



***Class 1***

ISO 9001 CERTIFIED

607 NW 27th Ave  
Ocala, FL 34475  
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SUITABLE FOR EXTERNAL DISTRIBUTION

## OPERATION MANUAL


### 4 LIGHT INTELLI-TANK WITH 1-WIRE AND CAN COMMUNICATION




113379 (12V), 114378 (24V)




119395 (12V), 119396 (24V)

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	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

<b>1.</b>	<b>REVISION LOG .....</b>	<b>3</b>
<b>2.</b>	<b>SYSTEM OVERVIEW .....</b>	<b>3</b>
2.1.	PART NUMBERS.....	3
2.2.	MODES OF OPERATION.....	3
<b>3.</b>	<b>OPERATION .....</b>	<b>4</b>
3.1.	LED INDICATIONS.....	4
3.1.1.	<i>Initial power ON indications.....</i>	4
3.1.2.	<i>Level indications.....</i>	4
3.1.3.	<i>Error indications.....</i>	5
3.2.	MAGNETIC SWITCHES .....	6
3.3.	CALIBRATION .....	7
3.3.1.	<i>1 Point Calibration .....</i>	7
3.3.2.	<i>2 Point Calibration .....</i>	7
3.3.3.	<i>5 Point Calibration .....</i>	7
3.3.4.	<i>9 Point Calibration .....</i>	8
3.3.5.	<i>Calibration retention .....</i>	8
3.3.6.	<i>Invalid calibration.....</i>	8
3.3.7.	<i>Calibration incomplete.....</i>	8
3.4.	SELF TEST .....	8
3.5.	SETTING THE DIM LED LEVEL.....	9
3.6.	SHOW DISPLAY TYPE AND ADDRESS INDICATIONS (CAN COMMUNICATION) .....	9
3.7.	CONFIGURING THE COMMUNICATION METHOD .....	9
3.7.1.	<i>Configuring a display as a Master with 1-wire communications .....</i>	10
3.7.2.	<i>Configuring a display as a Remote with 1-wire communications.....</i>	10
3.7.3.	<i>Configuring a display as a Master with CAN communications.....</i>	10
3.7.4.	<i>Configuring a display as a Remote with CAN communications.....</i>	10
<b>4.</b>	<b>PASSWORD LIST .....</b>	<b>11</b>
<b>5.</b>	<b>SOFTWARE REVISION CHECK.....</b>	<b>12</b>
<b>6.</b>	<b>INSTALLATION .....</b>	<b>13</b>
6.1.	CUTOUT DIMENSIONS (P/N 113739, 114378) .....	13
6.2.	OUTER BEZEL DIMENSIONS (P/N 113739, 114378) .....	13
6.3.	CUTOUT DIMENSIONS (P/N 119395, 119396) .....	14
6.4.	OUTER BEZEL DIMENSIONS (P/N 113739, 114378) .....	14
6.5.	LABEL ORIENTATION .....	15
6.6.	PRESSURE TRANSDUCER.....	15
6.6.1.	<i>Approved fluids.....</i>	15
<b>7.</b>	<b>WIRING .....</b>	<b>16</b>
7.1.	POWER AND GROUND.....	16
7.2.	DIM FUNCTION .....	16
7.3.	TRANSDUCER CONNECTION.....	16
7.4.	COMMUNICATION DATA LINE(S) .....	16
7.5.	COMMUNICATION WIRING EXAMPLES .....	17
7.5.1.	<i>1-wire method, 1 master and 3 remotes.....</i>	17
7.5.2.	<i>1-wire method, 2 masters and 2 remotes.....</i>	17
7.5.3.	<i>CAN method, 1 master and 3 remotes.....</i>	18
7.5.4.	<i>CAN method, 2 masters and 2 remotes.....</i>	18

 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	2 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

7.5.5.	CAN method, pump sensor module and 1 remote.....	19
7.5.6.	Terminating resistor requirement (CAN communication) .....	19
7.6.	SYSTEM COMPATIBILITY .....	20
7.6.1.	1-wire compatibility.....	20
7.6.2.	CAN compatibility .....	20
<b>8.</b>	<b>TROUBLESHOOTING .....</b>	<b>20</b>
8.1.	EVALUATION TABLE .....	20
8.2.	USING THE DISPLAY TO VERIFY VOLTAGE .....	22
<b>9.</b>	<b>GLOSSARY .....</b>	<b>22</b>
<b>10.</b>	<b>PRODUCT SPECIFICATION.....</b>	<b>23</b>
10.1.	TECHNICAL DETAILS .....	23
10.2.	WEEE (WASTE OF ELECTRICAL AND ELECTRONIC EQUIPMENT) DIRECTIVE.....	23
10.3.	CE STATEMENT .....	23
<b>11.</b>	<b>板料信息声明 (ROHS 声明) – DECLARATION INFORMATION SHEET (ROHS DECLARATION) .....</b>	<b>24</b>
11.1.	产品中有毒和有害的物质或成份的名称和含量 – (NAMES AND CONTENTS OF THE TOXIC AND HAZARDOUS SUBSTANCES OR ELEMENTS IN THE PRODUCTS) .....	24

 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	3 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

## 1. Revision Log

Rev	Date	Approved	Changes
1.00	12-12-2005		Initial requirements
1.10	2-26-2007	AK	Added CAN harness part numbers
1.20	10-23-2007	AK	Added WEEE, CE, and RoHS details
1.30	8-3-2009	AK	Add 119395, 119396 ITL's with new bezel

## 2. System Overview

The Intelli-Tank 4 light tank level (ITL) is designed to display a liquid's volume to an eighth of a tank level accuracy through 180-degree viewable ultra-bright LEDs. The unit set as a Master uses a 0 – 5 PSI pressure transducer to obtain tank level information and then relays that information along the communication line(s) (1-Wire or CAN) to units set as Remotes. Multiple Remote units can be linked to the Master tank level unit.


### 2.1. Part numbers

Tank Level Gauge	C1 – p/n 113739	– 12V	
	p/n 114378	– 24V	
	p/n 119395	– 12V	(new style black bezel)
	p/n 119396	– 24V	(new style black bezel)
Labels	C1 – p/n 106280	– water	
	p/n 106281	– foam	
	p/n 106282	– foam A	
	p/n 106283	– foam B	
	p/n 119199	– water	(for new style bezel)
	p/n 119200	– foam, red	(for new style bezel)
	p/n 119201	– foam, green	(for new style bezel)
Pressure Transducer	C1 – p/n 102162	– 0 to 5 PSI gage	
Adapter bushing	C1 – p/n 102219	– ¾ to ¼ NPT	
Installation Harness	C1 – p/n 106690	– Master 1-wire	
	p/n 106691	– Remote 1-wire	
	p/n 116032-10	– Master CAN, 10 feet length	
	p/n 116032-20	– Master CAN, 20 feet length	
	p/n 116032-30	– Master CAN, 30 feet length	
	p/n 116032-40	– Master CAN, 40 feet length	
Terminating resistor (CAN)	C1 – p/n DT06-3S-P006		
“Y” connector (CAN)	C1 – p/n DT04-3P-P007		
Operation Manual	C1 – p/n 114356		

### 2.2. Modes of Operation

**Master** When the ITL display is calibrated with a proper pressure signal it automatically becomes a Master display and will send tank level information along the communication line(s) (either 1-wire or CAN) to all other Remote displays.

**Remote** ITL displays are initially shipped as Remote displays. A Remote display only requires power, ground and communications line(s) (either 1-wire or CAN). The Remote display mimics the Master display's LEDs by reading the appropriate information on the communication line(s).

