



***WIRELESS  
TRANSCIEIVER  
SYSTEM***

**427 SERIES**

**TECHNICAL MANUAL  
VERSION 1.0**

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## **Limited Warranty**

For a period of one (1) year from the date of purchase, ICS, LLC warrants the transceivers against defects in materials and workmanship. ICS, LLC will not honor this warranty (and this warranty will be automatically void) if there has been any:

1. Tampering, signs of tampering, or opening of the transceiver's case.
2. Use of AC power adapters and cables other than those originally supplied with the transceivers.
3. Repair or attempt to repair by anyone other than an ICS, LLC authorized technician.

This warranty does not cover and ICS, LLC will not be liable for, any damage or failure caused by misuse, abuse, acts of God, accidents, electrical irregularity, or other causes beyond ICS, LLC's control, or claim by other than original purchaser.

## **FCC Notice**

**! Warning** This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

**! Warning** Changes or modifications not expressly approved by ICS, LLC will void the user's authority to operate the equipment.

### **These statements apply to the following ICS Wireless Transceiver System Models:**

**Model ICS 427-01A Wireless Loadcell Transceiver**

**FCC ID: XL5-ICS427-01A**

**And**

**Model ICS 427-01B Wireless Indicator Transceiver**

**FCC ID: XL5-ICS427-01B**

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## **Overview**

The ICS 427 Wireless transceiver system is designed to allow wireless connectivity from a loadcell(s) to an indicator. It eliminates the requirement for a local indicator or RS-232 modem transceiver.

This is a bi-directional wireless system that is composed of two transceivers, one that is designated as the transmitter and the other designated as the receiver. The transceivers are designed to be used in pairs, and will only operate with their respectable partner.

The loadcell transceiver, (Transmitter) supplies source excitation voltage to the connected loadcell(s), which can be connected in quantities of 1, 4, 6, or 8. The transceiver then receives the respective mV/V output signal from the connected loadcell(s) or J-box to be transmitted to the Indicator transceiver (Receiver).

The Indicator transceiver (Receiver) receives the transmission from the loadcell transceiver (Transmitter) and recreates mV/V signal. The mV/V output signal is then connected to the signal input connections of an indicator that meets operational requirements.

## **Transceiver Specifications**

### **Transmitter (Loadcell)**

<u>Source Voltage</u>	<u>3 – 12VDC</u>
<u>Internal Battery Voltage</u>	<u>3.6VDC</u>
<u>Internal Battery Life</u>	<u>100+hrs w/4 loadcells</u>

(Will accept 1-8 Loadcells. Battery life varies with qty of cells applied)

<u>AC Power Adapter Input</u>	<u>110VAC</u>
<u>AC Power Adapter Output</u>	<u>5VDC 2A</u>
<u>Loadcell Connection</u>	<u>5 Wire shielded</u>
<u>Antenna Frequency Band</u>	<u>902-928 MHz</u>
<u>Range (Line of Sight)</u>	<u>100+ m</u>
<u>Range (Non Line of Sight)</u>	<u>50+m</u>
<u>Operating Temperature</u>	<u>-40°C -- +85°C</u>
<u>Excitation Voltage</u>	<u>3.3VDC</u>
<u>Signal Input</u>	<u>≤3.9mV/V</u>

### **Receiver (Indicator)**

<u>Source Voltage</u>	<u>5-10VDC</u> <u>(supplied by indicator excitation Voltage)</u>
<u>Signal Output</u>	<u>2mV/V</u>
<u>Indicator Connection</u>	<u>5 Wire Shielded</u>
<u>Antenna Frequency Band</u>	<u>902-928 MHz</u>
<u>Range (Line of Sight)</u>	<u>100+m</u>
<u>Range (Non Line of Sight)</u>	<u>50+m</u>
<u>Operating Temperature</u>	<u>-40°C -- +85°C</u>
<u>Accuracy</u>	<u>1/5,000 for any Indicator</u>

