

EM Aware® - Comprehensive ESD Monitors

Connectivity

EM Aware can work as a stand-alone monitor or be connected to all major facility monitoring (FMS) systems or data acquisition (DAQ) systems. Each parameter that EM Aware monitors is presented on a separate data line. Typically, EM Aware provides 4..20mA output, however it can be configured for other types of interface -- please contact the factory.

Though each EM Aware can be powered by individual power adapter, there is no need for it.

Power to EM Aware can be provided by FMS via its own data cable, eliminating need for cumbersome "wall warts."

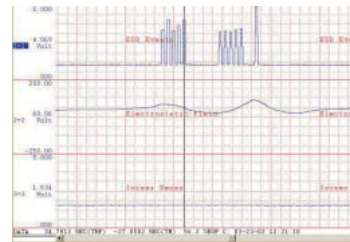
ESD Events are presented as pulses with the amplitude as a function of the strength of the events. EM Aware is fully characterized for three major discharge types -- Human Body Model (HBM), Machine Model (MM) and charged device model (CDM) -- and the distance from the source of the discharge.

Static voltage and ionization balance are presented on a separate combined line with indication of polarity of the voltage.

Ionization decay output is provided on its own separate data line.

All-in-One

In critical ESD/EMI environments EM Aware can be connected to its companion WS Aware workstation monitor to form a complete Aware® ESD/EMI monitoring system in one instrument. To assure the highest level of integration and the smallest real estate requirements on the workbenches and in the tools, EM Aware and WS Aware easily snap together with the help of the Aware® connectivity kit into one monitor with a single data and power connections..



Typical output of EM Aware with ESD Events, static voltage/ionizer balance and ionizer decay capabilities



EM Aware® and WS Aware® as a complete Aware® ESD/EMI/Workstation monitor with only one connection to FMS



ESD/EMI Events

The goal of the majority of ESD programs prevention of electrostatic discharges (ESD Events). It is ESD Events that cause damage to electronic devices. Presence of ESD Events indicates failure in ESD-preventive measures and potentially harmful environment for your components and assemblies.

Utilizing advanced patent-pending technology, EM Aware is capable of measuring magnitude of each individual ESD Event within very wide range -- from few volts crucial in disk drive manufacturing to hundred volts typical for electronic assembly lines. Threshold setting allows EM Aware to ignore events of insignificant magnitude so that only ESD Events important to you are reported.

At the same time EM Aware doesn't miss relevant ESD Events. It is equipped with an internal buffer that stores all the important data while it is being provided to the facility monitoring system.



Static Voltage

EM Aware can measure dynamics of electrostatic voltage in a very wide range. Using the same miniature antenna as for ESD Events, EM Aware can monitor static voltages in very tight places. EM Aware is calibrated for two types of measurements: induced voltage and voltage on the object 1" away from the antenna. EM Aware is ideal for monitoring voltage on wafers and reticles in process. For flat panel manufacturing EM Aware offers ability to monitor high voltages on panels in process. For high sensitivity disk drive manufacturing EM Aware can show induced voltage on sensitive components.

When static voltage of either polarity exceeds preset level, EM Aware sounds distinct alarm alerting personnel of dangerous electrostatic conditions.

EM Aware monitors both ESD Events and static voltage in one spot.



Ionizer Balance

Ionizer balance is essential for maintaining safe ESD environment. If an ionizer goes out of balance, it actually charges your sensitive components becoming a source of a problem rather than a solution.

Often, ionization balance needs to be maintained within 3V or even lower. EM Aware's unique design provides needed dynamic range for static voltages while having high sensitivity to ionization balance. This allows for greater accuracy and resolution in keeping balance in a necessary tight range.

EM Aware offers balance measurements for both AC and DC ionizers.

