Best Practices in Enterprise and Facility Optimization

Leveraging Enterprise Software and Services

E360 Webinar • October 29, 2019

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Ron Chapek is a director of product marketing responsible for ProAct™ enterprise software/services. Over his 30-year career in sales and product/strategic marketing management roles, he has focused on bringing new products to market for the PC-based data acquisition, industrial automation/process control-SCADA and intelligent building segments. Most recently, his focus has been on leveraging new software tools/platforms to better serve the multi-site retail segment. His areas of focus include: intelligent alarm/event monitoring; device networking/integration (IoT); fault detection and diagnostics/FDD; highly scalable data warehousing; and enterprise-level analytics.

Scott Fritz

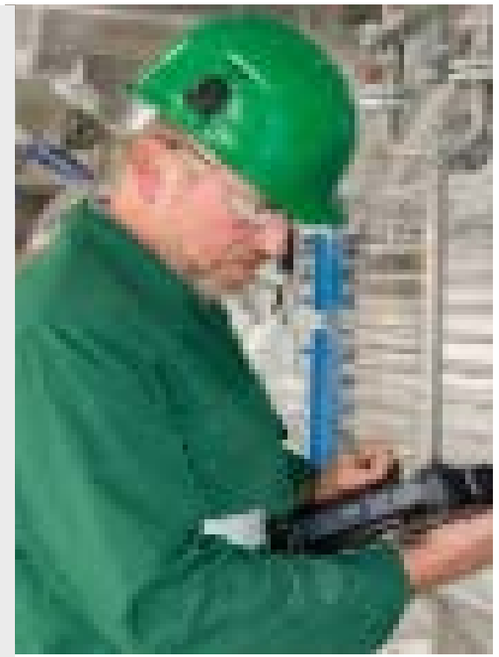
Director, Enterprise Services & IT Operations

Emerson

Scott Fritz has 25 years of experience managing large-volume service centers, workflow and process improvement within multiple industries. In his current role, he is responsible for Emerson’s enterprise services and information technology operations, managing the delivery and support of ProAct services for a diverse range of clientele.

The Opportunity

- Multi-site retailers are managing large portfolios with aging HVAC/lighting/refrigeration systems and a proliferating number of connected “smart” assets (IoT).
- Keeping these sites and their assets performing optimally, mitigating costly failures, saving energy, and ensuring food safety are major challenges.
- Service teams are running increasingly lean, and fresh talent is in short supply to address an aging workforce.
- Facilities managers are under increasing pressure to meet their commitments — while maximizing profitability and reducing liability/risk.



“Help me to identify the next most important thing I have to do.”

“Fix it right — and fix it fast.”

“I need to ‘get ahead’ of the issues. Now I’m still chasing to catch up.”

The Solution

Core Components

Alarm Management Services

- Service to remove noise and deliver actionable insights
- Mobile/desktop alarm workflows and reporting
- Advanced filtering

Enterprise Software

- Remote enterprise view and control
- Alarms in map view
- Food quality reporting
- Floor plans
- Setpoints and real-time, multi-point graphs

