

ULTRASONIC FLOW  
TRANSMITTER  
PROGRAMMING KEY  
USER'S MANUAL

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**DANIEL MEASUREMENT AND CONTROL  
HOUSTON, TEXAS**

**Part Number: 3-9000-683  
Revision A  
JULY 1997**

**DANIEL**

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**DANIEL INDUSTRIES, INC.  
ULTRASONIC FLOW TRANSMITTER  
PROGRAMMING KEY USER'S MANUAL**

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HOUSTON, TEXAS, U.S.A.

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## WARRANTY

Daniel Measurement and Control ("Daniel") warrants all equipment manufactured by it to be free from defects in workmanship and material, provided that such equipment was properly selected for the service intended, properly installed, and not misused. Equipment which is returned, transportation prepaid to Daniel within twelve (12) months of the date of shipment (eighteen (18) months from date of shipment for destinations outside of the United States), which is found after inspection by Daniel to be defective in workmanship or material, will be repaired or replaced at Daniel's sole option, free of charge, and return-shipped at lowest cost transportation. All transportation charges and export fees will be billed to the customer. Warranties on devices purchased from third party manufacturers not bearing a Daniel label shall have the warranty provided by the third party manufacturer.

*Extended warranty* - Models 2470, 2480 and 2500 are warranted for a maximum of twenty-four (24) months. The Danalyzer valves are warranted for the life of the instrument and the columns for five years.

*The warranties specified herein are in lieu of any and all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.*

Daniel shall be liable only for loss or damage directly caused by its sole negligence. Daniel's liability for any loss or damage arising out of, connected with, or resulting from any breach hereof shall in no case exceed the price allocable to the equipment or unit thereof which gives rise to the claim. Daniel's liability shall terminate one year after the delivery of the equipment except for overseas deliveries and extended warranty products as noted above.

In no event, whether as a result of breach of warranty or alleged negligence, shall Daniel be liable for special or consequential damages, including, but not limited to, loss of profits or revenue; loss of equipment or any associated equipment; cost of capital; cost of substitute equipment, facilities or services; downtime costs; or claims of customers of the purchaser for such damages.

## **INTRODUCTION**

The firmware of the ultrasonic flow transmitter is stored in the on-board nonvolatile memory called flash memory. Reprogramming the firmware requires a special device called a "Programming Key".

To reprogram the firmware, the Programming Key must be connected directly to the CPU board or the digital master board. Connecting the Programming Key puts the CPU board or the digital master board into a special "programming" mode, and provides the 12V required for programming the flash memory.

Figure 1 is the schematic of the Programming Key. It has a 5V to 12V DC-DC convertor which will provide up to 60 mA current at 12V. The built-in RS232 convertor provides a means to communicate with the PC when no other RS232 convertor is available, as in the case of the digital master board.

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**OPERATION**

**MARK II ELECTRONICS:**

1. First cut off the power to the ultrasonic transmitter.
2. Remove the end cap of the cylindrical housing (the far end from the connection conduit).
3. Unscrew the four bolts, and take the top two-board assembly to a safe area.
4. Disassemble the two-board assembly.
5. Connect the Programming Key to JP2 of the CPU board (P/N 3-3400-005), making sure pin 1 of the connector is aligned with pin 1 of the header.
6. Stack the boards back together.
7. Connect P2 of the power supply board (P/N 3-3400-006) to one of the PC's serial ports, and apply a 24V supply (either AC or DC) to P2.
8. The switches of the Programming Key should be set to 12V--on and Mode--PROG.
9. Finally push the RESET switch once.
10. Create a sub-directory in the PC containing the following files:

FLASH5  
DSP1.S  
DSP2.S  
DSP3.S  
HC114.S  
LOAD3.S  
BTLOD.S  
DIAG11.S  
DIAGLD.S  
DIAGDSP.S

11. Invoke FLASH5 by typing "FLASH5 -COM1" or "FLASH5 -COM2", depending on which PC serial port is connected to the board assembly. It will take a few minutes to program the eight banks of flash memory.
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**NOTE:** COM1 or COM2 is the serial port on the PC which is used.

