



## Static Management Program (SMP)

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## State of the ESD Industry

- **Past:**
  - HBM (human body model) most prevalent failure mode
  - S20.20 level of compliance sufficient for most operations
- **Current:**
  - CDM (charged device model) largest source of ESD issues
  - Must assure customers of ability to safely handle Class 0 components
  - Continuous monitoring is essential in high-reliability, high value environments
    - Critical to include SMT equipment
  - Diagnosing ESD problems can be challenging - data required
- **Future:**
  - Process control is inevitable. Customers will come to expect this.
  - High levels of automation, ultra-sensitive components, and shop floor software will drive manufacturers to proactively manage their ESD initiatives
  - Compliance verification replaced by auditing data - inspections inadequate

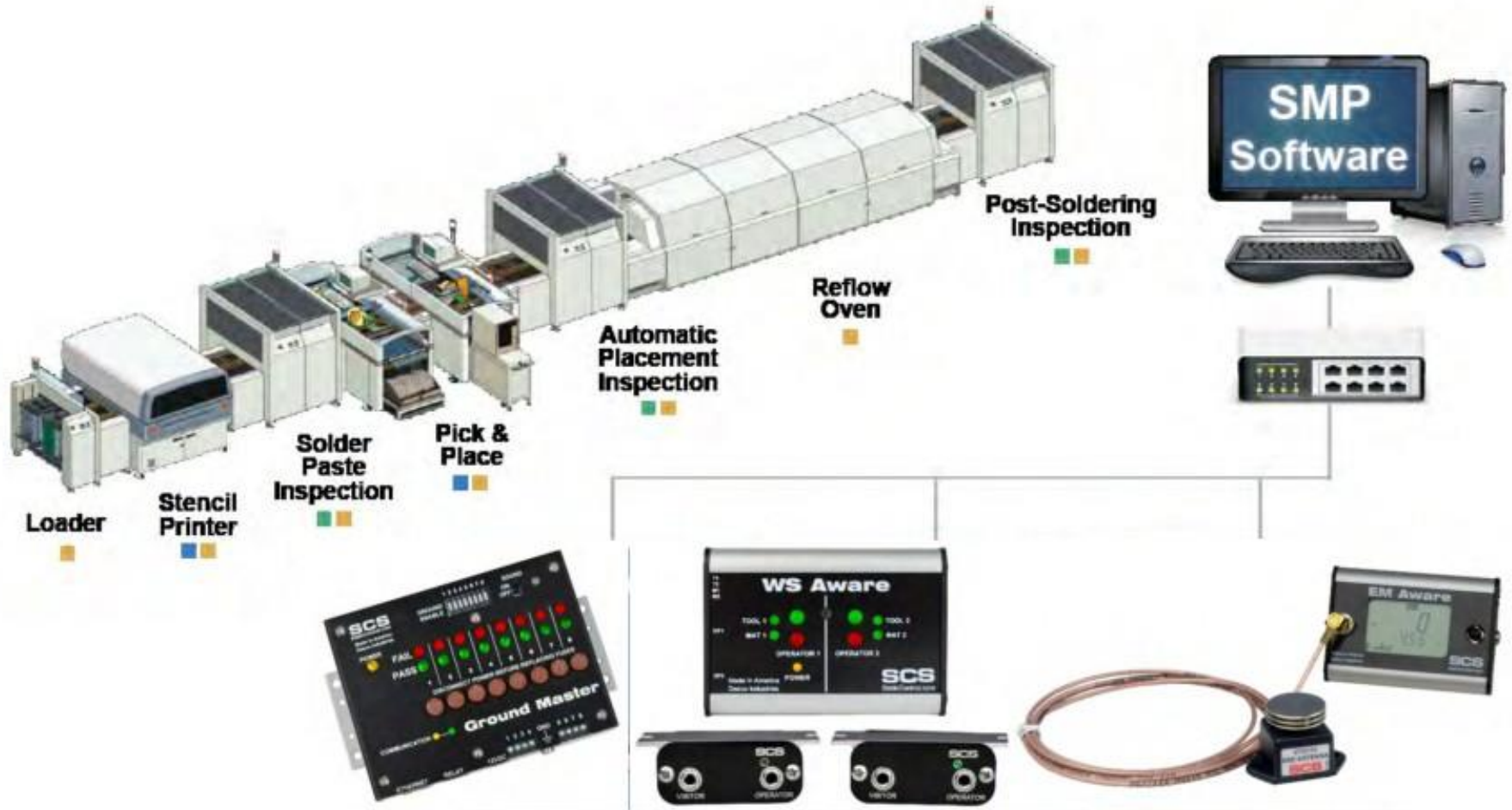
# Static Management Program (SMP)