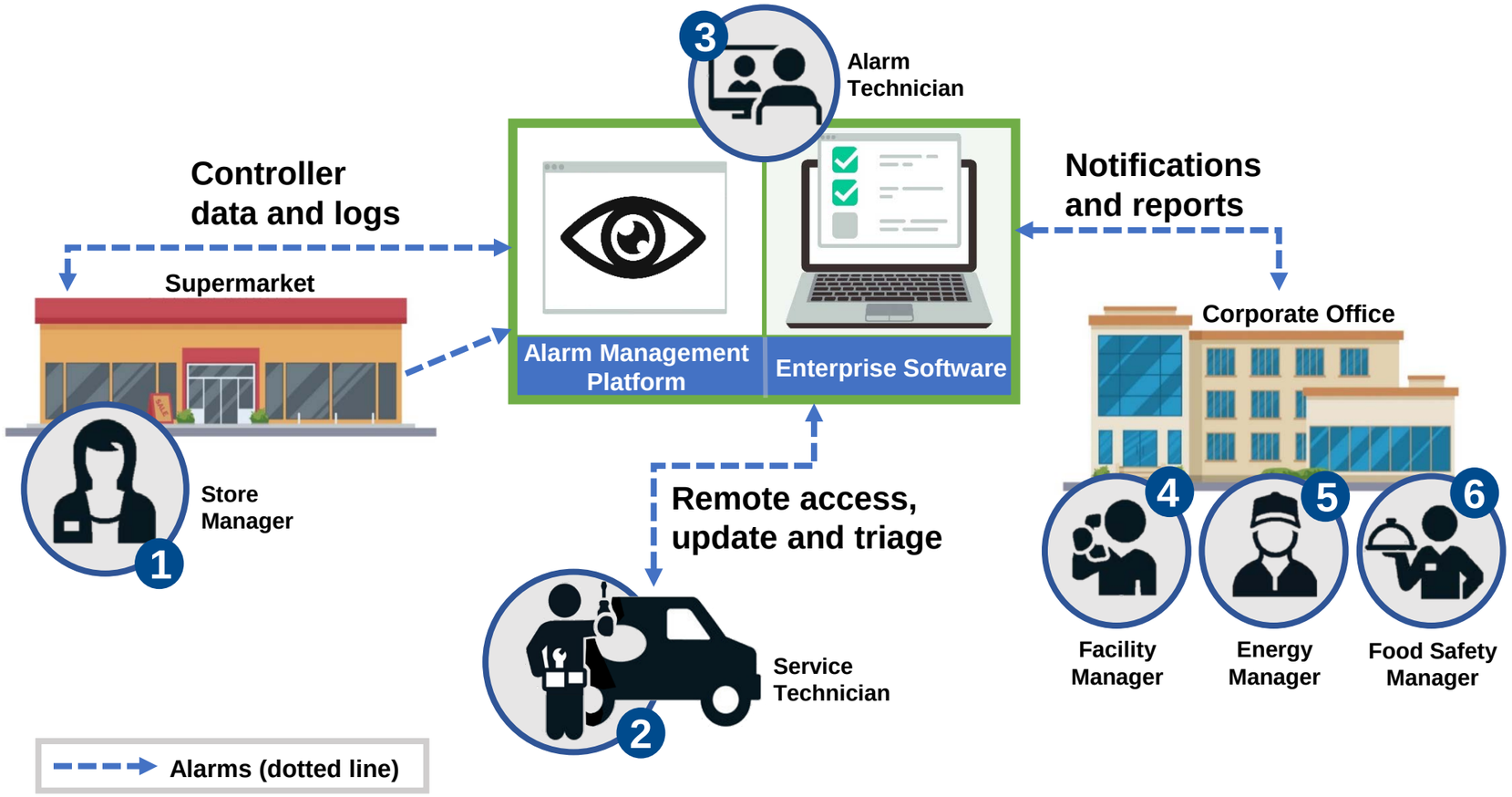
Value-Adds

Dispatch Services	• Dispatch service providers for repair
Predictive Maintenance	• Take action as asset condition deteriorates, prior to failure
Setpoint Services	• Track and analyze setpoint changes; ensure adherence to standards
Smart Energy	• Advanced reporting to optimize energy usage

Together, Services and Software Enable Operational Best Practices.

The Process

Enterprise and Asset Management Process



Needs (by Organizational Role)

1 Store Manager
- Alert me only when critical (focus and noise reduction)
- Provide an intuitive UI – floor plan and widgets
- Keep my focus on the customers

2 Service Technician
- Real-time notification of refrigeration issues
- Remote access and control

3 Alarm Technician
- Remote triage of refrigeration alarms
- Filter out non-critical alarms (up to 90%)
- Prescriptive alarm notification

