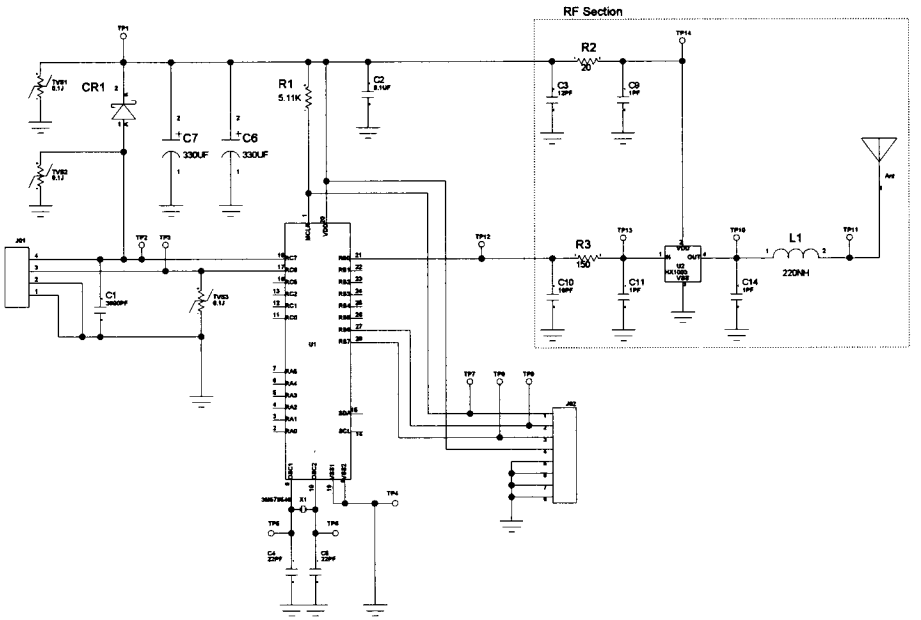


REV.	Description	ECO NO.	DATE	CHK.	APPD.

CONFIDENTIAL	LAYOUT: Dan Pommerening	10/14/99
This document and all information contained herein is proprietary to Deltec, Inc. and is not to be disclosed without the express written permission of Deltec, Inc.	DRAFTER: Dan Pommerening	10/14/99
DO NOT SCALE PRINT	TOLERANCES UNLESS OTHERWISE SPECIFIED .X .020, .XX .010, .XXX .005, ANGLES 1, MATL	APPROVALS: FUNCTION / NAME / DATE

Deltec
8865 Deltec, Inc., St Paul, MN 55112 U.S.A.

TITLE: Sch, Wireless Transmitter

SIZE	DWG. NO.	PROJ. NO.	REV.
D	D96-0405	10846	02

SCALE | SHEET 1 OF 1

REV=01

REV.	Description	ECO NO.	DATE	CHK.	APPD.

CONFIDENTIAL

This document and all information contained herein is proprietary to Deltec, Inc. and is not to be disclosed without the express written permission of Deltec, Inc.

DO NOT SCALE PRINT

TOLERANCES UNLESS OTHERWISE SPECIFIED
.X .020
.XX .010
.XXX .005
ANGLES 1
MATL

LAYOUT	Clarl Pommerening	10/15/99
DRAWN	Clarl Pommerening	10/15/99

APPROVALS

FUNCTION	NAME	DATE

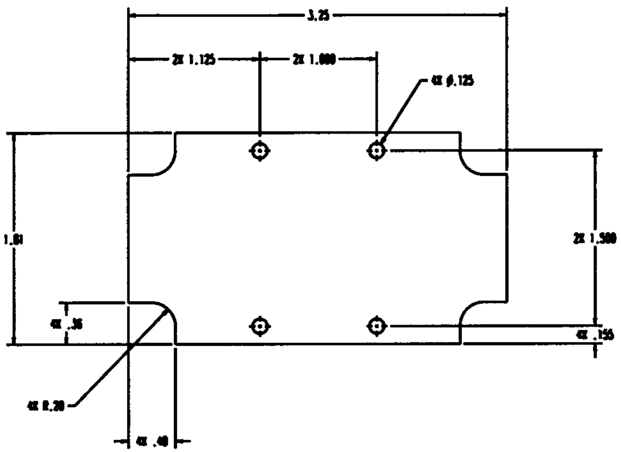
Deltec
2885 Deltec, Inc., St Paul, MN 55112 U.S.A.