 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	4 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

### 3. Operation

#### 3.1. LED indications

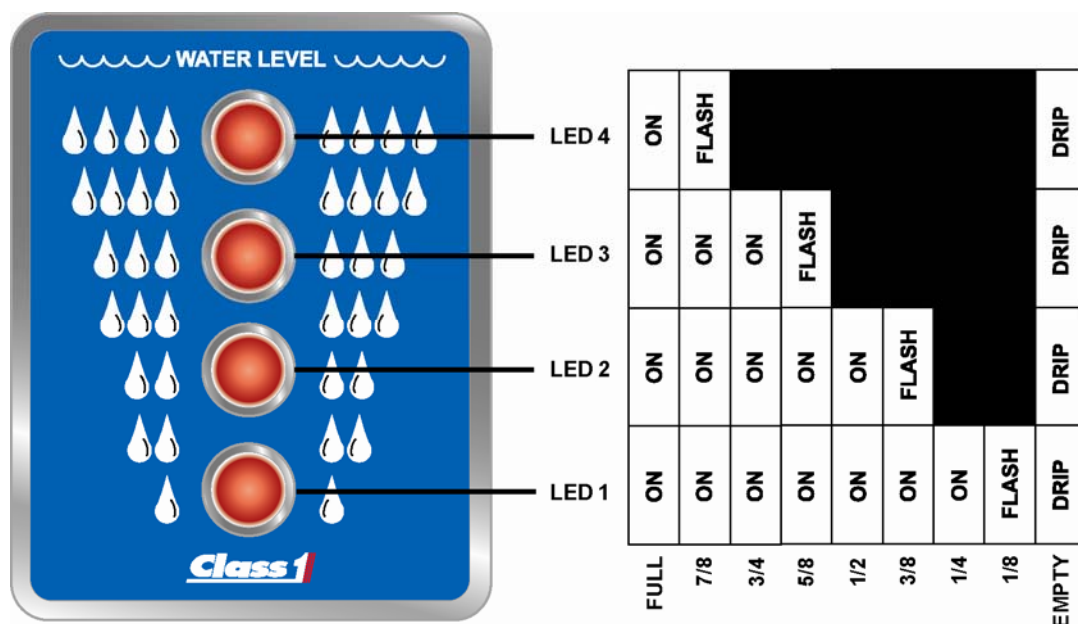
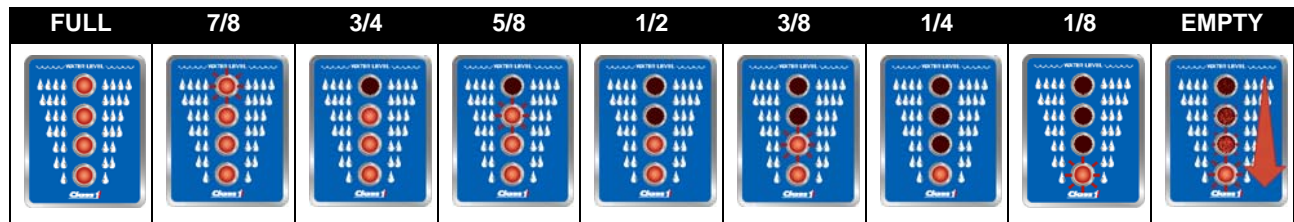
The ITL display uses the 4 LEDs to show the unit status (section 3.1.1), water level (section 3.1.2), and error conditions (section 3.1.3).

##### 3.1.1. Initial power ON indications


When the display is first powered up the LEDs will cycle on individually starting with the bottom LED (LED 1) and then the LEDs will show current status.

- A **Master** display properly connected to a functioning transducer will display current tank level information.
- A **Master** display not connected to a pressure transducer will alternately flash the bottom two LEDs.
- A **Remote** display connected to a Master display (through the 1-wire or CAN communication line(s)) will mimic the Master display's LED condition and flash pattern.
- A **Remote** display not connected to a Master display will alternately flash the upper two LEDs and the lower two LEDs. This indicates a "no communication" condition.




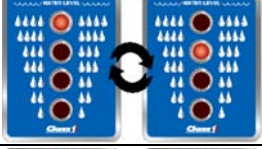




##### 3.1.2. Level indications



DRIP = cascades from top (LED 4) to bottom (LED 1), pauses, and repeats.


 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	5 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

### 3.1.3. Error indications

Condition	Visual
Invalid calibration	
Incomplete calibration	
EEPROM error	
Transducer signal voltage above 4.8V	
Transducer signal voltage below .4V	
Remote "NO DATA"	
Password Error "wave off" <sup>(1)</sup>	
Unit type error <sup>(2)</sup>	

<sup>(1)</sup> "Wave off" pattern: two center LEDs and then two outer LEDs flashing quickly for 8 cycles.

<sup>(2)</sup> Indicates that the unit type has erroneously changed. The two valid unit types are Remote and Master.

<b>Class 1</b>  607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	6 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

### 3.2. Magnetic switches

The display has two magnetic switches (left and right). The magnetic switches are activated by using a magnet and touching the front of the display on either side of LED 2.



For best results the magnet should be positioned over the desired magnet approximately 2 inches from the front of the display, pushed directly to the front of the display, and then pulled back to the start position.




LEFT

RIGHT

The LEDs on the display will indicate which switch was activated (upper two LEDs = left switch, bottom LED = right switch) for approximately half a second and then the display will go blank.

The maximum time between magnetic switch activations is two seconds. If longer than two seconds have passed between activations the unit will resume normal operation and the password attempted will be reset.



 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	7 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

### 3.3. Calibration

The ITL display can be calibrated four different ways: 1-point (quick calibration), 2-point (level calibration), 5-point and 9-point (volume calibration).

To enter calibration mode use a magnet and activate the magnetic switches in the order of the appropriate password.



*Entering an invalid password will initiate a “wave off” pattern on the display. (Two center LEDs, two outer LEDs flashing quickly for 8 cycles.) The unit will then resume its normal operation and the user can attempt to re-enter the password.*

Calibrate the unit by entering the desired point calibration password –

- |  |
|--|
| 1 point <b>RLLR LRRL</b> (see section 3.3.1)<br>2 point <b>RLLR LLRL</b> (see section 3.3.2)<br>5 point <b>RLLR LRLR</b> (see section 3.3.3)<br>9 point <b>RLLR RLLR</b> (see section 3.3.4) |
|--|

During calibration, the process can be cancelled at any time by activating the **LEFT** magnetic switch. This will allow the display to exit without showing an “incomplete calibration error” (section 3.1.3) on the next power cycle.

#### 3.3.1. 1 Point Calibration

1 point calibration only calibrates the full point. The empty calibration is always set to 0.55V (approximately 1.5 inches of liquid).

1. Make certain that the tank is **FULL**.
2. Enter the password **RLLR LRRL**. The display will respond by flashing the top LED twice. The display will then revert to normal operation by displaying **FULL** (all LEDs on).


#### 3.3.2. 2 Point Calibration

1. Enter the password **RLLR LLRL**. The display will respond by flashing the two center LEDs twice. The display will then begin cascading the LEDs from top to bottom (drip).
2. Make certain that the tank is **EMPTY** and then activate the **RIGHT** switch to store that point. The display will flash the top LED and then turn on all four LEDs.
3. Fill the tank and then activate the **RIGHT** switch. The display will respond by flashing the top LED then lighting the two center LEDs and then reverting to normal operation by displaying **FULL** (all LEDs on).

#### 3.3.3. 5 Point Calibration

1. Enter the password **RLLR LRLR**. The display will respond by flashing the two center LEDs five times. The display will then begin cascading the LEDs from top to bottom (drip).
2. Make certain that the tank is **EMPTY** and then activate the **RIGHT** switch to store that point. The display will flash the top LED and then turn on the bottom LED.
3. Fill the tank to the one-quarter tank point and then activate the **RIGHT** switch. The display will flash the top LED and then turn on the bottom two LEDs.
4. Fill the tank to the one-half tank point and then activate the **RIGHT** switch. The display will flash the top LED and then turn on the bottom three LEDs.