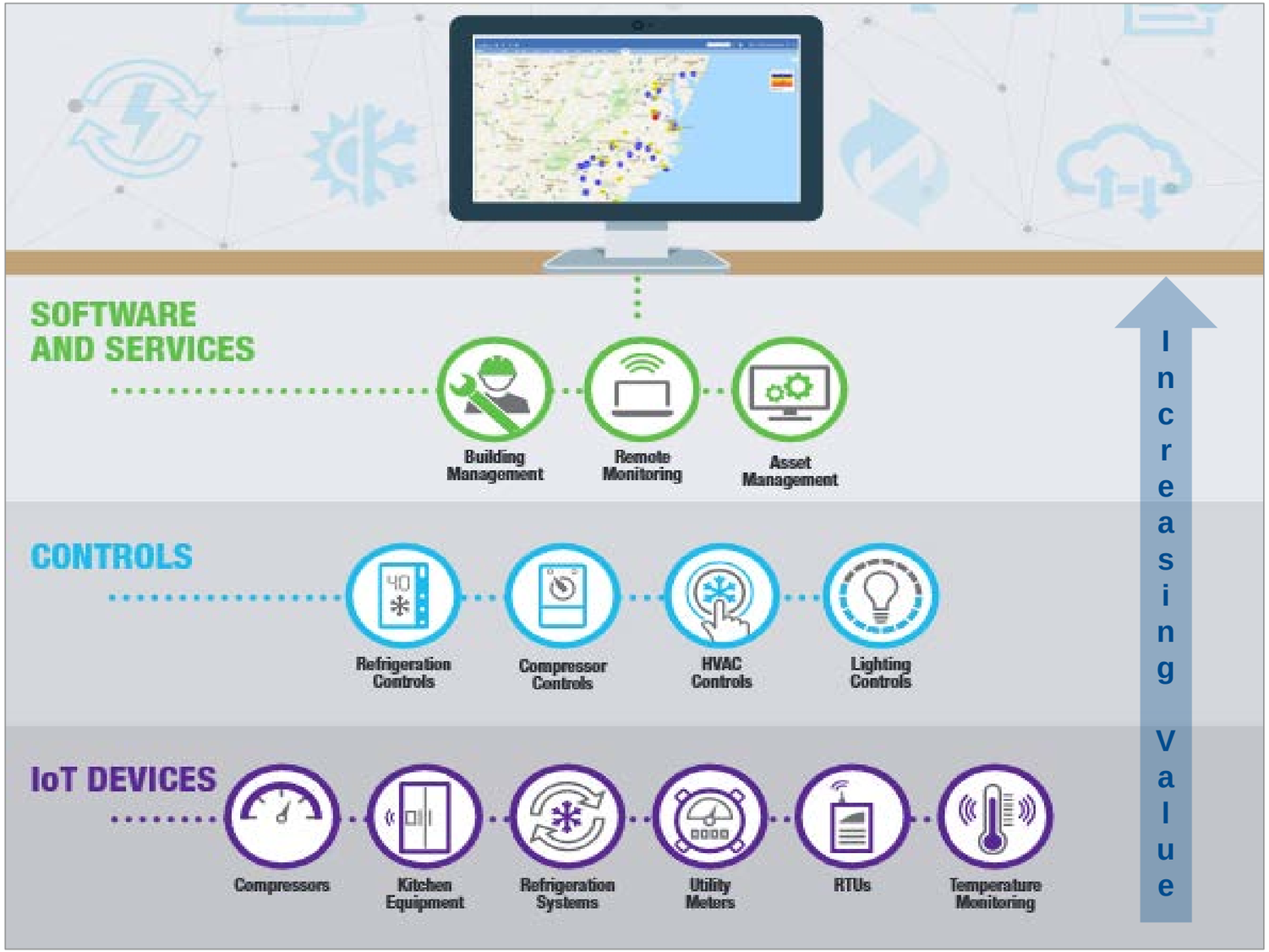
4 Facility Manager
- Centralized view and control of entire fleet
- Ensure real-time issues are addressed
- Enable implementation/enforcement of fleet standards