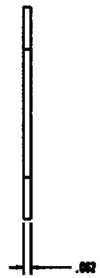
TITLE: Sch, Interconnect, Transmitter

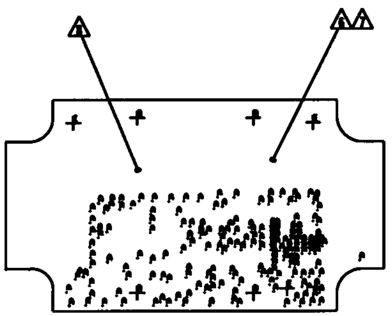
SIZE	DWG. NO.	PROJ. NO.	REV.
D	D96-0407	10846	01

SCALE | SHEET 1 OF 1

REV 01
SH. 1
DWG. NO. D96-0407







DRILL CHART				
SYM	DIAM	TOL	QTY	NOTE
	0.010	+.003/-.010	181	
	0.125	+/-.005	4	
	0.125	+.002/-.001	3	NON-PLATED
TOTAL			188	

REV.	DESCRIPTION	ECO. NO.	DATE	CHK.	APPR.
01	ENG. RELEASE		7-10-98		
02	ADDED NOTES; ADDED DRILL CHART TO SHEET 1; ADDED SHEET 2; DRAWING WAS C SIZE.		10-14-98		

1. MATERIAL: EPOXY GLASS FR-4 UL94V-0 OR EQUIVALENT, .062±.007, 1 OZ. COPPER ALL LAYERS.
2. FINISHED BOARD TO COMPLY WITH PHYSICAL AND ENVIRONMENTAL REQUIREMENTS OF IPC-A-600 CURRENT REVISION.
3. "LPI" (LIQUID PHOTO IMAGABLE) SOLDERMASK PER IPC-SM-840, TYPE B, CLASS 3. BOTH SIDES GREEN TRANSPARENT WITH MAX MISREGISTRATION TO BE .003, OVER BARE COPPER. ALL EXPOSED COPPER AREAS, BOTH SIDES, TO BE TIN LEAD COATED USING HOT AIR LEVELING PROCESS TO YIELD .0003 MINIMUM. VENDOR MUST MODIFY SOLDERMASK ARTWORK TO REMOVE ANY SLIVERS THAT ARE .004 OR LESS BETWEEN FINE PITCHED LANDS.
4. SILKSCREEN BOTH SIDES AS REQUIRED USING WHITE EPOXY INK. VENDOR MUST MODIFY SILKSCREEN ARTWORK TO REMOVE WHITE EPOXY INK FROM EXPOSED METAL.
5. IF REQUIRED, MAXIMUM RADIUS ON ALL INSIDE CORNERS TO BE .062.
6. MANUFACTURER TO MARK BOARD WITH COPPER OR WHITE EPOXY INK, IN GENERAL AREA DESIGNATED WITH UL IDENTIFICATION CODE AS REQUIRED BY UL796 AND UL94.
7. MANUFACTURER TO MARK BOARD WITH COPPER OR WHITE EPOXY INK, IN GENERAL AREA DESIGNATED WITH DATE CODE INDICATING YEAR AND WEEK OF FABRICATION, 4 DIGIT FORMAT, (YYWW).
8. MANUFACTURER TO MARK BOARD WITH COPPER, IN GENERAL AREA DESIGNATED WITH CURRENT REVISION LETTER AS SPECIFIED PER SHEET ONE OF THIS DRAWING, XX.XXXX REV.
9. SHEET 2 OF THIS DRAWING CONTAINS MASTER ARTWORK PATTERNS AND ARE USED TO FABRICATE BOARDS AS SPECIFIED PER THE REQUIREMENTS OF SHEET 1 OF THIS DRAWING. GERBER FILES MUST BE USED BY BOARD VENDOR AND A DETAILED COMPARISON WITH EACH MASTER ARTWORK PATTERN IS REQUIRED. THIS COMPARISON IS TO INCLUDE BUT IS NOT LIMITED TO ALL LAYERS SUPPLIED. HOLES, PADS, MASKS, SHEET REVISION, DESIGN RULES, MINIMUM SPACING REQUIREMENTS AND FABRICATION RULES, ETC. MUST BE IDENTICAL TO THE MASTER PATTERNS PROVIDED. SOLDER PASTE ARTWORK TYPICALLY WILL NOT BE INCLUDED IN THIS PACKAGE.
10. THIS PC BOARD CREATED WITH ORCAD SOFTWARE VERSION 9.0 A.
11. MULTILAYER BOARD PER IPC ML-950C.