## What is the Best Solution?

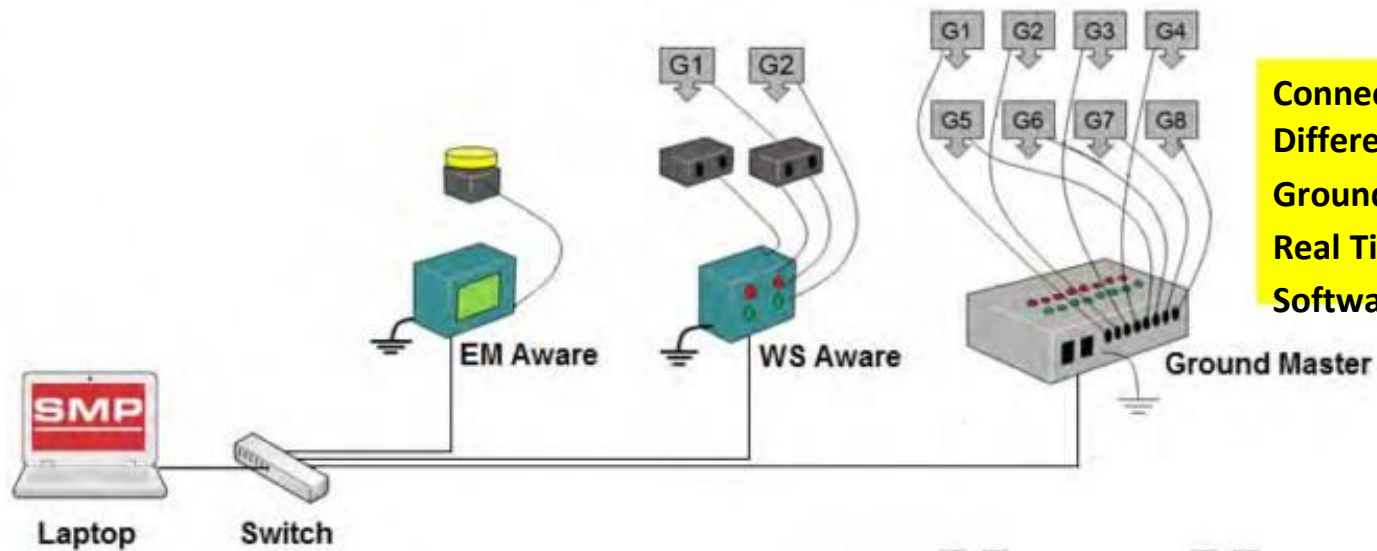
- System based on continuous detection in production areas
  - Ongoing readings at every stage where product could be damaged
  - Constant collection, reporting and analysis of data
- Equal attention to machine, bench and personnel monitoring
- User-friendly tools for ESD coordinators who wear many hats
- Ability to demonstrate robust static control measures to customers
- Transition away from reactive, fire-fighting approaches to proactive programs based on active management of entire ESD environment

# Static Management Program (SMP)

SCS Static Management Program (SMP) continuously monitors your ESD process control system throughout all stages of manufacturing. Static Management Program (SMP) captures data from SCS workstation, equipment and ESD event continuous monitors and provides a