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MARK 1.5 ELECTRONICS:

1. First connect the Programming Key to JP4 of the digital master board (P/N 3-3400-101), making sure that pin 1 of the connector is aligned with pin 1 of the header.
2. Remove the RS485 connection from the drive unit.
3. Connect one of the PC's serial ports to the 9-pin "D" connector of the Programming Key.
4. The switches of the Programming Key should be set to 12V--on and Mode--PROG.
5. Finally push the RESET switch once.
6. Create a sub-directory in the PC containing the following files:

FLASH5.EXE  
DUCK1.S  
DUCK2.S  
DUCK3.S  
HC114.S  
LOAD3.S  
BTLOD.S  
DIAG11.S  
DIAGLD.S  
DIAGDSP.S

7. Invoke FLASH5 by typing "FLASH5 -COM1 -DDUCK" or "FLASH5 -COM2 -DDUCK". It will take a few minutes to program the eight banks of flash memory.

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**NOTE:** COM1 or COM2 is the serial port on the PC which is used.

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8. After the download is complete, remove the Programming Key and cycle the power.

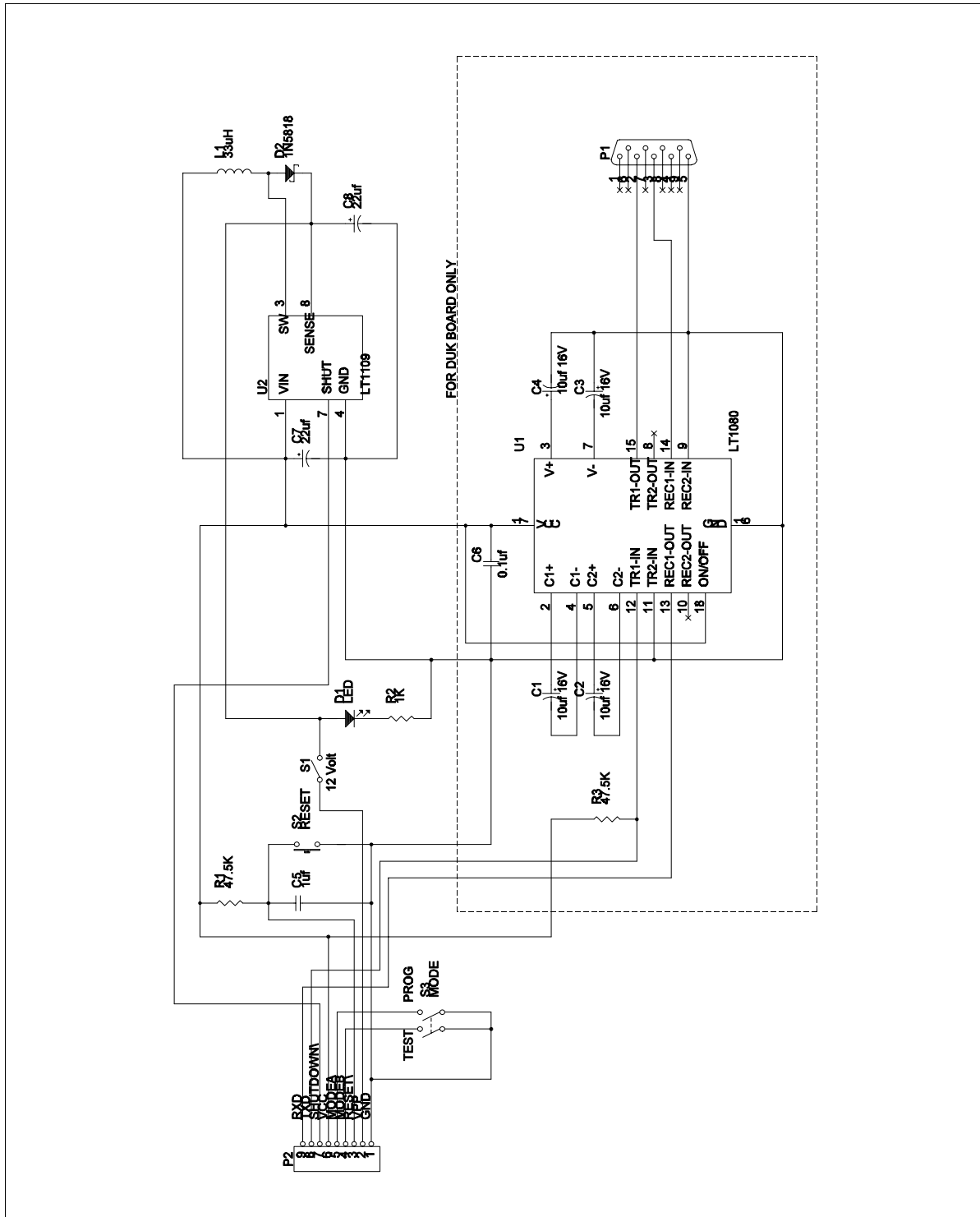


Figure 1. Schematic of the Programming Key

## **WARRANTY CLAIM REQUIREMENTS**

To make a warranty claim, you, the Purchaser, must:

1. Provide Daniel with proof of the Date of Purchase and proof of the Date of Shipment of the product in question.
2. Return the product to Daniel within twelve (12) months of the date of original shipment of the product, or within eighteen (18) months of the date of original shipment of the product to destinations outside of the United States. The Purchaser must prepay any shipping charges. In addition, the Purchaser is responsible for insuring any product shipped for return, and assumes the risk of loss of the product during shipment.
3. To obtain Warranty service or to locate the nearest Daniel office, sales, or service center call (281) 897-2900, Fax (281) 897-2901, or contact:

Daniel Measurement Services  
19203 Hempstead Highway  
Houston, Texas 77065

