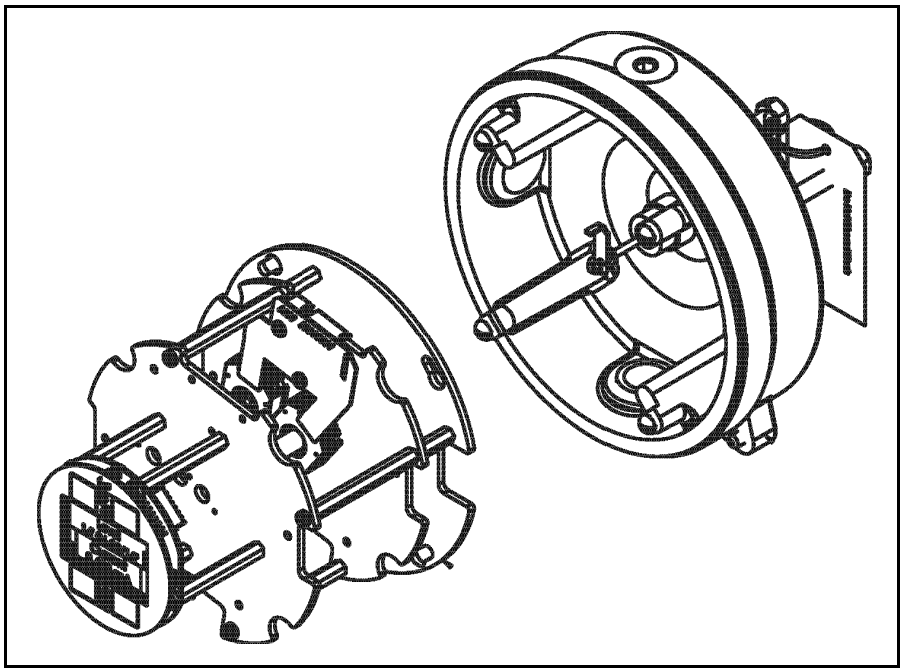
8200 AC Electronic Upgrade Instructions

This document provides directions for upgrading and configuring an 8200 Current Output Transmitter to an 8920 Loop Powered Transmitter.

Electronic Upgrading Steps



General Steps for Upgrading

The 8920 LPT fits within the 8200 COT's housing, so retrofitting and updating the hardware is performed following these steps:

1. **Mechanical** — Physically disconnecting the 8200 transmitter and replacing the transmitter with a new 8920 transmitter.
2. **Electrical** — Connecting the wiring to bring power to the 8920 within the housing.
3. **Setup/Configuration** — Configuring the 8920 LPT through the display interface.
4. **Calibration Setup** — Calibrating (if needed) the 8920 to fit the needs of the customer using it.

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Mechanical Retrofitting

Perform the following steps to remove the 8200's transmitter and replace it with the 8920's transmitter:

1. Remove the **enclosure cover**.
2. Remove the **four screws** for the 8200 encoder as well as the **rectangular washers**.
3. Slide the **8200 encoder assembly** off the central shaft.
4. Install the **8920 encoder assembly** on the central shaft.
5. Replace the **screws** and **washers** to the base to lock the encoder assembly into place.
6. Verify the **new encoder assembly** is secure.
7. Follow the "Electrical Wiring" on page 2 to ensure the wiring is connected.
8. Follow the "Configuring the 8200 Retrofit Display Interface" on page 5 to ensure the upgrade is configured for your tank.
9. Reinstall the **enclosure cover**.

Electrical Wiring

Loop Resistance

It is necessary to compute the total circuit resistance to determine the correct gauge of field signal wire to use. The maximum allowable total loop resistance (the sum of the wire line and receiver load resistance) may be calculated with the aid of the chart below.