5 Energy Manager
- Energy dashboard
- Outlier and other trend analyses

6 Food Safety Manager
- Critical product temperature alarms
- Food quality reports (FQRs)
- Hot and cold side checklists

Enterprise-Level Management Software — Key Requirements

- Intuitive, touch-enabled interface
- High performance at scale
- Prioritized (color-coded) advisories
- Global setpoint management and broadcasting
- Predictive analytics (asset level)
- Energy outlier management
- Role-specific reports and dashboards
- Open architecture/API



Enterprise Software Enables Best Practices

- Maintaining standards via **setpoint management**
  - Define standards by asset; commission to standard; establish baseline of settings
  - System flags changes for review
  - Maintain energy, food quality and operational benefits of commissioning
- Strong **user access management** to prevent unwanted/unauthorized changes
  - Remove standard access to controllers
  - Access only via named user profile in enterprise software
  - Manage what changes individuals can make, and track when they do
- **Predictive analytics** flag potential failures (compressor, leak, condenser)
  - Intervention prior to true/full failure
  - Include tests and analysis tools to remotely eliminate false positives
- These unlock significant but potential benefit (must be **actioned** to realize)
  - Best practice: establish a resource or team responsible for managing
    - Assigns responsibility
    - Ensures proper cadence
  - Given resource constraints, often benefit from leveraging managed services resources

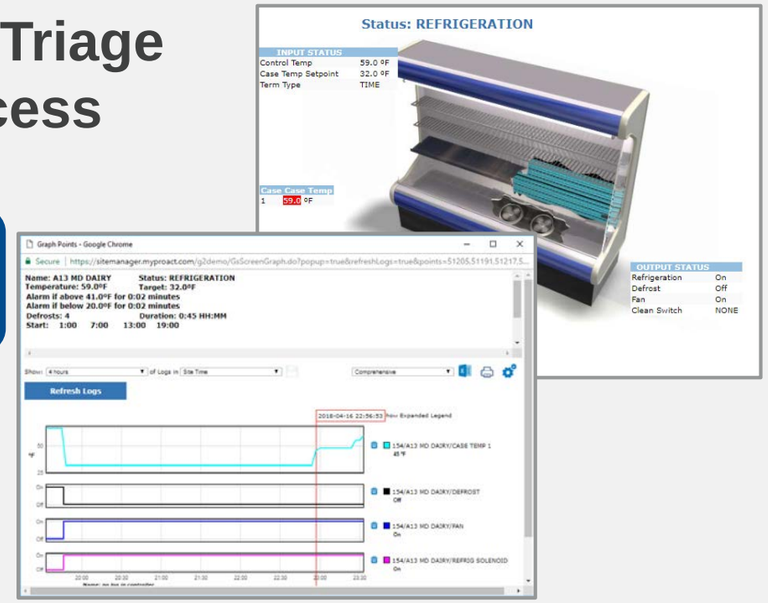
Unlocking Potential Benefits Must Be Actioned to Realize.

Alarm Management Best Practices

- First priority: Immediate notification of critical alarms to specific person/group responsible for action
- Identify the truly critical alarms through:
  - Machine filtering: Eliminates up to 75% of non-critical alarms
  - Best practice: Assign priority by alarm type
    - Enables prescriptive response time instead of FIFO
      - High — immediate review
        - Product temp, rack failure, phase fail, high suction, etc.
    - Appropriate contact channel by priority
      - Low — Email or daily report
        - Sensor alarms, filter alerts, proof fails
  - Best practice: Triage performed by internal or third party monitoring techs
    - Customer-specific business rules determine action/routing
    - Eliminates a further 20% of raw alarms

Many operators stop here.

The Triage Process



- Technicians **leverage enterprise software** to assess asset in alarm.
- If trending toward normal, pend and check back.
- If trend is negative, immediately notify, including additional context.

These Practices Eliminate up to 90% of Raw Alarms.