## Enclosures

### Standard Anodized Enclosure



**Loadcell Transceiver (Left)**

**Indicator Transceiver (Right)**

### Stainless Steel Nema 4 Enclosure (Optional)



**Loadcell Transceiver (Left)**

**Indicator Transceiver (Right)**

# Transceiver Connections

## Stainless Steel Nema 4 Enclosure

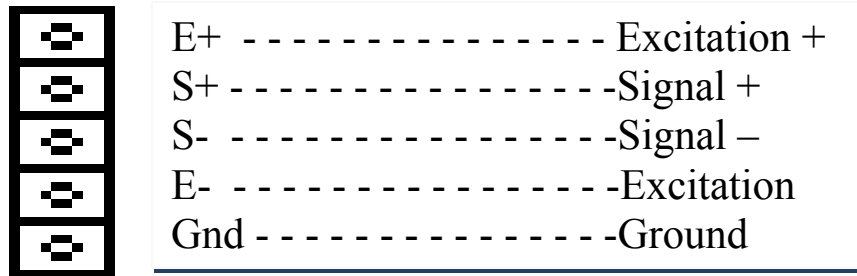


FIG 1.1

## Standard Anodized Enclosure

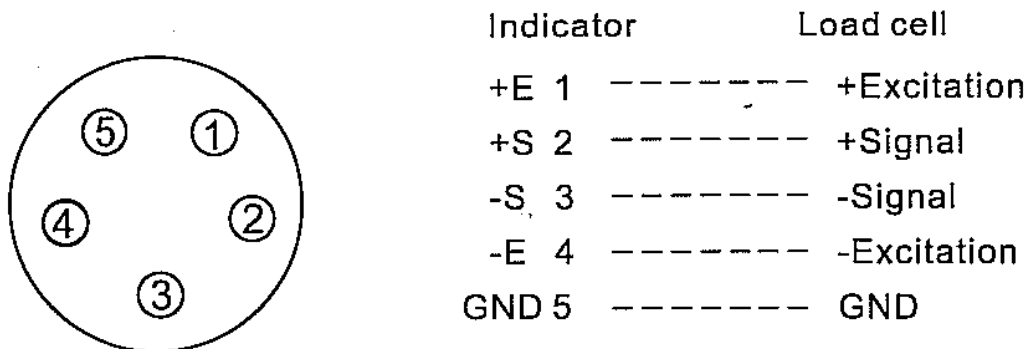


FIG 1.2

## **Loadcell Transceiver Installation**

**(Anodized Enclosure) See fig 1.2**

1. Connect the enclosed 5 pin female plug to the loadcell / Scale as follows:
  - a. Pin 1 = Excitation +
  - b. Pin 2 = Signal +
  - c. Pin 3 = Signal –
  - d. Pin 4 = Excitation –
  - e. Pin 5 = Shield (If so equipped)
2. Connect 5 pin plug to transmitter.
3. Connect the enclosed antenna to the transmitter
4. Transmitter is equipped with an internal rechargeable battery pack. To charge the battery pack, plug in enclosed power adapter.

**(Stainless Enclosure)**

See **Fig 1.1** for loadcell / scale connections.

For remaining connections follow steps 3 and 4 of instructions above.

**\*\*Loadcell transceiver will not power up until the receiver is powered up and communicating. Once power is turned off to the indicator transceiver, or communication is lost, the loadcell transceiver will enter “SLEEP MODE” to save battery life.\*\***

## **Indicator Transceiver Installation**

**(Anodized Enclosure Only) See Fig 1.2**

1. **(Depending on the indicator that is used, a cable may need to be made to go from the indicator to the transmitter plug)** Connect the enclosed 5 pin female plug to the loadcell connection from the indicator as follows:
  - a. Pin 1 = Excitation +
  - b. Pin 2 = Signal +
  - c. Pin 3 = Signal –
  - d. Pin 4 = Excitation –
  - e. Pin 5 = Shield (If so equipped)
2. Connect the enclosed antenna to the receiver.

3. The power to the receiver is supplied by the excitation voltage from the indicator
4. Power the indicator up and ensure that the transmitter and receiver are communicating (the signal LED will flash rapidly when communicating).
5. Follow calibration procedures for the indicator used.
6. To power down wireless units, remove power to the indicator.

**(Stainless Steel Enclosure)**

See **Fig 1.1** for indicator connections.

For remaining connections follow steps 2-6 of the instructions above.

**Jumper Settings “Loadcell Transceiver Only”**

**(Selects number of loadcells used up to 8 loadcells)**

1. There is a jumper located on the circuit board in the loadcell transceiver. The factory default setting is set for 4 loadcells.
2. To change the jumper setting, remove the end plate with the 5 pin connector, or for stainless enclosure, remove cover plate. The Jumper has 4 positions. The positions are labeled 1,4,6, and 8, which corresponds to the number of loadcells being used.
3. Move the jumper to the selected position and replace the end plate, or cover plate.

**\*\*Changing Jumper settings will affect indicator calibration, recalibration will be required.\*\***

## **Power Requirement**

### **Loadcell Transceiver**

1. Internal 3.6VDC rechargeable battery
2. 110VAC adapter

### **Indicator Transceiver**

DC operational source voltage supplied from indicator's + and – excitation connections.