 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	8 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

- Fill the tank to the three-quarter tank point and then activate the **RIGHT** switch. The display will flash the top LED and then turn on all four LEDs.
- Fill the tank to the full point and then activate the **RIGHT** switch. The display will respond by flashing the top LED then lighting the two center LEDs and then reverting to normal operation by displaying FULL (all LEDs on).

### 3.3.4. 9 Point Calibration

- Enter the password **RLLR RLLR**. The display will respond by flashing the two center LEDs nine times. The display will then begin cascading the LEDs from top to bottom (drip).
- Make certain that the tank is **EMPTY** and then activate the **RIGHT** switch to store that point. The display will flash the top LED and then begin flashing the bottom LED.
- Fill the tank to the one-eighth point and then activate the **RIGHT** switch. The display will flash the top LED and then turn on the bottom LED.
- Fill the tank to the one-quarter tank point and then activate the **RIGHT** switch. The display will flash the top LED and then turn on the bottom LED and flash the second LED.
- Fill the tank to the three-eighths point and then activate the **RIGHT** switch. The display will flash the top LED and then turn on the bottom two LEDs.
- Fill the tank to the one-half point and then activate the **RIGHT** switch. The display will flash the top LED and then turn on the bottom two LEDs and flash the third LED.
- Fill the tank to the five-eighths point and then activate the **RIGHT** switch. The display will flash the top LED and then turn on the bottom three LEDs.
- Fill the tank to the three-quarter point and then activate the **RIGHT** switch. The display will flash the top LED and then turn on the bottom three LEDs and flash the fourth LED.
- Fill the tank to the seven-eighths point and then activate the **RIGHT** switch. The display will flash the top LED and then turn on all four LEDs.
- Fill the tank to the full point and then activate the **RIGHT** switch. The display will respond by flashing the top LED then lighting the two center LEDs and then reverting to normal operation by displaying FULL (all LEDs on).

### 3.3.5. Calibration retention

Calibration data is saved in non-volatile memory (EEPROM) and the display does not need power to retain calibration data.

### 3.3.6. Invalid calibration

Calibration automatically makes the display a master if the calibration is valid. An invalid calibration is determined when any calibrated point is not at a higher level than the previous calibrated point, or if the transducer voltage falls outside of the valid minimum (.4V) or maximum (4.8V) range. An invalid calibration is acknowledged by giving the "wave off" and if this was a master display previously will show an "invalid calibration error" (section 3.1.3), while a Remote will revert to Remote operation.


### 3.3.7. Calibration incomplete

If the calibration is not completed the display will continually flash the "incomplete calibration error" (section 3.1.3), during all subsequent power cycles. This indicates that a calibration was attempted but never completed. Recalibrate the display completely to remove this error condition.

## 3.4. Self test

The Tank Level can check its hardware for proper operation by entering the password **RLLR LLRR**.

The display will then cycle each LED ON individually starting with the bottom LED and then all LEDs will come on and begin flashing between full bright and the calibrated dim level for 5 seconds. The display will then show the condition of the self test for 5 seconds.

 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	9 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

A **PASS** condition is indicated when only the top LED (LED 4) is on.

A **FAIL** condition exists if LED 4 is off and any other LED is on.

LED 3	ON	Memory (EEPROM) failure.
LED 2	ON	Data communication error.
LED 1	ON	Transducer signal line out of tolerance high (above 4.8V) or shorted to +5V.
LED 1	Flashing	Transducer signal out of tolerance low (below 0.4V) or shorted to ground.

*If the self test password is used on a Master display all Remote displays will also perform their self test.*

### 3.5. Setting the dim LED level

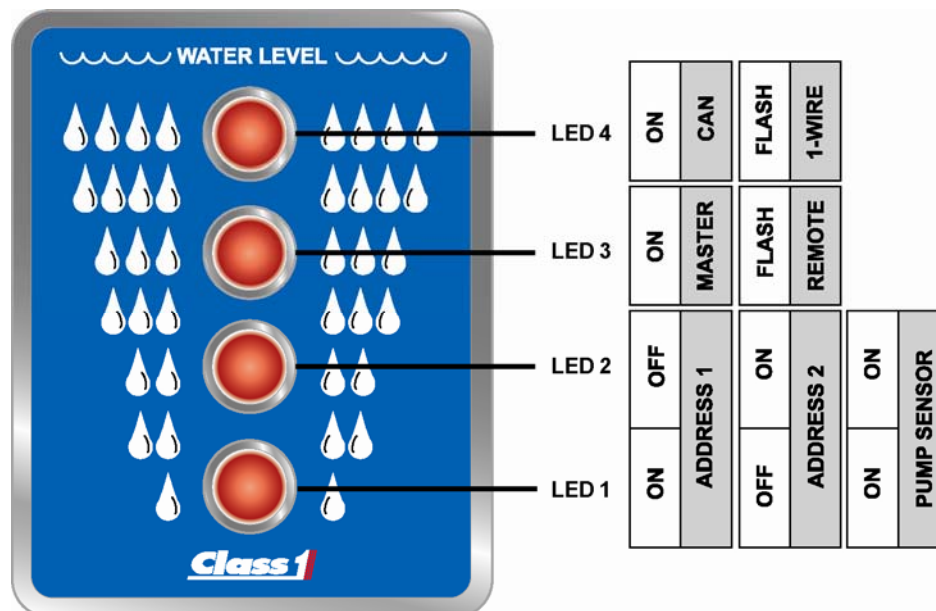
The display can be dimmed by applying system power to pin 3 (Dim Display input). To select the dim level of the display use the magnetic switches to enter the password **RLLR LLLR**.

All of the LEDs will be illuminated during the set-up. Hold the magnet against the **RIGHT** switch and the display will either brighten or dim. Release the magnet and again hold it against the **RIGHT** switch and the display's brightness will move in the opposite direction. When the dim level is at the desired point activate the **LEFT** switch.

### 3.6. Show display type and address indications (CAN communication)

Hold a magnet to the right magnetic switch during power up and the LED states will verify the display type, display address, and communication method.


LED 4 shows the communication method, LED3 shows the display type, and LEDs 2 and 1 show the CAN communication address.



### 3.7. Configuring the communication method

A Master display can communicate to other displays that are configured as remotes via CAN or 1-wire.

The 1-wire communication method was used on the original ITL displays. Use this method if older ITL displays will be utilized along with the new display. This method also only uses 1 communication wire (make certain that all displays on the 1-wire communication line have the exact same ground potential).

 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	10 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
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	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

The CAN communication method is new for the ITL displays and is a more robust communication method. This method requires two wires (CAN high, CAN low) and approved J1939 CAN wiring and connectors. There should be two 120 ohm terminating resistors located at the ends of the CAN bus.

### 3.7.1. Configuring a display as a Master with 1-wire communications

Enter the password **LRLl LLLR** to set the communication method to 1-wire. If the display was not previously a Master display, calibrate the display (see section 3.3).

### 3.7.2. Configuring a display as a Remote with 1-wire communications

Enter the password **LRLl LLLR** to set the communication method to 1-wire. If the display is a Master display, enter the password **LRLR LRLR** to turn the display into a Remote.

### 3.7.3. Configuring a display as a Master with CAN communications


Enter the password **LRLl LLRL** to set the communication method to CAN. If the display was not previously a Master display, calibrate the display (see section 3.3).