Zero-Balance Feedback Control

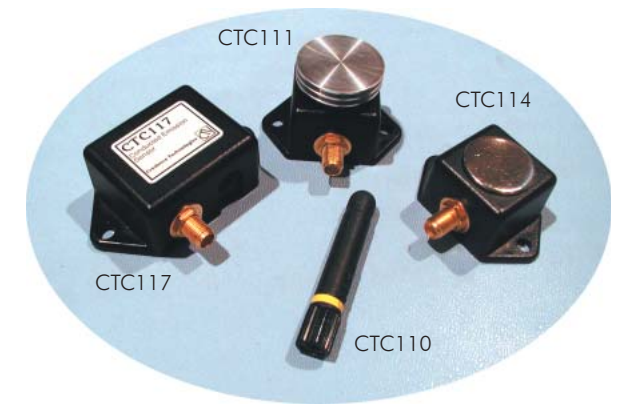
Any EM Aware capable of monitoring ionization balance can also be configured to provide zero-balance closed-loop zero-balance feedback control to specially-equipped ionizers.



Ionizer Decay

A true measure of performance of an ionizer is its decay time. Once-in-a-while measurements with regular charge plate monitor do not provide assurance of continuous performance in critical areas and areas where ionizer maintenance is done seldom. Also, large size of a charge plate doesn't guarantee that decay is adequate where it matters the most -- in the place where the sensitive components are being handled. The small size of its antenna allows EM Aware to monitor decay of AC and DC ionizers in tight places and in immediate proximity to the static-sensitive operations right where it is most needed, indicating problems with airflow and ion recombination.

EM Aware is the first instrument ever capable of continuous in-process monitoring of ionization decay and of providing local alarm and output to a facility monitoring system.



Antennae for All Applications

Credence Technologies offers large selection of antennae for different applications, including extended temperature range. Local and remote antennae are available for monitoring ESD environment and EMI on workbenches, in tight spots and inside the tools. Antennae are also available for monitoring discharges, transient and EOS signals on wires and cables. Please see the back of this brochure for details. EM Aware can also work with the third-party current sensors for accurate EOS monitoring. Contact factory for details.

What about ESD Events and EMI?

ESD Events generate electromagnetic fields which can interfere with normal operation of sensitive equipment and with wireless communication. This phenomenon is called EMI -- ElectroMagnetic Interference. Obviously, not every ESD Event creates strong enough field to cause interference and not all electromagnetic signals that cause interference are generated by ESD. Therefore, it is important not to confuse one phenomenon with the other.

Most damaging type of electromagnetic fields is transients -- short pulses that create pseudo-legitimate signals in the electronic circuits and disrupt their operation. EM Aware detects and measures such transient signals both from the air and from the cables using appropriate antennae. Use EM Aware to assure that your environment is EMI-free.

Credence Technologies is a world leader in EMI detection and measurements. We manufacture wide selection of instrumentation for EMI measurement and control -- contact factory for details.

EM Aware Starter Kits

The easiest way to get started with EM Aware is to use one of EM Aware Starter Kits. These Starter Kits contain everything you need to connect several EM Aware monitors to your computer and start collecting data on your ESD/EMI environment. EM Aware Starter Kits are perfect for diagnostics and portable or small installations.

Each EM Aware Starter Kit includes a number of selected EM Aware monitors, remote antennae, USB data acquisition system, Windows-based software, worldwide power adapter, all the cables and interconnects.

EM Aware Starter Kits Selection Table

Model	ESD Events	Static Voltage	Ionization Balance	Ionization Decay
CTK3A5-C	☑	☑	☑	☑
CTK2A6-C	☑	☑	☑	
CTK1A4-C	☑			

Number of monitors per kit can varies depending on selected features.

Specifications

Parameter	Value
ESD Events	
Sensitivity	1..1000V
Characterization	HBM, MM and CDM.
Threshold	Adjustable locally and remotely
Discharge Polarity	Both
Event Count	Available
Event Magnitude	Output to FMS, DAQ, LED Bar
ESD Event Indication	LED, Buzzer
ESD Event Hold	LED w/Reset
Static Voltage	
Types of Measurements	Induced Voltage 1" from the Surface
Measurement Range	+/-10V to +/-5000V Adjustable on-site
Indication	Output to FMS, DAQ; LED Bar
Alarm	Buzzer, Adjustable threshold
Ionization Balance	
Type of Ionizer	DC, AC
Measurement Range	+/-5V.. +/-500V full scale Adjustable on-site
Indication	Output to FMS, DAQ; LED Bar
Alarm	Buzzer, Adjustable threshold
Ionization Decay	
Type of Ionizer	DC, AC
Measurement Range	0..10 Seconds correlated to CPM
Indication	Output to FMS, DAQ
Alarm	Buzzer, Adjustable threshold
Interface	
Output to FMS, DAQ	4..20mA each channel Other interfaces available
Connector	RJ45
Power	12..24V DC, <200mA
Mechanical	
Dimensions (approx.) without antenna	3.2" x 2.25" x 1.30" 81mm x 57mm x 33mm