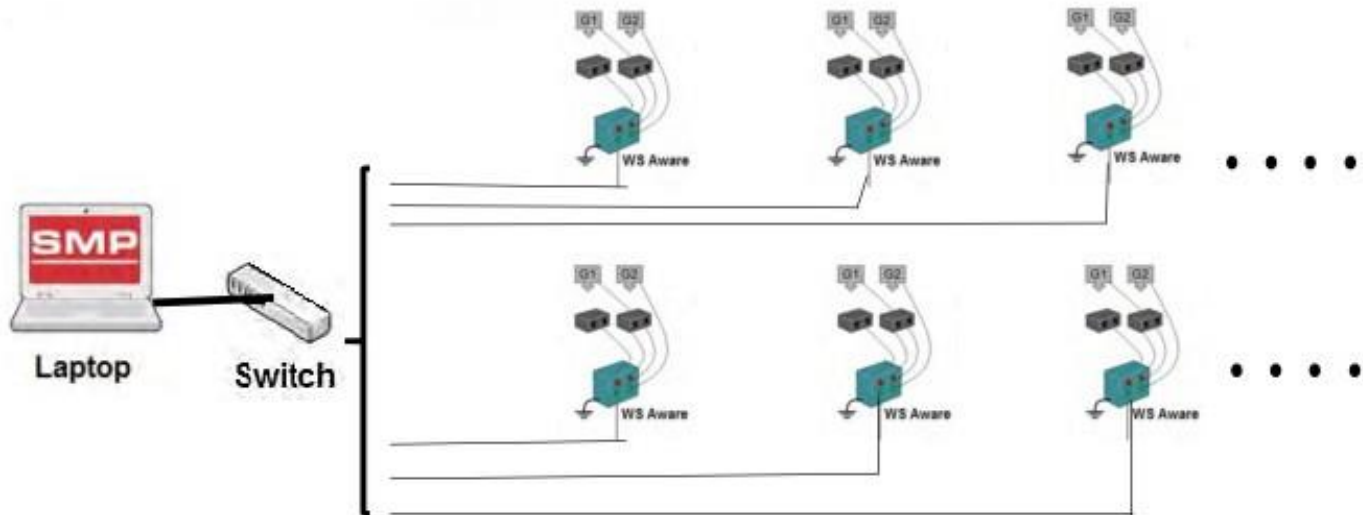


# Static Management Program (SMP)



Connection Schematic of Different Monitors - EM Aware, Ground Master, EM Aware to Real Time Station with SMP Software

Connection Schematic of Multiple WS Aware Units to the Real Time Station with SMP Software



# Static Management Program (SMP)

## EM Aware Monitor

- The EM Aware Monitor detects and measures electrostatic discharge (ESD) events, as well as static voltage and ionization parameters (depending on the model).
- The EM Aware Monitor is a continuous monitor with comprehensive diagnostics and troubleshooting features for use in an ESD environment.
- Provides monitoring of critical ESD processes and is an instrument that can qualify tools for handling ESD-sensitive devices, making it an essential ESD management tool.



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## WS Aware Monitor

- The WS Aware Monitor continuously monitors all grounding parameters in full compliance with ANSI/ESD S20.20 in accordance with ESD TR1.0-01-01, as well as high-frequency noise (EMI) on ground.
- WS Aware Monitors utilize dual wrist straps for a continuous resistivity check of human body connection using advanced digital signal processing technology for reliable monitoring utilizing ultra-low control voltage.
- Optional Big Brother remote terminals allow the monitor to alarm when an operator approaches static sensitive components, but does not plug in his/her wrist strap properly.
- WS Aware CTC061 provides continuous monitoring for two metal grounds (such as tools) and for two “soft” grounds
- WS Aware CTC062 provides continuous monitoring for four metal grounds



