press the **M1** key for PUMP 1 data)

— continued on the next page —

DISPLAY Navigation/Descriptions (CONTINUED...FROM PREVIOUS PAGE)

Pump DISPLAY examples:

Each controller type will vary in the available data that can be displayed. The example below is for the SCI controller. Here is the first display of three possible (typical) data displays...

PUMP 1	STATUS	FAULT	VOLTS	CVOLTS1
PUMP N	0071	00	204	201

- Press the **DOWN▼** key to scroll through the data displays.

PUMP 1	AMPS1	C AMPS1	WATTS	C WATTS
PUMP N	6.5	6.5	1140	1140

- Press the **DOWN▼** key to scroll through the data displays.

PUMP 1	DIPSW	SREV
PUMP N	FFFB	103

- Press the **CANCEL** key to return to the SELECT PUMP menu.

See Appendix E for detailed explanations of this data.

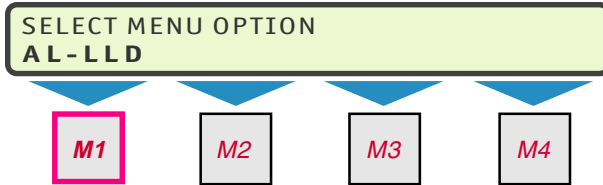
— continued on the next page —

DISPLAY Navigation/Descriptions (CONTINUED...FROM PREVIOUS PAGE)

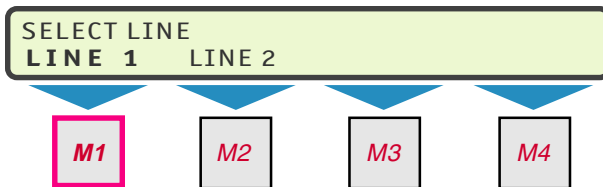
AL-LLD — shows the current status of the line leak sensing units via the LS 300

Special AL-LLD navigation —

- Press the (**M**) key aligned below AL-LLD,



- Press the (**M**) key under each LINE number,



(In this example, press the **M1** key for LINE 1 data)

AL-LLD DISPLAY example:

Each controller type will vary in the available data that can be displayed. The example below is for the SCI controller. Here is typical information displayed for each line number...

LINE 1	STATUS	PRESSURE	TEST	STATUS
LINE 1	OK	30.5	0015	0800

See Appendix E for detailed explanations of this data.

— Proceed to Chapter 28 - DIAG Menu —

Diagnostic Menu

Contents:	
Diag Menu	RESET Menu
Diag Navigation & Descriptions	DIPSW Menu
TPI Diagnostic Function Notes	CALIBRT Menu
	Calibration Procedure

DIAG Menu

NOTE * The **DIAG** menu appears *only* when the optional feature TPI is enabled and AUTO CFG has been performed.



Press this key and follow the highlighted sequence below

DIAG Navigation & Descriptions

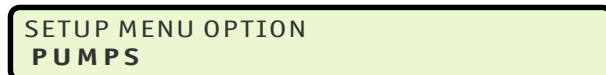


Follow these navigation steps to display the DIAG menu:

Press the **DOWN ▼** key once



Press the **M2** key below DIAG to show the PUMPS menu.



Press the **M1** key under PUMPS to display the SELECT PUMP menu.



The SELECT PUMP menu displays all of the pump numbers that are communicating with the Tank Sentinel.



Press the (**M**) key under each pump number to display the SELECT DIAGNOSTIC OPTION menu. In this example, press the **M1** key for the PUMP 1 options.



Here is the DIAGNOSTIC OPTION menu showing menu names for the three available functions.



— proceed to the next section - **TPI Diagnostic Function Notes** —

TPI Diagnostic Function Notes

The diagnostic function allows the user to command the pump controllers from the Tank Sentinel console. The user is able to issue resets to clear faults, override dipswitch values to help diagnose problems with the controllers, and enable calibration.

To access this function, the user first presses the MENU key, then DIAG, then PUMPS and then PUMP #. The tank gauge allows the user to select a pump number and will then display the diagnostic function keys RESET, DIPSW, and CALIBRT.



DANGER!
The potential for electric shock exists!
Verify the site is safe! — before
proceeding with a *Reset* operation.

If the user selects the RESET function, the Tank Sentinel will ask, “ARE YOU SURE?” and if the user presses the ENTER key, then the reset will be performed. Pressing ENTER in response to the question will issue the reset to the controller. If the user is not sure about the reset, perhaps due to a safety concern, then the user should press the CANCEL key to abort this operation.

If the user selects the DIPSW function, then the display shows DIP SWITCH OVERRIDE and allows the user to enter a 4 digit hexadecimal value. When the value is entered and the user presses ENTER, the new value is sent to the selected controller. This value is not saved in the programming. It will be lost to power cycles, and is simply used for diagnostic purposes.

If the user selects the CALIBRT function, the Tank Sentinel asks “ARE YOU SURE?” and if the user presses ENTER, calibration is enabled on the selected pump controller. When calibration is enabled, all three LEDs on the controller will blink. The hook signal needs to be turned on for greater than 16 seconds to trigger automatic calibration. After 16 seconds, the controller will take a snapshot of the voltage, current and power (i.e. these are the Calibrated status values) seen in the Display feature mentioned earlier. Once complete the LEDs will stop flashing and the Green light should remain flashing. The hook can then be turned off.

