



FIELD PROBE MONITORING SYSTEM

MODEL FPMS-L7

OPERATING INSTRUCTIONS

Document Number
FPMS-L7MNL V1.1

SERIAL NUMBER

Prepared for:

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SECTION 1.0



INTRODUCTION

Congratulations on the purchase of your new Field Probe Monitoring system from Instruments For Industry, Inc. Your new Field Probe Monitoring System's quality, performance and trouble free operation depends on you thoroughly reading through this manual and familiarizing yourself with its proper operation and usage in order to obtain accurate and repeatable measurements.

Your Field Probe Monitoring System comes with the following accessories, be sure to check your packaging for the items listed below before disposing of the packaging.

CONTENTS

(For a typical FPMS, Field Probe Monitoring System)

<u>Quantity</u>	<u>Description</u>
1	FPMS-L7, Field Probe Monitoring System
1	Operation and Instruction Manual
1	Power Line Cord



SECTION 2.0

GENERAL DESCRIPTION

The Field Probe Monitoring System, or FPMS, is a desired accessory for the Electronic Field Sensors manufactured by Instruments For Industry, Inc. The FPMS is designed to measure light in the red portion of the spectrum, with pulses between 1500 Hz and 3000 Hz, to a zero to full scale reading on the front panel LCD display via a powerfully microprocessor. While the FPMS may be used with any light source with the aforementioned spectrum and pulse rate, it is specifically intended for use with the Instruments For Industry 'E' Field Sensors. In this application it will perform the following functions:

1. Display the recovered pulses on the front panel LCD display. The indicated reading is in Volts/Meter, $\mu\text{W}/\text{cm}^2$ or mW/cm^2 and reproduces the 'E' Field measurement.
2. Select the range corresponding to the E field sensor setting.
3. Retrieve the measured field via the IEEE488 and control the range selection via the GPIB.

The FPMS also serves as a valuable accessory in isolating the user from potentially hazardous electric fields.



SECTION 3.0

WARRANTY INFORMATION

Instruments For Industry, Inc. (IFI) warrants each product of its manufacture to be free from any defect in material and workmanship for a period of one year from shipment to the original purchaser. Our factory office representative, however, must first authorize all warranty returns. Refer to the Service Section for information on how to return items for warranty repair.

Warranty liability shall be limited to repair or replacement of, or part thereof, which proves to be defective after inspection by IFI. This warranty shall not apply to any IFI product that has been disassembled, modified, physically or electrically damaged or any product that has been subjected to conditions exceeding the applicable specifications or ratings.

IFI shall not be liable for any direct or consequential injury, loss or damage incurred through the use, or the inability to use, any IFI product.

IFI reserves the right to make design changes to any IFI product without incurring any obligation to make the same changes to previously purchased units.

This warranty is the full extent of obligation and liability assumed by IFI with respect to any and all IFI products. IFI neither makes, nor authorizes any person to make, any other guarantee or warranty concerning IFI Products.



SECTION 4.0

OPERATION PROCEDURE

The following procedure describes operating the FPMS with an 'E' Field Sensor , various menus are shown in the following pictures.

Step 1. Plug the FPMS line cord into a suitable 115VAC or 230VAC, 50/60 Hz outlet.

Step 2. Turn the power switch ON, at this time after the CPU booting cycle the startup menu will appear where the GPIB address can set by the control knob after pressing the GPIB button. Follow instruction on the LCD display.

Step 3. Connect the fiber optic cable between the 'E' Field Sensor and the FPMS, for multi-channel unit connect the number of cables desire.

Step 4. Turn on the 'E' Field Sensors and FPMS and allow 5 minutes for the equipment to warm up.

Step 5. Select which channel to be monitored and the Range which must be corresponding to the 'E' field sensor setting. Use the buttons CHNL & RANGE.

Step 6. Select mode of operation, i.e. MANUAL, LEVELED, MAXIMUM, AVERAGE, MINIMUM and EXTERNAL. (When leveling mode is selected one or more Channels should be Active. This can done by selecting the Channel and pressing the ACTV button)



FIGURE 1.1 – FRONT PANEL DISPLAY (START-UP MENU)

Apply power to the unit using the front panel ON/OFF switch. When the circuit breaker or AC Power On switch is energized, the above menu will be displayed after the Microprocessor (MPU) booting cycle has completed. This menu displays the company information, the amplifier model number and serial number along with the firmware version used. The Start-Up menu will be replaced by the Operate Menu after about 5 seconds or the operator may elect to bypass the Start-Up Menu by pressing the CONT button.

From this menu, the GPIB ADDRESS (GPIB ADDR) Number can be entered by using the Control/Level knob. From the START-UP Menu, press the button located under the GPIB ADDR indication on the display. In this screen, the GPIB Address is entered by dialing in the desired number using the Control Level Adjust knob and pressing the RETURN button. The START-UP Menu will be displayed after pressing the RETURN button.

Wait approximately 5 seconds (or press the CONTINUE (CONT) button) for the Operate Menu, as seen in Figure 1.2.



FIGURE 1.2 - OPERATE MENU

From this menu select the channel and then by pressing the Range button, range can be selected it will scroll from range 1 (3.16 V/M) range 2 (10V/M) range 3 (31.6 V/M) range 4 (100 V/M) up to range 5 (316 V/M). The Mode is set to Manual.



FIGURE 1.3 – Set Level Mode MENU

From this menu the leveling mode is selected and the level value can be set using the knob.