Big Brother  
Remote Terminal

# Static Management Program (SMP)

## Ground Master Monitor

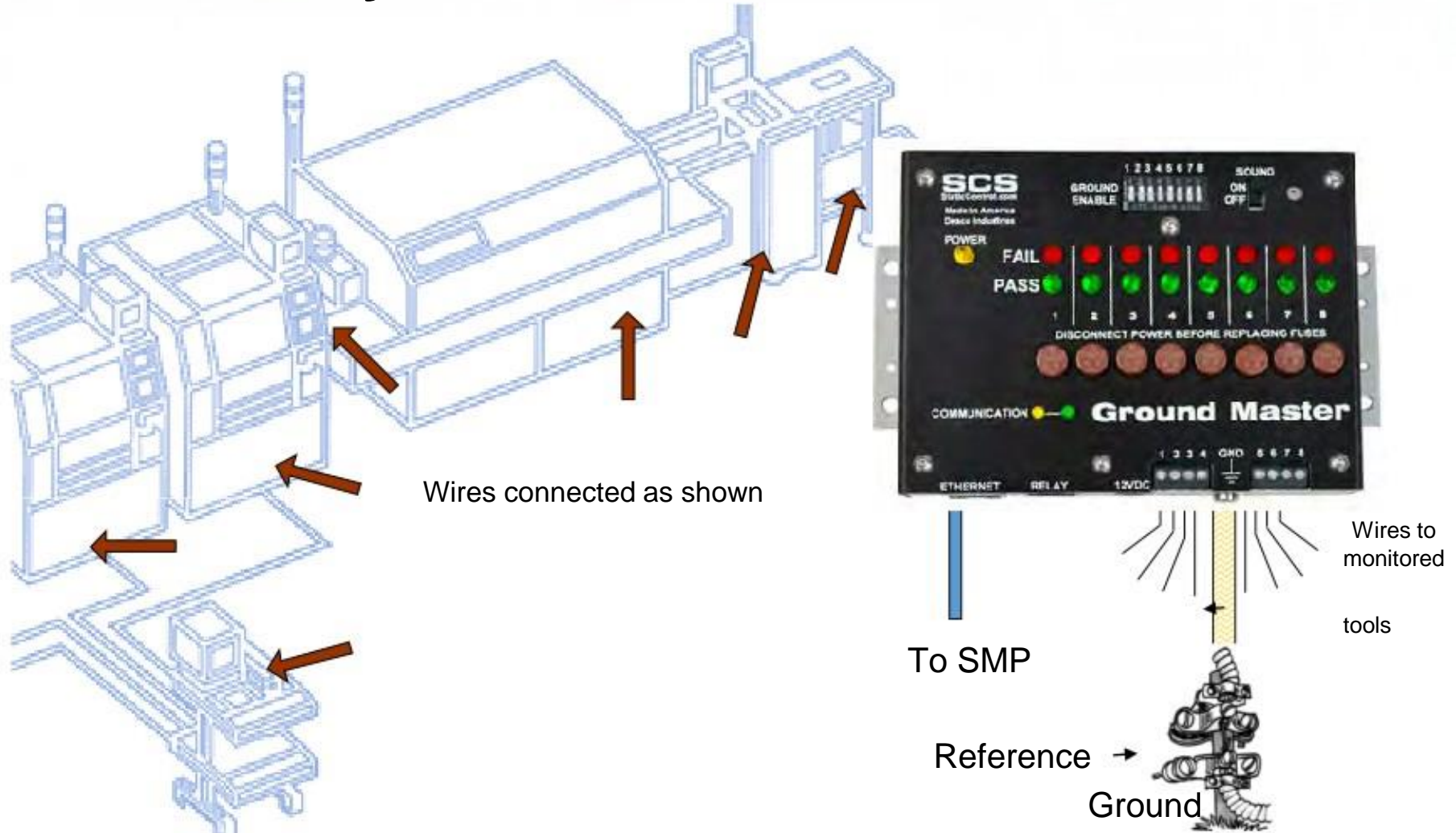
- Ground Master Monitor is designed to provide continuous monitoring of proper ground connections of up to eight tools.
- Ground Master Monitor measures impedance in accordance with ANSI/ESD S20.20
- Ground Master Monitor also monitors EMI Voltage signals on each ground, to assist in diagnostics of equipment lockups and malfunctions.
- Ground Master Monitor provides intelligent information to a facility monitoring system with detailed status on each ground connection.





