

Insulated Modem for Smart Fieldmeter® Digital RFP-05M

IM-MU and FOLK-02 Kit

Users Manual



1. Description of IM Insulated USB and Fiber Optic Modem for RFP-05M

IM insulated modem is an accessory for Smart Fieldmeter® Digital **RFP-05M**. It allows direct connection to computer USB port, allowing both battery charging and PC communication. Internal optical isolation of the USB modem provides RF decoupling between the meter with connected RF probe and PC. Fiber optic ST ports can be connected to the byline communication fiber optic cable, totally eliminating any wiring that may affect the measured RF fields.

- IM modem itself comes in the following three configurations:
 - **IM-MF** (Fiber optic and USB, connects to meter),
 - **IM-MU** (USB only, connects to meter),
 - **IM-PF** (Fiber optic, USB connects to PC).
- Mounts at the bottom of **RFP-05M** meter (**IM-MU, IM-MF**).
- Plugs into USB port of PC for communication (**IM-PF**).
- Dual ST fiber optic connectors.
- Optical isolation prevents RF coupling.
- Allows USB charging of **RFP-05M** battery.
- Lightpipe shows the charging LED status.
- **IM** doesn't need any additional power supply.
- All functions of the modem are fully automatic, and controllable from the meter software menu.
- Small size (WxHxD): 3x1.5x1 inch, 76x38x25 mm.
- Weight: 0.2 lb, 100 g.
- Designed and made in the **USA**.

2. Applications and IM Insulated Modem Kits

There are two main applications of the IM Insulated Modem:

1. In the field and in the lab when USB bidirectional communication and charging is required. RF/AC isolation from the power source and/or PC is a must.
2. In the lab (mainly - in the screen rooms and anechoic chambers) and for some permanent installations when totally wireless connection with PC is needed.

Based on the applications above **we offer two IM configurations for sale:**

Insulated Modem IM-MU



View shows meter mounting connectors



View shows USB port

- Choose **IM-MU** for all applications requiring RF isolated USB powering, battery charging and communication.

IM-MU unit does not include the fiber optic connectors which is the convenience in the field (no sticking out ST ports) and cost reduction.

RF/AC decoupling allows this model to be used in both cases - when meter is internally battery powered and when the whole unit is connected to the USB port of the PC. It allows little power when meter is powered by its battery, and provides meter USB charging from all USB compatible ports.

Fiber Optic Link Kit FOLK-02



Component IM-MF

View shows fiber optic and USB ports. USB port is used for battery charging or for communication, if desired.



Component IM-PF

View shows fiber optic and USB ports. USB port connects to a PC.



FOLK-02 Kit



FOLK-02 Kit assembled with meter

- Choose **FOLK-02** (IM-MF with IM-PF and 10 meter fiber optic cable) for applications requiring fiber optic connection with communication. Longer cables are available on request.

In this case unit that is connected to the meter is IM-MF, having both USB and fiber optic ports. Unit IM-PF with fiber optic ports and USB is connected to the USB port of the PC. Meter can be battery powered or it can be also connected to the USB compatible power supply (to charge the battery and keep meter alive for long periods of time). PC communication can be only done through one source at a time (either through IM-PF and fiber optic ports or through USB port of the IM-MF modem).

3. IM Installation and Operation

Installation of insulated modem (both IM-MF and IM-MU) requires the following steps:

1. Turn the meter RFP-05M off before IM installation.
2. Remove two diagonal bottom screws from RFP-05M meter.
3. Plug IM two connector plugs (serial data plug and DC power one) into corresponding jacks at the bottom of the meter. Watch for perfect alignment - do not apply force.
4. Securing the IM with two long screws (installed diagonally) supplied with IM.

The IM link starts operation as soon as RFP-05M is set into "PC" mode and PC software controlling the serial port is running (see below).

Data from RFP-05 can be viewed on PC and all meter pushbuttons can be emulated from PC by sending an appropriate commands, thus allowing the user to create a custom bidirectional remote control test system.

For USB charging and/or communication - connect Mini USB cable into USB port of IM-MF (IM-MU). The other end must be connected either to USB port of PC or - to USB compatible power supply: 5V/0.5A.

Note: Not all power supplies on the market that have USB 5V jack are "USB Compatible". We recommend using the AC/DC adapter that we provide with unit.