## **Unit Operation**

### **Turning Transceivers On/Off**

#### **Indicator Transceiver**

The indicator transceiver receives its source voltage from the excitation voltage of the connected indicator. Once the indicator is powered up, the transceiver is automatically powered up with it.

#### **Loadcell Transceiver**

The loadcell transceiver receives its source voltage from either the internal rechargeable battery or the supplied 110 VAC adapter. If the unit is running on its internal rechargeable battery, it will not power up until it has received a signal from the indicator transmitter (this is an internal sleep mode that is used to prolong battery life.) If at any time during operation the transceivers lose connectivity, the transceiver will return to sleep mode until connection is restored. If the loadcell transceiver is connected to the supplied 110 VAC adapter, it will remain powered up continuously.

## Calibration

**\*\*The transceivers require no calibration, adjustment, or programming for indicator calibration.\*\***

Follow manufacturer provided calibration instructions for the connected indicator .

## LED Indicator Lights

**(For Anodized Enclosure Only)**

### **Signal Indicator**

**Green LED – Good signal strength** – LED will flash 10 times per second.

**Poor signal strength, or loss of signal** – LED will flash once for every 1.5 sec while searching for signal.

(Transmitter will enter sleep mode after 5 seconds of signal loss. Transmitter will reactivate once signal strength is re-obtained.

### **Battery Indicator**

**Green LED - Good Battery Strength**

**Red LED - Low Battery strength**

### **DC Power Indicator**

**Orange LED - Recharging Battery** – Unit will function properly while battery is recharging, or running solely on DC power

## Troubleshooting

### Problem

Indicator transceiver will not power up.

Loadcell Transceiver will not power up.

Inaccurate weight readings on indicator.

Unstable weight readings or severely erratic readings.

Loss of connectivity between transceivers.

Low battery light is illuminated on loadcell transceiver.

### Solution

Check indicator connections, Power is supplied from excitation voltage.

Check power connections. Charge battery.

Check Power connections. Charge battery. Check loadcell connections. Recalibrate indicator.

Check loadcell/indicator connections. Check for connectivity. Check Power connections. Charge Battery

Check connections. Transceivers may also be out of range. Check Power connections. Charge battery

Plug in supplied AC power adapter to recharge battery.

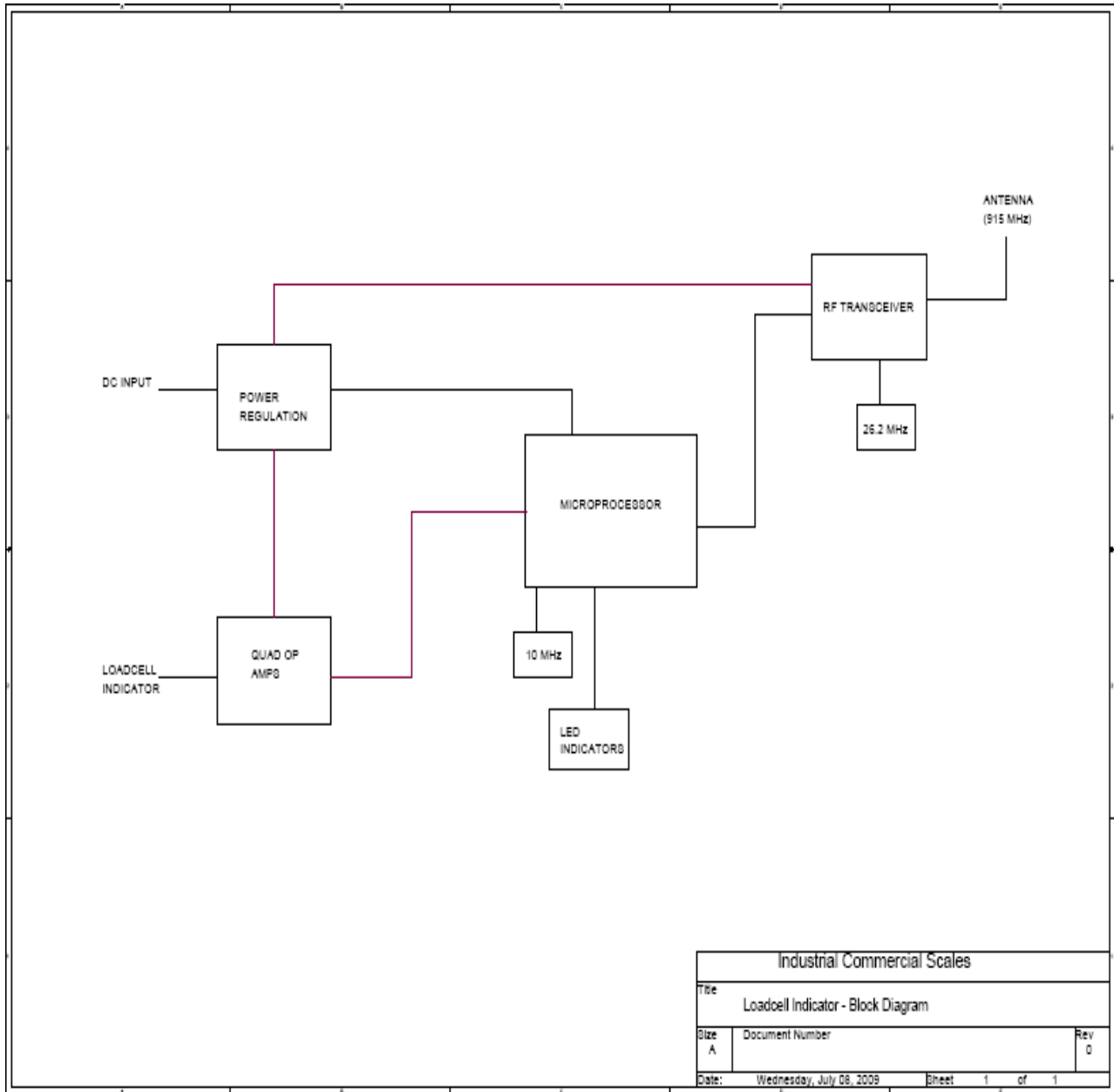
**\*\*To obtain optimal battery life, battery must be charged with supplied charger for a minimum of 8 hours when recharging\*\***