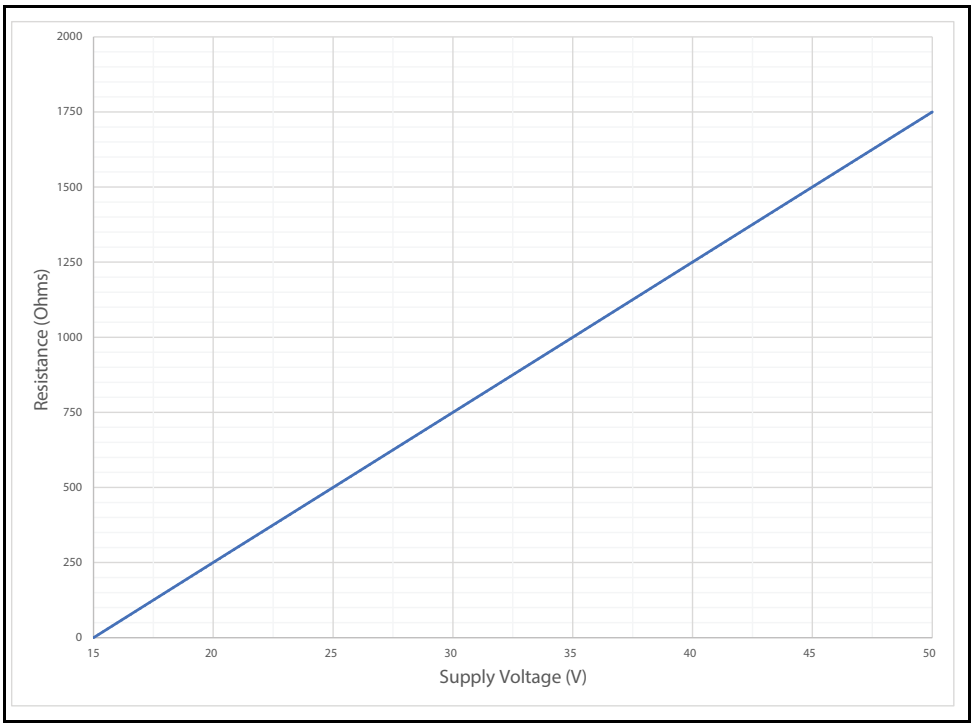
The following equation can be used to calculate maximum loop resistance (line and load):

MAX RESISTANCE = 50(DC POWER SUPPLY VOLTAGE -15)

Varec recommends that 22 gauge or larger size wiring be used.

Note The larger the gauge number the smaller the wire diameter.

Field conditions affect the wire choice and cost.



AC Electrical Connection

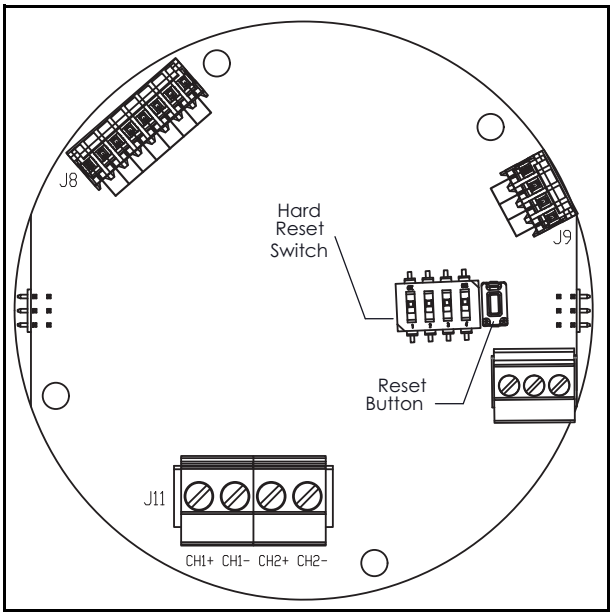
Follow the steps below to install AC line power:

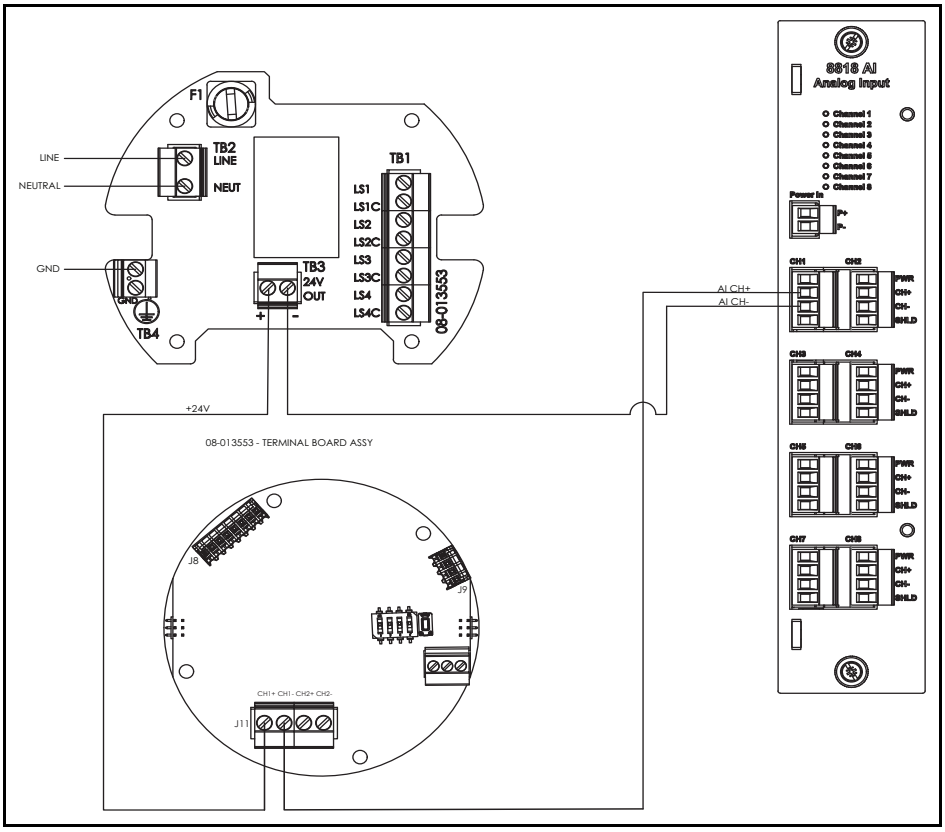
1. Connect the **AC Line Power** to the **TB2 LINE**.
2. Connect the **neutral connector** to the **TB2 NEUT**.
3. Connect the **ground connector** to the **TB4** (Ground Symbol).
4. On the terminal board, connect **TB3 24V+** to **J11 CH1+** on the display board.
5. On the display board, connect **J11 CH1–** to **AI CH+** on the 8818 AI Analog Input module.
6. On the 8818 AI Analog Input module, connect **AI CH–** to **TB3 24V–** on the terminal board.