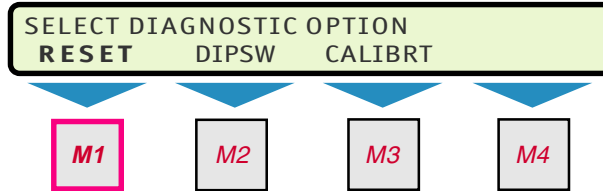
— Proceed to the next DIAG Menu section - **RESET Menu** —

RESET Menu



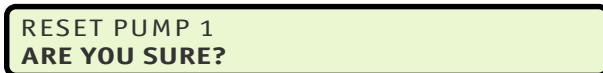
DANGER!
The potential for electric shock exists!
Verify the site is safe! — before
proceeding with a *Reset* operation.

RESET



Here is the SELECT DIAGNOSTIC OPTION menu displaying RESET, DIPSW and CALIBRT menu names.

Press the **M1** key under the word RESET.



The RESET PUMP 1 display asks if the user is sure before resetting a pump controller; giving the user a chance to press **CANCEL** to abort the reset operation.

Press the **ENTER** key to reset the pump controller.



DANGER!
The potential for electric shock exists!
Verify the site is safe! — before
proceeding with a *Reset* operation.

(Press the **CANCEL** key to abort the reset operation.)

After entering a reset, the display will flash the word DONE ... for a few seconds and then it will automatically return to the SELECT DIAGNOSTIC OPTION menu, displaying RESET, DIPSW and CALIBRT.

— Proceed to the next DIAG Menu section - **DIPSW Menu** —

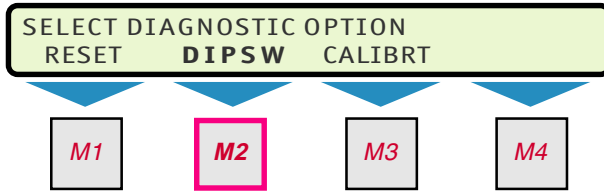
DIPSW Menu



CAUTION!

Changing Dipswitch settings should be used for diagnostic purposes only. Consult controller manuals for switch settings and their meanings.

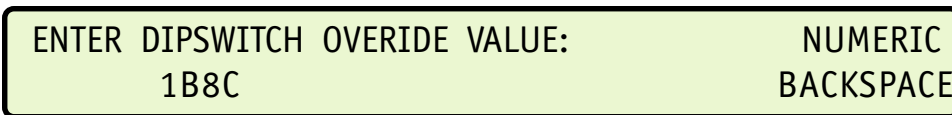
DIPSW



Here is the SELECT DIAGNOSTIC OPTION menu displaying RESET, DIPSW and CALIBRT menu names.

Press the **M2** key under the selection DIPSW.

Here is the default DIPSWITCH OVERRIDE display



Press the **M4** key to backspace and erase the '1B8C' default setting.

Use the keypad to enter a particular Dip Switch setting.

Remember:

- Use the **SHIFT** key to change the keypad from A...M to N...Z and to (numeric) 1-9, 0, ., +/-, and SPACE (a blank space)


Press the **ENTER** key to accept data entry.

The display returns to the SELECT DIAGNOSTIC OPTION menu.

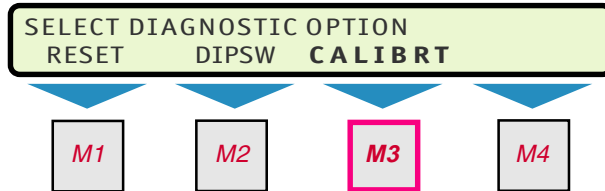
Repeat the user interface steps for each pump.

— Proceed to the next DIAG Menu section - **CALIBRT Menu** —

CALIBRT Menu

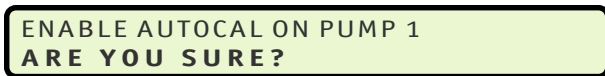
NOTE  In the following examples, “N” represents any pump number - 1, 2, 3 and so on.

CALIBRT



Here is the SELECT DIAGNOSTIC OPTION menu displaying RESET, DIPSW and CALIBRT menu names.

Press the **M3** key under CALIBRT.



The CALIBRATE PUMP 1 display asks if the user is sure before enabling automatic calibration for a particular pump controller; giving the user a chance to press **CANCEL** to abort the calibration process.

Press the **ENTER** key to enable calibration for the pump controller.



(Press the **CANCEL** key to abort the process.)

After enabling calibration, the display will flash the word DONE ... for a few seconds and then it will automatically return to the SELECT DIAGNOSTIC OPTION menu, displaying RESET, DIPSW and CALIBRT.

Calibration Procedure

When calibration is enabled, all three LEDs on the pump controller are blinking

- 1.) Verify this condition.
- 2.) Turn on the hook signal for greater than 16 seconds to trigger automatic calibration.