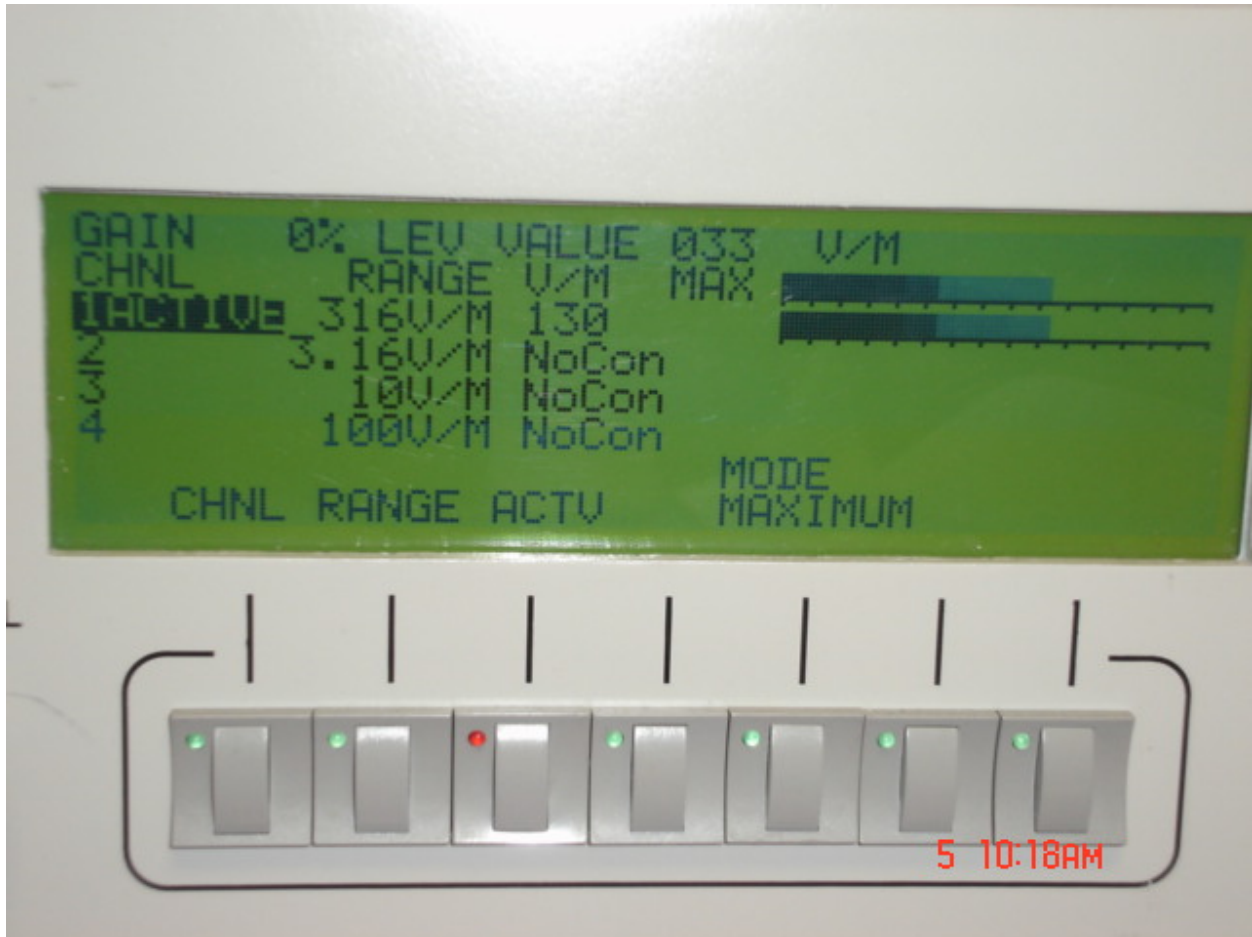


FIGURE 1.4 – Maximum Mode MENU

From this menu the leveling mode is selected to level on the Max field by selecting which probes to be active. To activate the probes select the channel and then press the ACTV button to activate that channel.



SECTION 5.0

IEEE-488.2 INTERFACE

5.1 INTRODUCTION

The Instruments For Industry, Inc. (IFI) FPMSs can be operated remotely from a personal computer having an IEEE-488 interface. This interface allows the FPMS to be remotely controlled over the General Purpose Interface Bus (GPIB) by sending commands. Additionally, field levels readings may be read over the GPIB. All functions can be controlled by coded messages sent over the interface bus via the 24-pin socket connector on the rear panel of the unit. IEEE-488.2 Standard is implemented, which defines the protocols and syntax of commands. The GPIB command codes for the IFI FPMS are discussed on subsequent pages and, for ease of identification; the command codes are identified within the text by bold capital characters. For full information on the IEEE protocols and syntax the IEEE-488.2 Standard should be consulted.

5.2 REMOTE INITIALIZATION

Not Used

5.3 GPIB ADDRESS

The GPIB address of the FPMS is set via the Front panel using the Control knob at the start up menu.

NOTES ON USING NATIONAL INSTRUMENTS' GPIB CONTROLLERS:

In order for the FPMS to operate correctly with a National Instruments GPIB controller card, the following must be done: (Items 1-5 are done in the IBCONF program.)

1. Set "Terminate reads on **EOS**" to **yes**.
2. Set "Set **EOI** with **EOS** on Writes" to **yes**.
3. Set the **EOS** byte to **0Ah** (an ASCII line feed character).
4. Set "Send **EOI** at end of writes" to **yes**.
5. Set "Enable **repeat addressing**" to **yes** at the board level.



6. When sending command strings to the FPMS, a carriage return character (**0Dh**) followed by a line feed character (**0Ah**), must always be appended to the command, otherwise the FPMS will wait indefinitely for the **CR-LF** combination. If this happens the unit will have to be powered off and back on to reset this condition. (The interface device will automatically assert the **EOI** line during the **LF** if items 2 - 4, above, are set to yes in the IBCONF program.) As an example, when issuing the zero attenuation command using the IBIC or WIBIC program, the command string would look like this: "**ZA\r\n**". (The **\r** is National Instruments' notation for the carriage return, and the **\n** is the line feed or 'new line' character.) Notice that the commands are upper case only.



IEEE Commands for FPMS

REQUEST STATUS (METERING)

