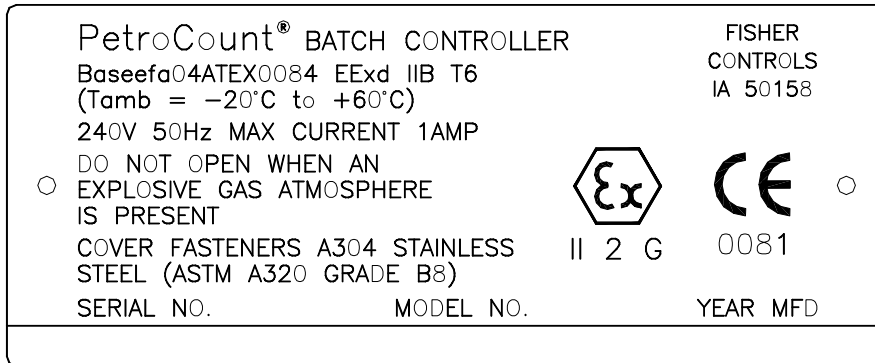


PetroCount[®] SMS and RMS Preset (ATEX Version)



D0C0524A

Figure 1. PetroCount Label

The PetroCount[®] Sequential Management System (SMS) provides precise sequential blending batch delivery for custody transfer of petroleum, industrial, and chemical products. The PetroCount Ratio Management System (RMS) provides precise ratio blending batch delivery for custody transfer of petroleum, industrial, and chemical products.

This instructions sheet is to be used with the *Model PetroCount SMS Sequential Management System Instruction Manual (X-0511-SMS)*, the *Model 0511 PetroCount Sequential Management System Instruction Manual (X-0511-SMS-Eng)*, and the *PetroCount Ratio Management System Instruction Manual (X-0511 RMS-2)*. For full cautions and descriptions of installation and troubleshooting procedures, refer to the manuals.

CAUTION

When installing units in a hazardous area, make sure all installation components selected are labeled for use in such areas. Installation and maintenance must be performed only when the area is known to be non-hazardous. Installation in a hazardous area could result in personal injury or property damage.

Dangerous voltages are present in a control unit when power is applied. Whenever

possible, turn off power before you perform installation, configuration, or maintenance tasks. Wiring of powered equipment could result in personal injury or property damage.

To avoid circuit damage when working inside the unit, use appropriate electrostatic discharge precautions, such as wearing a grounded wrist strap.

To maintain explosion-proof integrity of the PetroCount unit, follow all procedures carefully. Pay particular attention to the condition of the flange surfaces which comprise the explosion proof joint.

Before proceeding with the start-up procedure, you must have a securely closed block valve upstream of the flow control valve to prevent unwanted product flow. Also, the pump control circuits must be turned off.

Any default parameters set at the factory are not intended to provide a safe initial system check. Be sure to review the configuration.

As most adjustment tools have non-conductive handles, they are potential sources of static electricity. To ensure complete discharge of a tool, both its handle and metallic surfaces must be discharged before you use it.

D301218X412

Specifications

ELECTRICAL INSTRUMENT POWER

115 volts ac Configuration: 95 to 135 volts ac, 47 to 63 Hz. 0.25 Amp max. without heaters operating. 1.0 Amp max. with heaters operating.

230 volts ac Configuration: 190 to 270 volts ac, 47 to 63 Hz. 0.125 Amp max. without heaters operating. 0.50 Amp max. with heaters operating.

INPUTS

12 volts dc Source Meter Pulse Inputs (intended for pulsers that generate 12 volts dc pulses)

Threshold: 6.3 ± 0.5 volts dc.
Input Resistance: 1.5 Kohms.
Maximum Input Voltage: 30 volts dc.
Maximum Input Frequency: 10 KHz.
Maximum Input frequency for Additives: 5 KHz.