# Static Management Program (SMP)

## Continuously Monitors Automated Tools



# Static Management Program (SMP)

## Homepage

SMP Device Monitoring v.2.0.6

Real Time

Building: -- all --

Find device:

Navigation buttons are present throughout all pages of the software.

Line	Wrist Straps	Personal Voltage	Process Voltage	Grounds	DC Ionization Parameter	Static Voltage	ESD Events
CA1   R&D   SMT	Gray	Gray	Green	Green	Green	Green	Red
-- unassigned --							

The entire status table is hyperlinked, which allows you to quickly and easily drill down to a particular room or even one particular line.

Homepage shows status of the entire facility, organized by building, room, line. Green = Good; Red = Alarm; Gray/White = Disabled.

### Alarms

order by: severity time

7/14/2016 8:10:14 AM	Operator 1 resistance on WS Aware 2 Grounds Touch-UP	13.74 MΩ
7/14/2016 7:39:01 AM	Operator 2 resistance on WS Aware 2 Grounds SMT Operator	0.00 MΩ

A list of recent alarms for all devices in the facility is present on the right side of every page.

All alarm notifications are hyperlinked...i.e. clicking on an alarm notifications will take you to a page showing live and archived data for that particular monitoring device.

Once addressed, alarms can be cleared from this view at your discretion.

# Static Management Program (SMP)

## Floor View

SMP Device Monitoring v.2.0.6

Real Time

Find device:

Floor: R&D CA1

A blueprint of your facility is uploaded or created, and icons representing various SCS monitoring devices are placed in the appropriate positions.

Icons will show a green light if they are turned on and there are no alarms; red light indicates an alarm.