CODE	FUNCTION
VALUE1	Returns Channel One Field level Value, 'VALUE 1: X.XXV/M' (for 3.16V/M range) 'VALUE 1: XX.XXV/M' (for 10V/M range) 'VALUE 1: XX.XV/M' (for 31.6V/M range) 'VALUE 1: XXX.XV/M' (for 100V/M range) 'VALUE 1: XXXV/M' (for 316V/M range)
VALUE2	Returns Channel Two Field level Value (In multi channel unit)
VALUE3	Returns Channel Three Field level Value (In multi channel unit)
VALUE4	Returns Channel Four Field level Value (In multi channel unit)
RANGE1	Sets the Range for Probe 1, Returns 'RANGE 1: 3.16V/M' (for 3.16V/M range) 'RANGE 1: 10V/M' (for 10V/M range) 'RANGE 1: 31.6V/M' (for 31.6V/M range) 'RANGE 1: 100V/M' (for 100V/M range) 'RANGE 1: 316V/M' (for 316V/M range)
RANGE2	Sets the Range, 3.16V/m, 10V/M, 31.6V/m, 100V/M, 316V/M, Probe 2
RANGE3	Sets the Range, 3.16V/m, 10V/M, 31.6V/m, 100V/M, 316V/M, Probe 3
RANGE4	Sets the Range, 3.16V/m, 10V/M, 31.6V/m, 100V/M, 316V/M, Probe 4
ACTIVE1	Sets the Probe 1 to be Active, Response with 'PROBE 1 ACTIVE'
ACTIVE2	Sets the Probe 2 to be Active, Response with 'PROBE 2 ACTIVE'
ACTIVE3	Sets the Probe 3 to be Active, Response with 'PROBE 3 ACTIVE'
ACTIVE4	Sets the Probe 4 to be Active, Response with 'PROBE 4 ACTIVE'
ZEROATT	Sets the FPMS for ZERO Attenuation & Returns, 'GAIN: 00100 %'
FULLATT	Sets the FPMS for FULL Attenuation & Returns, 'GAIN: 00000 %'
GAIN	Returns Gain Value in percentage, 'GAIN: XXXXX %'
GAININCxx	Increases Gain (xx- # of steps,0-99) [Response with Gain value, 'GAIN: XXXXX %']
GAINDECxx	Decreases Gain (xx- # of steps,0-99) [Response with Gain value, 'GAIN: XXXXX %']
LEVLINCxx	Increases Leveling value (xx- # of steps,0-99) [Response with Level value, 'LEVEL x.xxV/M']
LEVLDECxx	Decreases Leveling value (xx- # of steps,0-99) [Response with Level value, 'LEVEL x.xxV/M']
MODE	Sets the leveling Mode (MANUAL, SET LEVL, MAXIMUM, AVERAGE, MINIMUM, EXTERNAL)
*IDN?	Returns ASCII response comprising of four data fields in the format <Manufacturer>, <Model>, <Serial Number>, <Firmware Version>
*RST	Reset Command, Sets the FPMS to the factory default power up state

NOTES:

1. ALL GPIB COMMANDS AND REQUESTS MUST CONSIST ENTIRELY OF UPPER CASE ALPHANUMERIC CHARACTERS.
2. WHEN SENDING COMMAND STRINGS TO THE FPMS, A CARRIAGE RETURN CHARACTER (**0Dh**) FOLLOWED BY A LINE FEED CHARACTER (**0Ah**), MUST ALWAYS BE APPENDED TO THE COMMAND, and OTHERWISE THE FPMS WILL WAIT INDEFINITELY FOR THE **CR-LF** COMBINATION.



GPIB Commands specific to leveling preamp:

Command	Action	Response
"VALUE _n ",(cr),(lf)	Reads volts/m for channel n	"VALUE n: x.xxV/M",(cr),(lf) (for 3.16V/M range) "VALUE n: xx.xxV/M",(cr),(lf) (for 10V/M range) "VALUE n: xx.xV/M",(cr),(lf) (for 31.6V/M range) "VALUE n: xxx.xV/M",(cr),(lf) (for 100V/M range) "VALUE n: xxxV/M",(cr),(lf) (for 316V/M range)
"RANGE _n ",(cr),(lf)	Changes the range for channel n	"RANGE n: 3.16V/M",(cr),(lf) "RANGE n: 10V/M",(cr),(lf) "RANGE n: 31.6V/M",(cr),(lf) "RANGE n: 100V/M",(cr),(lf) "RANGE n: 316V/M",(cr),(lf)
"RNGVAL _n ",(cr),(lf)	Reads range for channel n	"RANGE n: 3.16V/M",(cr),(lf) "RANGE n: 10V/M",(cr),(lf) "RANGE n: 31.6V/M",(cr),(lf) "RANGE n: 100V/M",(cr),(lf) "RANGE n: 316V/M",(cr),(lf)
"MODE",(cr),(lf)	Changes mode of operation	"MANUAL",(cr),(lf) "SET LEVL",(cr),(lf) "MAXIMUM",(cr),(lf) "AVERAGE",(cr),(lf) "MINIMUM",(cr),(lf) "EXTERNAL",(cr),(lf)
"ACTIVE _n ",(cr),(lf)	Toggles channel n between active and inactive	"PROBE n ACTIVE",(cr),(lf) "PROBE n INACTIVE",(cr),(lf)
"GAININC _{xx} ",(cr),(lf)	Increases gain $xx/256 * 100$ to a maximum of 100%	"GAIN: 00xxx%",(cr),(lf) (where xxx is % full gain)
"GAINDEC _{xx} ",(cr),(lf)	Decreases gain $xx/256 * 100$ to a minimum of 0%	"GAIN: 00xxx%",(cr),(lf) (where xxx is % full gain)
"GAIN",(cr),(lf)	Reads Gain	"GAIN: 00xxx%",(cr),(lf) (where xxx is % full gain)
"FA",(cr),(lf)	Reduces gain to 0%	"GAIN: 00000%",(cr),(lf)
"ZA",(cr),(lf)	Increase gain to 100%	"GAIN: 00100%",(cr),(lf)
"FULLATT",(cr),(lf)	Reduces gain to 0%	"GAIN: 00000%",(cr),(lf)
"ZEROATT",(cr),(lf)	Increase gain to 100%	"GAIN: 00100%",(cr),(lf)
"LEVLINC",(cr),(lf)	Increases leveling value by $xx/256 * \text{full scale value}$ to a maximum of full scale value	"LEVEL x.xxV/M",(cr),(lf) (for 3.16V/M range) "LEVEL xx.xxV/M",(cr),(lf) (for 10V/M range) "LEVEL xx.xV/M",(cr),(lf) (for 31.6V/M range) "LEVEL xxx.xV/M",(cr),(lf) (for 100V/M range) "LEVEL xxxV/M",(cr),(lf) (for 316V/M range)
"LEVLDEC",(cr),(lf)	Decreases leveling value by $xx/256 * \text{full scale value}$ to a minimum of 0	"LEVEL x.xxV/M",(cr),(lf) (for 3.16V/M range) "LEVEL xx.xxV/M",(cr),(lf) (for 10V/M range) "LEVEL xx.xV/M",(cr),(lf) (for 31.6V/M range) "LEVEL xxx.xV/M",(cr),(lf) (for 100V/M range) "LEVEL xxxV/M",(cr),(lf) (for 316V/M range)
"EXTLEVIN",(cr),(lf)	Responds with voltage of external input channel	"EXT VINx.xxV" where x.xx ranges from 0.00 to 4.99

Note: "n" is the channel number to be operated on by the command
"x" is a decimal number to indicate the amplitude of a value



SECTION 6.0

SERVICING EQUIPMENT

Should such an event arise that the users' Field Probe Monitoring System (FPMS) requires repair only (no calibration is required), it is recommended that the reader follows the Equipment Return Procedure so the equipment can be repaired or calibrated and returned in a efficient and timely manner.