Choose the CAN identification address to use (either address 1, 2, or 3) and enter the appropriate password to set the address (**LRRR LLLL** address 1, **LRRR LLLR** address 2, **LRRR LRRR** address 3). All Remote displays that are to mimic this Master display must have their addresses matching the Master's.

### 3.7.4. Configuring a display as a Remote with CAN communications


Choose the CAN identification address to use (either address 1, 2, or 3) and enter the appropriate password to set the address (**LRRR LLRL** address 1, **LRRR LLRR** address 2, **LRRR LRRL** address 3). All Remote displays that are to mimic the Master display must have their addresses matching the Master's.

The display can also be configured to mimic a Class 1 Pump Sensor Module by entering the password (**LRRR LRLl**).

 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	11 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
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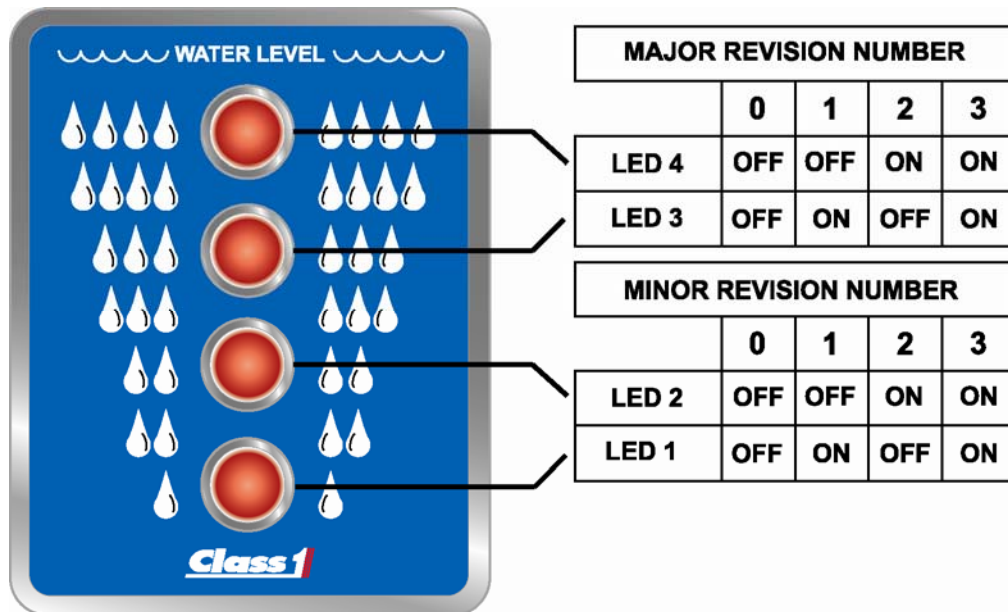
#### 4. Password list

RLLR LRRl	1 point calibration (section 3.3.1)
RLLR LLRL	2 point calibration (section 3.3.2)
RLLR LRLR	5 point calibration (section 3.3.3)
RLLR RLLR	9 point calibration (section 3.3.4)
RLLR LLRR	Self test (section 3.4)
LRLR LRLR	Configure display as Remote display (section 2.2)
RLLR LLLR	Configure dim level (section 3.5)
LLRR LLRR	Display voltage (section 8.2)
LRLl LLLR	Configure for 1-wire communications (section 3.7)
LRLl LLRL	Configure for CAN communications (section 3.7)
LRRR LLLL	Configure as Master display with CAN address 1 (section 3.7.3)
LRRR LLLR	Configure as Master display with CAN address 2 (section 3.7.3)
LRRR LRRR	Configure as Master display with CAN address 3 (section 3.7.3)
LRRR LLRL	Configure as Remote display with CAN address 1 (section 3.7.4)
LRRR LLRR	Configure as Remote display with CAN address 2 (section 3.7.4)
LRRR LRRL	Configure as Remote display with CAN address 3 (section 3.7.4)
LRRR LRLL	Configure as Remote display for use with Pump Sensor Module (Tank 1)
LRRR RLRL	Configure as Remote display for use with Pump Sensor Module (Tank 2)
LRRR RLRR	Configure as Remote display for use with Pump Sensor Module (Tank 3)


 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	12 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

## 5. Software revision check

Hold a magnet on the **LEFT** magnetic switch while powering the display. The LEDs will display the software revision. (Use the chart below to decipher).



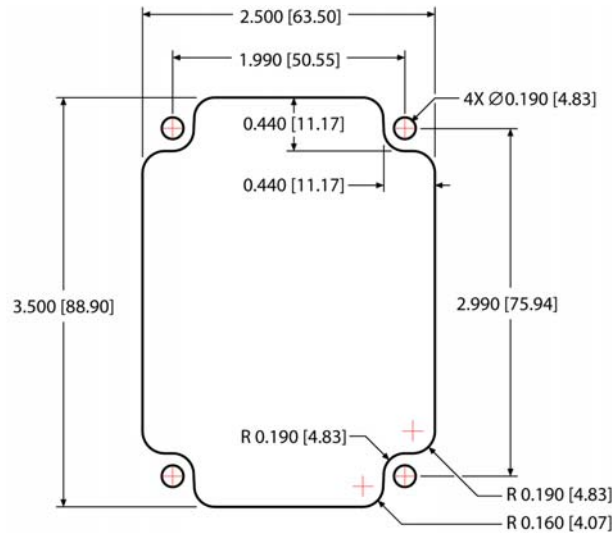
Example. (LED 4 – OFF, LED 3 – ON, LED 2 – OFF, LED 1 – ON) = Ver 1.1

 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	13 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

## 6. Installation

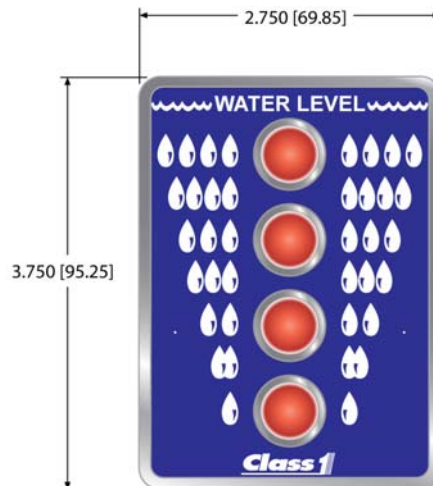
### 6.1. Cutout dimensions (p/n 113739, 114378)

The display requires a cutout as shown. The display is water tight and may be mounted in any location on the operator's panel.




Unit of scale: inches [millimeters]

### 6.2. Outer bezel dimensions (p/n 113739, 114378)

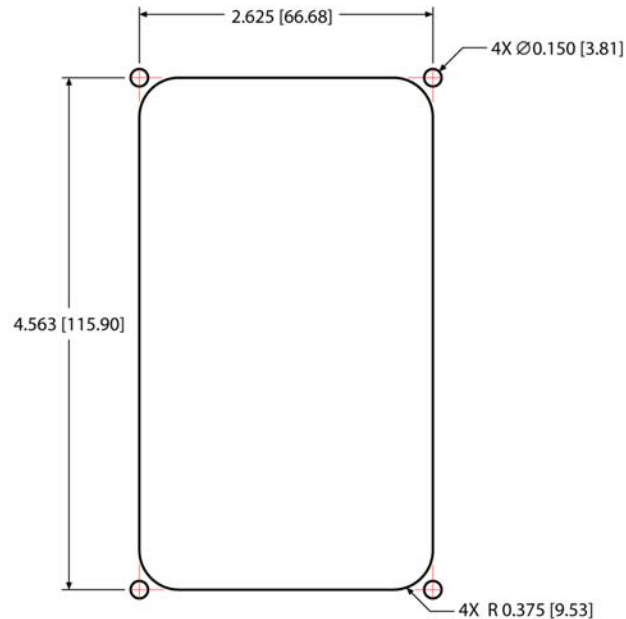


Unit of scale: inches [millimeters]

<b>Class 1</b>  607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	14 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

### 6.3. Cutout dimensions (p/n 119395, 119396)

The display requires a cutout as shown. The display is water tight and may be mounted in any location on the operator's panel.