USED FOR INSPECTION PURPOSES ONLY

SEE SPEC	STEVE CODE	10-13-98
	STEVE CODE	10-13-98
	APPROVALS	

Deltec

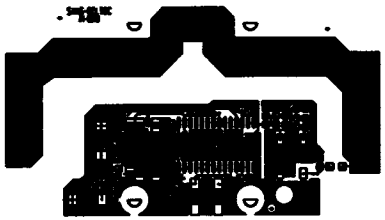
TITLE: PCB, TRANSMITTER, WIRELESS

SIZE	DWG. NO.	PROJ. NO.	REV.
D	071-0313	10846	02

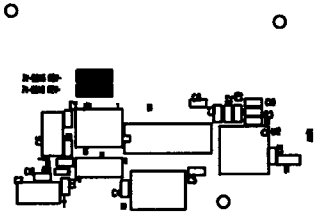
SCALE: NONE — SHEET 1 OF 2

DO NOT SCALE PRINT

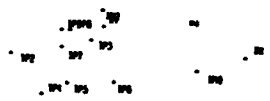
DWG. NO. 071-0313 — SHEET 1 — REV. 02



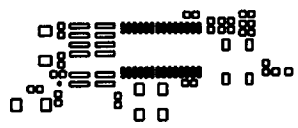
SMS DELTEC 71-0313
COMPONENT SIDE
RF TRANSMITTER REV-02