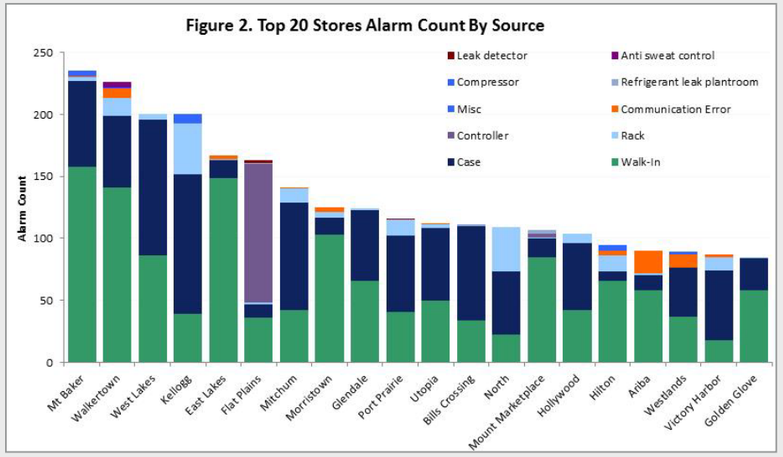
Alert the Right Resource and Close the Loop

- Following filter/triage, actionable alarms are routed to the person or group responsible for **initial action** by alarm type:
  - Air temp and door alarms = the store/restaurant/hospital department
  - Mechanical, leak, device absent alarms = maintenance/service technician
  - Product temperature = store/restaurant/hospital department with copy to food safety
- Best practice: **Closed loop** with **corrective action** captured for each alarm
  - Alarms captured as a case within an event management system
  - Each notification requires a response from the responsible owner
  - Lack of response triggers defined escalation process
- Later generation tools enable **flexible contact channel** selection
  - Different departments prefer notifications via phone, text, email or mobile
  - Contact channel can also vary by priority, time of day or other considerations
- Best practice: Alarm **integration** with work order management system
  - Automatically generate work orders in Verisae, Corrigo, Service Channel, etc.
    - High-priority alarm = Critical tickets; Low-priority alarm = PM ticket
    - Enabled via web service or API
  - Work order status updates are fed back to alarm management system
  - Enables better analysis of alarm impact on maintenance effort/cost

Ensure Critical Issues Are Addressed Through Prescriptive and Documented Notification to the Right Resource at the Right Time via the Right Channel.

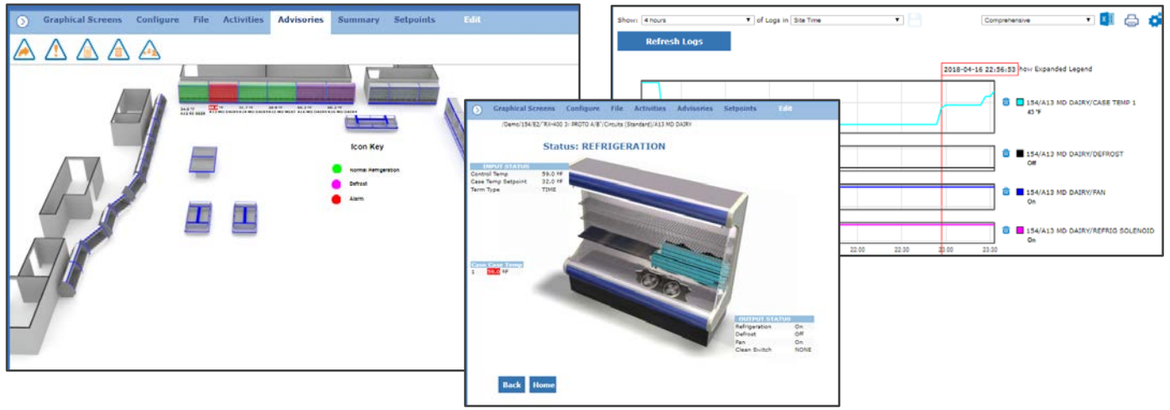
Insight: Track Performance by Store, Service Provider or Equipment Type

