**More details on the Manufacturing Analytics Dashboard and Enhanced Dashboard Features**

1.   **Productivity Dashboard Panel:** The productivity panel is used to measure real-time productivity on a production line, using measurements that output binary values, such as activity, motion, or a door opening or closing. An assigned shift schedule defines the work shifts during which productivity is measured. The productivity counter shown in the panel is based on how many times the binary measurement completed a cycle since the beginning of the active shift.
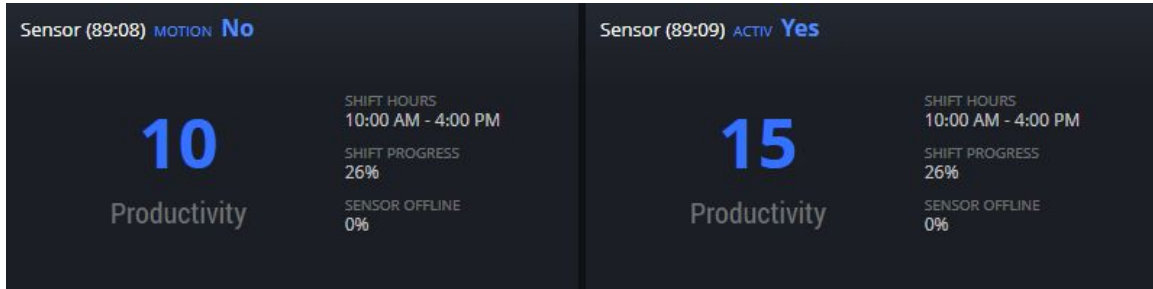