After 16 seconds, the controller will take a snap shot of the voltage, current and power (i.e. these are the Calibrated status values) seen in the Display feature mentioned earlier.

Once complete, the LEDs stop flashing and the Green light remains flashing.

- 3.) Verify this condition.
- 4.) Turn off the hook.
- 5.) Verify that the Tank Sentinel display has returned to the RUN MODE, showing SYSTEM, TANK, SENSOR, etc. are all OKAY.

— Proceed to Chapter 29 - Problem Solving —

Problem Solving (Alarms & Errors)

Contents: See the Table of Contents to find topics in this manual. See the Preface for general information about this manual. Also see the Installation, Operator's, Troubleshooting Guides, and Application Notes for other reference sources.

Problem Solving
Outputs DON'T Turn On When Expected

Problem Solving

The following table lists alarms and errors in alphabetical order. Notice they are grouped by 'Alarm Type' in the middle section. Contact INCON for more help.

NOTE: **Diagnostic text** in the left column, is shown **bolded** { become alarms if active for 48 hours }

#	Printed / Faxed / Displayed Alarm / Warning Text:	Alarm Type:	System WARNING / Error Descriptions and ALARM Descriptions (<i>actions to take</i>)
1	0.1 GPH LINE LEAK DETECTED	LINE	For LINE # N: Line Leak Detected / Leak Test Failed <i>(1. Inspect dispense area for leaks 2. Retest if no leaks seen 3. Shut off pump / dispenser power</i>
2	0.1 GPH ABORT (DISPENSE)	LINE	Attempted dispense causes the annual line leak test to aborted (dispensing is not allowed during this test). To allow dispensing: push the RESET / TEST button on the TS-LLD Control Unit that is flashing the 80 alarm-error-code. <i>See the TS-LLD Quick Reference Guide</i> about the 0.1 gph Annual Test and requirements.
	0.1 GPH LINE LEAK (Continued...)	LINE	<i>4. Second failure: Call Service provider / local Regulatory Agency / Manager per policy procedure at your site).</i>
3	0.1 GPH LINE TEST ABORTED	LINE	The annual precision line leak test was intentionally canceled / aborted from the Tank Gauge or from the TS-LLD control unit.
4	0.2 GPH LINE LEAK	LINE	Follow the steps detailed above for 0.1 gph Line Leak Detected
5	3 GPH LINE LEAK	LINE	LINE # N - Line Leak Detected / test failed Large / gross leak <i>(see above 0.2 gph line leak & follow steps 3, 1, and 4 in this order).</i>
6	BLK TUB/LSU BLOCKED TUBE	LINE	<i>(Push RESET / TEST button on the TS-LLD control unit that is flashing an 81 Alarm-error code and call for cleaning service).</i>
7	CU COMM/CU COMM FAILURE	LINE	Communications was lost between the Tank Sentinel console and TS-LLD Control Unit ... (call for service).

NOTE: **Diagnostic text** in the left column, is shown **bolded** { become alarms if active for 48 hours }

#	Printed / Faxed / Displayed Alarm / Warning Text:	Alarm Type:	System WARNING / Error Descriptions and ALARM Descriptions (<i>actions to take</i>)
8	LINE OUT OF COMPLIANCE	LINE	33 or more days have passed since a 0.2 gph line leak test has finished and passed (<i>prevent dispense attempts until the monthly test passes</i>)
9	LSU COMM/LSU COMM FAILURE	LINE	(<i>Push RESET / TEST button on the TS-LLD control unit that is flashing an 83 Alarm-error code and call for service</i>).
10	LSU FAIL/LEAK SENSING UNIT FAIL	LINE	(<i>Push RESET / TEST button on the TS-LLD control unit that is flashing an 81 Alarm-error code and call for service</i>).
11	ACKNOWLEDGED	message	A warning or alarm has been ACKNOWLEDGED
12	ACTIVE	message	An ACTIVE Alarm or Warning exists
13	CLEARED	message	Formerly active Alarm or Warning has cleared
14	LEAK TEST: ABORTED RESULT	message	Leak Test was aborted for Tank N
15	LEAK TEST: FAILED RESULT	message	- Slope is less / more negative than the leak threshold for Tank N (<i>see LEAK above - Retest & See Chapter 3 & 4</i>)
16	LEAK TEST: INCREASE RESULT	message	+Slope is more positive than the leak threshold value (= leak test/2) for Tank N (<i>see LEAK, Retest and See Chapter 3 & 4</i>)
17	LEAK TEST: PASSED RESULT	message	Slope is less than leak threshold for Tank N
18	LEAK TEST: INDETERMIN RESULT (indeterminate)	message	The leak test ran 8 hours but still can't determine a result for Tank N (<i>some disturbance affected the test... try again but wait 2 hours after the last dispense, or 6 hours after the last delivery</i>).
19	SENSOR FAIL / SNS FAIL / SEN FAL	message	Proceeds Sensor Fail Alarm reports
20	SYSTEM FAIL	message	Proceeds System Alarm Warning reports
21	TEST FAILED	message	A Leak Test Failed result - for Tank and/or Line N alarm report
22	TRANSIENT	message	Brief Alarm or Warning that clears quickly / automatically
23	AUXILIARY INPUT	SENSOR	Auxiliary input detected on channel 1 or 2 (<i>follow policy procedure at your site</i>).
24	CPM LOW CURRENT	SENSOR	Current of Rectifier dropped below the threshold value (a Tank Sentinel setting) (<i>follow policy procedure at your site</i>)