**For further technical assistance please contact the technical support department.**

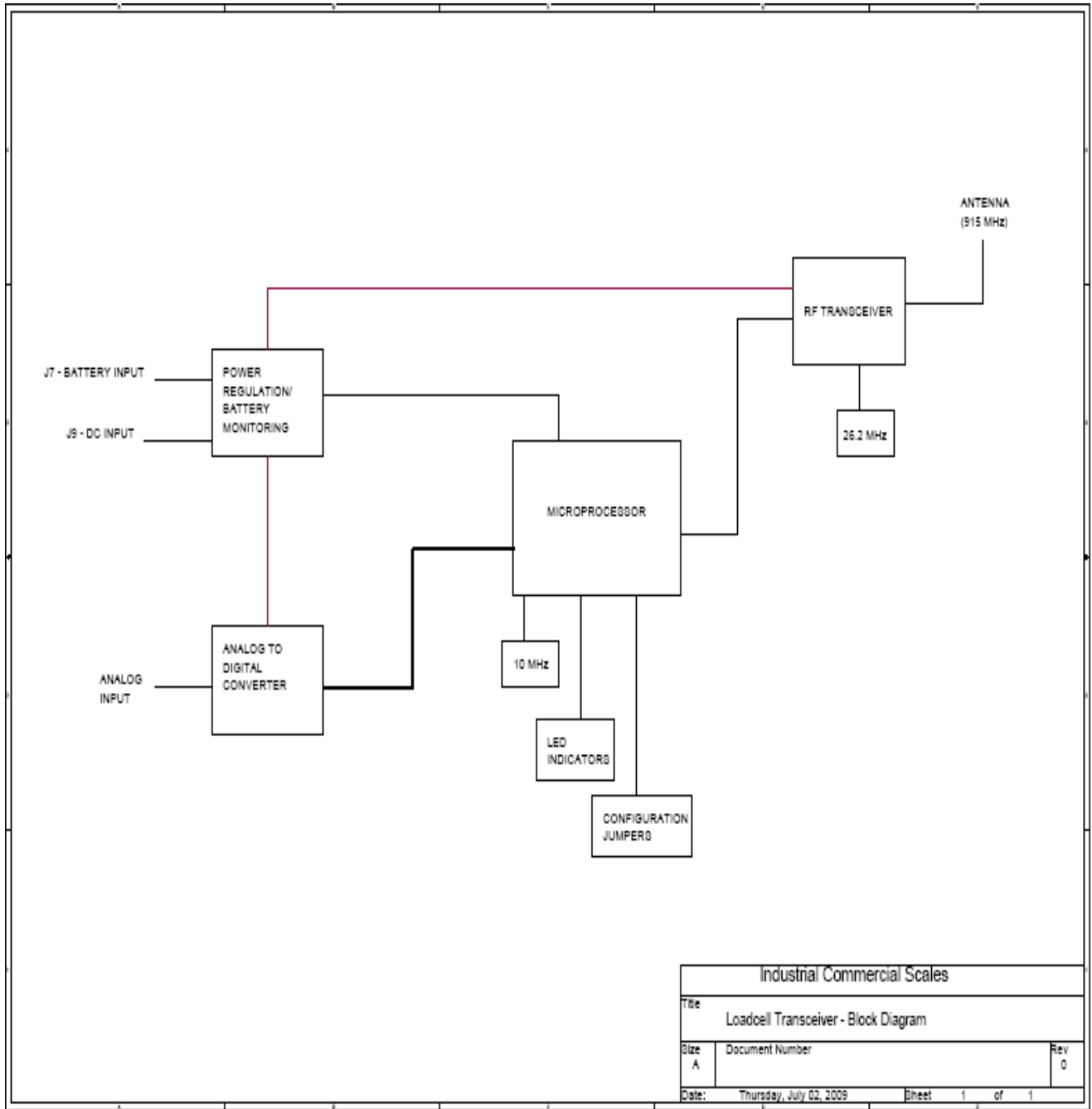
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**[service@icscale.com](mailto:service@icscale.com)**



