Description:

The PI-4100 is Potomac's third generation of precision survey instrumentation intended for the direct measurement of electromagnetic field strength in the 520 kHz to 5.1 MHz frequency spectrum. This instrument combines a laboratory quality radio frequency voltmeter, a balanced loop antenna, an internal GPS receiver,an internal calibration source and data acquisition hardware and software, in a single rugged package weighing less than 3 kg.

Drawing upon the combined knowledge of thousands of user engineers and literally hundreds of thousands of hours of real world field operations, Potomac Instruments, inc. has developed another product worthy of the Potomac name.

Voltmeter Display:

Station - Date & Time Stamp
Frequency - Battery Voltage

Field Strength displayed in mV/m & dB above 1 V/m
Low Pass Filter setting

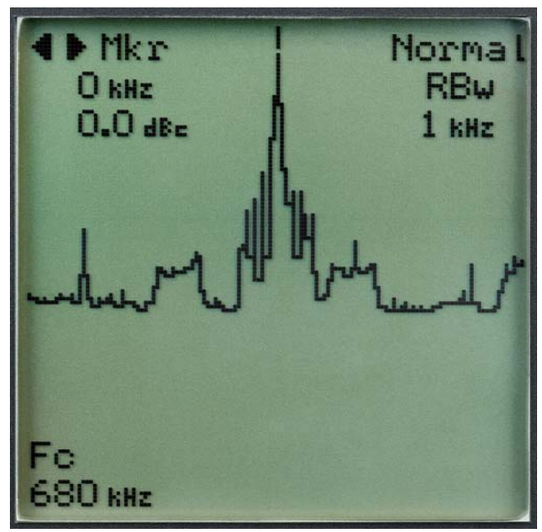
Bearing (degrees) and Distance (km) to Station

Latitude & Longitude in GPS Coordinates
Satellite Vehicles Seen

Context sensitive menu prompts

This device is equipped with an embedded microcontroller engine that obtains measurement data from the various transducers within the instrument and formats that data for display and, at the option of the user, stores it to memory.

Spectrum Display:



The spectrum display screen provides 1.0 kHz resolution bandwidth and a sweep width of either +/-220 kHz or +/-60 kHz from center. Amplitude resolution is 1.0 dB.

The carrier frequency is displayed (center screen) and an internal Marker can be moved in increments of 1.0 kHz either side of the carrier to precisely measure frequency response or interference level (in tenths of a dB below carrier) at the Marker frequency. This information is also digitally displayed on the screen.

Meter trend indicator - referenced to last meter sample

△ Greater Than
▬ Equal To
▽ Less Than

Various I/O ports have been provided to enhance the versatility of the instrument and to perform such operational tasks as battery recharge and computer data exchange.

Calibrate Input

External RF Input & F.S. DC Output

RF Output

Headphone Jack

Charger Input

USB I/O

The PI-4100 was designed to become the successor to the industry standard FIM-41 and to provide the accuracy and reliability that the international engineering community, government regulators, and broadcast licensees have depended on for more than a generation.

PI-4100 innovations include:

- √ 127 dB dynamic range measuring receiver
- √ Digitally synthesized tuning in 1.0 kHz increments
- √ Spectrum Display to facilitate various compliance measurements (Field Strength, Harmonic level, and Spectrum Occupancy) in a single instrument
- √ Provisions for third party calibration, using their own laboratory standards, when it is impractical to return the instrument to the manufacturer for calibration
- √ Data acquisition software and PC interface to enable the collection, analysis, and e-distribution of field measurements. (This feature anticipates the future acceptance of data e-filing by federal regulatory agencies.)

[1] US National Institute of Standards and Technology

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Specifications

Field Strength Meter	
Frequency Range	520 kHz to 5.1 MHz, calibrated
Field Strength Range	22 µV/m to 50 V/m (27 dBuV/m to 154dBuV/m)
Measurement Uncertainty	3.0% (±0.3 dB) referenced to NIST[1] standard field
Measurement Bandwidth	1.0 kHz
Adjacent Channel Rejection	>85 dB at ±9 kHz
Image Rejection	>60 dB
Spurious Rejection	>80 dB
Minimum Frequency Step	1.0 kHz
Self generated 2nd & 3rd harmonics	<-85 dBc (carrier F/S <10 V/m, from 530 to 1700 kHz)
Antenna Type	Balanced Multiturn Loop (removable)
DC Field Strength Output	10 mV/dBuV/m over full FS range
RF Voltmeter	
Electrical specifications shown above	RF Signal applied to RF In BNC
Measurement Units	µV-mV-V; mV only; dBuV/m
Spectrum Display	
Center Frequency Range	520 kHz to 5.1MHz
Frequency Span	±63 kHz, ±22 kHz
Resolution Bandwidth	1 kHz
Data Storage and Retrieval	
Measurement Points	250 max.
Download Software	**PI** Proprietary (Microsoft Excel® format compatible)
Download Format	ASCII; Comma Delimited
I/O Ports	
Headphone Jack	3.5 mm Stereo Audio Jack
Battery Charging Jack (12-15 Vdc)	2.1 mm Power Jack (Switchcraft 722A or equiv.)
Data output / Control Input Jack	USB Type B (for bi-directional computer interface)
External RF Calibration Jack	BNC (provides for calibration by a 3rd party cal. lab)
External RF Input Jack	BNC (Input Impedance 1890Ω +12pF)
External RF Output Jack	BNC (50Ω) RF output is proportional to Field Strength
General	
Batteries (AA cells, six required)	Rechargeable; NiMH pack supplied (can also use 1.5V Alkaline or Lithium)
Battery Life	5 Hrs. Minimum before Recharge (NiMH)
Battery Recharge Time	3 to 4 Hours
Operating Temperature Range °C (°F)	-15°C to +50°C (+5°F to +130°F)
Dimensions cm (inches)	L x W x H 38x18x28 cm (15x7x11 in.)
Weight kg (lbs.)	2.5 (5.5)

Specifications subject to change without notice

PI 4100

Medium Wave Field Strength Meter

Salient Features:

Lightweight, Rugged & Portable
Self Calibrating & Easy to Operate
Digital Tuning
Digital Field Strength Display
Digital Spectrum Display
Digital Data Capture & Storage
SBAS augmented GPS positioning
Calculates TX Distance & Azimuth
E-Data Friendly Transport Software
Useable, 200 kHz - 8500 kHz
Harmonics Measured to 5.1 MHz
Uncalibrated FS to 600 V/m
Antenna Orientation Compass
Use Hand-held or Tripod mounted
Calibration Traceable to NIST[1]
DRM Capable
External 50Ω Calibration Input Port
RF Output for external Spectrum Analyzer
DC Output Proportional to dBuV/m
Removeable Loop Antenna
Speaker & Headphone Audio Outputs
Built-in Quality and Reliability by:

PI Potomac Instruments, inc.