SMS DELTEC 71-0313
COMPONENT SIDE SILK SCREEN
RF TRANSMITTER REV-02

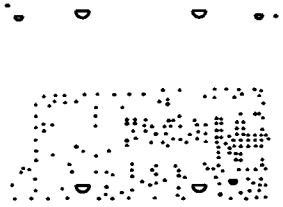


SMS DELTEC 71-0313
CIRCUIT SIDE SILK SCREEN
RF TRANSMITTER REV-02



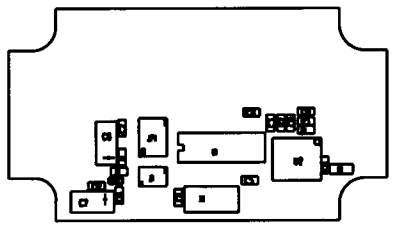
SMS DELTEC 71-0313
COMPONENT SIDE SOLDER PASTE
RF TRANSMITTER REV-02

SMS DELTEC 71-0313
COMPONENT SIDE SOLDER MASK
RF TRANSMITTER REV-02



SMS DELTEC 71-0313
CIRCUIT SIDE SOLDER MASK
RF TRANSMITTER REV-02

SMS DELTEC 71-0313
CIRCUIT SIDE
RF TRANSMITTER REV-02



SMS DELTEC 71-0313
COMPONENT SIDE ASSEMBLY
RF TRANSMITTER REV-02

USED FOR INSPECTION PURPOSES ONLY

Deltec

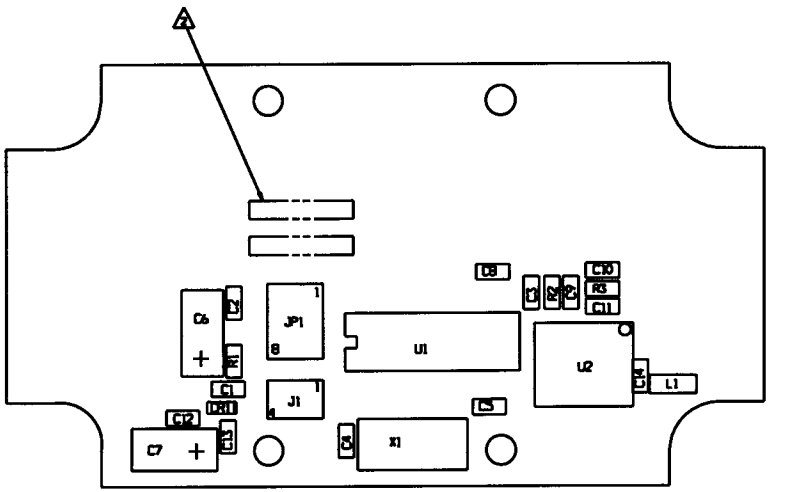
PCB, TRANSMITTER, WIRELESS

SIZE	DWG. NO.	REV.
D	071-0313	02

PROJ. NO.	SHEET
10846	2 OF 2

071-0313

QTY	REF DESIGNATION	PART NUMBER	DEVICE	PACKAGE	VALUE	MANUFACTURER
1	C1	08051C382KATMA	CAPACITOR	805	3800PF	AVX
1	C2	08055C104KATMA	CAPACITOR	805	0.1UF	AVX
1	C3	08051A120JATMA	CAPACITOR	805	12PF	AVX
2	C4, C5	08051A220JATMA	CAPACITOR	805	22PF	AVX
2	C6, C7	T495D337K016AS	CAPACITOR	7343H	330UF	KEM
3	C8, C12, C13	VC080505A150	TVS	805	0.1J	AVX
3	C9, C11, C14	08051A1R0CATMA	CAPACITOR	805	1.0PF	AVX
1	C10	08051A100JATMA	CAPACITOR	805	10PF	AVX
1	CR1	MA729-(TX)	SM_DIODE	MA729		PMI
1	J1	95615-104	CONN	CONN		BERG
1	J2	95615-008	CONN	CONN		BERG
1	L1	1206CS-221XJBC	INDUCTOR	1206	220NH	COILCRAFT
1	R1	MCR10FS111	RESISTOR	805	5.11K	ROHM
1	R2	MCR10F20R0	RESISTOR	805	20	ROHM
1	R3	MCR10F150R	RESISTOR	805	150	ROHM
1	U1	18LC63-04/SO	PROCESSOR	SOIC28		MICROCHIP
1	U2	HE1803	XMTR	SMH		RFM
1	X1	ECS-35-17-18-TR	CRYSTAL	CSM-12	36579545	ECS
1	SOFTWARE	97-0338-01A				DELTEC
1		71-0313				



NOTES

1. ASSEMBLY MUST MEET REQUIREMENTS OF IPC-A-610 CLASS 2, MOST RECENT REV.

2 IDENTIFY ASSEMBLY WITH PART NUMBER AND REVISION, APPROXIMATE WHERE SHOWN.

3-FRONT

USED FOR INSPECTION PURPOSES ONLY

REV	DESCRIPTION	ENG. NO.	DATE	APP.
00	ENG RELEASE		09-11-00	

S. CORE 10-11-00
B. WARE 10-11-00

Deltec

PMA TRANSMITTER, U.S.
WIRELESS REMOTE MONITOR

SIZE D | DWG. NO. 071-0316 | REV. NO. 10846 | REV. 01

SCALE: 2/1 | SHEET | OF

071-0316

REV 01	First draft	9-22-99

1.0 SCOPE

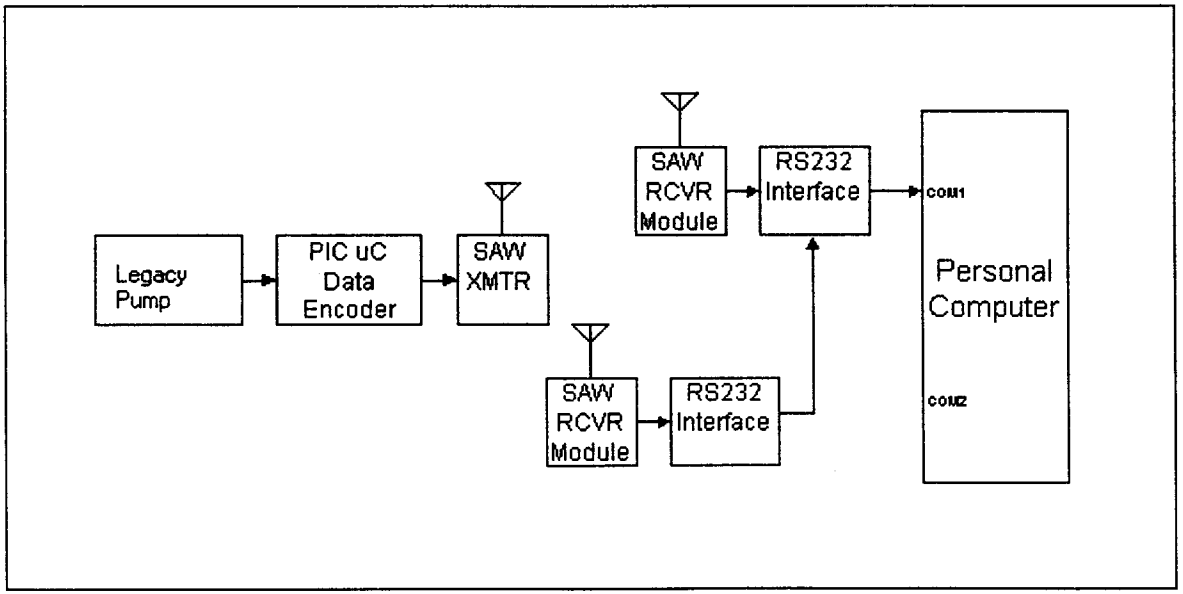
Summary

A one-way RF data communications system that will notify a personal computer when message is received from a Legacy Pump. This system will have two parts: a transmitter and a receiver. The transmitter accepts a data string from a Legacy pump and transmits the data. The receiver demodulates the transmitted RF signal and forwards it to a personal computer. The CRC check code will accompany the transmitted data to insure communications integrity. A single receiver can be used to monitor up to 40 transmitters.