6.1 REQUEST A RMA NUMBER

Contact the IFI Service Department either in writing or by calling (631) 467-8400 and ask for a Return Material Authorization (RMA) Number.

The RMA Number is the method IFI uses to prepare its' services for returned material in transit and acts as a tracking document for the returned material through the repair or calibration process.

The RMA also documents the readers' specific instructions or reason related to the return of the material.

6.2 RETURN ALL ACCESSORIES

In the interest of saving time and expediting the repair or calibration process, return all the associated accessories described in Section 1.0 when returning the sensor for repair .

In many cases, a faulty accessory could give an illusion that the sensor itself has failed. For this reason it is important to return the all the accessories with the sensor. It is also IFI's policy to verify performance of all associated accessories of Section 1.0 before returning the sensor to service.

6.3 PACKAGING THE ITEM

When returning equipment to the manufacturer, always wrap each accessory separately and provide sufficient protective material around each item to prevent damage from handling and shipping conditions.

6.4 REFERENCE THE RMA NUMBER

As detailed in Paragraph 6.1.1, always reference the IFI assigned RMA Number on your Packing List and Purchase Order and also when any inquiries are made.



SECTION 7.0

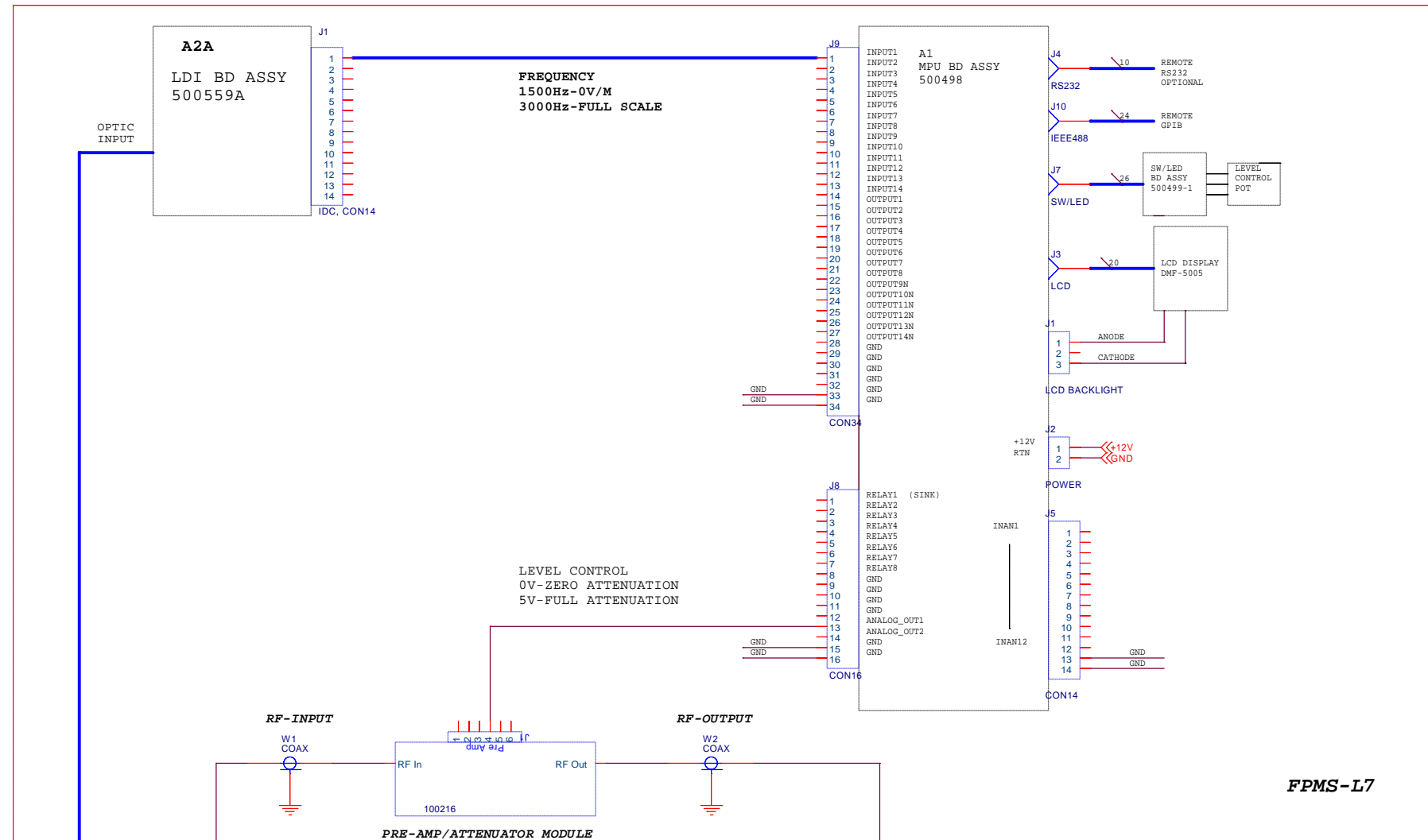
FPMS SPECIFICATIONS

Input:	1500 to 3000 Hz red light flashes proportional in frequency to the Volts/Meter level.
Accuracy:	Better than 5% of full scale
Reading:	Direct reading in Volts/Meter and $\mu\text{W}/\text{cm}^2$ or mW/cm^2
Input Power:	115/230 VAC, 50/60 Hz
Dimensions:	19 x 16.2 x 5.25 in (W x D x H)
Weight:	12.0 Lbs.
Channels:	1 to 4
Frequency:	10KHz to 1GHZ, extended up to 40GHZ (Optional)



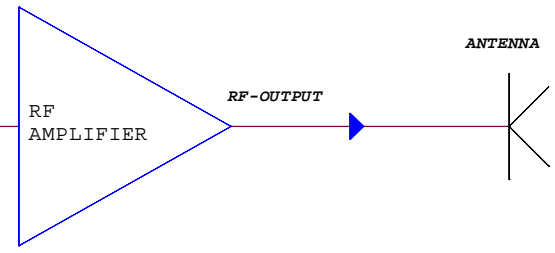
DRAWINGS

900413	Interconnect Diagram
100216-1	Attenuator Pre-Amp (500316-2)
500559	Light Sensor Bd, Schematic
500499-1	Switched Led Bd, Schematic
BOM	Bill Of Materials (BOM)