NOTE: **Diagnostic text** in the left column, is shown **bolded** { become alarms if active for 48 hours }

#	Printed / Faxed / Displayed Alarm / Warning Text:	Alarm Type:	System WARNING / Error Descriptions and ALARM Descriptions (<i>actions to take</i>)
25	DRY WELL	SENSOR	TSP-MWS ground water Monitoring Well BriteSensor is not submerged in water @ Channel #N (<i>it cannot detect a product leak unless it's submerged in ground water... the well may not be deep enough or the sensor long enough... contact service provider</i>)
26	EXTERNAL INPUT	SENSOR	External N input module has detected an input signal (<i>follow policy procedure at your site</i>).
27	HIGH BRINE	SENSOR	TSP-HIS BriteSensor @ Channel #N detected a High Brine level (<i>Call service provider [to confirm leak] and call your local Regulatory agency. Shut down pump & dispenser if a leak test has failed on that tank and see procedures at your site.</i>)
28	LIQUID DETECTED / LIQUID	SENSOR	Standard Sensor @ Channel #N detected a liquid (<i>run a tank leak test [depending on the sensor location] and call service provider to identify the liquid and retest sensor</i>)
29	LOW BRINE	SENSOR	TSP-HIS BriteSensor @ Channel #N detected a Low Brine level (<i>Call service provider [to confirm leak] and call your local Regulatory agency. Shut down pump & dispenser if a leak test has failed on that tank and see procedures at your site.</i>)
30	PRODUCT PRESENT / PRODUCT DETECTED	SENSOR	TSP-DIS, -DDS, -DTS, -MWS BriteSensor @ Channel #N detected Product / leak (<i>Call service provider [confirm leak] call the local Regulatory agency. Shut down pump & dispenser for that tank and see procedures at your site. [replace sensor]</i>)
31	STANDARD ALARM / STANDARD INPUT	SENSOR	A Standard Sensor (type TSP-EIS, -HLS, -ULS) @ Channel #N has detected liquid (<i>run a tank leak test [depending on the sensor location] and call service provider to identify the liquid and retest sensor</i>)
32	SUMP FULL	SENSOR	TSP-DDS, -DTS BriteSensor @ Channel #N liquid... Sump Full alarm (<i>see site policy about pumping containment sump waste water</i>)
33	VAPOR DETECTED / VAPOR	SENSOR	TSP-DVS BriteSensor @ Channel #N detected product Vapor in the vapor monitoring well (<i>Call service provider [to analyze the leak], call your local Regulatory agency, and see procedures at your site.</i>)
34	WATER DETECTED	SENSOR	TSP-DIS*, -DDS, DTS, DVS* BriteSensor @ Channel #N detected Water, some sensors* may not be able to detect product when water is present (<i>see procedures at your site</i>)

NOTE: **Diagnostic text** in the left column, is shown **bolded** { become alarms if active for 48 hours }

#	Printed / Faxed / Displayed Alarm / Warning Text:	Alarm Type:	System WARNING / Error Descriptions and ALARM Descriptions (<i>actions to take</i>)
35	ALPHA ERROR / ALPHA ERR / ALPHA V	SYSTEM	Error in API temperature compensation calculating ALPHA (check any Special Products -- reprogram temperature compensation type & API ALPHA value).
36	API ERROR / API VOL	SYSTEM	Error in API temperature compensation routine (check any Special Products -- reprogram temperature compensation type).
37	CPM FAILURE	SYSTEM	No Power / Power is below 5 VDC - Check Power Supply / Increase Voltage (if possible)
38	CPU CRASH	SYSTEM	WARNING - Central Processing Unit / hardware failure / power quality problem
39	DATA ERROR / DIM	SYSTEM	Transient communication error between the Tank Sentinel and TS-DIM unit. This alarm/error will clear itself automatically.
40	DATA NOT AVAILABLE / DIM	SYSTEM	Transient alarm/error caused when TS-DIM unit is 'busy' performing another task and cannot make the requested data available until it is not 'busy'. This alarm/error will clear itself automatically.
41	DIM COMM FAILURE	SYSTEM	Tank Sentinel has lost communications with the TS-DIM unit. Verify power to the DIM / Verify proper connection between DIM and console.
42	F14 OPEN / F14 FUS	SYSTEM	WARNING - FUSE F14 is blown... <u>no 5 VDC</u> Sensor Supply Power. Leak detection sensors are not working and cannot work without power (<i>call service provider immediately to replace F14</i>)
43	FAX HARDWARE FAILURE / FAX HW FAIL / FAX FAL	SYSTEM	WARNING - Fax Hardware Failure... alarms & compliance faxes cannot be sent (<i>call service provider ASAP</i>)
44	FAX SND FAIL / FAX SND	SYSTEM	WARNING - Fax Send Failure... (<i>check Dial tone, cable, call service provider... are the fax phone numbers correct ?</i>)
45	FLOAT HEIGHT / FLOAT HT / FLT HT	SYSTEM	WARNING - Float Height - calculation Error (<i>setup program error... call service provider</i>)
46	FLOAT MISSING / FLT MISSNG / FLT MIS	SYSTEM	WARNING - diagnostic warning Float Missing (<i>call service provider</i>)
47	LEAK	SYSTEM	WARNING - a Leak detected @ Tank N during the after hours Sentinel mode (<i>shut down dispensing, see procedures at your site... 1. Shut off pump / dispenser power 2. Retest / start a Standard 0.2 gph tank test for Tank N, 2 hours after the last dispense 3. Retest & See Chapters 3 & 4</i>)