Connecting the Electrical Wiring

Perform the following steps to connect the 8920's wiring:

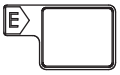
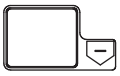
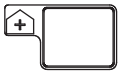
1. Plug the **display** into the **2-pin connector wire** and thread it through one of the side holes.
2. Connect the other end of the **2-pin connector wire** to the **RTU** such as the 8818 Analog Input card.


J8
J9
Hard
Reset
Switch
Reset
Button
J11
CH1+ CH1- CH2+ CH2-


F1
LINE
NEUTRAL
GND
TB2
LINE
NEUT
TB1
LS1
LS1C
LS2
LS2C
LS3
LS3C
LS4
LS4C
TB3
24V
OUT
TB4
08-013553
+24V
08-013553 - TERMINAL BOARD ASSY
J8
J9
J11
CH1+ CH1- CH2+ CH2-
8818 AI
Analog Input
Channel 1
Channel 2
Channel 3
Channel 4
Channel 5
Channel 6
Channel 7
Channel 8
Power In
AI CH+
AI CH-

Configuring the 8200 Retrofit Display Interface

Perform the following steps to configure the 8200 Retrofit's display interface to work with the equipment.

	Name	Function
	Cancel	Cancels the operation and returns you to the previous menu
	Enter	Enters the selection or confirms the selection made
	Minus (-)	Scrolls down through the menu options
	Plus (+)	Scrolls up through the menu options

Note To adjust the LCD contrast on the screen, go to the Main Data display by pressing the **E** and Plus (**+**) or the **E** and Minus (**-**) to adjust the contrast up or down respectively.To access the configuration menu tree, press Enter.

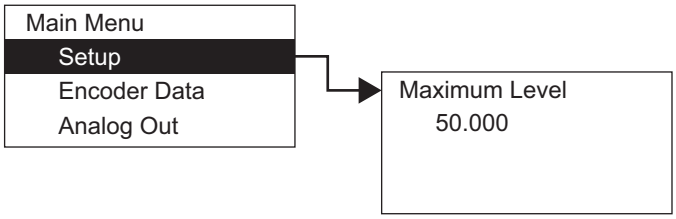
Setup

The Setup menu is used to configure various parameters of the device, such as level, temperature, communications and so on. The Setup parameters menu presents three options:

- Display Only — displays the current reading, such as with a level or temperature, or current setting such as feet or degrees Fahrenheit.
- Config Params — allows you to change the configuration parameters in Setup.
- All Params — scrolls through the Display, Commands, and Config parameters in one all inclusive list.

Access the Setup

1. Press **Enter** to access the Main Menu. The Setup menu is automatically highlighted.



2. Press the **up arrow** (the **+** arrow) or the **down arrow** (the **-** arrow) on the display interface to get to Setup.
3. Press **Enter** and the Setup menu opens.
4. To select one of the options, press **Minus** (-) to move the highlight to the option you want and then press **Enter**.