5 volts dc Source Meter Pulse Inputs (intended for pulsers that generate 5 volts dc pulses)

Threshold: 2.0 ± 0.4 volts dc.
Input Resistance: 2 Kohms.
Maximum Input Voltage: 30 volts dc.
Maximum Input Frequency: 10 KHz.
Maximum Input frequency for Additives: 5 KHz.

Sink Meter Pulse Inputs (intended for pulsers with open collector or contact closure outputs)

Nominal Applied Voltage: 12 volts dc.
Nominal On Current: 8 mAmp.
Maximum On Resistance: 700 ohms.
Maximum On Voltage: 4.0 volts dc.
Maximum Off Leakage: 1.0 mAmp.
Minimum Input Frequency: 10 kHz.

Digital Inputs (For use with open collector or contact closure inputs only)

Nominal Applied Voltage: 12 volts dc.
Nominal On Current: 6 mAmp.
Maximum On Resistance: 1.5 Kohms.
Maximum On Voltage: 4.0 volts dc.
Maximum Off Leakage: 0.5 mAmp.
Minimum Pulse Width: 15 ms.

AC Permissive Power Detect Inputs

Input Voltage: 90 to 270 volts ac (47 to 63 Hz).
Input Impedance: 56 Kohms.

PRTD Inputs

Connection Type: 4-wire.
Accuracy: $\pm 0.139^\circ\text{C}$ over a range of -45 to 232°C .
Drive Current 1 mAmp.

Current Loop Inputs

Input Resistance: 110 Ohms.
Nominal Input Current: 4-20 mAmp.
Maximum Input Current 45 mAmp.

OUTPUTS

AC Solid State Relays

Load Voltage: 24 to 280 volts ac (25 to 79 Hz).
Maximum Current: 1.5 Amp.
Maximum Off State Leakage: 6 mAmp.
Maximum On State Voltage Drop: 1.6 volts ac.

DC Solid State Relays

Load Voltage: 3.0 to 60 volts dc.
Load Current: 0.01 to 1.5 Amp.
Maximum Off State Leakage: 1.0 mAmp.
Maximum On State Voltage Drop: 1.85 volts dc.

Digital Outputs

Maximum Off State Voltage: 60 volts dc.
Maximum On State Voltage: 1.0 volts dc with a current of 0.25 Amp.
Maximum On State Current 1.0 Amp.
Maximum Off State Leakage: 1 μ Amp.
Maximum Output Frequency: 1 KHz.

DC Power Sources (For use with Pulsers, Digital Outputs, and Current Loop Transmitters)

+12 Vdc Regulated at 300 mAmp, Fused at 750 mAmp.
+24 Vdc Unregulated at 100 mAmp, 1% ripple maximum, Fused at 250 mAmp.

AC Power Sources for Use with Relays

Line Power Fused at 3 Amp.
Permissive Power Fused at 3 Amp.

ENVIRONMENTAL

Ambient Operating Temperature: -20 to 60°C .

Storage Temperature: -40 to 79°C .

Operating Humidity: 0 to 95%, non-condensing.

Vibration: SAMA Standard PMC 31.1 -1980 Section 5.3 (Condition #2 - Field Mounted).

Shock: Drop and Topple test from a height of three feet when packaged in its normal shipping container.

EMI/RFI: Meets Emmission requirements for industrial locations per EN61000-6-3:2001. Meets Immunity requirements for industrial locations per EN61000-6-2:2001.

Salt Fog: NEMA 4X.

APPROVALS

Evaluated per the following European standards:

EN 50014 (1998).

EN 50018 (2000) + A1 (2003).

Product Markings for Hazardous Locations:

EEx d IIB T6 ($T_{amb} = -20$ to 60°C).



II 2 G.

Cert. No. Baseefa 04ATEX0084.

The following tools are required for installation, maintenance and troubleshooting:

- Phillips-head screwdriver.
- Flat-head screwdriver.
- Hex socket wrench.

1. When you receive the PetroCount unit, check the packing case for any damage incurred during shipment. Although the components are rated for significant levels of shock and vibration, avoid rough handling and dropping the units.

