

MC-4040 Repeater/Splitter

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Manual Part #: 180-0212A

DESIGN AND MANUFACTURE

ELECTRONIC EQUIPMENT

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1 Introduction

The MC-4040 is a line-powered signal repeater and splitter. Line-powered meaning that it receives its power from the data transmission cable and does not have a power supply itself. This unit has one data line input and up to three output data lines as well as two analog input channels. An updated version (P/N 253-0211A) also has two control output channels.

1.A Specifications

1.A.1 Physical

Temperature: 0-70 Deg C.

Humidity: 0-90% R.H. (no condensation)

Weight:: 12 lbs.

Dimensions: 12"H x 8.25"W x 4.75"D

1.A.2 Electrical

Operating Voltage: 12-28 VDC

Operating Current: 15-30 mA depending upon configuration.

Baud Rate: Slow (4800) and Fast (38.4k)

Analog Inputs: (2) 0-5VDC or 4-20 mA Current Loop

Control Outputs: (2) NFET Transistor 100 mA current sink (P/N 253-0211A)

2. Installation

Installing the MC-4040 is a simple series of tasks which will be explained in the following sections. A summary checklist of this procedure is listed in Section 3.

2.A Setting the Baud Rate and Address

The MC-4000 System offers two different modes of operation as summarized below:

Slow Mode

- 4800 Baud
- Low current allowing more sensors to be placed on a data line before the power has to be repeated.
- Almost any type of data cable can be used.

Fast Mode

- 38.4 kBaud
- Requires 16 gauge low-capacitance data transmission line.

Both modes are quick and efficient. However, the fast mode allows the system to be used for applications where speed is of utmost importance. The mode is selected with position 1 of the Setup Switch (Figures 1 and 2) where 'ON' is fast and 'OFF' is slow.

Positions 2-4 of the Setup Switch are not used in this card's application as an MC-4040 and should be set to 'OFF'.

Each remote station in the MC-4000 system must have a different address. The address switches, SW1 and SW2 (Figures 1 and 2), are self-explanatory. Simply dial up the desired address where SW1 represents the 'ones' place and SW2 represents the 'tens' place.