10 Stores With Most Critical Alarms	
Store	**Alarms**
Mt Baker	227
Walkertown	199
West Lakes	196
East Lakes	163
Kellogg	152
Mitchum	129
Glendale	123
Morristown	117
Bills Crossing	110
Utopia	108

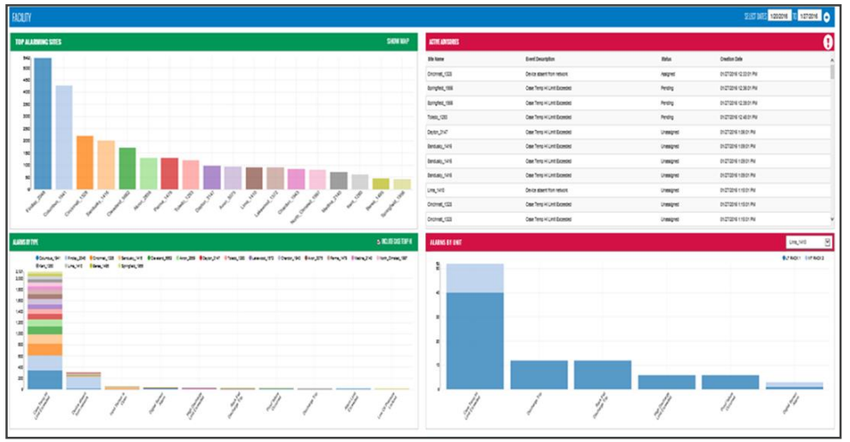


Role-Based Reporting and Analytics

Store Manager and Service Provider



Facilities Manager



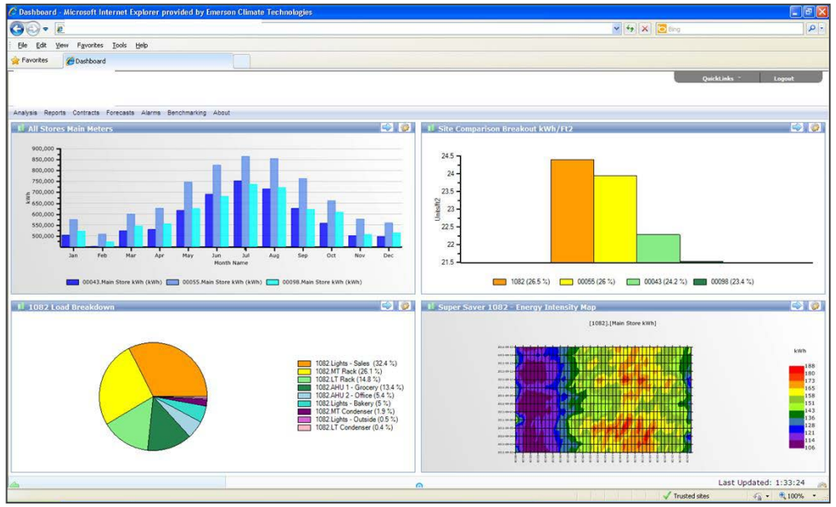
Food Safety

Normal | Too Cold | Too Hot | Defrost (log) | Defrost (schedule)