Block Diagram

A one-way RF communications system with the following components (see the diagram below):

1. A microcontroller-based data encoder.
2. A discrete SAW-based transmitter including antenna.
3. A dual SAW-based receiver module including antenna.
4. An RS-232 interface to a personal computer.

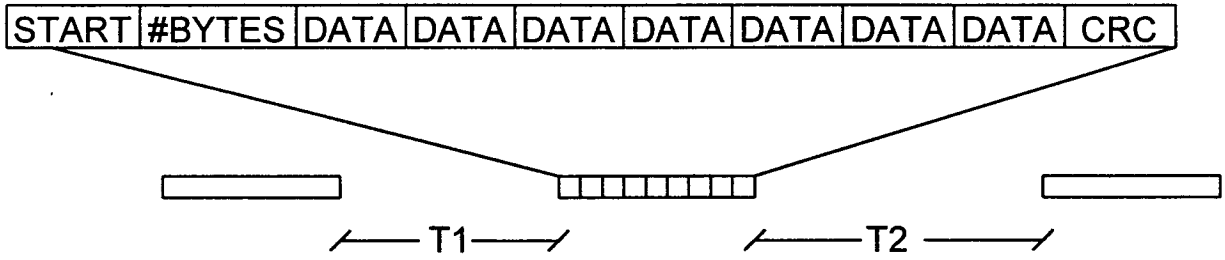


Transmitter

The Microcontroller will signal it is ready to receive data by transmitting an ASCII "R" tp the pump indicating "Ready".

The microcontroller will accept and buffer serial data. The transmitter will respond to the pump with an ASCII "B". Indicating "Busy".

The transmitter [keys]will transmit the resultant packet several times at random intervals. The diagram below shows a transmit data string.



After the transmitter is finished transmitting the data, it will send an ASCII "R" to the pump. To indicate it is ready for the next packet.

The Transmitter is powered from the pump communications port.

The transmit frequency for US and UK applications is 418 MHz. The transmit frequency for all EC countries except the UK will be 433.92 MHz. The transmitter circuit can be used at all these frequencies with minor modifications.

Receiver

More than one receiver, with separate antennas, may be used. This provides spatial diversity to improve communications integrity in cases where multipath signal cancellation can occur.

Each receiver uses a small whip antenna and an RF Monolithics hybrid receiver module. These receivers use a SAW-based ASH architecture making them small, low cost and low power. The raw data output of both receivers is forwarded to a personal computer via an RS-232 connection. Transmissions received correctly by either receiver will be sent to the computer. Transmissions received with CRC errors are discarded.

2.0 DOCUMENT CITATIONS

AC Adapters
Transmitters
Receivers

3.0 ELECTRICAL REQUIREMENTS

3.1. THE RECEIVER IS POWERED FROM A SIMS DELTEC AC ADAPTER. EACH AC ADAPTER CAN POWER UP TO THREE RECEIVERS. CONNECT THE AC ADAPTER TO THE RECEIVER CLOSEST TO THE COMPUTER.

U.S.	71-0266
UK	71-0267
Euro	71-0268
JA	71-0273
VK	71-0274

3.2. DISTANCE

TBD

3.3. ERROR RATE

TBD

4.0 PHYSICAL REQUIREMENTS

4.1. DIMENSIONAL

See drawings for device dimensions.

5.0 ENVIRONMENTAL

5.1. OPERATING ENVIRONMENT

- Temperature: 2°C (35.6°F) to 40°C (104°F)
- Humidity: 90% relative humidity maximum, non-condensing.
- Atmospheric Pressure: 70 kPa (10.2 PSI or 10,000 feet above sea level) to 106 kPa (15.4 PSI).

5.2. STORAGE ENVIRONMENT

- Temperature: -20°C (-4°F) to 60°C (140°F)
- Humidity: 90% relative humidity maximum, non-condensing
- Atmospheric Pressure: 70 kPa (10.2 PSI or 10,000 feet above sea level) to 106 kPa (15.4 PSI).