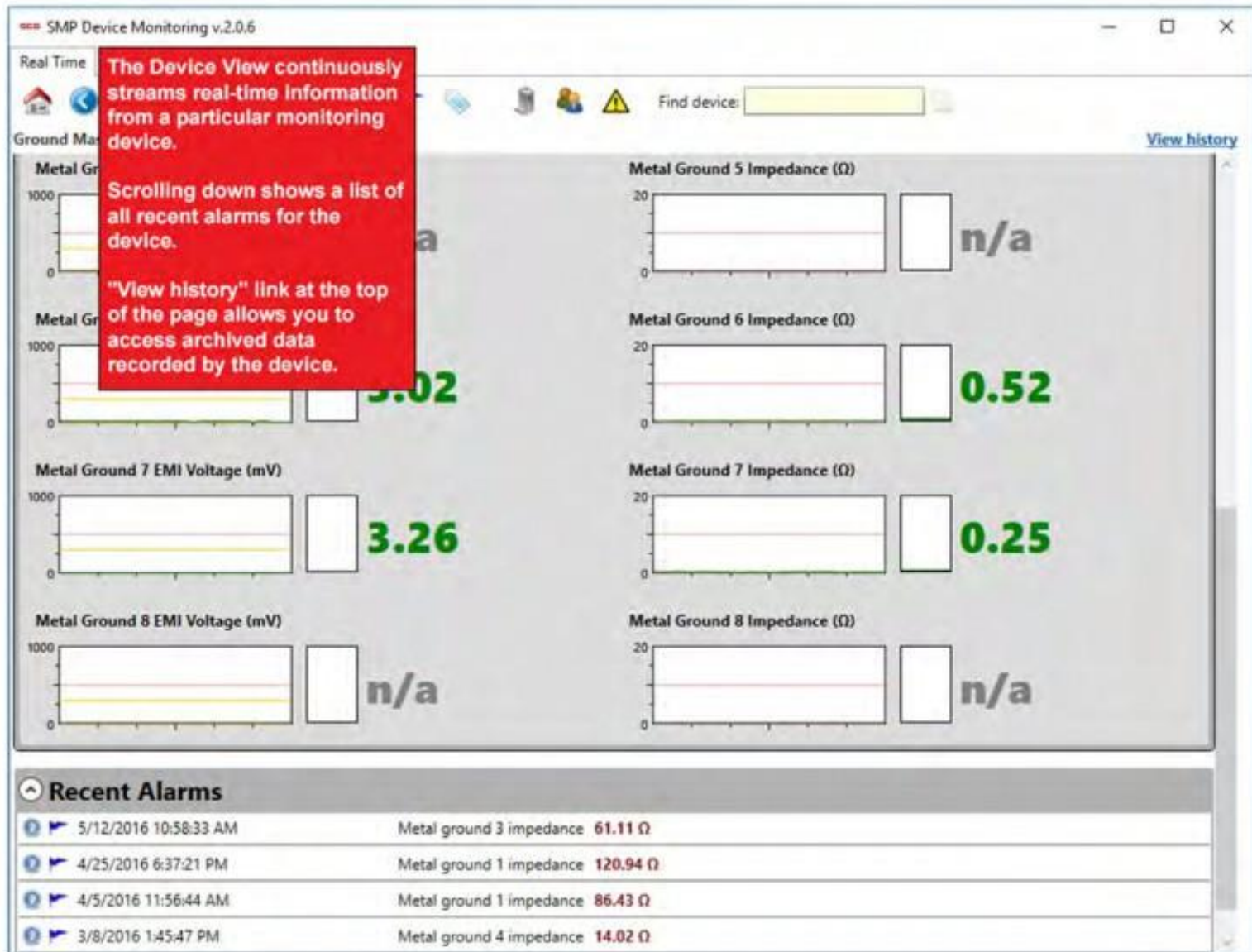
All icons are hyperlinked...i.e. clicking on an icon will take you to a page showing live and archived data for that particular device.

The screenshot displays a software window titled "SMP Device Monitoring v.2.0.6" with a "Real Time" tab. The interface includes a toolbar with various icons and a "Find device" search box. Below the toolbar, the "Floor" is set to "R&D" and "CA1". A large red text box on the left provides instructions: "A blueprint of your facility is uploaded or created, and icons representing various SCS monitoring devices are placed in the appropriate positions. Icons will show a green light if they are turned on and there are no alarms; red light indicates an alarm. All icons are hyperlinked...i.e. clicking on an icon will take you to a page showing live and archived data for that particular device." The main area shows a floor plan with several monitoring devices represented by icons. A central red icon labeled "Ethernet Router" is connected by red lines to other devices. The floor plan includes labels for "ASSEMBLY", "SMT OP", "Pick And Place 2", "Pick And Place 1", "Ethernet Router", "BURN-IN/CA", "CALIBRATION", "PROGRAM", "WORK STATION CONVEYOR 1", "WORK STATION CONVEYOR 2", "Cabinet 1", "Cabinet 2", "Foster Storage Cart", "Serial Storage Shelf", "Printer", "Water Meter", and "Shelf".