Selection Guide

Model	ESD Events	Logic Level Only	Event Magnitude	Event Counter	Static Voltage	Ionizer Balance	Ionizer Decay	Ionizer Feedback
CTC034-031	☑		☑	☑	☑	☑	☑	⓪
CTC034-030	☑		☑	☑	☑	☑		⓪
CTC034	☑		☑	☑				
CTC033-031	☑		☑	☑	☑	☑	☑	⓪
CTC033-030	☑		☑		☑	☑		⓪
CTC033	☑		☑					
CTC032	☑	☑						
CTC031					☑	☑	☑	⓪
CTC030					☑	☑		⓪

⓪ Add -F to the model to indicate ionizer feedback option. This option comes with 10' (3m) feedback cable.

Antenna Selection
EM Aware utilizes variety of antennae to provide the best performance for a specific application.

Local
CTC110 ☑ ☑ ☑ ☑ ☑

Remote
CTC111 ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑
CTC114 ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑

Remote Extended Temperature Range
CTC115 ☑ ☑ ☑ ☑ ☑
CTC118 ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑ ☑

Current/EOS
CTC117 ☑ ☑ ☑ ☑

All remote antennae come with 6' (1.8m) RF coaxial cable. Contact factory for other antenna options.

EM Aware® ESD Monitors

Essential Tools for ESD/EMI Management

Ionizers, wrist straps, anti-static chairs, conductive floors, special packaging materials -- if you have them, you must feel safe already. Then why are you still interested in yet more protection against ESD? Preventive measures work on assumption that no ESD events are generated if these measures are properly implemented. However assumption is not the word you want to hear when your production yield is falling and losses are piling up.

As an ESD management tool, EM Aware will:

- ☐ assess the existing ESD environment by collecting factual data and provide you with the information to make an informed decision on the level of ESD protection you need
- ☐ verify in real time how effective these ESD-protective measures are
- ☐ provide 24x7 365 days a year complete information on actual ESD environment so that no ESD problem will go unchecked.
- ☐ be a comprehensive diagnostics and troubleshooting tool for your ESD and EMI problems.

Award-winning EM Aware® is an essential link in establishing and maintaining safe ESD environment.



Applications

- Semiconductor Fabrication
- Disk Drive Assembly
- Flat Panel Fabrication
- Electronic Assembly
- Industrial Robotics
- Medical
- Military
- Powder and Liquid Handling
- Wherever ESD is a Problem

Features

- ESD Events: magnitude and count
- Static Voltage
- Ionization Balance
- Closed-Loop Ionizer Feedback
- Ionizer Decay
- EMI
- Broad Sensitivity Range
- Adjustable Sensitivity
- Audio and Visual Indication
- Stand-Alone or Networked
- Output to FMS and DAQ
- Individual Alarm Settings
- Local or Remote Antenna

EM Aware® Features

ESD Events

EM Aware detects ESD Events and measures their magnitude in a very wide range of sensitivity, as well as provides event count

Static Voltage

Real-time measurements of static voltage dynamics are done in a wide range that can be adjusted in the field.

Ionizer Balance

Unique feature of EM Aware allows to have high sensitivity to ionizer balance while maintaining wide range for static voltage.

Ionizer Decay

EM Aware provides on-going measurements of ionizer decay at the place where it matters -- where you handle sensitive components

Connectivity

EM Aware provides outputs for every parameter to all major facility monitoring systems (FMS).

Ordering Information

XXX + YYY + (F) + Z

XXX (Model Number) + YYY (Antenna Selection -- number only) + F (Feedback Option) + Z (Interface). Example:

CTC034-031-111-F-3

EM Aware CTC034-031 with ESD Event, static voltage, ionization balance, ionization decay, CTC111 antenna, ionizer feedback option with 4..20mA interface.

4..20mA interface (-3) is provided as default. Please contact factory for other interface options as well as power adapters and other accessories. Don't forget to order proper power adapter unless FMS or data acquisition system provides power to EM Aware.



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