Figure 1, Repeater/Splitter Card Options

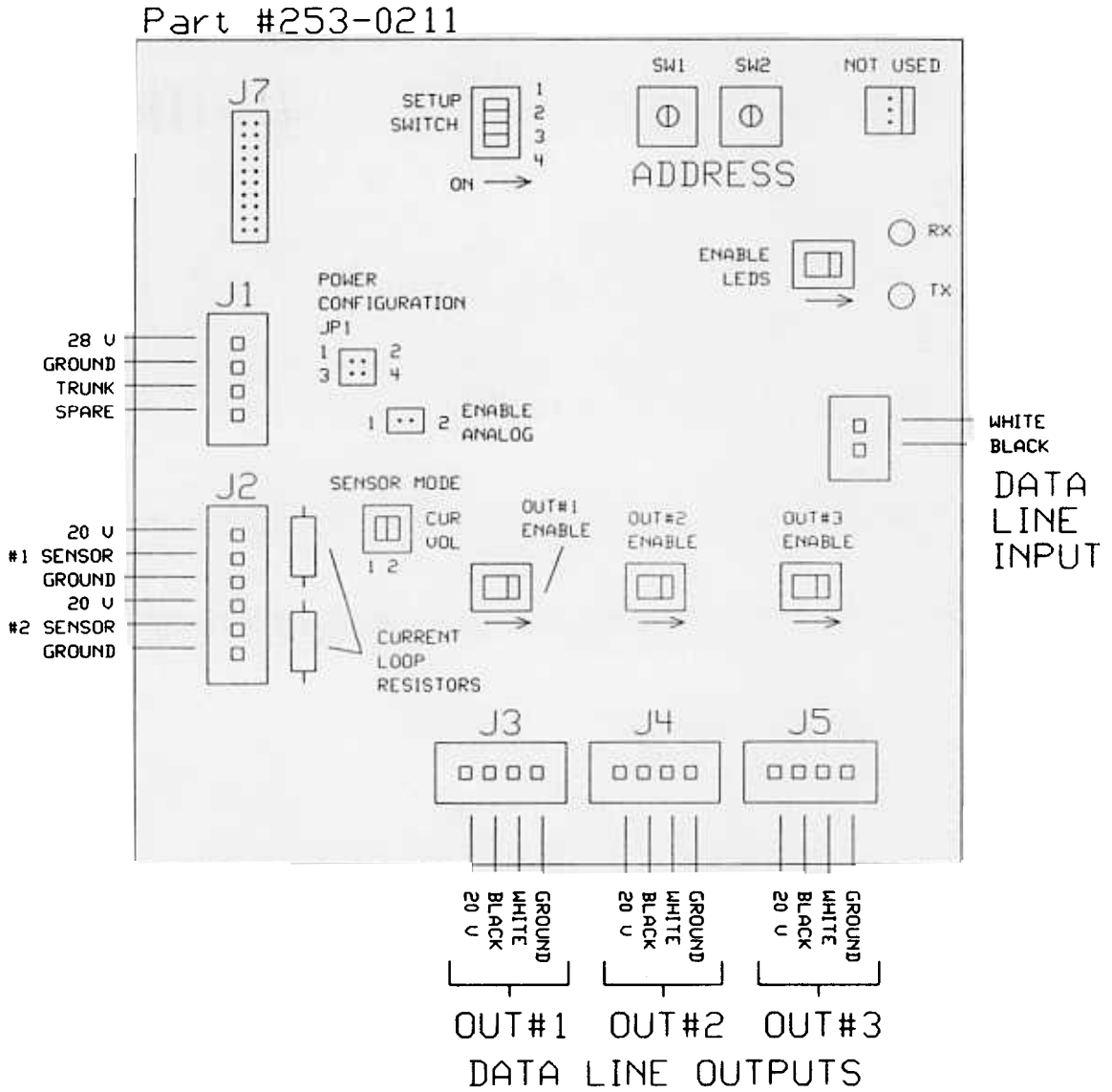
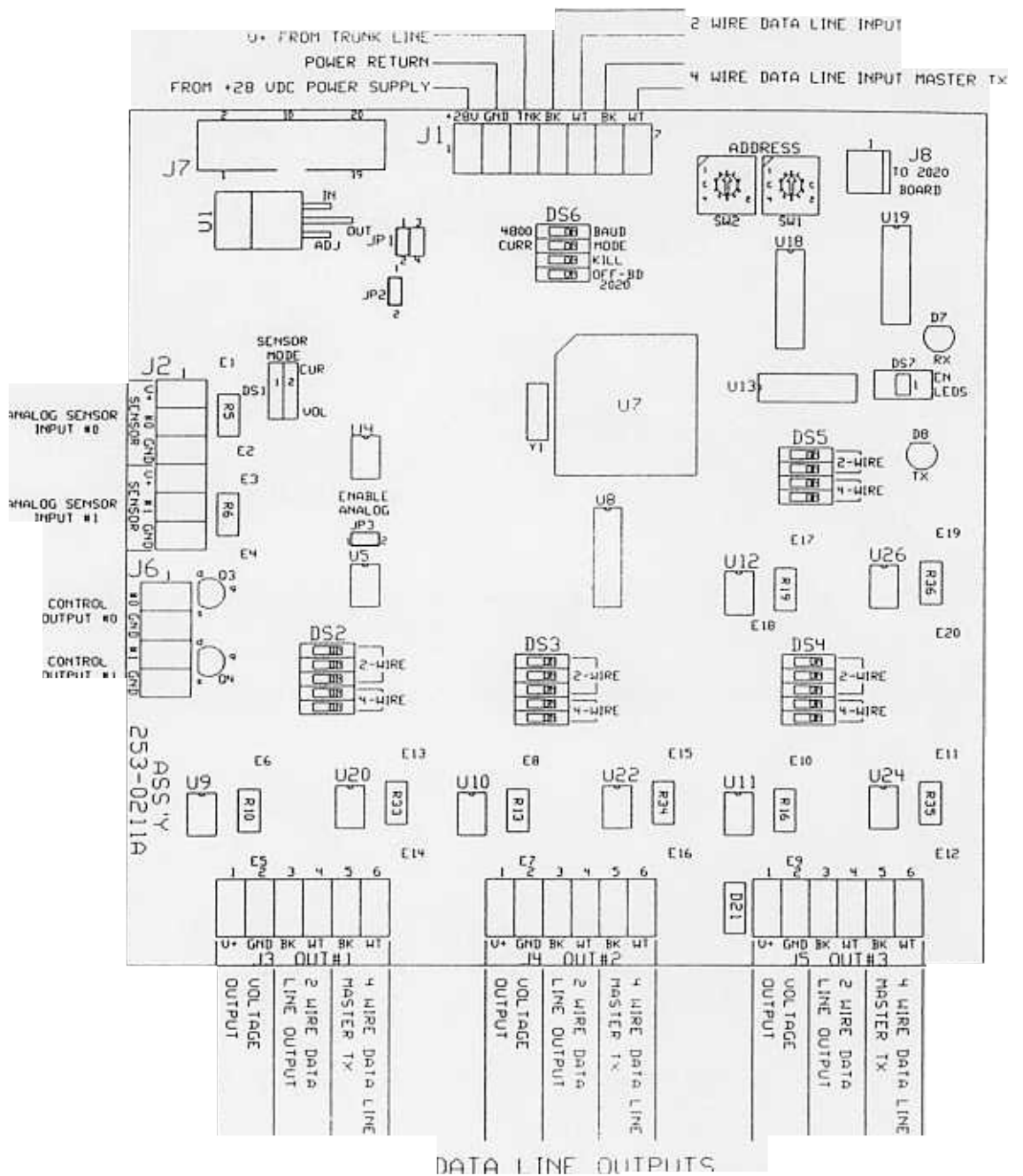