Unit of scale: inches [millimeters]

### 6.4. Outer bezel dimensions (p/n 119395, 119396)



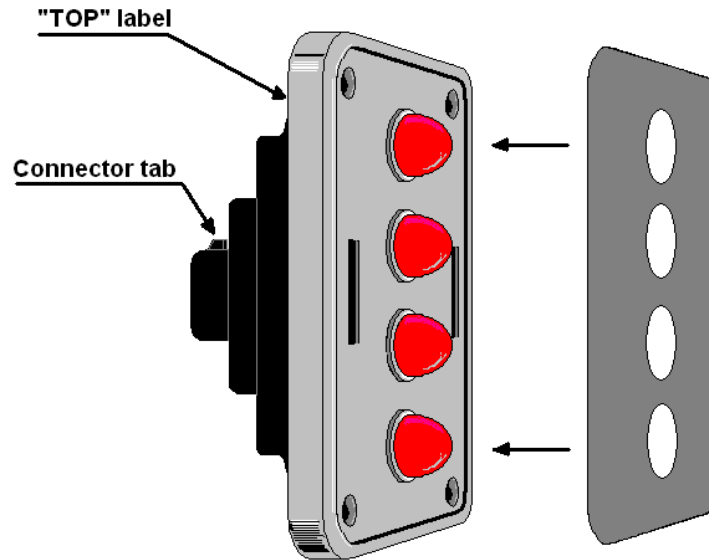
Unit of scale: inches [millimeters]



 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	15 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

## 6.5. Label orientation

Before mounting the display and adhering the label insure that the display is situated correctly (TOP is UP). Refer to the drawing for orientation.

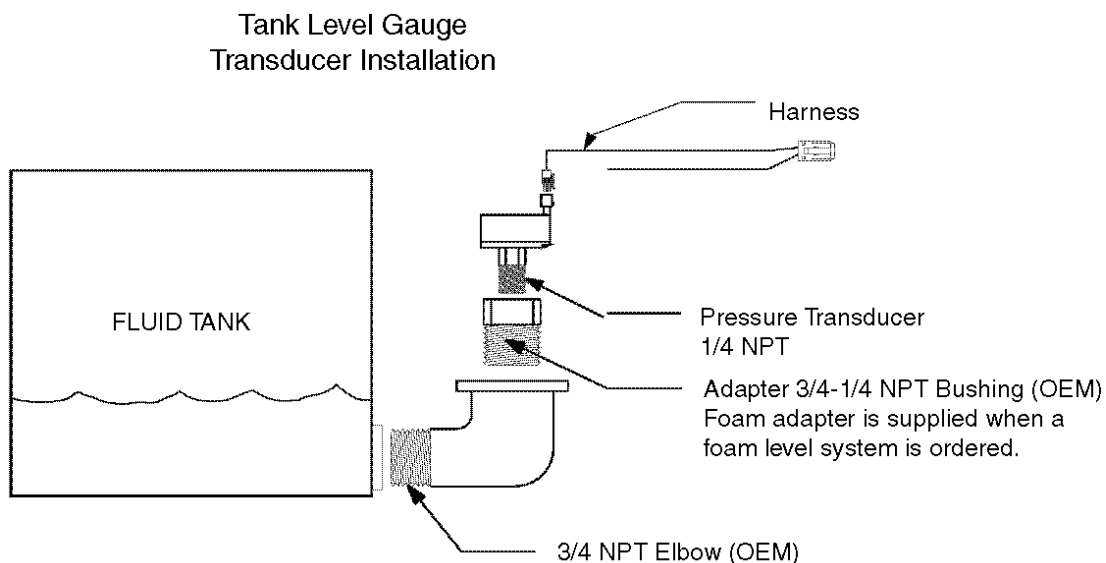



## 6.6. Pressure transducer

The transducer has a 1/4" NPT mount and must be mounted vertically as depicted to insure an accurate reading.

### 6.6.1. Approved fluids

The pressure transducer has been tested and approved for water, foam A, and foam B.



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	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

## 7. Wiring

### 7.1. Power and Ground

It is imperative that a system utilizing Master and Remote tank level displays connected by the 1-wire data line have a common ground. The remote displays will not follow the master display otherwise.

Pin 1	System voltage
Pin 2	Ground

### 7.2. Dim Function

The LEDs on the tank level display can be dimmed to a user selectable dim setting by applying system voltage to the Dim display Input.

Pin 3	Dim display input (system voltage)
-------	------------------------------------

### 7.3. Transducer Connection

Pin 6	Sensor power (+5V)
Pin 7	Sensor signal
Pin 8	Sensor ground

### 7.4. Communication Data Line(s)

Pin 4	CAN high communication line (or 1-wire communication line)
Pin 5	CAN low communication line

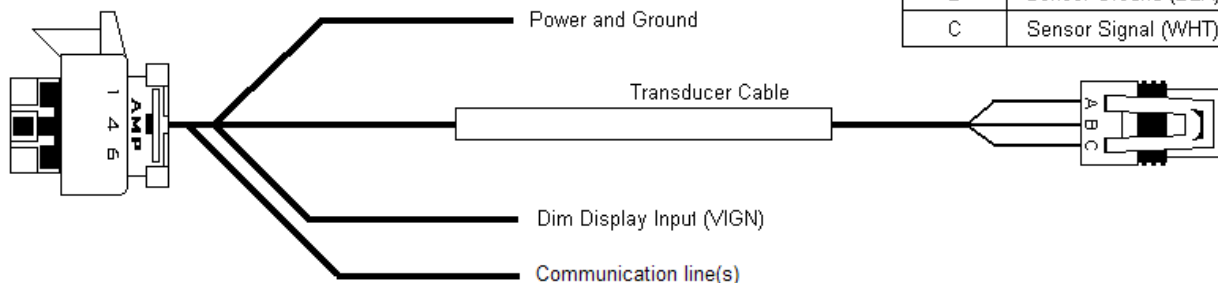
CONNECTOR: AMP  
776286-1


PINS: AMP  
770520-1

POS	WIRE DESCRIPTION	
1	Power	(input)
2	Ground	(input)
3	Dim Display (VIGN)	(input)
4	1-Wire or CAN high	(I/O)
5	CAN low	(I/O)
6	Sensor Power (+5V)	(output)
7	Sensor Signal	(input)
8	Sensor Ground	(output)

Communication lines (1-wire method only uses pin 4)

POS	WIRE DESCRIPTION
A	Sensor Power +5V (RED)
B	Sensor Ground (BLK)
C	Sensor Signal (WHT)

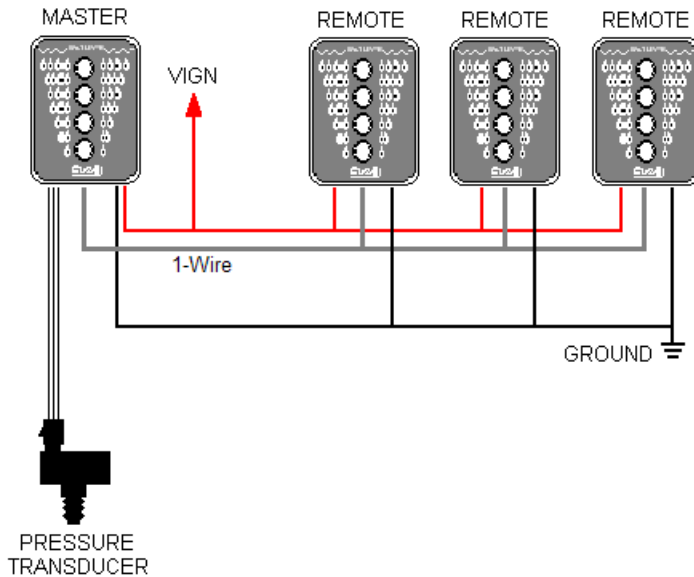


<b>Class 1</b>  607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	17 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