NOTE: **Diagnostic text** in the left column, is shown **bolded** { become alarms if active for 48 hours }

#	Printed / Faxed / Displayed Alarm / Warning Text:	Alarm Type:	System WARNING / Error Descriptions and ALARM Descriptions (<i>actions to take</i>)
	LEAK (Continued...)	SYSTEM	3. Second confirming failure: Call Service provider / local Regulatory Agency / Manager per policy procedure at your site or 4. Second Test passes [false leak failure]... turn pump and dispenser power back on and restore normal operation.
48	LEVEL ERROR / LEVEL ERR / LVL ERR	SYSTEM	WARNING - product Level - calculation Error (<i>call service provider to fix this problem</i>)
49	MEMORY ERROR / MEM ERR	SYSTEM	WARNING - Memory Error (power quality problem, or memory-backup battery is dead... <i>have service provider check / replace battery and verify that unit works correctly as originally programmed</i>)
50	NO PROBE / NO PROB	SYSTEM	Diagnostic WARNING - No Probe Detected NO PROB (<i>call service provider to correct this problem</i>)
51	PAPER OUT	SYSTEM	The printer is out of paper (<i>add new roll of TS-TP2 thermal paper</i>)
52	POWER DOWN	SYSTEM	WARNING - Power Down (time that the unit lost power or was turned off)
53	POWER UP	SYSTEM	WARNING - Power Up (time that the unit was powered up / regained power)
54	PROBE SYNC / PRB SYC	SYSTEM	Diagnostic WARNING - signal lost from Probe (PRB SYC <i>call service provider if continuous</i>)
55	RTC FAILURE	SYSTEM	Real Time Clock has failed. Clock and Calendar settings are affected. Verify date and time are correct (use CHECK key). Change settings as needed. Cycle power. Verify settings (use CHECK key).
56	RTD TABLE ERROR / RTD TBL ER / RTD TBL	SYSTEM	WARNING - Number of RTDs Error does not match actual / setup - programmed value (<i>call service provider to correct this problem</i>)
57	SCALD TEST FAILED / SCALD DETECTED LEAK	SYSTEM	WARNING - SCALD Leak Test Failed alarm report for Tank N (<i>run a Standard leak test for that tank... See LEAK</i>)
58	SEN DAT / SENS DATA / SENSOR DATA ERROR	SYSTEM	WARNING - a BriteSensor @ Channel #N is sending data errors (<i>call service provider ASAP</i>)
59	SENS LOSS OF SIGNAL / SIG LOST / SEN SIG	SYSTEM	WARNING - no data sent / signal lost from BriteSensor @ Channel #N (<i>call service provider ASAP to correct this</i>)
60	SENSOR ID ERROR / SENSOR ID / SENS ID	SYSTEM	WARNING - a Standard sensor or BriteSensor was incorrectly typed / identified (<i>call your service provider to correct this</i>)

NOTE: **Diagnostic text** in the left column, is shown **bolded** { become alarms if active for 48 hours }