Temperature Report for "10.161.92.158". Fri, 5 Aug 2011 CST

Item	Low	High	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
AirTemp con39X (EC2 391 CC_001)	-40.4	-30.4	-9.4	-9.4	❄	❄	-9.4	-9.4	-9.4	-9.4	-9.4	-9.4	-9.4	-9.4	-9.4	-9.4	-9.4	-9.4	-9.4	-9.4	---	---	---	---	---	---	
CASECTL CKT003 (CC LIQUID_001)	-32.8	-22.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
DEFR LOG ONLY	-19.8	-15.8	---	---	---	❄	---	---	---	---	---	---	---	❄	---	---	---	---	---	---	---	---	---	---	---	---	
DEFR NO LOG	-19.8	-15.8	---	---	---	❄	❄	---	---	❄	❄	---	---	❄	❄	---	---	❄	❄	---	---	❄	❄	---	---	❄	
DEFR SKIP DAYS	---	---	---	---	---	---	❄	---	---	---	---	---	❄	---	---	---	---	---	❄	---	---	---	---	---	❄	---	
DEFROST LOG2 (4C LIQUID_003)	-8.7	-4.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
DEFROST LOG2 (CC LIQUID_004)	-8.7	-4.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
DEFROST LOG2 (CCB_001)	-8.7	-4.7	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	-23.3	---	---	---	---	---	---	
DEFROST LOG (CC LIQUID_002)	-24.5	-18.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
DISCH AIR CCB (CCB_002)	-24.5	-18.5	❄	10.0	10.0	10.0	10.0	10.0	❄	10.0	10.0	10.0	10.0	10.0	❄	10.0	10.0	10.0	10.0	10.0	❄	---	---	---	---	---	
DISCH AIR1 : DEFROST LOG2 (4C LIQUID_003)	-6.7	-2.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
DISCH AIR1 : DEFROST LOG2 (CCB_001)	-6.7	-2.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
DISCH AIR1 : DISCH AIR CCB (CCB_002)	-21.5	-17.5	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	---	---	---	---	---	---	
MAX TEMPS (10)	---	---	---	---	❄	❄	---	---	---	---	---	---	---	---	---	---	❄	❄	---	---	---	---	---	---	---	---	
MAX TEMPS (11)	---	---	---	---	❄	❄	---	---	---	---	---	---	---	---	---	---	❄	❄	---	---	---	---	---	---	---	---	
MAX TEMPS (12)	---	---	---	---	❄	❄	---	---	---	---	---	---	---	---	---	---	❄	❄	---	---	---	---	---	---	---	---	
MAX TEMPS (1)	---	---	---	---	❄	❄	---	---	---	---	---	---	---	---	---	---	❄	❄	---	---	---	---	---	---	---	---	
MAX TEMPS (2)					❄	❄											❄	❄									

Energy Manager

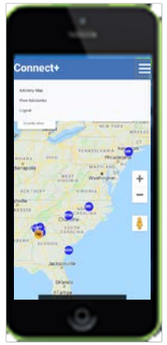


Use Case: Mobile Alarm/Event Management

1. View Advisories by priority.
   - High.-Critical Active
   - Med -Non-Critical Active
   - Low -Return-to-Normal

2. Click to expand view to Advisory details

3. Click controller link for direct connect to Controller View for full controller access.



4. Click Advisory Message to view alarming point responsive graph (if applicable)

Only Four Steps From MACRO View to Asset-Specific Data for Rapid Troubleshooting

The Results

Multi-site retailers are managing large portfolios with aging HVAC/lighting/refrigeration systems and a proliferating number of connected “smart” assets (IoT).	**Enterprise Software**	**Best Practice:** Centralized view and management of entire fleet, enabling remote support, user access controls, broadcasting of changes	***Benefits:** Optimize Facilities Management and Setpoint Broadcast $1M annually *Operational labor savings*
Keeping these sites and their assets performing optimally, mitigating costly failures, saving energy, and ensuring food safety are major challenges.	**Alarm Management**	**Best Practice:** Alarm filtering and triage, followed by timely notification of critical issues, prevents food loss	***Benefits:** Food loss avoidance $2.1M annually *25 – 30% of perishable shrink*
Service teams are running increasingly lean, and fresh talent is in short supply to address an aging workforce.	**Enterprise Software**	**Best Practice:** Remote access via intuitive software reduces both training time and truck rolls	***Benefits:** Reduction of unnecessary truck rolls/service calls $1.5M annually *Avoid 1 truck p/store monthly*
Facilities Management under pressure to meet their commitments — while maximizing profitability and reducing liability/risk.	**Predictive Analytics**	**Best Practice:** Establish Setpoint Management tools and process to maintain optimal energy setpoints	***Benefit:** Energy benefit of Setpoint Management $2.7M annually *4% of energy spend*

***Benefits based upon typical 250-site retail grocery chain**

Thank You!

Questions?

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