## 7.5. Communication wiring examples

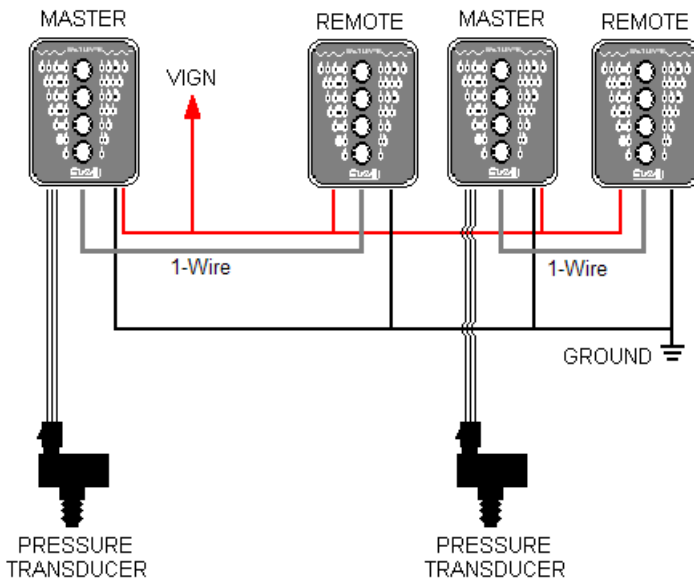
The displays can be set up to use the 1-wire or CAN communication methods. A standard system could be comprised of as few as 1 master display. Two master displays may be used in a system where two fluid levels must be displayed (*for example, 1 water tank and 1 foam tank*).

### 7.5.1. 1-wire method, 1 master and 3 remotes




System configured with 1-wire communication method. Make certain that the ground for each display is tied to a common point or the remote displays will not follow the master display.

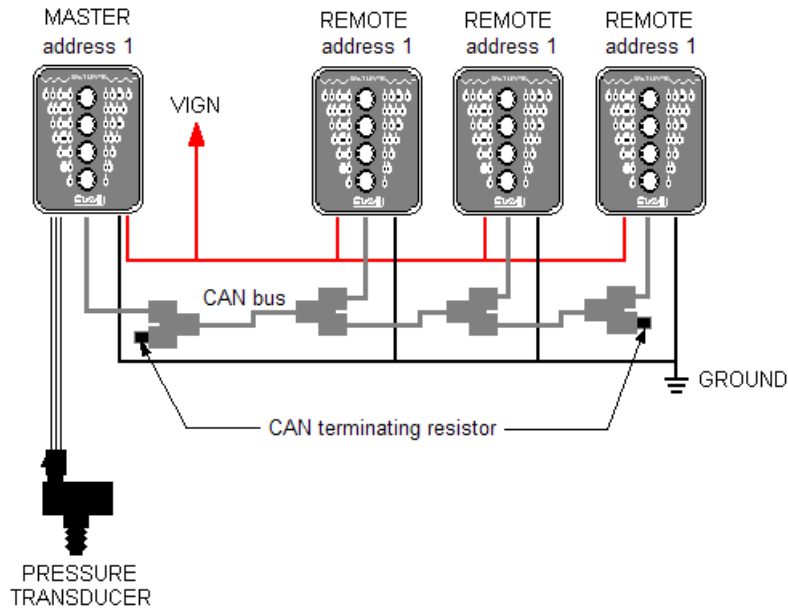
### 7.5.2. 1-wire method, 2 masters and 2 remotes



System configured with 1-wire communication method. Make certain that the two master 1-wire data lines are not connected and that the ground for each display is tied to a common point or the remote displays will not follow the master displays.

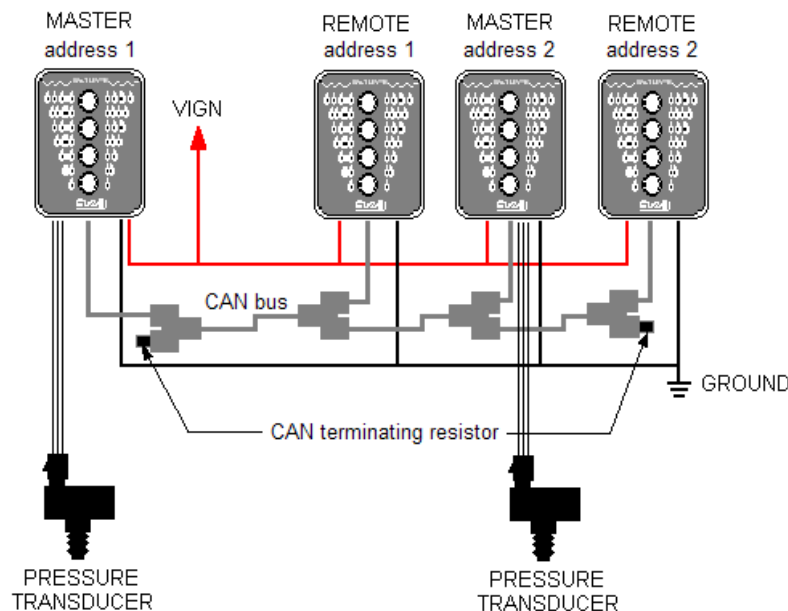
 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	18 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

### 7.5.3. CAN method, 1 master and 3 remotes




System configured with CAN communication method. This example shows one master display (address 1) communicating with 3 remote displays (address 1).

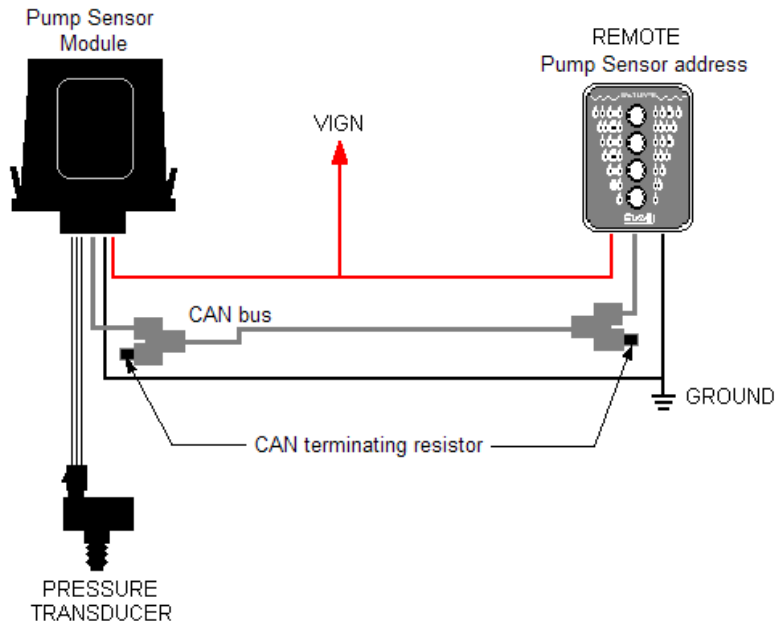
### 7.5.4. CAN method, 2 masters and 2 remotes



System configured with CAN communication method. This example shows two master displays (address 1 and 2) communicating with 2 remote displays (address 1 and 2). Remote display address 1 only follows the indications of master display address 1, and remote display address 2 only follows the indications of master display address 2.