FPMS-L7

RF SIGNAL GENERATOR

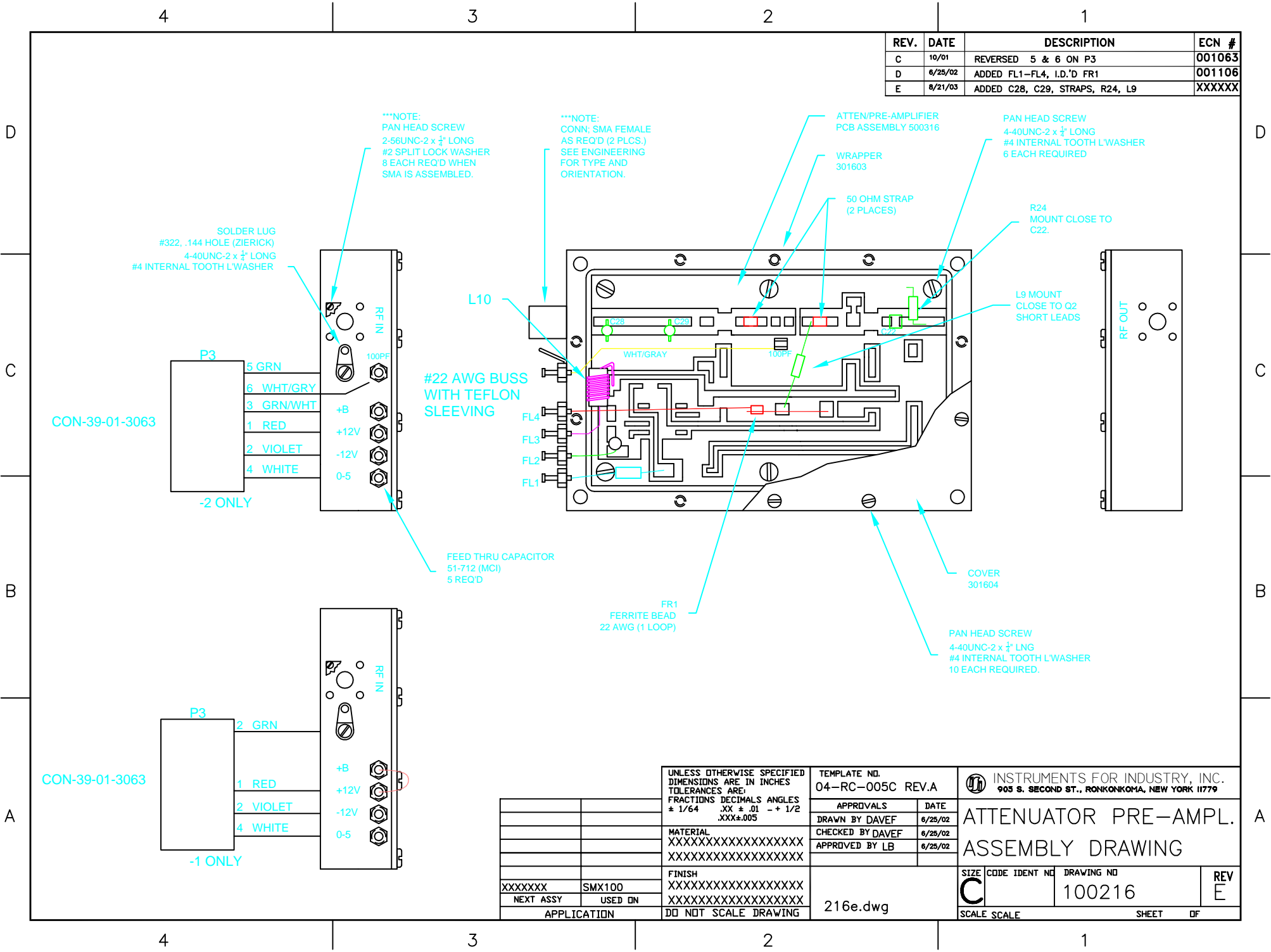


FIELD PROBE SENSOR
EFS-7 W/LMT

FIBER OPTIC CABLE
1500Hz for 0V/M
3000Hz for FULL SCALE

INSTRUMENTS FOR INDUSTRY RONKONKOMA, NY			
FPMS-L7, FUNCTIONAL DIAGRAM			
Size C	CAGE Code 01105	DWG NO 900413	Rev NR
Monday, October 03, 2005		Scale	Sheet 1 of 1

REV.	DATE	DESCRIPTION	ECN #
C	10/01	REVERSED 5 & 6 ON P3	001063
D	6/25/02	ADDED FL1-FL4, I.D.'D FR1	001106
E	8/21/03	ADDED C28, C29, STRAPS, R24, L9	XXXXXX



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
± 1/64 .XX ± .01 - + 1/2
.XXX±.005

TEMPLATE NO.
04-RC-005C REV.A

INSTRUMENTS FOR INDUSTRY, INC.
905 S. SECOND ST., RONKONKOMA, NEW YORK 11779

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CHECKED BY DAVEF	6/25/02
APPROVED BY LB	6/25/02

