

**Technical Description
for
Pumped Ink Supply
P/N 11930-UV
P/N 11930-H2O**

PRELIMINARY

Revision History

Revision	Description	Date
-	Initial Release	TBD

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Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information about the system.

CAUTION: A CAUTION indicates potential damage to hardware if instructions are not followed.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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1. Basic Theory of Operation

The Pumped Ink Supply contains the pneumatics and fluidics required to deliver ink and flush to any of the ARRAY printing systems. The ink is supplied in a bag in box format. The box has an RFID tag on the bottom that identifies the type and amount of ink in the box. Installation of an ink box into the supply is as simple as placing the box in the holder on the front of the ink supply and attaching the input connector to the fitting on the top of the ink box.

Once the printing system and the ink supply are connected and turned ON and the RAPTOR software is running on the connected Windows 7 PC, the ink supply will continuously look for an RFID tag. When an ink box is installed and its RFID tag is read, the RFID tag on the box is compared against the type of ink required by the particular printing system and if a match, the ink supply will fill from the box (if needed) and indicate to the RAPTOR printing system that it is ready. If not a match, the ink will not be pumped from the box, an error code will be sent to the RAPTOR printing system and the status LED on the top of the ink supply will be flashing RED.

Ink is moved from the external bag/box to an internal storage tank using a liquid pump. A three way valve selects either the ink path to the tank or the flush path around the tank. The tank has a float that will turn the ink pump OFF when the fill level is reached and back ON when the tank needs to be refilled. There is always some ink in the tank, even when the float indicates that it needs to be refilled.

The RAPTOR printing system controls the ink delivery to the printer by sending commands to the ink supply to start and stop the deliver operation as ink is needed by the printer. In the ink supply, delivery is performed by opening a valve at the bottom of the tank to allow ink to flow. An air pump system will then pressurize the tank to force the ink to the printing system. Pressure is programmable and is set for the type of printing system being used. The internal tank may be automatically refilled from the ink box while delivery is in process.

If a flush box is installed, the 3 way valve at the top of the tank is turned ON and the valve at the bottom of the tank is turned OFF. This routes the flush around the ink tank (preventing ink and flush from mixing in the tank) to minimize the amount of ink needed to refill the system after a flush. When commanded by the RAPTOR printing system, the ink supply will use the liquid pump to directly move the flush from the bag/box to the ink supply output and to the printer. The ink pump has a check valve in parallel (from input to output) that will turn ON if pressure exceeds 10psi, preventing the ink pump from over pressuring the line if there is a valve failure or blockage in the printer.

During operation, the ink supply will track ink usage (flush is not tracked) and periodically update the RFID tag on the box with the amount of ink used until the box is empty. At that time the RFID tag on the box will be marked as empty so that the box can not be refilled. The RAPTOR printing system will display a gauge showing the ink usage and the ink supply status.

2. Operational Description of Transmitter

The transmitter is composed of a TI TRF7960 RFID chip. The TRF7960/61 is an integrated analog front end and data-framing system for a 13.56-MHz RFID reader system. The RF interface is conditioned by an impedance matching network, and transmitted through a 4"long SMA cable to and Antenna PN 119321-01.

The transmitter has selectable output power levels of 100 mW (20 dBm) or 200 mW (23 dBm) into a 50- Ω load (5 -V supply) and is capable of ASK or OOK modulation. Data transmission comprises low-level encoding for ISO15693, modified Miller for ISO14443-A, high-bit-rate systems for ISO14443 and Tag-it coding systems. Included with the data encoding is automatic generation of SOF, EOF, CRC, and / or parity bits.

The receiver system enables AM and PM demodulation using a dual-input architecture. The receiver also includes an automatic gain control option and selectable gain. Also included is a selectable bandwidth to cover a broad range of input sub-carrier signal options. The received signal strength for AM and PM

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modulation is accessible via the RSSI register. The receiver output is a digitized sub-carrier signal among a selectable protocol and bit rate. A selected decoder delivers bit stream and a data clock as outputs. The receiver system also includes a framing system. This system performs CRC and / or parity check, removes the EOF and SOF settings, and organizes the data in bytes. Framed data is then accessible to the MCU via a 12-byte FIFO register and MCU interface. The framing supports ISO14443 and ISO15693 protocols.

This complete subsystem provides for bidirectional communications with the passive RFID Tag attached to the underside of the Ink Box which contains information about the ink contained in the bottle so that the pumping system may be appropriately configured.