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	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

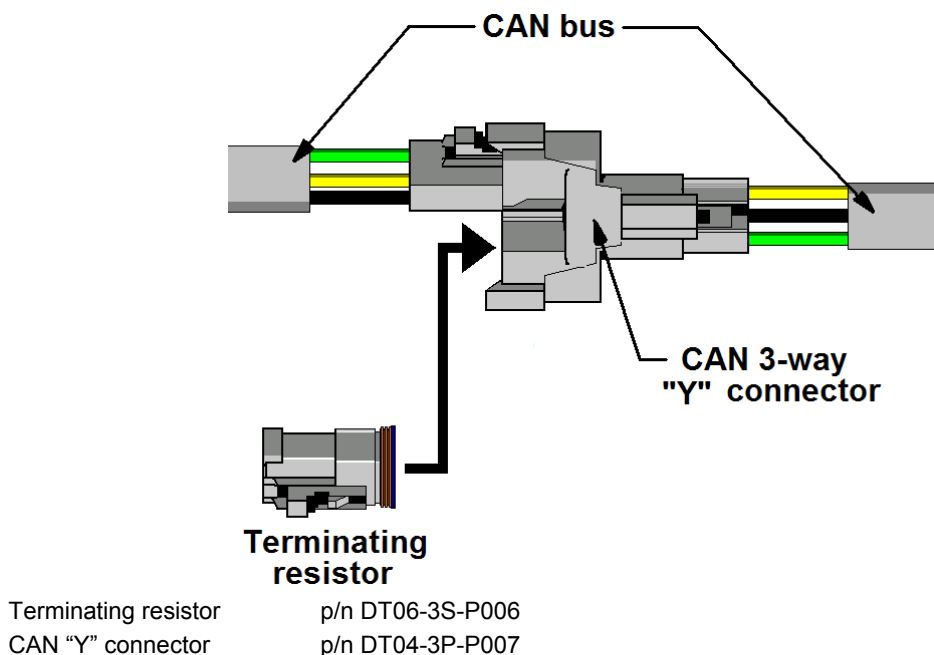
### 7.5.5. CAN method, pump sensor module and 1 remote




System configured with CAN communication method. This example shows one remote display (using pump sensor module address) following the indications of the Class 1 Pump Sensor Module.

### 7.5.6. Terminating resistor requirement (CAN communication)

A terminating resistor (120 Ohm) is required on both ends of the CAN bus for proper operation. Only two terminating resistors are allowed on a CAN bus.



 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	20 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

## 7.6. System compatibility

The ITL display is compatible with other Class 1 CAN and 1-wire products.

### 7.6.1. 1-wire compatibility




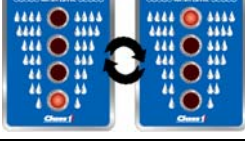
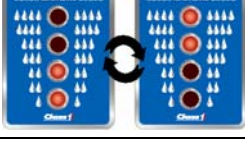

An ITL display configured with 1-wire communication is compatible with the 4 light remote driver module (p/n 106877), Pump input sensor module (p/n 111097), mini remote driver module (p/n 112648), mini remote dash gauge (p/n 112649), and all older 4 and 5 light ITL displays (p/n 106299, 106296, 108858, 108859).


### 7.6.2. CAN compatibility






The ITL display configured with CAN communications is compatible with the Command Master (p/n 111084, 111085, 111086), Pump input sensor module (p/n 111097), and future Class 1 ES-Key CAN products.

## 8. Troubleshooting


### 8.1. Evaluation table

Condition	Visual	Evaluate
Bottom two LEDs alternate flashing. Unit fails self test, LED 1 flashing.		Check transducer wiring. Ensure +5V at pin A, ground at pin B and at least .4V at pin C (Signal).
Top two LEDs alternate flashing. Unit fails self test, LED 1 on.		Check transducer wiring. Ensure +5V at pin A, ground at pin B and no more than 4.8V at pin C (Signal).
Middle two LEDs alternate flashing.		Perform self test. If it fails with LED 3 on replace display.
Outer two LEDs alternate flashing.		Try to recalibrate. If condition remains, check if transducer signal voltage (pin C) changes as tank level increases. If it doesn't, replace transducer. If it does, verify depth of tank. It may be impossible to calibrate a tank with a depth of less than 6 inches.
Bottom two and Upper two LEDs alternate flashing.		The display is configured as a Remote. Recalibrate if a Master is required. If the display is required to be a Remote check Data line(s) (Pin 4, 5) continuity and insure line(s) is(are) not grounded.
No LEDs on.		Check power (Pin 1) and ground (Pin 2) connection.

 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	21 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

Condition	Visual	Evaluate
Master Tank level unit does not change when actual tank level is changing.	No picture	Check transducer wiring. Ensure transducer signal voltage (Pin C) is varying. If it does, check for same signal changes at Pin 6 of tank level connector (if it is not the same repair wiring). If signal is good at both locations try re-calibrating.
Remote Tank level unit does not follow Master display.	No picture	Perform self test. If self test is good, check pin 4 (data line) for continuity and insure it is not shorted to ground or power. Insure data line is not routed near noisy power or RF sources.
Unit fails self test, LED 2 on.		Check pin 4 (data line) for continuity and insure it is not shorted to ground or power.
No passwords are accepted.		If the display issues the "wave off" after entering a password, insure the display is installed upright. During power-up the display should cycle on each LED individually starting with the bottom LED.  Check that the left and right magnetic switches are recognized by activating each switch and verifying that the associated LEDs illuminate.
The bottom two LEDs are on and occasionally they go out and the top two flash and then return to the bottom two LEDs on (or vice-versa). (REMOTE).		Check for large noise spikes on the 1-wire data line.  Insure that the display's ground potential is the same as the Master's.  Insure that the data line is not chaffed and making contact with other electrical wires.
The points calibrated seemed to have changed.	No picture	Self test the display to check for any malfunctions.  Check the pressure transducer for problems.  Recalibrate the display and take a voltage reading from the transducer (pin 7 on the display's connector) at each calibration point. When the calibration points again look wrong check the voltages at those points and determine if they are the same as the voltage reading taken during calibration.
Unit will not dim display.	No picture	Insure the Dim input voltage on Pin 3 is at least 9V. Recalibrate dim setting (RLLR LLLR). If display does not dim LEDs while in dim calibrate mode, replace display.
The middle two LEDs are flashing together.		A calibration was started on the display but not completed correctly. Set the display to a REMOTE display (LRLR LRLR) or calibrate it as a MASTER (follow calibration steps exactly).
Top LED is the only LED illuminated.		The display has had a unit type memory error.  Attempt to set the display back to REMOTE or MASTER as required.

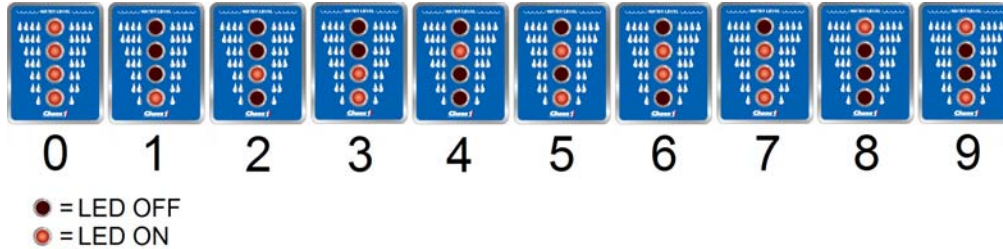


 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	22 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

## 8.2. Using the display to verify voltage

The display can show the voltage level that it detects on the transducer signal line by entering the password **LLRR LLRR**.