2.   **Compliance Dashboard Panel:** The compliance dashboard panel is used to monitor real-time compliance with environmental thresholds, using measurements that output scalar values, such as temperature, voltage, and vibration. An assigned threshold defines when a measurement is in compliance according to the threshold's normal status. An assigned shift schedule defines the work shifts during which compliance is required. The compliance percentage shown in the panel is based on time spent in normal threshold status since the beginning of the active shift.
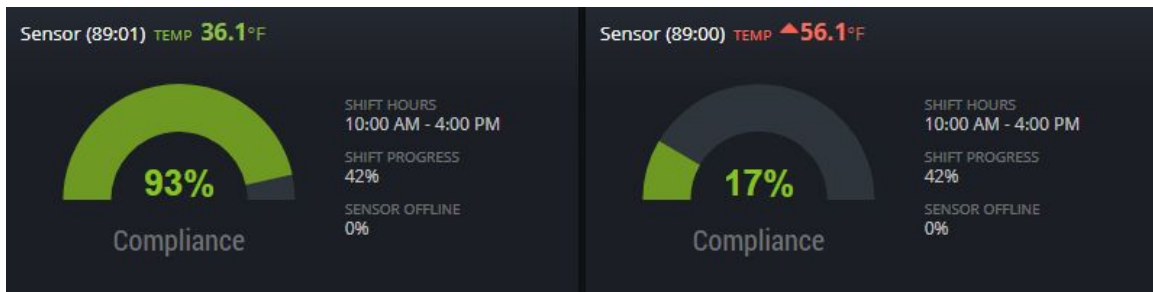
3.   **Utilization Dashboard Panel:** The utilization dashboard panel is used to monitor real-time utilization of equipment, using measurements that output binary values, such as activity, motion, door, or contact. An assigned threshold defines when equipment is in use according to the threshold's normal status. An assigned shift schedule defines the work shifts during which this equipment is scheduled to be in use. The utilization percentage shown in the panel is based on time spent in normal threshold status since the beginning of the active shift.
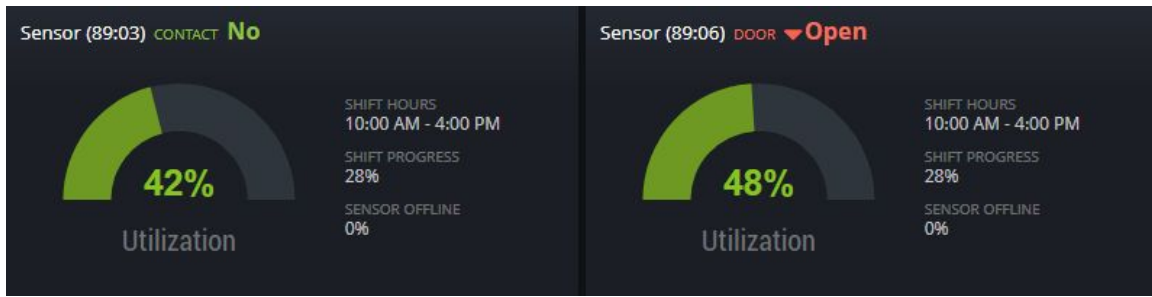
4.   **Shift Schedule Management:** Administrators can define a set of related work shifts at a facility. Each shift is defined by days of the week and time of the day in local time when the shift is active. A shift schedule can be assigned to measurements that monitor the environment or equipment in use during these shifts. Shift schedules allow real-time and historical analytics based on work shifts, including the utilization of equipment, compliance with thresholds, and productivity at various stages of a production line.
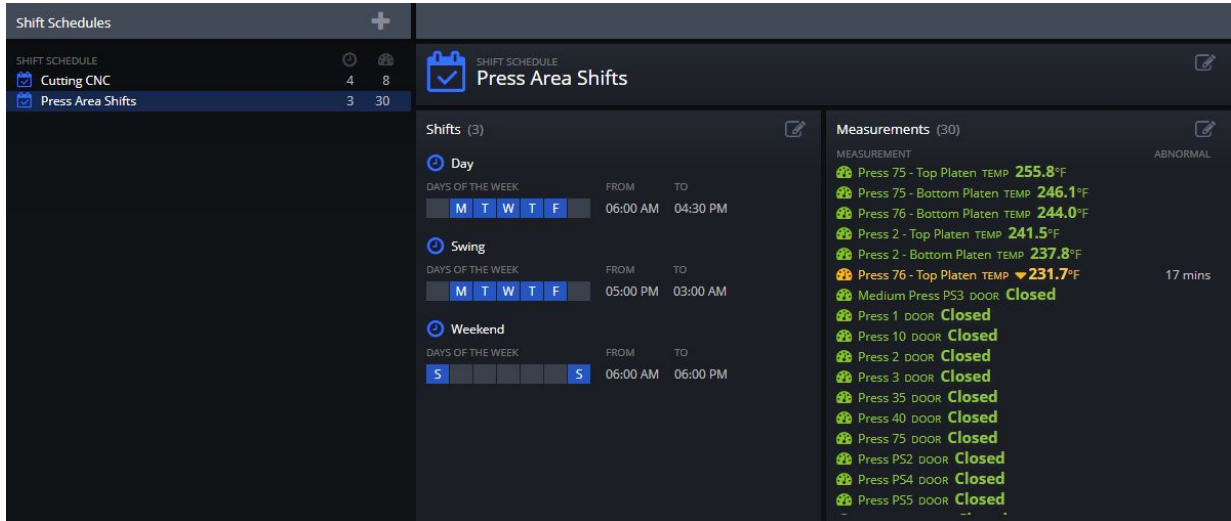
5.   **Analytics Reports:** The Analytics section in the Dashboard is used to gain business insights from the historical sensor data. While the real-time dashboard analytics panels focus on the current measurements and active shifts, historical analytics can reveal weeks or months of business trends and facilitate comparisons among successive shifts over time, or among multiple measurements in each shift. Analytics such as compliance, utilization, and productivity are compiled by time windows (shifts) according to a custom shift schedule for the selected date range. Optionally, results for each measurement can be averaged per shift to provide a high-level overview. Users can easily print analytics reports or save them as PDF files.

Analytics Reports

ANALYTICS ENGINE

Compliance ▾

Calculates the percentage of time spent in compliance with thresholds using measurements that output scalar values, such as temperature. The measurement is in compliance when threshold status is normal, so a threshold is needed.