#	Printed / Faxed / Displayed Alarm / Warning Text:	Alarm Type:	System WARNING / Error Descriptions and ALARM Descriptions (<i>actions to take</i>)
61	SENSOR SYNC ERROR / SENSOR SYNC / SEN SYN	SYSTEM	WARNING - data signals not synchronous from BriteSensor @ Channel #N (<i>call service provider ASAP to correct this</i>)
62	CORRECTION (STRAPPING) TABLE ERROR / TABLE ERR / TBL ERR	SYSTEM	WARNING - Tank Strapping Chart or Table... setup Error (<i>call service provider to correct</i>)
63	TEMPERATURE ERROR / TEMP ERROR / TMP ERR	SYSTEM	WARNING - probe/product Temperature - calculation Error (TMP ERR <i>call service provider to correct this problem</i>)
64	THEFT DETECTED / THEFT LIMIT	SYSTEM	WARNING - Sentinel Mode: Theft Detected (the amount of product missing reached the Theft Limit) alarm report for Tank N
65	TS-SEM FUSE OPEN / SEM FUS / SEM FUSE	SYSTEM	WARNING - TS-SEM FUSE OPEN @ BriteBox #1 or #2... [#1 is closest to the console] there is no 5 VDC ...Leak Detection Sensors wired to the BriteBox won't function ! (<i>call service provider to troubleshoot/replace TS-SEM FUSE F1</i>)
66	UNSTABLE PROBE / UNST PROBE / UNST PB / UNST PB	SYSTEM	WARNING - the signal from Probe N has become Unstable (<i>call service provider to correct</i>)
67	VOLUME ERROR / VOLUME ERR / VOL ERR (also see level, net, ullage, water error)	SYSTEM	WARNING - product - Volume calculation error (<i>Error in programming: tank shape / probe type / special probe - OR - no level signal from probe. Call service provider to correct this.</i>)
68	WATCHDOG TIMEOUT / WD TIMEOUT	SYSTEM	WARNING - the console self-monitoring program has detected a software or power quality problem (<i>this error may happen after hardware upgrades</i>)
69	WATER VOLUME ERROR / WTR VOL ER / WTR VOL	SYSTEM	WARNING - Water Volume calculation error (<i>Error in tank shape / probe type or special probe data - OR - no water float / level signal from probe. Call service provider to correct this.</i>)
70	HIGH HIGH / HIGH HIGH LIMIT	TANK	High High product level Limit @ Tank N (<i>see procedures at your site about this alarm / overfill</i>)
71	HIGH LIMIT	TANK	High product level Limit @ Tank N (<i>see procedures at your site about this alarm / overfill</i>)
72	LARGE THEFT	TANK	Generated by TS-DIM unit. The amount of product dispensed exceeded the programmed User Threshold value, and/or exceeded the number of Dispensers in use. Also caused by a Catastrophic Leak. (see policy procedures at your site)
73	LOW LIMIT	TANK	Low product level Limit @ Tank N (<i>see policy procedures at your site</i>)

NOTE: **Diagnostic text** in the left column, is shown **bolded** { become alarms if active for 48 hours }

#	Printed / Faxed / Displayed Alarm / Warning Text:	Alarm Type:	System WARNING / Error Descriptions and ALARM Descriptions (<i>actions to take</i>)
74	LOW LOW LIMIT / LOW LOW	TANK	Low Low product level Limit @ Tank N (<i>see policy procedures at your site</i>)
75	OVERFILL	TANK	The overflow limit has been reached or exceeded. Stop filling tank / Lower the product level.(see policy procedures at your site)
76	WATER LIMIT (or HIGH WATER)	TANK	The high Water level Limit has been reached or exceeded @ Tank N (<i>see procedures at your site about this alarm, is a Grace Period allowed ? how many ?</i>)

NOTE



See the Operators Guide for other error messages that are listed by type.

Outputs DON'T Turn On When Expected

- Printout setup report(s)
- Check Worksheets for alarm-limit or alarm Output Group assignments
- Check output device (Annunciators / Relays / Output modules) for alarm group assignments.
- Correct programming assignments as necessary and retest operation

Appendix A Standard Tanks

O/C = Owens Corning / FC Fluid Containment
 D = Diameter (Dia.)
 L = Length
 S = Single Wall
 DW = Double Wall Tank (DWT)

TYPE #	MANUFACTURER	MODEL	CAPACITY (GALLONS)	DIMENSIONS D x L (INCHES)	S / DW WALL
01	O/C TANKS	D5	550	48 X 78	S
		DWT-4 (4)	550	51 X 83	DW
02	O/C TANKS	D-5	1,000	50 X 132	S
		DWT-4 (4)	1,000	53 X 138	D
03	O/C TANKS	D-2B	2,000	74 X 133	S
		D-6	2,000	74 X 133	S
04	O/C TANKS	DWT-2 (6)	2,500	75 X 151	D
05	O/C TANKS	D-6	4,000	74 X 236	S
		DWT-2 (6)	4,000	75 X 239	D
06	O/C TANKS	G-5	4,000	92 X 167	S
		G-6	4,000	95 X 167	S
07	O/C TANKS	G-3	4,000	92 X 165	S
08	O/C TANKS	D-6	6,000	74 X 354	S
		DWT-2 (6)	6,000	75 X 357	D
09	O/C TANKS	G-3	6,000	92 X 231	S
10	O/C TANKS	DWT-2 (8)	6,000	95 X 237	D
11	O/C TANKS	G-3	8,000	92 X 300	S
12	O/C TANKS	G-5	8,000	92 X 299	S
		G-6	8,000	95 X 299	S
		DWT-2 (8)	8,000	95 X 303	D
13	O/C TANKS	DWT-2 (6)	8,000	75 X 472	D
14	O/C TANKS	G-3	10,000	92 X 362	S
15	O/C TANKS	G-5	10,000	92 X 365	S
		G-6	10,000	95 X 365	S
16	O/C TANKS	D-6	10,000	120 X 245	S
17	O/C TANKS	DWT-2(6)	10,000	75 X 570	D
18	O/C TANKS	G-3	12,000	92 X 432	S
19	O/C TANKS	G-5	12,000	92 X 431	S
		G-6	12,000	95 X 431	S
		DWT-2(8)	12,000	95 X 435	D
20	O/C TANKS	DWT-2(10)	15,000	124 X 348	D
21	O/C TANKS	DWT-2(10)	20,000	124 X 458	D
22	O/C TANKS	DWT-2(10)	25,000	125 X 554	D