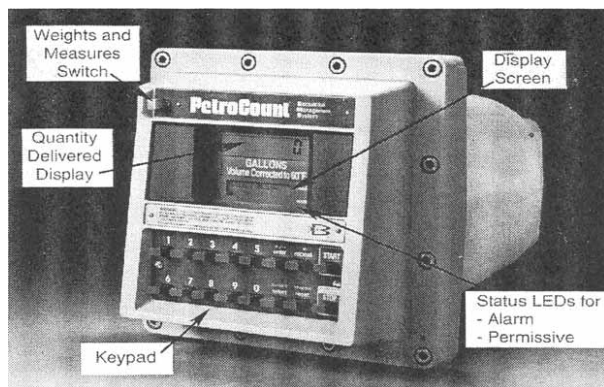


Figure 2. PetroCount SMS Unit

2. Mount the PetroCount case in an upright position. This is the only possible mounting orientation. Refer to Figure 5.

The display viewing angle is adjustable and should be positioned at a height that best facilitates operation.

The Control Unit has three 1-1/4 inch NPT openings for conduit connection. Remove the plastic plugs that ship from the factory.

Install conduit in the appropriate openings. All AC power and control connections are located to the right hand side of the unit. All data communication port connections and low level signal connections are located to the left and middle of the unit.

Unused conduit entries must be fitted with suitable certified flame-proof stopping plugs.

Electrical conduits connected to the explosion proof housing must be internally sealed within 450 mm of the Control Unit to limit an explosion to a single enclosure and to prevent hazardous gases from migrating. The conduit seal prevents pressure piling or pre-compression. Sealing the conduit may be accomplished by the installation of a conduit seal. The seal should be

installed in the conduit as recommended by the manufacturer.

The cable entry devices, thread adaptors, and stopping plugs used shall be suitable for the equipment, cable and conditions of use, and shall be certified as Equipment (not a component) under an EC Type Examination Certificate to Directive 94/9/EC.

The PetroCount must be installed with shielded cables:

- ◆ Signal cable must have near 100% shield coverage.
- ◆ Power cable must have at least 80% shield coverage.
- ◆ Interprocessor cable must have 100% shield coverage.

The shield must be connected to the housing over 360° via a suitable cable. Any other additional screening, if present in the cable, must be connected to the case using the ground lugs provided inside the unit. Unused wires must be connected to case ground via the ground lugs.

- ❖ **NOTE:** Do not attempt to install field wiring in new installations, until after you configure the hardware.

3. Configure the electrical circuits and software database. The electrical circuit options are selected by bit links (jumpers) on the Pulse Processor and System I/O boards. Refer to Figure 3, Figure 4, and Figure 7. For information on the functions of each bit link, refer to the *Model PetroCount SMS Sequential Management System Instruction Manual (X-0511-SMS)* and the *PetroCount Ratio Management System Instruction Manual (X-0511 RMS-2)*.

The configuration of the software database is described in the *Model 0511 PetroCount Sequential Management System Instruction Manual (X-0511-SMS-Eng)* and the *PetroCount Ratio Management System Instruction Manual (X-0511 RMS-2)*. Check your application, to establish the values for each parameter.

4. Connect the field wiring and grounding.

Leave approximately 2.5 cm extra wire on each incoming field wire to permit the connector circuit board to be removed and folded down during service. A complete service loop is not recommended to prevent overcrowding the wiring compartment.

Terminal blocks 4, 5, and 6 accept wire sizes 12 to 28 AWG. Terminal blocks 1, 2, and 3 accept wire sizes 18 to 28 AWG.

a. **Power.** The Control unit provides for three separate ac power circuits: instrument power, permissive power, and auxiliary power. A separate fuse is provided for each of these power circuits.

A schematic of the internal power and ground circuits is shown in Figure 6. The permissive power sense circuit on the solid state relay card requires both L1 and L2 to operate. If a separate AC circuit is provided for permissive power, then the permissive L2 line must be provided.