Figure 2, Repeater/Splitter A Card Options



2.B Communications and Power Conservation

The MC-4040 has one data line input and three data line outputs. Each of the outputs can be disabled to conserve power. Use the DS2, DS3 and DS4 (Output Enable) switches shown in Figure 1 for P/N 253-0211. Place the “two-wire switches” to ON for each of DS2, DS3, DS4 and DS5 switch, Figure 2, to enable the data input and outputs for P/N 253-0211A. An example of how the unit would be wired to repeat the data signal is shown in Figures 5 and 6. Although the output power on J3, J4 and J5 is labeled 20V, it is actually connected directly to the input voltage when the card is configured as described in Section 2.D. To split the transmission line, simply enable another output and connect the cable.

Two LEDs that blink when the system is active are located in the upper right corner of the card to help with troubleshooting. To conserve power, these LEDs can also be disabled using the switch located next to them as shown in Figures 1 and 2.

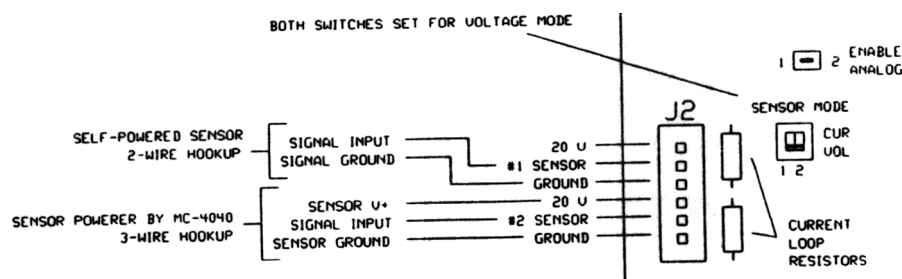
2.C Analog Inputs

The two analog inputs of the MC-4040 accept sensors with outputs from 0 to 5 VDC. Current loop sensors which provide a 4-20 mA output are also supported. The basic configuration uses a self-powered sensor and only the signal and ground are connected to the sensor input is shown in Figure 3. For this example, the sensor is shown connected to the input marked Sensor #1. Notice that position 1 of the Sensor Mode switch is set for voltage mode.

The next sensor configuration is a 3-wire hookup where the sensor is powered from the MC-4040 as shown in Figure 3 on the input marked Sensor #2. The Sensor Mode switch for this type of sensor is also set for voltage mode.

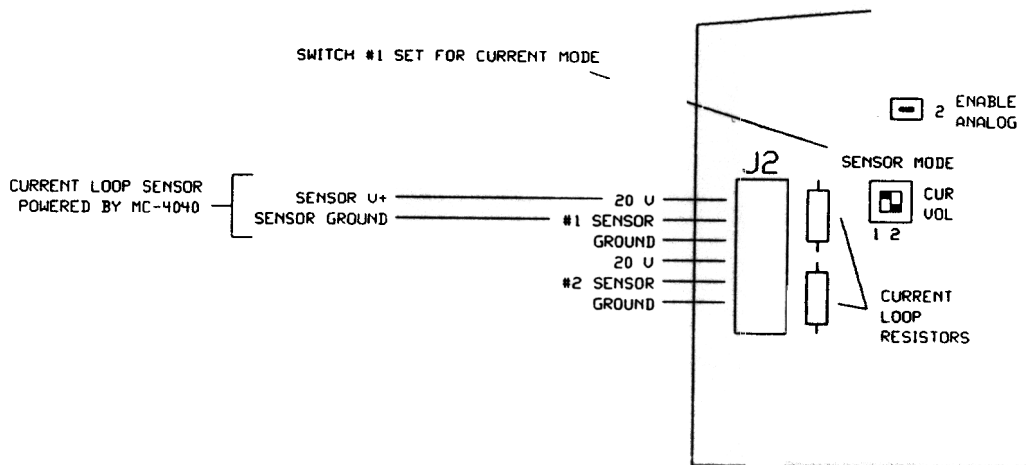
NOTE: The ENABLE ANALOG jumper (JP3) should always be installed even if analog inputs are not used.