TYPE #	MANUFACTURER	MODEL	CAPACITY (GALLONS)	DIMENSIONS D x L (INCHES)	S / DW WALL
23	O/C TANKS	DWT-2(10)	30,000	124 X 656	D
24	XERXES	—	2,000	96 X 108	S
25	XERXES	—	2,000	76 X 166	D
26	XERXES	—	2,000	75 X 144	S
27	XERXES	—	3,000	96 X 147	S
28	XERXES	—	4,000	75 X 263	S
29	XERXES	—	4,000	96 X 180	S
30	XERXES	—	4,000	76 X 252	D
31	XERXES	—	6,000	75 X 353	S
32	XERXES	—	6,000	96 X 246	S
		—	6,000	97 X 251	D
33	XERXES	—	8,000	96 X 312	S
		—	8,000	97 X 317	D
34	XERXES	—	10,000	96 X 378	S
		—	10,000	97 X 383	D
35	XERXES	—	10,000	124 X 257	S
		—	10,000	125 X 262	D
36	XERXES	—	12,000	96 X 444	S
		—	12,000	97 X 449	D
37	XERXES	—	12,000	124 X 288	S
		—	12,000	125 X 293	D
38	XERXES	—	15,000	124 X 353	S
		—	15,000	125 X 359	D
39	XERXES	—	20,000	124 X 452	S
		—	20,000	125 X 458	D
40	CORESPAN	—	4,000	99 X 162	D
41	CORESPAN	—	5,000	99 X 192	D
42	CORESPAN	—	6,000	99 X 216	D
43	CORESPAN	—	8,000	99 X 282	D
44	CORESPAN	—	10,000	99 X 342	D
45	CORESPAN	—	12,000	99 X 402	D
46	CORESPAN	—	15,000	99 X 576	D
47	—	—	275	44 Vertical	S
48	—	—	550	44 Vertical (Dual 275 gal.)	S
49	—	—	275	44 Horizontal	S



Standard Products


PRODUCT NAME	API GRAVITY (6B Compensation)
Leaded Regular	63.5
Unleaded Regular	63.5
Unleaded Plus	62.8
Unleaded Extra	62.8
Unleaded Super	51.3
Diesel	32.8
Kerosene	41.8
#2 Fuel Oil	32.8



Typical Tank Leak Test Times

For 7 Tank Sizes at Half Capacity (Worst Case is 50% Full)

Tank Size in Gallons	Typical - Tank Leak Test Times (to Finish)
4,000	2.0 hours
6,000	3.0 hours
8,000	4.0 hours
10,000	5.0 hours
12,000	6.0 hours
15,000	7.5 hours
20,000	8.0 hours

NOTE  The Leak Threshold value is one half of the Leak Test value. See the Operator's Guide for example reports and explanations.



Part Number Codes

Tank Sentinel Part Numbering

The Tank Sentinel tank gauges and leak detection systems are available in many different configurations. You can determine what features a particular console has by its part number... press **CHECK** then **M4** to display the part number code.

Example Part Numbers

T1P/0	=	TS-1001 with Printer / 0 tanks (0 tank defines a Leak Detection Monitoring System or LDS). <i>NOTE: The T in the part number represents a standard power configuration (Single pole 120 V AC, Neutral and Ground)</i>
T1PM/2SFLR	=	TS-1001 ATG with Printer, Modem / 2 tank, SCALD, Fax and Data (modem), TS-LLD (RS-485 Line Leak Detector) and Reconciliation
T1P/4GC	=	TS-1001 ATG with Printer / 4 tank, Generator (interface - this type of system is primarily used with Backup Generator applications) Canadian (export only)
V1PM/4FL	=	Export only... single pole 240 VAC, Neutral and Ground power configuration, TS-1001 with Printer, Modem / 4 tank, Fax and Data (modem), with TS-LLD (RS-485 Line Leak Detector)
T504PM/4F	=	TS- 504 with Printer, Modem / 4 tank, Fax and Data (modem)
T504P/4CR	=	TS- 504 with Printer / 4 tank, Canadian, Reconciliation

— Continued on next page —

- T2PM/8SDCL = TS-2001 with **Printer, Modem / 8 tank, SCALD, Data (modem), Canadian, TS-LLD (RS-485 Line Leak Detector Interface)**
(T) = standard 120 V AC
- V2P1/8GR = Export single pole 240 V AC, Neutral & Ground power configuration, TS-2001 with **Printer, 1 Internal Expansion Module (IEM) / 8 tank, Generator, Reconciliation**
- T508P/8 = **TS-508 with Printer / 8 tank**
- T508PM/8FCR = **TS-508 with Printer, Modem / 8 tanks, Fax and Data (modem), Canadian, Reconciliation**

Part Number Codes & Meaning

The following options are available:

Part Number Codes			
Field 1 Options	Field Separator	Field 2 Options	Part Number Code Descriptions
T or V			T = Standard voltage 120 VAC or V = Export voltage 240 VAC
1			1 = TS-1001 (All Options except TS-IEM)
2			2 = TS-2001 (All Options)
504			504 = TS-504 (No SCALD, LLD, Generator - No Tank Testing)
508			508 = TS-508 (No SCALD, LLD, Generator - No Tank Testing)
750			750 = TS-750 (No SCALD, LLD, Generator - No Tank Testing)
P			P = Printer
M			M = Modem
1 or 2			1 = 1 TS-IEM (TS-2001 only) or 2 = 2 TS-IEMs (TS-2001 only)
	/		...separates part number fields...
		0	0 = zero tank L.D.S. (Leak Detection System)
		2 or 4	2 = 2 tank or 4 = 4 tank A.T.G. + L.D.S.
		8	8 = 8 tank A.T.G. + L.D.S.
		S or G	S = SCALD or G = Generator
		D or F	D = Data modem or F = Fax / Data modem
		C	C = Canadian / Export Tank Sentinel
		L	L = Line Leak Detector Interface (RS-485 in console)
		R	R = Reconciliation, used with TS-DIM

NOTE See the Chapter in this manual about Upgrading the Tank Sentinel system with optional add-on features.



Customer Feedback Form

<p>Your ideas and opinions are important ! Please help us improve our products, services, and documentation by filling out and answering this Customer Feedback Form. Then return it to INCON, either at this address or via the FAX number.</p>	<p>INCON TECHNICAL SERVICES 74 INDUSTRIAL PARK ROAD SACO ME 04072 USA FAX#: 207-282-9002</p>
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Please print these two pages and fill out information about yourself and the products you have received. Use black ink and print clearly. Next, circle a 'rating' number for each statement. Finally, write in your own comments and suggestions. **Thank You!**

Your Name (and Position): _____



Company Name: _____

Street Address: _____

State and ZIP Code: _____

Documentation & Manual Names: _____

Document & Manual Part Numbers: _____

Product - Model and Serial Numbers: _____

Documentation and Manual rating: Installation Date: _____ Today's Date: _____

Please circle (1 = no / poor, 2 = fair, 3 = okay, 4 = good, 5 = yes / excellent, N = don't know)

The documentation is easy to use	1	2	3	4	5	N
Information is easy to find	1	2	3	4	5	N
The Table of Contents is useful to find data	1	2	3	4	5	N
Information is well organized	1	2	3	4	5	N
Information is clear and easy to understand	1	2	3	4	5	N
Information is complete and accurate	1	2	3	4	5	N
The illustrations are clear and easy to follow	1	2	3	4	5	N
The number of illustrations are adequate	1	2	3	4	5	N

Comments & Suggestions ? (please be specific) _____

Sale and Supply Orders:

Please circle (1 = no / poor, 2 = fair, 3 = okay, 4 = good, 5 = yes / excellent, N = don't know)

Your order was processed quickly	1	2	3	4	5	N
You were treated professionally & with respect	1	2	3	4	5	N
You received what you ordered on time	1	2	3	4	5	N

Sales Suggestions

Technical Service / Support (Name of the service organization that you contacted?):

Please circle (1 = no / poor, 2 = fair, 3 = okay, 4 = good, 5 = yes / excellent, N = don't know)

Your call was processed quickly	1	2	3	4	5	N
Help and advice was professional & accurate	1	2	3	4	5	N
You were not kept on hold (for a long time)	1	2	3	4	5	N

Service / Support Suggestions

Your **INCON** system or product:

Please circle (1 = no / poor, 2 = fair, 3 = okay, 4 = good, 5 = yes / excellent, N = don't know)

Operates well and as expected	1	2	3	4	5	N
You are pleased with your purchase	1	2	3	4	5	N
You would buy / recommend INCON products	1	2	3	4	5	N

Product Comments & Suggestions

Thanks for your help & advice!



Contents

- Overall Information & Requirements
- INDUSTRY CANADA Information & Requirements
- CP-01 Issue 8, Part I, Section 14.1
- CP-01 Issue 8, Part I, Section 14.2

Overall Information & Requirements

This equipment complies with Part 68 of the FCC Rules. On the bottom of the equipment exterior, near the telephone and serial ports, there is a label that contains, among other information, the FCC Registration Number and the Ringer Equivalence Number (REN) for this equipment. You must, upon request, provide this information to your telephone company.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all those devices ring when your telephone numbers are called. In most, but not all areas, the sum of the REN's of all devices connected to one line should not exceed five. To be certain of the number of devices you may connect to your line, as determined by the REN, you should contact your telephone company to determine the maximum REN for your calling area.

If your telephone equipment causes harm to the telephone network, your telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

Should you experience trouble with this equipment, TS-1001/504 /750/TS-2001/508, please contact INCON Technical Service, in the U.S.A., for repair or warranty information, at 1-800-98INCON. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment.

Only INCON certified technicians may make repairs to this equipment, TS-1001/504 /750 / TS-2001/508. Please call your local distributor for service or INCON Technical Service for assistance.

This equipment cannot be used on a public coin phone service provided by the telephone company. Connection to a party line service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information.)

CP-01 Issue 8, Part I, Section 14.1

“NOTICE: The Industry Canada Label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user’s satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.



CAUTION Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.”

CP-01, Issue 8, Part I, Section 14.2

“NOTICE: The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.”





INTELLIGENT CONTROLS

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