4. RFP-05M PC mode setup

To put RFP-5 into PC mode, perform the following settings:

<MENU> brings to the screen the Main Menu.
<↓> Select Setup.
<ENTER> brings to the screen the Setup Menu.
<↓> Select DSP/Key.
<ENTER> brings to the screen the Dsp/Key SetupMenu.
<↓> Select Sleep/PC.
<→> Select PC.
<MENU> brings to the screen the Main Menu.
<NORD> brings the Normal display.

Note: When PC link is not in use we recommend selecting the Sleep from Sleep/PC menu to extend the battery run time in case of prolonged periods of inactivity.

5. PC setup

The default software that can be used for communication with RFP-05 is a standard program HyperTerminal® from Hilgraeve, Inc., supplied with every Windows® operating system (except Vista®). We will specify the steps for Windows XP®, other Windows® variants can be done in a similar way.

First, RFP-05 should be turned on, Data cable and Serial cable - connected.

To start the HyperTerminal®, perform the following:

Run HyperTerminal by selecting:

<START> <All Programs><Accessories><Communications><HyperTerminal>.

Ignore the HyperTerminal warning by pushing <OK>.

Print the session name <ABC>.

Ignore the HyperTerminal warning by pushing <OK>.

Select your COM port number (typically, COM1 or COM3).

<OK>.

Select the serial port communication parameters:

Bits per second: 4800.

Data Bits: 8.

Parity: None.

Stop Bits: 1.

Flow Control: None.

<OK>.

Configure the data display by selecting:

<File><Properties><Settings><ASCII> and

check "Append line feeds to incoming line ends"

<OK><OK>.

6. Specification

Parameter	Value
Model Number	IM-MF, IM-MU, IM-PF
Number of Channels	1
Interface	Serial USB UART
Inputs/Outputs	Balanced/Single Ended, Isolated
Communication speed	4800 baud
RS 232 protocol setting	"4800, N, 1 S, No Hardware" protocol
Decoupling	134 dB@60 Hz
Power	Ports powered

Note: This Specification may be changed without notice due to continuous improvement of the design and manufacturing process.

7. Serial Link Set of Commands

RFP-05 can be controlled from the serial port similar way as from the soft keys and/or from the IR remote. Standard Terminal program (like HyperTerminal®) can control SFD and can get status/measurement information. Each message should be terminated by "<CR>" (ASC-II 13, known as Carriage Return or Enter code).

- All control can be executed from PC through serial link same way as from the front-panel soft keys.
- Each 7 soft key can be pushed from a terminal program by typing: Kx<CR>.
- Where the first character is an upper case K. The second character is a number from 1 to 7 (1=Upper Left key, 2=Middle Left key, 3=Upper Right key, 4=Middle Right key, 5=Lower Left key, 6=Lower Right key, 7=Lower Middle key – Menu key).

The third character is the Carriage Return (or Enter key) on the terminal.

- Logging to PC through Serial Port can be enabled by the “PC1<CR>” command, while it can be disabled by the “PC0<CR>” command.
- If the PC Log enabled then the PC Log can be canceled any time with typing CTRL_C (Hold the Control key and type C). This command is equivalent by setting the Sleep/PC line to PC on the DSP/Key Setup screen.
- When PC Log is enabled then all measurement value is pushed (sent) to the terminal as an ASC-II string (measurement with units and terminated by CR, like: “ 7.49 V/m <CR>”). The measurement frequency depends of the measurement mode. If MAN selected then every time when the [MAN] button pushed otherwise in every 100msec, 300msec, 1sec, 3sec, 10sec, 30sec, 1min, 6min, 30min accordingly.
- Anytime the current measurement value can be requested by the “GM<CR>” command. The format is same as in the PC Log mode: 3 numbers with a properly positioned decimal point followed by 4 ASC-II characters Unit description, like: “mV/m”.
- The Battery Time can be requested by the “BT<CR>” command.
- The Unit operation time Time can be requested by the “UT<CR>” command.

Note: Developers who would like to write their own communication software should contact the manufacturer for more detailed software information.

8. Limited Warranty

The manufacturer (EMC Test Design, LLC) warrants the product to be free from defects in material and workmanship under normal use and service for the period of 1 (one) year from the date of purchase. This warranty extends only to the original buyer or end use customer of a manufacturer-authorized distributor.

Manufacturer’s warranty obligation is limited, at manufacturer’s option, to refund of the purchase price, or free of charge repair or replacement of a defective product, which is returned to an authorized distributor or manufacturer within the warranty period.

Manufacturer authorized distributors have no authority to extend the warranty on behalf of the manufacturer.

To obtain the warranty service, contact your authorized distributor. Buyer pays for the insured shipping of the unit to be returned or serviced. Manufacturer doesn’t assume any risk for damage in transit. Following the warranty repair, the product will be returned to the buyer, transportation prepaid.