Figure 3, Analog Input Examples



Finally, an example of a current loop sensor is shown in Figure 4. The current loop resistors must be installed when using current loop analog inputs.

Figure 4, Analog Input Examples



2.D Powering the Unit

The repeater/splitter card used in the MC-4040 can be powered in two ways depending on the application. In this case, the power supplied by the data transmission line should be connected to TRUNK(+) and GROUND(-) on J1; see Figure 5 and 6. Also, a shorting jumper should be placed across pins 3 and 4 of jumper area JP1. These options are used to conserve as much power as possible.

NOTE: Jumper JP2 should always be installed.

Figure 5, Basic Repeater

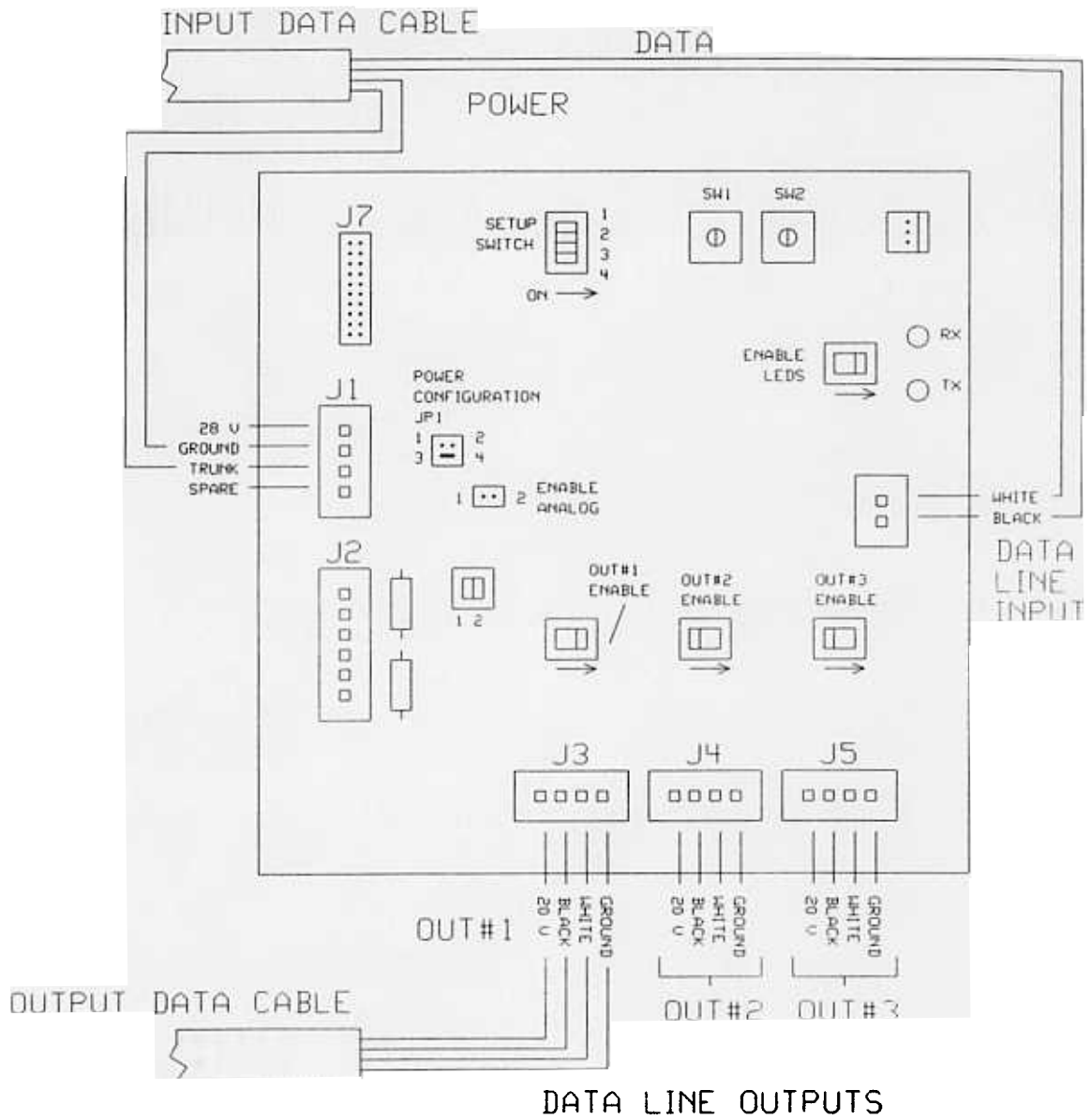
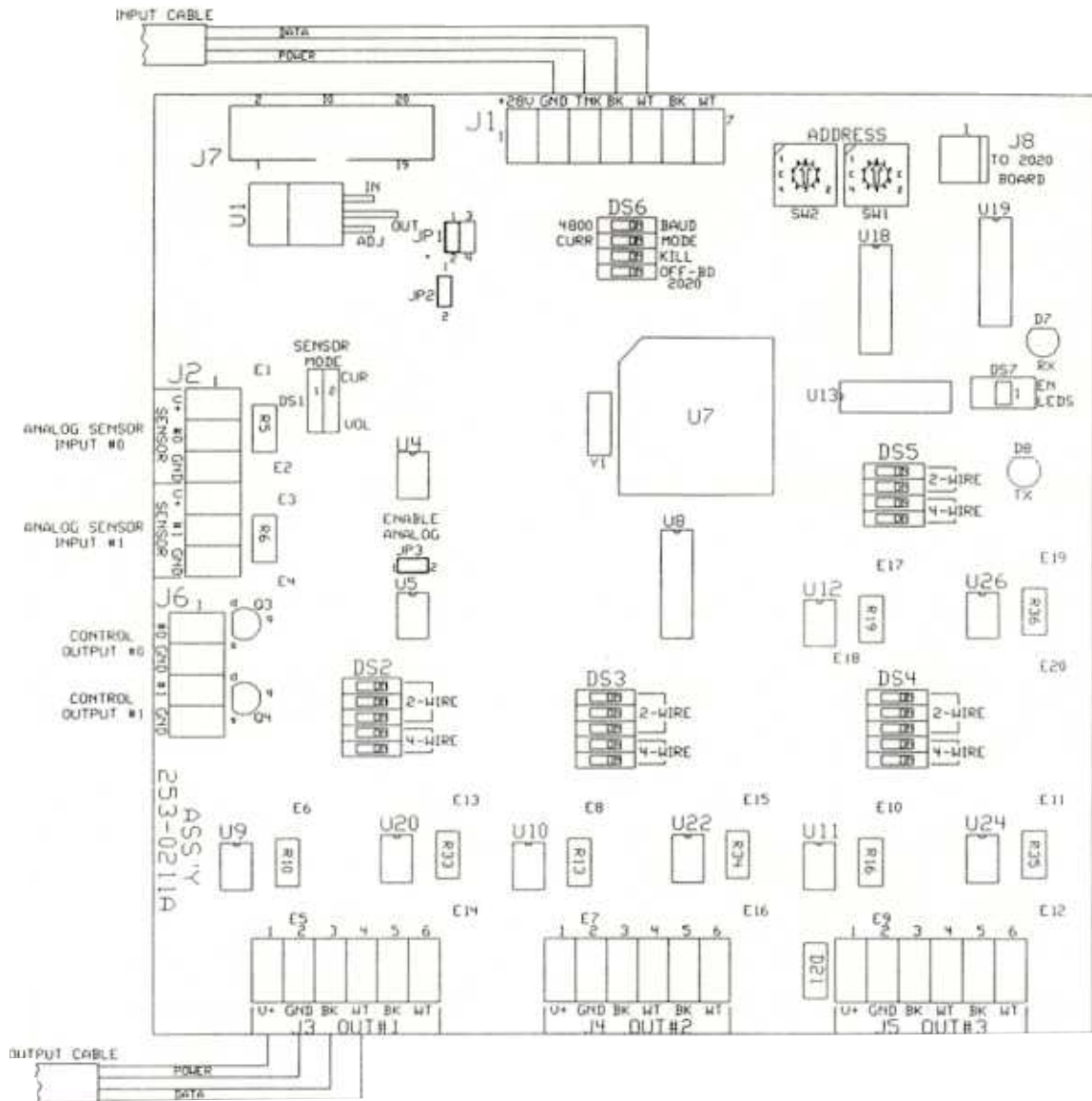


Figure 6, Basic Repeater A



3 Installation Checklist

- Set the baud rate and address (Section 2.A).
- Connect the data line to the input and enable and connect as many output lines as necessary (Section 2.B).
- If desired, connect sensor(s) to the sensor inputs (Section 2.C).
- Connect power (Section 2.D)