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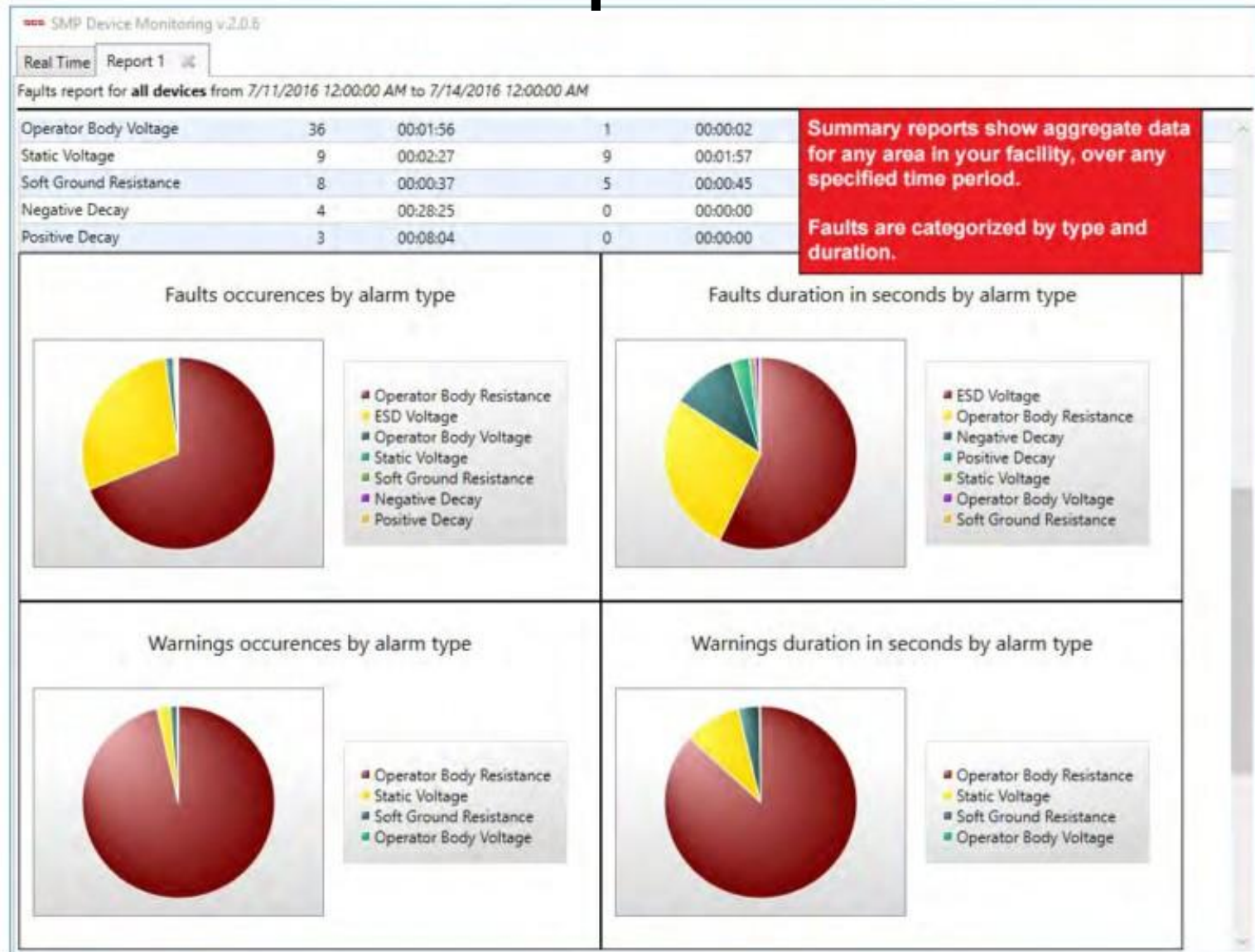
# Static Management Program (SMP)