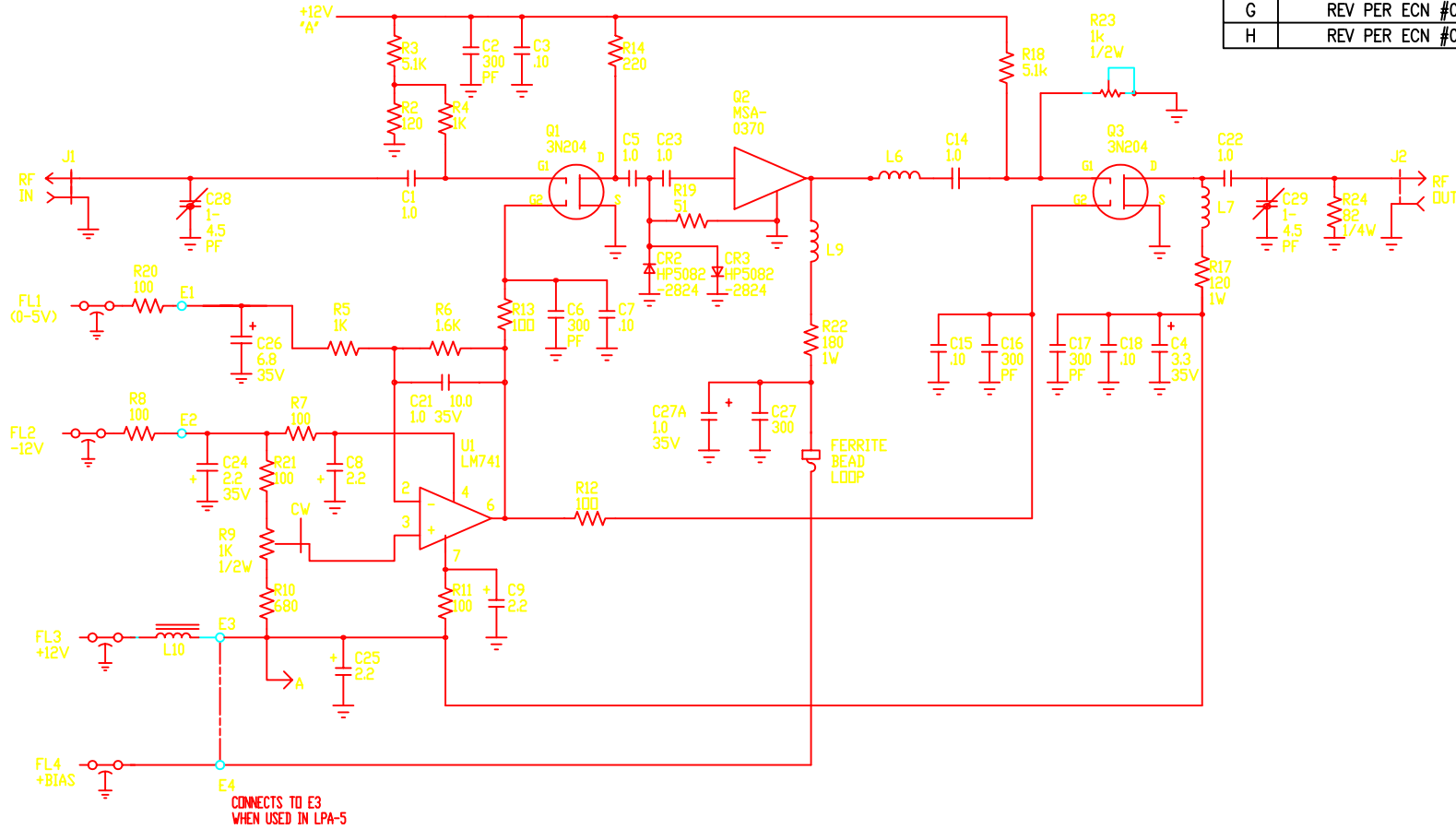
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	SCALE	SCALE	SHEET	DF

REVISIONS

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B	REV PER ECO #312	9/89	
C	REV PER ECO #453	12/90	
D	REV PER ECO #602	12/91	
E	REV PER ECO #637	3/92	
F	REV PER ECO #669	5/92	
G	REV PER ECN #0038	5/94	
H	REV PER ECN #0102	1/96	



- NOTE:
- UNLESS OTHERWISE SPECIFIED, RESISTANCE IS IN OHMS, CAPACITANCE IS IN MICROFARADS.
 - * INDICATES SELECT FINAL VALUE AT TEST.
 - ALL FEEDTHRU'S ARE 1000PF.
 - NOT USED: C10-13,19,20 CR1 R1,15,16
 - LAST USED: C29 R24 CR3

CONNECTS TO E3 WHEN USED IN LPA-5

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLLERANCES ARE: FRACTIONS DECIMALS ANGLES ± 1/64 .XX ± .01 - + 1/2 .XXX+-.005