For a full list of the terminations and their functions, refer to the *Model PetroCount SMS Sequential Management System Instruction Manual (X-0511-SMS)* and the *PetroCount Ratio Management System Instruction Manual (X-0511 RMS-2)*.

❖ **NOTE:** You must select the operating voltage of the PetroCount unit (115 or 230 volts ac). You make this voltage selection by installing wire bit links (jumpers) on Terminal Block TB6. The jumper placement is illustrated in Figure 3. A plastic packet with four wire jumpers has been placed inside the unit.

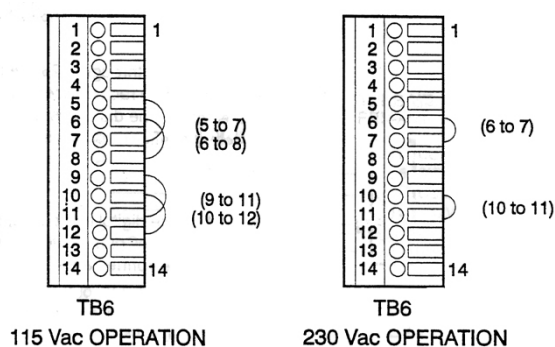


Figure 3. Power Selection Bit Links

b. **I/O.** Each signal type has its own set of wiring considerations. Refer to Table 1.

The Digital Inputs and meter Pulse Inputs are not isolated from the PetroCount power supply. No external power supplies may be connected.

The Digital Outputs are isolated from the PetroCount power supply. External power supplies may be connected.

The Control unit Analog Input circuits are referenced to signal ground at the Control unit.

If multiple devices are to be tied to a particular current loop signal, the Control unit must be the sourcing device on the loop, supplying both 24 voltsdc power and ground reference for the loop (that is to say, the Control unit can not be a passive sensor on the loop).

c. **Communications.** Two separate communication ports are provided. Both are isolated from the PetroCount power supply. A typical use of the two ports is one for multi-drop connection to a printer and one for a link to a terminal automation computer. These connections can be EIA-232 (RS-232) or EIA-485 (RS-485). Refer to the *Model PetroCount SMS Sequential Management System Instruction Manual (X-0511-SMS)* and the *PetroCount Ratio Management System Instruction Manual (X-0511 RMS-2)* for a full set of wiring schematics.

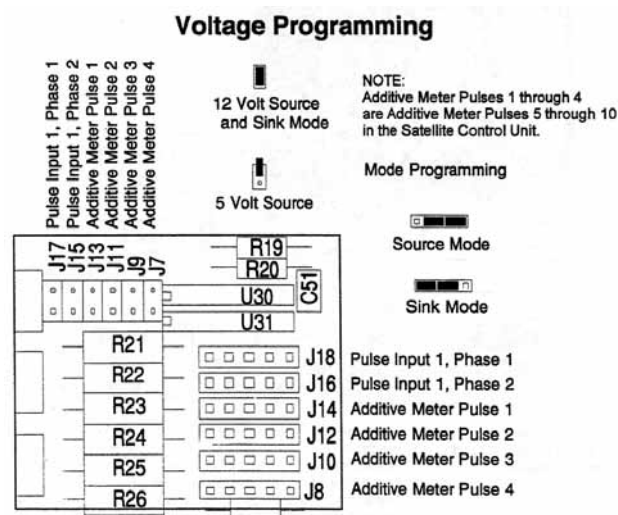


Figure 4. Pulse Input Bit Links

5. After completing the field wiring, close and seal all conduit accesses. When closing the unit, be sure all wires and cables clear the door flanges. Verify that the cover O-ring seal has been installed properly.

6. The PetroCount unit is now ready to go on-line. Follow the caution regarding a securely closed block valve. Apply power to the circuit that feeds the Control unit.

The front panel light should come on and "Select Blend / Off" should appear. If it does not, verify the circuit configurations and wiring connections.