If manufacturer determines that the failure was caused by misuse, negligence, accident or abnormal condition of operation and handling, manufacturer will provide an estimate of the repair costs and obtain authorization before commencing the work. Following repair, the product will

be returned to the buyer, transportation prepaid, after customer has paid for the repair and return transportation charges.

The typical example of product abuse, which voids the warranty, is: broken connectors. We will void the warranty if product has been opened.

This warranty is purchaser's sole and exclusive remedy and is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty or merchantability or fitness for a particular purpose.

EMC Test Design, LLC shall not be liable for any special, indirect, incidental or consequential damages or losses, including loss of data, whether arising from breach of warranty or based on contract, tort, reliance or any other theory.

The limitations and exclusions of the warranty may not be applicable to every buyer depending on the laws of the land of residence.

Buyer has the rights to return the unit within 14 (fourteen) days from the date of purchase using the insured prepaid carrier, in mint condition in undamaged original package with all accessories and documentation for replacement or refund. In case of refund the restocking fee of \$10% will be charged.

9. Technical Support

To purchase the additional units, accessories, get technical support or warranty service, buyer should contact the authorized distributor or manufacturer by e-mail (preferred), or phone. Check our web site www.emctd.com for the most up to date information.

Buyer should supply the following information:

- Buyer's name, company name and contact information.
- Distributor's name, and contact information.
- Date of purchase.
- Serial numbers of the meter and probe.
- Accurate description of the issues.

Your answers will be used in full confidentiality with only one purpose – to make IM for Smart Fieldmeter® Digital RFP-05M better.

10. EC Declaration of Conformity



We, the undersigned, manufacturer: **EMC Test Design, LLC**
P.O. Box. 600532, Newton, MA 02460, USA

certify and declare our sole responsibility, that the following apparatus:

Description:	Electronic Test Equipment
Brand:	Insulated Modem for Smart Fieldmeter® Digital RFP-05M
Identification:	Model IM-MF (with subsets: IM-MU, IM-PF)
Manufacturer:	EMC Test Design, LLC

conforms with the essential requirements of the **EMC Directive 2004/108/EC**, based on the following specifications applied:

EU Harmonized Standards:	EN 61326-1: 2006,
specifically:	EN55011: 2007+A2:2007
	IEC 61000-4-2: 2008
	EN 61000-4-3: 2006

and with requirements of the **Low Voltage Directive 2006/95/EC**, based on the following specifications applied:

EU Harmonized Standard:	EN 61010-1: 2001
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and therefore, complies with the essential requirements and provisions of the EMC Directive. The technical documentation is kept at the following address:



EMC Test Design, LLC P.O. Box. 600532, Newton, MA 02460, USA www.emctd.com

July 1, 2013

A handwritten signature in black ink, appearing to be 'D. Lee', written over a horizontal line.

10. About EMC Test Design, LLC

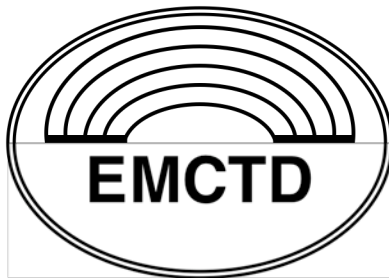
EMC Test Design, LLC is a company created and driven by group of professionals with background in RF, Analog and Digital Electronics with particular expertise in EMC instrumentation. Our field strength monitoring products are designed for EMC/RF professionals as tools for RF safety, regulatory and EMC applications. We served the EMC/RF testing needs of our customers since 1992.

The most known product [Smart Fieldmeter®](#) has been in production since 2004 and it is an instrument of choice of EMC and RF professionals all over the world. It has been recognized as "best field strength monitor for the money" and we are proud of it.

The advanced product addition was [Smart Fieldmeter® Digital](#). This instrument was designed as a response to our customer requests for state of the art field strength monitor with flexible and expandable architecture for demanding applications but still with convenience and simplicity. We designed [Smart Fieldmeter® Digital](#) to be not only the "best field strength monitor for the money" but simply - "The Best".

The [Insulated Modem IM](#) is an accessory to [Smart Fieldmeter® Digital](#) allowing both USB RF/AC isolated operation and totally wireless fiber optic operation - widely expanding the usability and value of our field meters and probes.

[Smart Fieldmeter® Digital](#) and all other products that we make are designed and manufactured in Boston, MA. Our office is located in Newton, MA, USA.



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