CONTRACT NO

APPROVALS DATE

DRAWN Wm.ALTMAN 9/13/89

CHECKED

MATERIAL N/A

FINISH N/A

DO NOT SCALE DRAWING

316H.dwg



INSTRUMENTS FOR INDUSTRY, INC.
731 UNION PKY., RONKONKOMA, N.Y. 01779

SCHEMATIC, ATTENUATOR PREAMPL

SIZE CODE IDENT NO

SCALE NONE

DRAWING NO

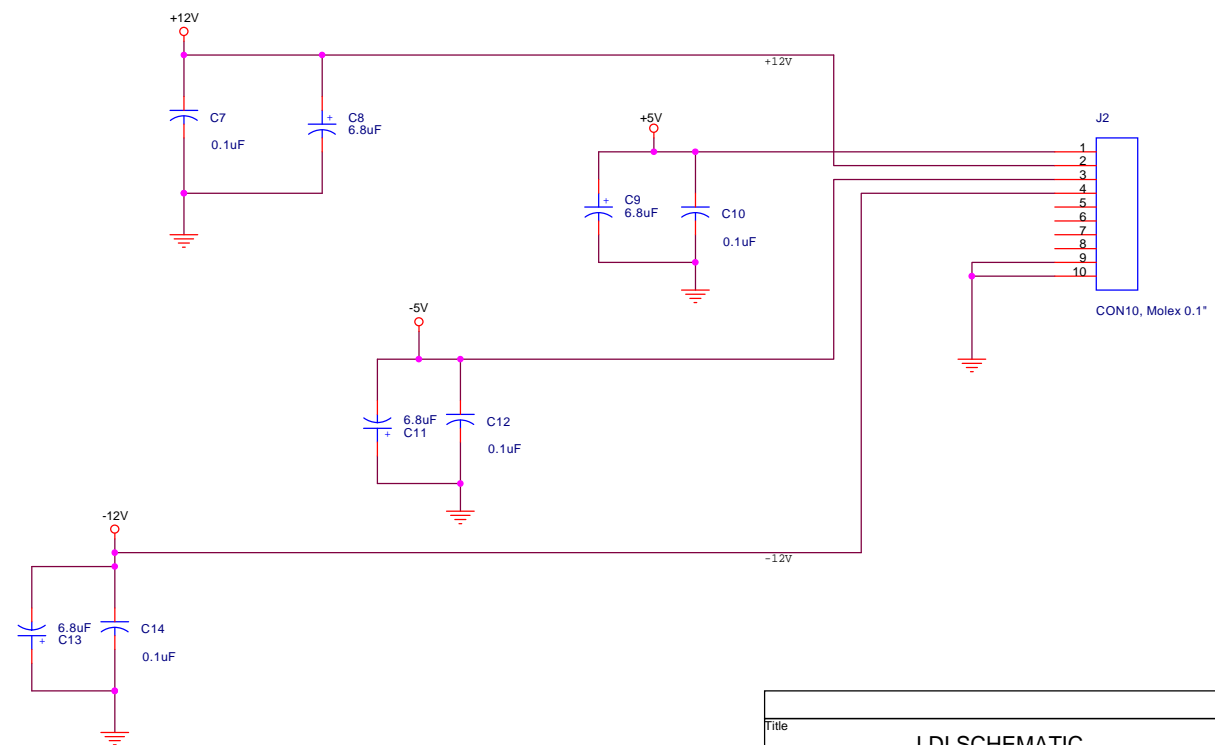
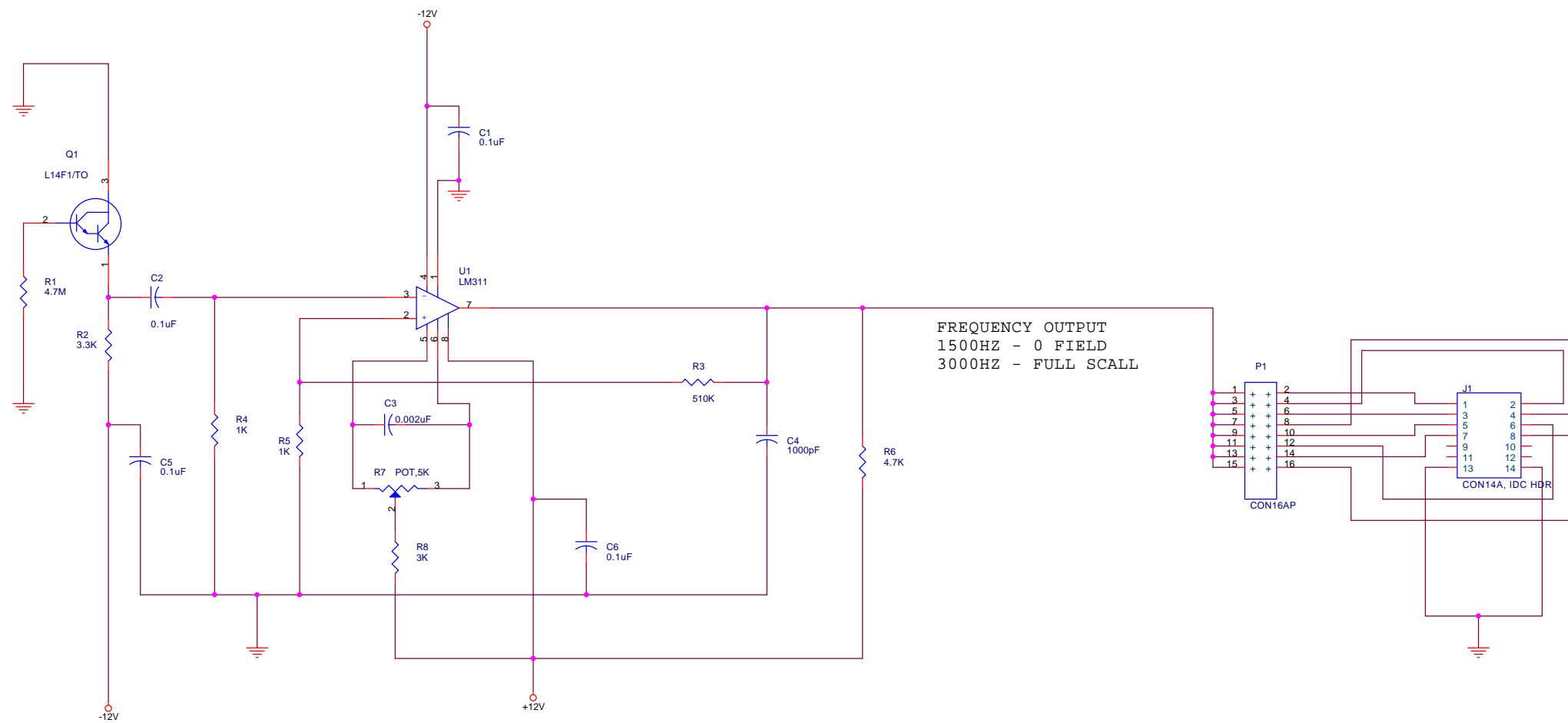
500316

REV

H

SHEET 1 OF 1

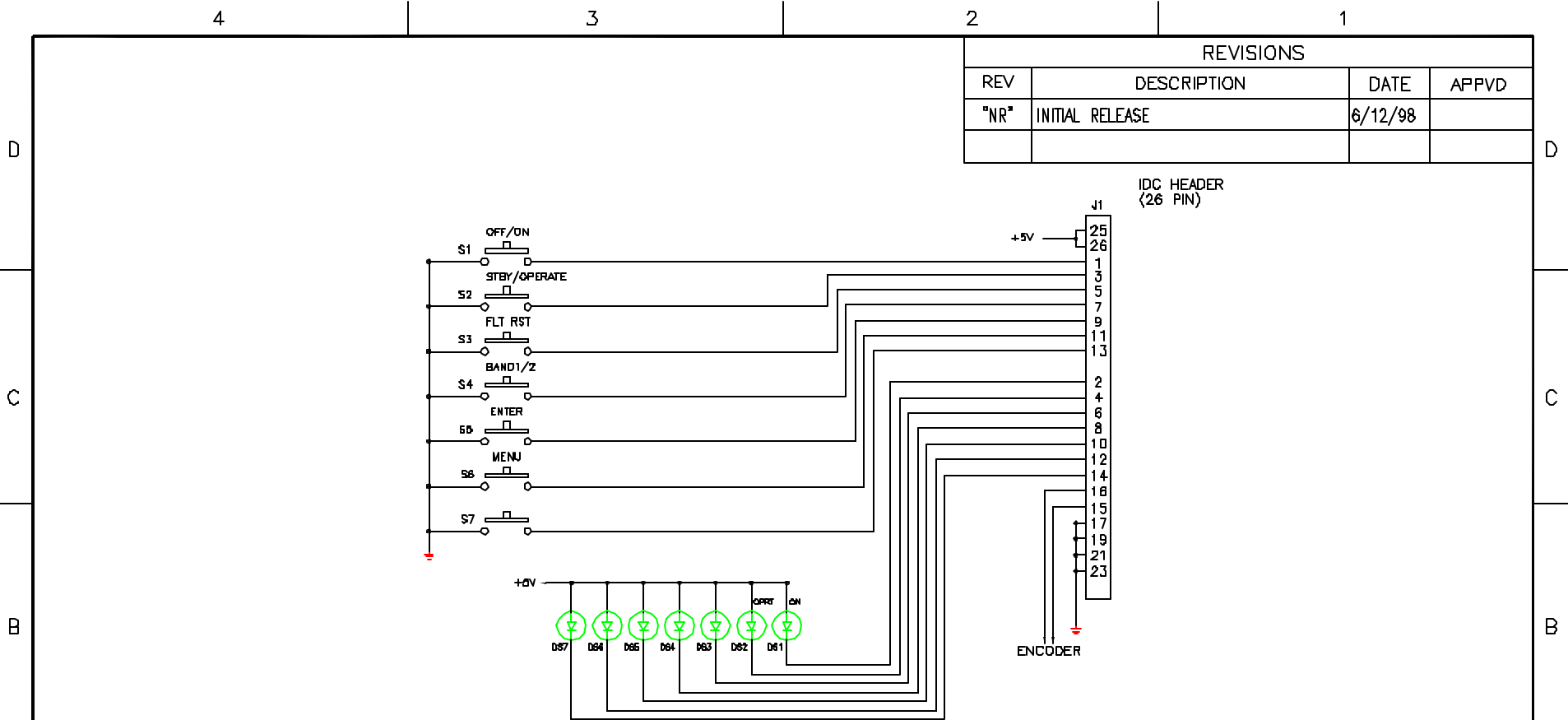
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NEXT ASSY	USED ON