7. Verify and set parameters in the PetroCount database to complete the start-up procedure.

The *Model 0511 PetroCount Sequential Management System Instruction Manual* (X-0511-SMS-Eng) and the *PetroCount Ratio Management System Instruction Manual* (X-0511 RMS-2) provide the information required to access and change settings in the parameter groups.

- a. Turn off the front panel security switch.
- b. Enter the access code for program mode.
- c. Verify the parameter settings.
- d. Change the settings as required by your application.
- e. When using a PetroCount RMS, select the recipes as required by your application.

8. Adjust the digital valve control algorithm. The flow meter must have sufficient pulse resolution, and the control valve opening and closing speeds must be properly set for the digital valve control algorithm to work smoothly. Refer to the *Model PetroCount SMS Sequential Management System Instruction Manual* (X-0511-SMS) and the *PetroCount Ratio Management System Instruction Manual* (X-0511 RMS-2) for the tables and figures to perform these adjustments.

❖ **NOTE:** Product must flow through the valve to perform the necessary adjustments. You must provide a suitable container to catch the product flow through the system.

9. Adjust the opening rate to be as slow as required to achieve flow rate lock during the no-flow to low-flow transitions with a minimum number of solenoid valve actuations (listen for the clicks). Adjust the closing rate to be as fast as possible without experiencing excessive flow rate undershoot and no shut-off during high-flow to low-flow or stop transitions.

❖ **NOTE:** The pressure stability of the pump system is critical for smooth control valve operation. All pump systems must be sized properly to assure good system stability under all flow conditions.

Adjustments are made by turning the corresponding needle valve clockwise (to decrease) and counterclockwise (to increase). Refer to *Model PetroCount SMS Sequential Management System Instruction Manual* (X-0511-SMS) and the *PetroCount Ratio Management System Instruction Manual* (X-0511 RMS-2) for a full explanation of this procedure.

10. Perform a final stop adjustment after the flow rate and response time adjustments. Refer to *Model PetroCount SMS Sequential Management System Instruction Manual* (X-0511-SMS) and the *PetroCount Ratio Management System Instruction Manual* (X-0511 RMS-2) for a full explanation of this procedure.

11. Perform a prover calibration on the unit on-site to achieve optimal meter performance. This may be required by your local weights and measures authority.

12. If the RTD probe has not been installed, do so and make the wiring connections to the RTD terminals in the Control unit. Then, set the RTD Offset. Set the value to zero. The *Model 0511 PetroCount Sequential Management System Instruction Manual* (X-0511-SMS-Eng) and the *PetroCount Ratio Management System Instruction Manual* (X-0511 RMS-2) provide information on setting this parameter.

13. Close the Control unit and secure all twelve cover bolts. Then, return the security switch to the sealed position. Wire seal the security switch and special cover bolts.

14. While in operation the PetroCount unit allows functions to be performed at the keypad on the front of the unit. The Delivery "Driver ID#" display indicates that the unit is ready to start a delivery. For the full delivery procedure, refer to *Model PetroCount SMS Sequential Management System Instruction Manual* (X-0511-SMS) and the *PetroCount Ratio Management System Instruction Manual* (X-0511 RMS-2).

15. If at any time during operation, the unit does not seem to be functioning properly, conduct a diagnostics test by entering the Access Code for program mode, pressing the Select button, and when "Test" appears pressing the Enter button. Refer to *Model PetroCount SMS Sequential Management System Instruction Manual* (X-0511-SMS) and the *PetroCount Ratio Management System Instruction Manual* (X-0511 RMS-2) for the full procedure and test code definitions.

If you are experiencing problems that appear to be hardware-related, return product to:

Emerson Process Management
Flow Computer Division
Outgang Lane
Pickering, North Yorkshire UK Y018 7JA

16. To remove the PetroCount unit from operation, disconnect power from the unit and then remove all external wiring connections. Remove the PetroCount from the mounting apparatus. The unit may be placed in a case or box for transportation.