## Indicator Transceiver Block Diagram



## Loadcell Transceiver Block Diagram

## **Parts List**

### **Anodized Enclosure**

#### **Loadcell Transceiver**

- |   |         |
|---|---------|
| 1. PC Board                                 | 427-101 |
| 2. Power Switch                             | 427-102 |
| 3. AC Power Jack                            | 427-501 |
| 4. Rechargeable Battery Pack                | 427-502 |
| 5. DC Wire Harness (for PC board)           | 427-503 |
| 6. Power Switch Wire Harness (for PC board) | 427-504 |
| 7. Antenna Cable (for PC board)             | 427-505 |
| 8. Antenna                                  | 427-509 |
| 9. Case                                     | 427-103 |
| 10. End Plate (5 Pin Jack Side)             | 427-104 |
| 11. End Plate (Antenna, Power side)         | 427-105 |
| 12. End Plate Screws                        | 427-106 |
| 13. 5 Pin Jack                              | 427-506 |
| 14. 5 Pin Plug                              | 427-507 |
| 15. AC Power Adapter                        | 427-510 |

#### **Indicator Transceiver**

- |                                 |         |
|---------------------------------|---------|
| 1. PC Board                     | 427-201 |
| 2. Case                         | 427-203 |
| 3. End Plate (5 pin jack side)  | 427-104 |
| 4. End Plate (antenna side)     | 427-202 |
| 5. End Plate Screws             | 427-106 |
| 6. Antenna Cable (for PC board) | 427-505 |
| 7. Antenna                      | 427-509 |
| 8. 5 Pin Jack                   | 427-506 |
| 9. 5 Pin Plug                   | 427-507 |

## **Parts List cont.**

### **Stainless Steel Enclosure**

#### **Loadcell Transceiver**

- |   |           |
|---|-----------|
| 1. PC Board                                 | 427-301   |
| 2. Power Switch (toggle)                    | 427-302   |
| 3. Splashproof Boot (for toggle switch)     | 427-303   |
| 4. AC Power Jack                            | 427-501   |
| 5. Loadcell Connection Block                | 427-511   |
| 6. Plastic Standoffs                        | 427-304   |
| 7. Mounting Screws (for standoffs)          | 427-305   |
| 8. Cover plate                              | 427-306   |
| 9. Case                                     | 427-307   |
| 10.Screws (for cover plate)                 | 427-306-1 |
| 11.Washers (for cover plate)                | 427-306-2 |
| 12.Rechargeable Battery Pack                | 427-502   |
| 13.Power Switch Wire Harness (for PC board) | 427-504   |
| 14.DC Wire Harness (for PC board)           | 427-503   |
| 15.Battery Retention Plate                  | 427-310   |
| 16.Hex Nuts for Battery Retention Plate     | 427-310-1 |
| 17.Antenna Cable (for PC board)             | 427-505   |
| 18.Antenna                                  | 427-509   |
| 19.Strain Relief                            | 427-512   |

#### **Indicator Transceiver**

- |                                    |           |
|------------------------------------|-----------|
| 1. PC Board                        | 427-401   |
| 2. Loadcell Connection Block       | 427-511   |
| 3. Plastic Standoffs               | 427-304   |
| 4. Mounting Screws (for standoffs) | 427-305   |
| 5. Cover Plate                     | 427-402   |
| 6. Case                            | 427-403   |
| 7. Screws (for cover plate)        | 427-306-1 |
| 8. Washers (for cover plate)       | 427-306-2 |
| 9. Antenna Cable (for PC board)    | 427-505   |
| 10.Antenna                         | 427-509   |

**Notes**