



Electric Field Mill Sensor

Atmospheric Monitoring and Lightning Warning Device

Highest Quality, Low Maintenance Robust Design

Having a system to monitor the atmosphere to provide early warning when lightning may be present is not just a luxury for many operations, but a necessity. For those whose operations are critical the system must be as reliable, robust, and maintenance free as possible.

The 1000 Series Electric Field Mill is the result of more than 15 years of collaboration with mission critical managers, scientists, and field maintenance personnel to produce the highest quality, most robust system design possible.

A custom brushless motor with heavy-duty bearings, stainless steel shaft, and electronic commutation is specially designed into the EFS 1000 Series to withstand the harsh rigors of the outdoor environment where it must operate 24 hours/day, 7 days/week.

Carefully specified front-end components and precision molded high impedance Teflon insulators are combined with hardware consisting of stainless steel and an exterior housing of aluminum with rugged fused epoxy powder-coating. Use of these materials ensure durability and the best corrosion resistance possible.

In addition to the use of high quality manufacturing and material standards, consideration has been given to field maintenance and a service profile which allows for complete servicing without disturbing the unit's calibration. The need for maintenance is further reduced through use of a downward looking design which drastically reduces the effects of precipitation and atmospheric contaminants. Such attention allows Mission Instruments to have the best MTBF (mean-time-between-failure) in the industry and the longest initial warranty policy offered for a field mill (3 Years).

Field Mills have been in use for over 70 years and have been praised for their usefulness in providing lightning warning information. Field Mills are not Lightning Detectors but rather, are designed to determine when conditions exist where lightning is likely to occur in the local area. The simple fact is that without elevated electric fields and a separation of charge lightning will not and cannot occur. Monitoring the threat against pre-defined thresholds makes it possible to implement timely decisions and to take action such as triggering alarms and notification devices, engaging auxiliary power sources, or isolating sensitive equipment and data, and more.

Customer List Includes:

- Los Alamos National Lab
- Sandia National Lab
- US Naval Air Warfare Center China Lake
- Weapons Station Pearl Harbor
- US Army National Guard
- Lockheed Martin Aerospace
- Naval Station Pt. Mugu
- Loral Aero Space
- Mass. Institute of Technology



EFS 1000 Series Electric Field Mill

Applications:

- DOD / DOE Facilities
- Blasting Operations
- AeroSpace
- Hazardous Materials Management
- Atmospheric Research
- Oil & Gas Storage and Handling Facilities
- Military/Commercial Ordnance & Munitions
- Airport FBO and Ground Operations
- Golf Courses and Swimming Pools
- Crane/Heavy Equipment Operations
- Construction Sites
- Public Events and Outdoor Recreation



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Technical Specifications

Operational

Accuracy of field measurement	$\pm 1\% + 6V/m$ (when $20V/m < E\text{-field} < 20kV/m$)
Range	storm dependent, minimum 7 mile radius
Reliability	100% notification of field changes
False Alarms	0% chance of providing false indication of field change in the area
Response Time	0.1 second
Signal Interface	Analog Optional: 15-bit resolution digital interface
Measuring Range	0 to ± 20 kV/m

Electrical

Power Requirements	100-240 V AC, 50/60Hz or 20-30VDC, user option
Power Consumption	8 Watts

Power Protection

(Sensor; AC Input)	User-replaceable fuses
(Sensor; DC Input)	Self-Resetting Protection
(Motor)	Automatic overload protection, self-resetting

All Interfaces feature Multi-Stage Transient Protection

Mechanical

Motor

Type	Custom, Brushless
MTBF	300,000 hours
Speed	1650 RPM

Sensor

Weight	5.0 lb (2.3 kg)
Dimensions	height 7.5" (19.0 cm), diameter 6.0" (15.3 cm)
Cable Type	8-Cond. Shielded, Chrome PVC jacket

Sensor Mounting Stand

Weight	8.0 lb (3.6 kg)
Height (Installed)	60" (24 cm)
Junction Box	$\frac{1}{2}$ " EMT outlet, screw terminal
Exterior Construction:	Aluminum with powder coating for corrosion protection.

Remote Receiver

Height	6" (15.3cm)
Width	6" (15.3cm)
Depth	6" (15.3cm)

Supplied 100 ft cable connects field mill to "indoor" remote receiver

Environmental

Operating Range	-20 to +140 Degrees (F) -30 to +60 Degrees (C)
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Communications

Analog Output	0 - ± 10 Volt swing
Digital Output (Optional)	RS-232 Polled, User-selectable Baud rate, Full Duplex, ASCII format

Mounting Hardware

Stand with junction box mounts on flat horizontal surface (6 x 6 inches [2.5 x 2.5 cm] minimum), concrete pad or roof mount.

Customer Furnished

Concrete Pad and anchor bolts
Power to Site

Accessories / Options

Winmills	Windows based display software
Webmills	Internet / Intranet distribution software
ALB 101	Stand-alone hardware-based Alarm/Monitor external alarm interface via dry contact relays or line-voltage switched receptacles.
Siren System	Audible notification Interface
Rotating Beacon	Visual notification Interface
Strip Chart Recorder	Paper Interface

Contact Information

Sales Inquiries ..	
Company Web Site	www.missioninstruments.com
Warranty	3 yr. defective parts and/or manufacturing
Customer Support	Ron Binford, 520-721-7242

References

Upon Request