## Device View



# Static Management Program (SMP)

## Reports



# Static Management Program (SMP)

## Reports

SMP Device Monitoring v.2.0.6

Real Time Report 1

Faults report for device **Pick&Place #2** from 11/7/2016 12:00:00 AM to 11/11/2016 11:01:00 AM

summary details Export

Total number of faults: 7378

Data can be easily filtered and/or exported

Filter

Time	Duration	Device	Type	Channel	Average	Min Value	Max Value
11/10/2016			EM Aware	ESD event (V)	45.34	45.34	45.34
11/10/2016			EM Aware	ESD event (V)	70.68	43.59	97.76
11/10/2016			EM Aware	ESD event (V)	31.95	31.95	31.95
11/10/2016			EM Aware	ESD event (V)	88.06	88.06	88.06
11/10/2016			EM Aware	ESD event (V)	63.43	60.45	65.67
11/10/2016			EM Aware	ESD event (V)	60.45	60.45	60.45
11/10/2016			EM Aware	ESD event (V)	48.55	48.55	48.55
11/10/2016 2:06:41 PM	00:00:01	Pick&Place #2	EM Aware	ESD event (V)	96.27	96.27	96.27
11/10/2016 2:06:29 PM	00:00:06	Pick&Place #2	EM Aware	ESD event (V)	67.34	35.44	111.54
11/10/2016 2:06:27 PM	00:00:01	Pick&Place #2	EM Aware	ESD event (V)	62.69	62.69	62.69
11/10/2016 2:06:22 PM	00:00:02	Pick&Place #2	EM Aware	ESD event (V)	52.98	44.76	61.20
11/10/2016 2:05:47 PM	00:00:03	Pick&Place #2	EM Aware	ESD event (V)	102.30	35.73	221.18
11/10/2016 2:05:44 PM	00:00:01	Pick&Place #2	EM Aware	ESD event (V)	52.98	52.98	52.98
11/10/2016 2:05:19 PM	00:00:01	Pick&Place #2	EM Aware	ESD event (V)	82.84	82.84	82.84
11/10/2016 2:05:14 PM	00:00:03	Pick&Place #2	EM Aware	ESD event (V)	57.53	30.77	93.28
11/10/2016 2:05:00 PM	00:00:02	Pick&Place #2	EM Aware	ESD event (V)	64.83	45.34	84.33
11/10/2016 2:04:52 PM	00:00:01	Pick&Place #2	EM Aware	ESD event (V)	61.94	61.94	61.94
11/10/2016 2:04:49 PM	00:00:02	Pick&Place #2	EM Aware	ESD event (V)	72.02	68.66	75.38
11/10/2016 2:04:46 PM	00:00:02	Pick&Place #2	EM Aware	ESD event (V)	87.81	43.88	131.73
11/10/2016 2:04:42 PM	00:00:01	Pick&Place #2	EM Aware	Static voltage (V)	250.00	250.00	250.00
11/10/2016 2:04:18 PM	00:00:01	Pick&Place #2	EM Aware	ESD event (V)	30.48	30.48	30.48
11/10/2016 2:04:14 PM	00:00:03	Pick&Place #2	EM Aware	ESD event (V)	62.35	48.25	69.41
11/10/2016 2:04:11 PM	00:00:01	Pick&Place #2	EM Aware	ESD event (V)	89.55	89.55	89.55
11/10/2016 2:04:09 PM	00:00:01	Pick&Place #2	EM Aware	ESD event (V)	42.43	42.43	42.43
11/10/2016 2:04:07 PM	00:00:01	Pick&Place #2	EM Aware	ESD event (V)	67.16	67.16	67.16
11/10/2016 2:04:01 PM	00:00:03	Pick&Place #2	EM Aware	ESD event (V)	57.44	44.76	61.20

Detailed reports show all faults individually and list the characteristics of each

Identifies the specific device and quantifies the intensity and duration of the fault

# Static Management Program (SMP)

## What is the Payback?

Instead of spending money on just prevention, not knowing if products are protected, and unable to determine payback...

- Companies can now determine and measure
- Savings may be realized from:
  - Higher yields & process efficiencies
  - Elimination of costly inspections
  - Fewer customer complaints
  - Less re-work and lower field returns
  - Budgets driven by performance data
- Leverage SMP to attract and retain customers
  - New source of competitive advantage
  - Tip the scale in project negotiations





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