The display will then cycle through three LED patterns, pause, and then repeat. The three patterns each equate to a digit of the detected voltage. For example, if the three patterns shown were 1, 4, and 7, the voltage would be 1.47 volts.



The display will continue showing the voltage until either of the magnetic switches is activated.

## 9. Glossary

<b>LED</b>	<u>L</u> ight <u>E</u> mitting <u>D</u> iode. The lights on the display used to show tank level and information.
<b>ITL</b>	<u>I</u> ntelli- <u>T</u> ank <u>L</u> evel. The tank level display.
<b>PSI</b>	<u>P</u> ounds per <u>S</u> quare <u>I</u> nc. Pressure measurement.
<b>CAN</b>	<u>C</u> ontroller <u>A</u> rea <u>N</u> etwork. SAE J1939 communication method.
<b>NPT</b>	<u>N</u> ormal <u>P</u> ipe <u>T</u> aper. Pipe thread specification.
<b>EEPROM</b>	<u>E</u> lectrically <u>E</u> rasable <u>P</u> rogrammable <u>R</u> ead- <u>O</u> ny <u>M</u> emory. The memory of the tank level display, used to store the display information (tank level points, display type, dim value, etc).
<b>OEM</b>	<u>O</u> riginal <u>E</u> quipment <u>M</u> anufacturer.
<b>SAE</b>	<u>S</u> ociety of <u>A</u> utomotive <u>E</u> ngineers.
<b>TBD</b>	<u>T</u> o <u>B</u> e <u>D</u> eveloped.
<b>ESD</b>	<u>E</u> lectro <u>S</u> tatic <u>D</u> ischarge.
<b>IP</b>	<u>I</u> ngress <u>P</u> rotection (IP 67, etc).
<b>p/n</b>	part <u>n</u> umber
<b>C1</b>	<u>C</u> lass <u>1</u>
<b>Master</b>	Master display. The tank level display wired to the transducer. This display transmits data to other remote displays.
<b>Remote</b>	Remote display. A tank level display that receives data from the master unit. The remote display will only display what the master display commands.
<b>1-wire</b>	Proprietary communication method that uses only one wire for data transfer.
<b>System voltage</b>	The normal power level used by the system or vehicle. This voltage level will normally come from the vehicle's battery and charging system (vehicle ignition, vehicle power, etc.)
<b>Sensor</b>	The pressure transducer.
<b>Foam A</b>	Class "A" type foam used when fighting fires where the cooling effect of water is of prime importance in extinguishing (wood, paper, etc.)
<b>Foam B</b>	Class "B" type foam used when fighting fires involving flammable liquids where blanketing or smothering effect of water is of prime importance in extinguishing (gasoline, etc.)

 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	23 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	<b>4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN</b>			BY	AMS

## 10. Product specification

### 10.1. Technical details

Product category	ITL (Intelli-tank level)
Voltage range	+9VDC...+16VDC (12V display p/n 113739) +9VDC...+32VDC (24V display p/n 114378) LEDs will be dimmer at voltages less than 16V.
Power consumption	
@13.8VDC	205 mA (12V display p/n 113739)
@27.6VDC	200 mA (24V display p/n 114378)
Operational temperature range	-40°C...+85°C
Environmental range	IP 67
CAN specification	SAE J1939 proprietary, 250 Kbits/second
1-Wire specification	Class 1 proprietary, 425 bits/second
Protection	Internal thermal fuse Reverse voltage protection (pins 1 and 2 of connector) CAN buses protected to 24V ESD voltage protected to SAE J1113 specification for heavy duty trucks Transient voltage protected to SAE J1113 specification for heavy duty trucks
Dimensions (W x H x D) in inches [mm]	2.750 [69.85] x 3.750 [95.25] x 2.060 [52.32] (p/n 113739, 114378) 3.185 [80.90] x 5.125 [130.17] x 2.060 [52.32] (p/n 119395, 119396)
Weight in ounces	6.7

### 10.2. WEEE (Waste of Electrical and Electronic Equipment) directive



This symbol [crossed-out wheeled bin WEEE Annex IV] indicates separate collection of waste electrical and electronic equipment in the European Union countries. Please do not throw the equipment into the domestic refuse. Each individual European Union member state has implemented the WEEE regulations into national law in slightly different ways. Please follow your national law when you want to dispose of any electrical or electronic products.


More details can be obtained from your national WEEE recycling agency.

### 10.3. CE statement



This device complies with the European Regulations for Electromagnetic Compatibility (EMC) of the European Union and it is equipped with the CE mark. This unit must be used in accordance with the details specified within this manual.

**Class 1**  
 Unit of IDEX Corporation  
 607 NW 27th Avenue  
 Ocala, FL 34475 U.S.A  
 Phone: 1.800.533.3569 • 352.629.5020  
 Fax: 1.800.520.3473 • 352.629.2902  
 www.class1.com

 607 NW 27th Ave Ocala, FL 34475 Ph: 352-629-5020 or 1-800-533-3569 Fax: 352-629-2902 or 1-800-520-3473	SUITABLE FOR EXTERNAL DISTRIBUTION				PAGE	24 of 24
	<b>OPERATION MANUAL</b>				DATE	8/3/2009
	PRODUCT GROUP	ITL	P/N	12V: 113739, 119395      24V: 114378, 119396	REV	1.30
	PRODUCT	4 LIGHT INTELLI-TANK DISPLAY WITH 1-wire and CAN			BY	AMS

## 11. 板料信息声明 (RoHS 声明) – Declaration Information Sheet (RoHS Declaration)


### 11.1. 产品中有毒和有害的物质或成份的名称和含量 – (NAMES AND CONTENTS OF THE TOXIC AND HAZARDOUS SUBSTANCES OR ELEMENTS IN THE PRODUCTS)

**Class1** is committed to comply with the [Management Methods on Control of Pollution from Electronic Information Products of China \(China RoHS\)](#). The RoHS Directive restricts substances including lead (Pb), mercury (Hg), Cadmium (Cd), hexavalent chromium (CrVI) and certain halogenated flame retardants such as polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) in electrical and electronic equipment.

零件名称 Parts	有毒和有害的物质或成份 TOXIC AND HAZARDOUS SUBSTANCES OR ELEMENTS					
	铅 (Pb)	汞 (Hg)	六价铬 (CrVI)	多溴联苯 (PBBs)	多溴二苯醚 (PBDEs)	镉 (Cd)
基准 Base	O	O	O	O	O	O
盒子 Box	O	O	O	O	O	O
镀层 Coating	O	O	O	O	O	O
面板 Faceplate	O	O	O	O	O	O
标签 Label	O	O	O	O	O	O
透镜 Lens	O	O	O	O	O	O
印制电路 PCB	X	O	O	O	O	O
元器件 Components	X	O	O	O	O	O
连接器 Connector	O	O	O	O	O	O
密封垫 Gasket	O	O	O	O	O	O
螺钉 Screw	O	O	O	O	O	O

○ : 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T 11363-2006标准规定的限量要求以下。  
○ : Indicates that this hazardous substance contained in all homogeneous materials of this part is below the limit requirement in SJ/T 11363-2006.

× : 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006标准规定的限量要求。  
× : Indicates that this hazardous substance contained in at least one of the homogeneous materials of this part is above the limit requirement in SJ/T 11363-2006.



除非另外特别的标注,此标志为针对所涉及产品的环保使用期限标志.此环保使用期限只适用于产品在产品手册中所规定的条件下工作.

The Environment-Friendly Use Period (EFUP) for all enclosed products and their parts are per the symbol shown here, unless otherwise marked. The Environment-Friendly Use Period is valid only when the product is operated under the conditions defined in the product manual.