AGGREGATION

| None | Average |

SHIFT SCHEDULE

Coolers Schedule ▾

DATE RANGE

FROM	TO
2/18/18 📅	3/2/18 📅

MEASUREMENTS

☐ SELECT ALL

☑ Sensor (89:00) TEMP **57.6**°F
☑ Sensor (89:00) TEMP **68.7**°F
☑ Sensor (89:01) TEMP **48.5**°F
☐ Sensor (89:01) TEMP **34.3**°F
☐ Sensor (89:01) TEMP **31.8**°F
☐ Sensor (89:02) TEMP **115.8**°F
☐ Sensor (89:02) TEMP **39.5**°F
☐ Sensor (89:03) TEMP **56.4**°F
☐ Sensor (89:18) TEMP **233.7**°F

✖ 📊

Utilization

SHIFT SCHEDULE
📅 Coolers Schedule

DATE RANGE
2018/2/28 - 2018/3/2

AGGREGATION
Average

MEASUREMENTS
🕹 Sensor (89:07) BUTTON
🕹 Sensor (89:08) MOTION
🕹 Sensor (89:09) ACTIV

SHIFT	UTILIZATION %	OFFLINE %
Morning Shift 2018/2/28 8:00 AM	55	0
Afternoon Shift 2018/2/28 4:00 PM	43	8
Morning Shift 2018/3/1 8:00 AM	50	0
Afternoon Shift 2018/3/1 4:00 PM	51	0
Morning Shift 2018/3/2 8:00 AM	53	0

Productivity

SHIFT SCHEDULE
📅 Coolers Schedule

DATE RANGE
2018/3/1 - 2018/3/2

AGGREGATION
None

MEASUREMENTS
🕹 Sensor (89:07) BUTTON
🕹 Sensor (89:08) MOTION
🕹 Sensor (89:09) ACTIV

SHIFT	PRODUCTIVITY	OFFLINE %
Morning Shift 2018/3/1 8:00 AM	49 / 48 / 55	0 / 0 / 0
Afternoon Shift 2018/3/1 4:00 PM	29 / 23 / 24	0 / 0 / 0
Morning Shift 2018/3/2 8:00 AM	34 / 33 / 26	0 / 0 / 0
Afternoon Shift 2018/3/2 4:00 PM	61 / 72 / 71	0 / 0 / 0

6. **Goals for Analytics:** Each goal defines the desired output for selected measurements during a shift for a specific analytics type. Analytics for measurements with goals are automatically enhanced by comparing each measurement output against its goal. Analytics values appear green if the goal has been met or if the goal is projected to be met by the end of the shift, otherwise they appear red. Analytics values without a goal appear blue. Goal-enhanced analytics are available for both historical analytics reports as well as real-time analytics dashboards. Even aggregated analytics reports support goals, as long as all the measurements being aggregated have the same goal. Goals can be managed and attached to measurements on a new Goals page accessible from the Analytics menu.

7.   **Enhanced Chart Navigation:** Measurement data can be viewed with enhanced controls below the chart on each measurement details page. A slider allows users to highlight historical values. The magnifying glass buttons zoom in and out while keeping the selected value centered. The double arrow buttons pan the view left or right. Finally, the skip-to-end button on the far right returns the chart to showing the latest value at the present time.

8.   **Dashboard Annotations:** Measurement data points can be annotated to explain the root cause of abnormal readings, describe special circumstances, or document events that affect the environment. A note can be added on the measurement details page using the note button below the chart on the far left. The slider and other navigation controls can be used to select the exact data point where a note is to be attached. Notes can also be added to gaps in the data to document network outages, power loss, or drained batteries by selecting a data gap with the slider. The note can be up to 100 characters long and appears as a gray sticky note icon on the chart. Note contents can be shown by tapping the icon or by using the slider to select the data point. Pressing the edit button on the note balloon allows the note to be edited or deleted.

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