Table 1. Field Signal Wiring

Terminal Block	Signal Type	Designator
TB2	Digital Input Digital Output Meter Pulses	AMP1 to AMP10 (SMS) AMP1A, AMP2A (RMS) DI1 to DI4 MMP, AMP1-4
TB3	RTD Analog Input	RTD1 to RTD3 AI1, AI2
TB4	Solid State Relay Auxiliary Power Permissive Power	K1A to K10A Hot Hot
TB5	Solid State Relay Auxiliary Power Permissive Power	K1A to K10A Return Return

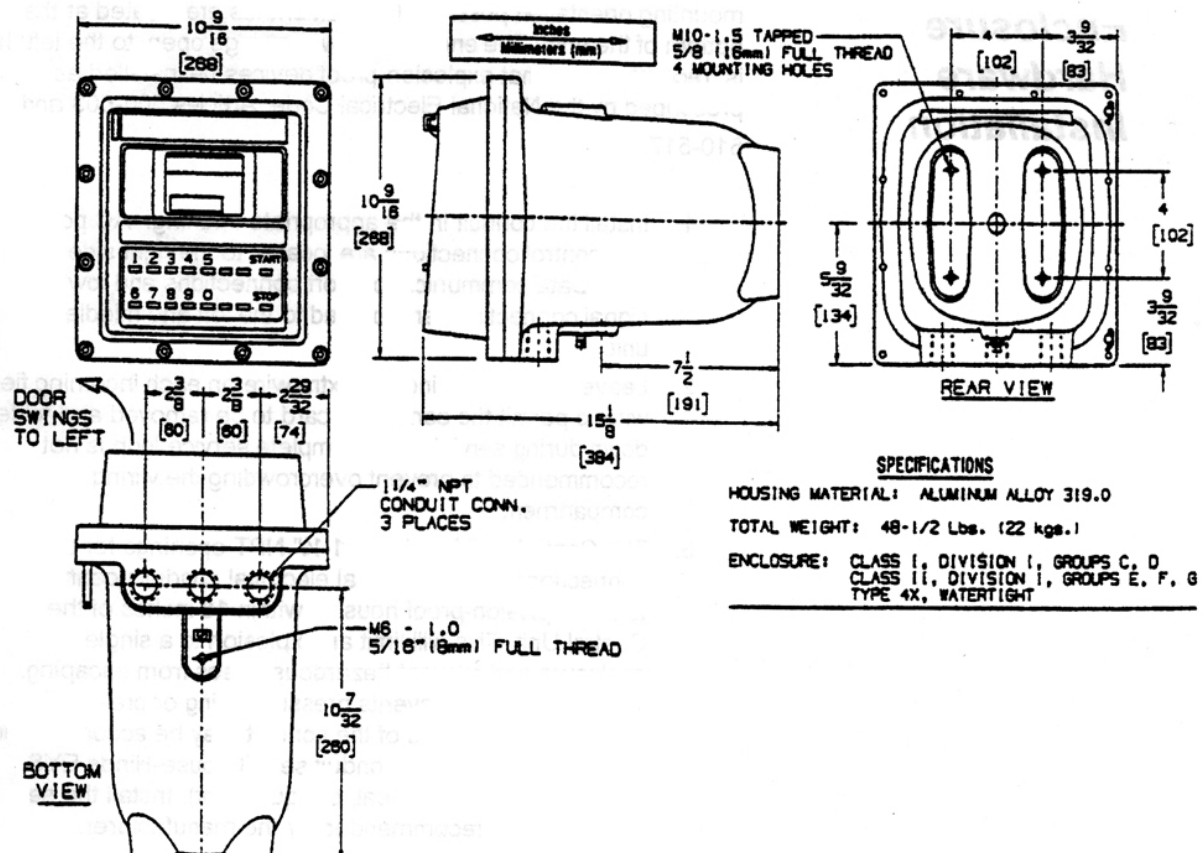