NOTE: ALL RESISTORS ARE 1/4W

Title		
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Size	Document Number	Rev
C	500559	A
Date:	Tuesday, December 14, 2004	Sheet 1 of 1

REVISIONS			
REV	DESCRIPTION	DATE	APPVD
"NR"	INITIAL RELEASE	6/12/98	



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MATERIAL		APPROVALS	DATE	SCHEMATIC SWITCH/LED CKT BD	
FINISH		DRAWN BY F.V.	6/12/98		
NEXT ASSY USED ON		CHECKED BY	APPROVED BY		
APPLICATION		499-1.DWG		REF. CODE IDENT NO	DRAWING NO
DO NOT SCALE DRAWING		SCALE		B	500499-1
				REV	
				SHEET 1 OF 1	

BILL OF MATERIALS

PRINTED 3/6/2007

ITEM PART NUMBER	PRODUCT DESCRIPTION	COST/ITEM	NO OF SUBS	REV LTR
FPMS-L7	PROBE, FIELD MONITOR W/LEVELING			NR

COMPONENTS

Upper Level Part Number	Component Part Number	Part Description	No. Req'd	Rev Level
FPMS-L7	100216-1	PRE AMP ASSEMBLY	1	NR
FPMS-L7	300371	OPTIC BUSHING	4	
FPMS-L7	300886	COVER, CHASSIS	1	
FPMS-L7	300886-BLK	COVER, CHASSIS PAINTED BLK	1	
FPMS-L7	301495	LPA/FPMS CHASSIS	1	F
FPMS-L7	301495-BLK-S	LPA/FPMS CHASSIS PAINTED BLACK AND SCREENE	1	
FPMS-L7	302338	U CHANNEL CHASSIS	1	B
FPMS-L7	302470	BRACKET, MPU BD	1	G
FPMS-L7	302698	BRACKET, FPMS-7 LDI BOARD	4	A
FPMS-L7	302699	PANEL, FRONT, FPMS-L	1	B
FPMS-L7	302699-G-S	PANEL, FRONT, FPMS-L, PAINTED AND SCREENED	1	C
FPMS-L7	500498	MPU, HC6811, BD ASSY	1	C
FPMS-L7	500499-1	SWITCH/LED BOARD ASSY	1	A
FPMS-L7	500559	LDI BD ASSY	4	A
FPMS-L7	700543-24	CABLE, RIBBON, A1P10-GPIB CON	1	
FPMS-L7	700544-6	CABLE, RIBBON, A1P7-LED/SW BD	1	
FPMS-L7	700545-6	CABLE, RIBBON, A1P3-LCD DISPL	1	
FPMS-L7	700546-20	CABLE, RIBBON, A1P5-500559S	1	
FPMS-L7	CON-08500106	CONN, PIN, CONTACT 0.156 SERIES	10	
FPMS-L7	CON-09503-3	CONN, HOUSING, MOLEX SINGLE ROW, 3 POS, 0.156	1	
FPMS-L7	CON-09503-6	CONN, HOUSING, MOLEX SINGLE ROW, 6 POS, 0.156	1	
FPMS-L7	CON-102387-2	CONN, IDC FEMALE WIRE APPLIED HOUSING, 14 PIN	1	
FPMS-L7	CON-102387-3	CONN, IDC FEMALE WIRE APPLIED HOUSING, 16 PIN	1	
FPMS-L7	CON-102387-8	CONN, IDC FEMALE WIRE APPLIED HOUSING, 34 PIN	1	
FPMS-L7	CON-553636	CONN, GPIB, ACCESSORY, MTG HD	1	
FPMS-L7	CON-87523-6	CONN, CONTACT, SNAP IN, PINS	40	
FPMS-L7	CON-B52C4U02T	CONN, PLUG, 5MM, R/A, 2 POS.	1	
FPMS-L7	CON-COA-2990-6005	CONN, BULKHEAD SMA F TO F ADAP. (M	2	
FPMS-L7	CON-COA-KC19-175	CONN, BNC, BULKHEAD (KING MFG NO SUB)	2	
FPMS-L7	CON-COA-KC19-61	CONN, BNC BULKHEAD JACK (AMPH NO 3	2	
FPMS-L7	DIS-DMF5005	DISPLAY, MODULE, LCD, 240X64 DO	1	
FPMS-L7	FAN-4	FAN, 4 INCH GUARD	1	

FPMS-L7	FAN-SF1212AD	FAN, 4 INCH AC 115/230V	1	
FPMS-L7	FIL-5110.1533.1	FILTER, LINE, IEC EMI, 15A, 115/230 SINGLE PHASE	1	
FPMS-L7	FUS-FEK031.1666	FUSE, SCHURTER, CARRIER HOLDER	1	
FPMS-L7	FUS-FEU031.1673	FUSE, SCHURTER, HOLDER BODY	1	
FPMS-L7	HAN-245-24BR-10-32T	HANDLE, BLACK OXIDE, 4 5/8" MTG	2	
FPMS-L7	KNO-RKP3SB	KNOB, SKIRTED, BLACK TEXTURE	1	
FPMS-L7	PDA-AGT2018D	PIN DIODE ATTENUATOR, VOLTAGE CNTRL, 1-18 GHz	1	
FPMS-L7	PDA-VA18G40G60DB	PIN DIODE ATTENUATOR, VOLTAGE CNTRL, 18-40 GHz	1	NR
FPMS-L7	POT-288TR12	POT, MECHANICAL ROTARY ENCODER, 2 BIT DETECT	1	
FPMS-L7	POW-PSA4531	PS, 5V @ 4A, 12V @ 1.5A, -12V @ 0.5A	1	
FPMS-L7	SWI-LRA21IL24V	SWITCH ROCKER ILLUMINATED, S	1	