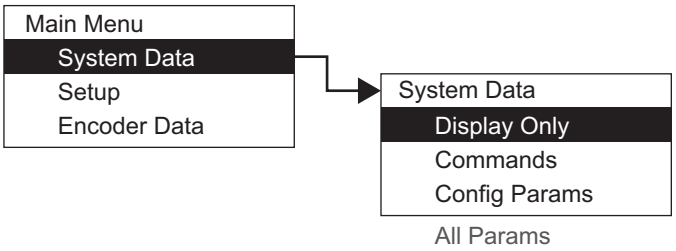
Refer to the table below for more information about each Setup option.

Setup		Description
	Maximum Level	The 20 mA value for the tank.
	Cal Level	Calibration Level is used to set (calibrate) the encoder level. **Note** If you enter a decimal value, the 8920 interprets the measurement as a decimal value and applies the Level Display Units to format the level. If you enter a string of numbers separated by a dash (xx - xx - xx), the 8920 applies the format of feet-inches-sixteenths.
	Enc Failure mA	The mA output value to alert the terminal unit if the encoder reaches a specific value. If an alarm is set to trigger in the inventory management/ SCADA software when the Enc Failure mA reaches the value, the user can be alerted.
	Gauge Type	Mechanical gauge type: • English for 2500 English • Metric for 2500 Metric
	Lev Disp Units	Level Display Units - how the level is formatted on the Display. For example: in decimal feet, or feet, inches & 16ths, meters, and so on.
	Enc Direction	The direction the encoder turns: • Forward for Varec 2500 • Reverse for L&J
	Minimum Level	The 4 mA value for the tank.

Access the System Data

If other system settings need to be configured, follow the steps below to set up the 8200 DC electrical upgrade:

1. Press **Enter** to access the Main Menu. The System Data point is automatically highlighted.



2. Press **Enter** to open the System Data parameters and the System Data options appear.
3. To select one of the options, press **Minus** (-) to move the highlight to the option you want and then press Enter.

Refer to the table below for more information on each System Menu option.

Display Only		**Description**
	softw. version	The firmware version
	Sys Checksum	CRC-16 Checksum of the firmware
	Build Date	The date the database structure was generated
	DB Size	The size of the database in bytes
	Num DB Pnts	The number of database points defined
	Board Number	The specific number of the encoder board
	Product SN	The product serial number
	Order Code	The product's order code of the encoder assembly added during production
	Pnt Checksum	CRC-16 Checksum of point's static configuration parameters
	Hardware Version	The PCB hardware version
Commands		**Description**
	Admin PIN	Allows you to set the administrative PIN code.
	Display Test	The Display test temporarily illuminates all segments of the graphical display to test the operation of the display.
	Reset Cmd	The Reset Command allows reset of the transmitter through the user interface. A soft reset restarts the application. A hard reset resets all configuration data to default values. **Note** Be careful not to perform a hard reset inadvertently.
	User PIN	Allows you to set the user PIN code.

Config Params		Description
	Tag	The Tag contains 7 bytes of data to identify the transmitter. The format of the TAG is “LT xxx” where xxx is the transmitter address.
	User Ref Level	
	Sec. Display 4 through 1	These parameters determine which data items is displayed in the lower (secondary) area of the display. Display 1 defaults to Tank Temperature. Display 2 to 4 default to no value. (undefined)
	Prim Display	This determines data value displayed in the upper (primary) portion of the LCD. The default in Tank Level.
	Display Timeout	The time in seconds without a key press before the Display returns to the main data display screen.
	LCD Contrast	Set the contrast on the LCD. The LCD contrast can be adjusted from the Main Data display by pressing the E and Plus (+) or the E and Minus (-) to adjust the contrast up or down, respectively.
	Backlight Ctrl	Sets how long the LCD back light is illuminated after the last key press. Setting this value to zero, causes the back light to illuminate continuously.
	Scroll Rate	The bottom portion of the display can display up to four data values by scrolling through the items. This parameter sets (in seconds) how long each item is displayed.
	leading zeroes	Select to display leading zeros in front of the numerical values.
	Format of zero	Selects either a zero or a zero with a slash.
	Decimal Sep.	Selects the display of the decimal separator, either a period (.) or a comma (,).
All Params		Lists all Display, Commands, and Config Params in a list.

Calibration

1. Press **E** to bring up the Main Menu.
2. Press the **up arrow** (the **+** arrow) or the **down arrow** (the **-** arrow) on the display interface to get to Calibration.
3. Press **Enter** and the Calibration starting screen opens.
4. Press the **up arrow** (the **+** arrow) or the **down arrow** (the **-** arrow) on the display interface to configure the calibration points as needed. Press **E** to move to the next digit. Press **E** after entering or accepting all of the digits to finish the calibration point value and to go to the next calibration point to configure.
5. Repeat Step 4 until finished.