When contacting Daniel for product service, the purchaser is asked to provide information as indicated on the following "Customer Problem Report".

Daniel Measurement Services offers both on call and contract maintenance service designed to afford single source responsibility for all its products.

Daniel Industries, Inc. reserves the right to make changes at any time to any product to improve its design and to insure the best available product.



**DANIEL INDUSTRIES, INC.  
CUSTOMER PROBLEM REPORT**

FOR FASTEST SERVICE, COMPLETE THIS FORM, AND RETURN IT ALONG WITH THE AFFECTED EQUIPMENT TO CUSTOMER SERVICE AT THE ADDRESS INDICATED BELOW.

COMPANY NAME: \_\_\_\_\_

TECHNICAL CONTACT: \_\_\_\_\_ PHONE: \_\_\_\_\_

REPAIR P. O. #: \_\_\_\_\_ IF WARRANTY, UNIT S/N: \_\_\_\_\_

INVOICE ADDRESS: \_\_\_\_\_

SHIPPING ADDRESS: \_\_\_\_\_

RETURN SHIPPING METHOD: \_\_\_\_\_

EQUIPMENT MODEL #: \_\_\_\_\_ S/N: \_\_\_\_\_ FAILURE DATE: \_\_\_\_\_

DESCRIPTION OF PROBLEM: \_\_\_\_\_

WHAT WAS HAPPENING AT TIME OF FAILURE? \_\_\_\_\_

ADDITIONAL COMMENTS: \_\_\_\_\_

REPORT PREPARED BY: \_\_\_\_\_ TITLE: \_\_\_\_\_

IF YOU REQUIRE TECHNICAL ASSISTANCE, PLEASE FAX OR WRITE THE MAIN CUSTOMER SERVICE DEPARTMENT AT:

DANIEL MEASUREMENT SERVICES  
ATTN: CUSTOMER SERVICE  
19203 HEMPSTEAD HIGHWAY  
HOUSTON, TEXAS 77065

PHONE: (281) 897-2900  
FAX: (281) 897-2901





The sales and service offices of Daniel Industries, Inc. are located throughout the United States and in major countries overseas. Please contact Daniel Measurement Services at 19203 Hempstead Highway, Houston, Texas 77065, or phone (281) 897-2900 for the location of the sales or service office nearest you. Daniel Measurement Services offers both on-call and contract maintenance service designed to provide single-source responsibility for all Daniel Measurement and Control products.

Daniel Measurement and Control reserves the right to make changes to any of its products or services at any time without prior notification in order to improve that product or service and to supply the best product or service possible.

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