3. Technical Specifications

Power

Unit	Voltage	Current
Ink Supply (11930)	24VDC to 28VDC	600mA

Physical

Unit	Height	Width	Depth	Weight
Ink Supply (11930)	14.50 (36.8cm)	4.0 (10.2cm)	7.7 (19.6cm)	7.5lbs (3.4KG)
Ink Box (incl. connector)	12.0 (30.5cm)	3.2 (8.2cm)	4.1 (10.5cm)	TBD

Environmental

Temperature:

Operating: 50° to 95°F (10°C to 35°C)

Storage: –40° to 149°F (–40° to 65°C)

Relative humidity:

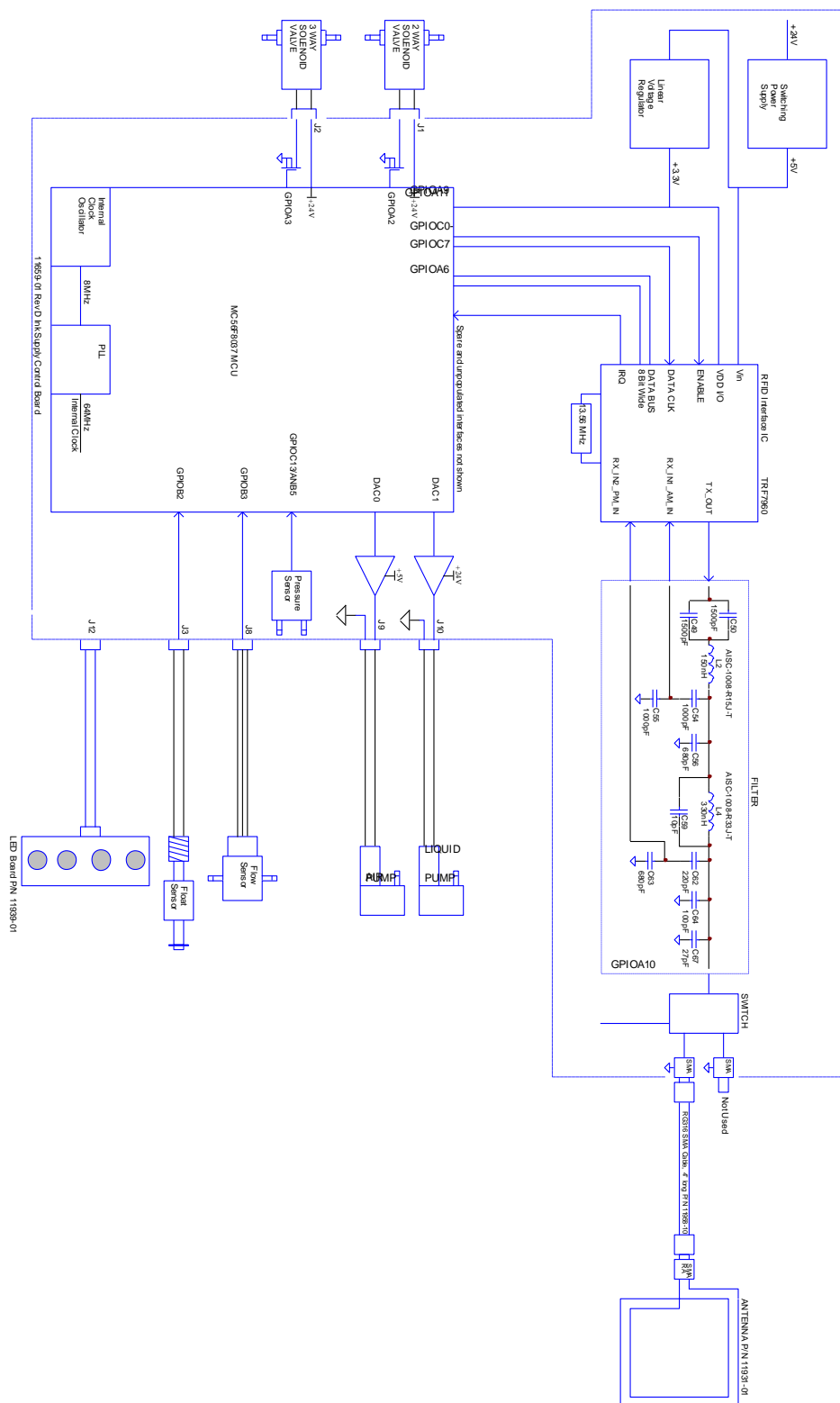
20% to 80% (non-condensing)

Altitude:

Operating: –50 to 10,000 ft (–15.2 to 3048 m)

Storage: –50 to 35,000 ft (–15.2 to 10,668 m)

4. Electrical Block Diagram



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5. Compliance Information (once testing is completed)**FCC Class A**

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

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

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

Add section for RFID Transmitter compliance/licensing