Figure 5. Mounting Dimensions

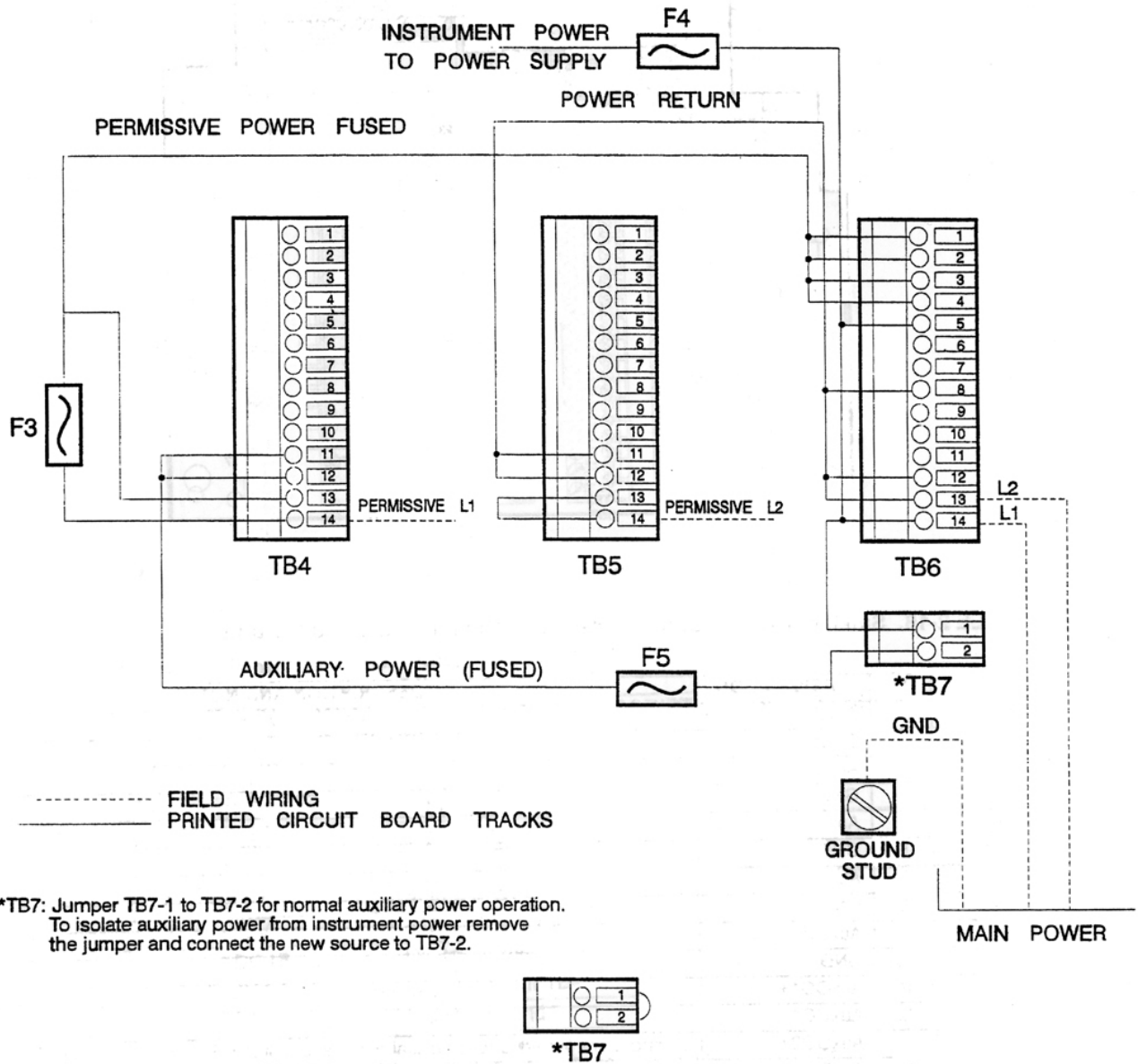


Figure 6. Power Schematic

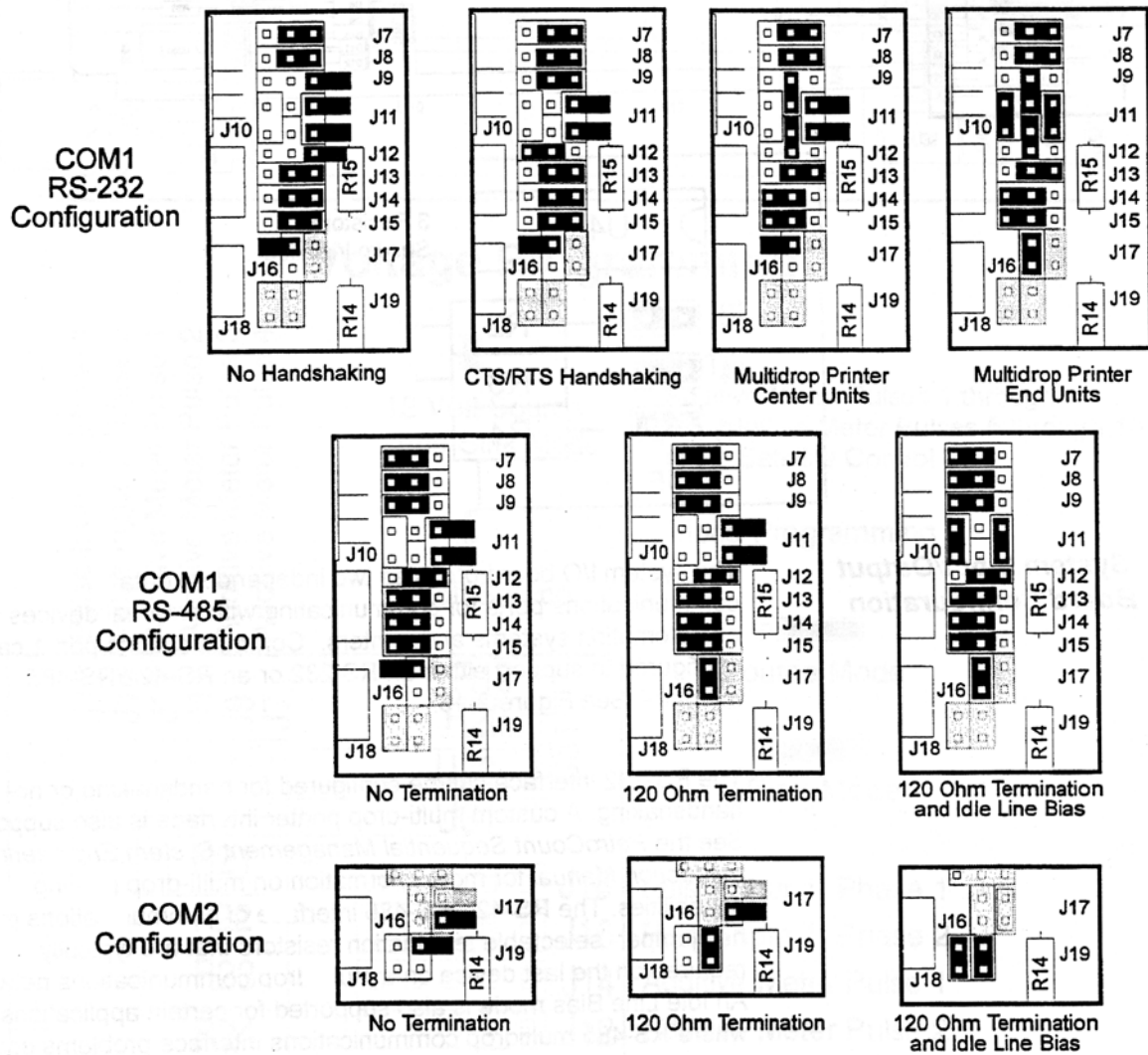


Figure 7. Communication Bit Links

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