Simplicity SE (SMART Equipment) Controls Technical Guide

SE-SPU1001 (031-03480-000A / 1149498) 1-stage no Comm
SE-SPU1002 (031-03481-000A / 1149499) 2-stage no Comm
SE-SPU1011 (031-03030-000A / 1089066) 1-stage with Comm
SE-SPU1012 (031-03031-000A / 1089070) 2-stage with Comm

General

The Simplicity SE improve occupant comfort by providing reliable control of standard Rooftop Units (RTU), including both split system and heat pump equipment types. The innovative control algorithms provide superior temperature control of HVAC equipment.

The Simplicity SE advanced Direct Digital Control (DDC) controllers are bundled with Single Packaged Units (SPUs), actuators, sensors, and damper assemblies.

Advanced operating modes, such as Fault Detection Diagnostics, load shed, power exhaust, demand controlled ventilation (DCV), and occupancy sensing, ensure that Simplicity SE are the most advanced equipment offering within the light commercial market.

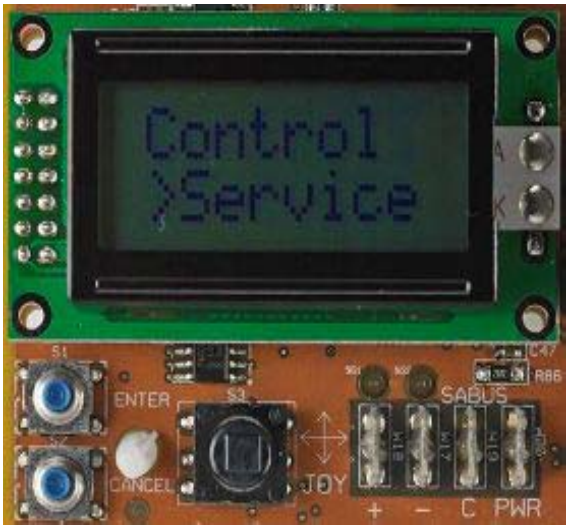

FIGURE 1 : Simplicity SE Controls

Table 1: Features and Benefits

Features	Benefits
Innovative Local User Interface	Provides a simple local UI for commissioning and startup that requires no additional hardware.
Factory-Mounted and Wired Equipment Assemblies	Save installation time and cost with pre-assembled and pre-configured controller and actuator systems.
Adjustable Logic Parameters	Optimize HVAC zone control of a system.
Factory-Loaded and Self-Configuring Components	Reduce installation time and cost by eliminating software commissioning tools.
Fault Detection Diagnostics (FDD)	Provides a game-changing feature with predictive failures that can assist on life cycle of the equipment, service awareness, and lower energy costs.
Performance Indexing	Provides efficiency and capacity real-time information that continues to calculate throughout the life cycle of the equipment.
Fully Integrated Economizer Control	Provides greater visibility of free cooling and energy savings.
Self Test Mode	Provides ease of startup and validation in the field by initiating an automatic self test through the local display.
Advanced Operating Mode	Provides greater capabilities, such as load shed for energy savings, Demand Controlled Ventilation (DCV) for CO_2 level monitoring, and standby mode for occupancy sensing.
Support for Standard Communication Protocols	Provides standard communication for integration of Building Management Systems (BMS). Protocols supported include: BACnet® MS/TP, Modbus®, and N2 communication. LONWORKS® networks are supported with an external gateway.

Table 1: Features and Benefits (Continued)

Features	Benefits
USB Support	Provides ease-of-service with the ability to view reports from a USB memory device and software upgrades.
Equipment Model Support	Provides future readiness of plug-and-play equipment to all parts of the Metasys® system architecture.
California Energy Code Compliance	Provides full compliance with Title 24 regulations to display faults on Economizer applications.
Mobile Access Portal Gateway	Provides a new tool for ease-of-service to commission, startup, configure, monitor, and control equipment through mobile devices.

Operation Overview

The Simplicity SE Controls offer a new control architecture designed to provide basic equipment protection, and simple thermostat control options, as well as advanced DDC control and diagnostic algorithms. This modular architecture offering helps control the costs that are associated with field installations. Programmed, factory-mounted controls eliminate the need for field wiring.

Additionally, the DDC controls and diagnostics offer the necessary startup and commissioning automation to further decrease installation costs while improving energy efficiency over the life of the installation. This fully implemented solution aligns with the product road maps for Building Automation Systems (BAS), HVAC, and refrigeration to not only deliver a buy blue product, but also to ensure we deliver a fully optimized solution to the market.

Simplicity SE is fully compatible with Metasys® software and its associated components. The equipment behaves similar to other Metasys network controllers, such as the Field Equipment Controller (FEC), so it is easily integrated into your network. The factory-programmed Simplicity SE is designed for all 3-40 Ton packaged products and 7.5-50 Ton Split System products. To ensure controller support for the wide range of RTUs, we developed a super application that consists of all available parameters within one controller. From an installation perspective, no programming is required.

The unit is configured at the factory based on the order. You can modify the unit in the field with either the controller's local display or Mobile Access Portal (MAP) Gateway.

Simplicity SE Local Display

The Simplicity SE local display provides a simple and local interface that lets mechanical contractors operate the equipment without additional tools, software, or computers. All configuration settings are accessible through the local LCD, and you can modify them for the specific application requirements (Figure 2).

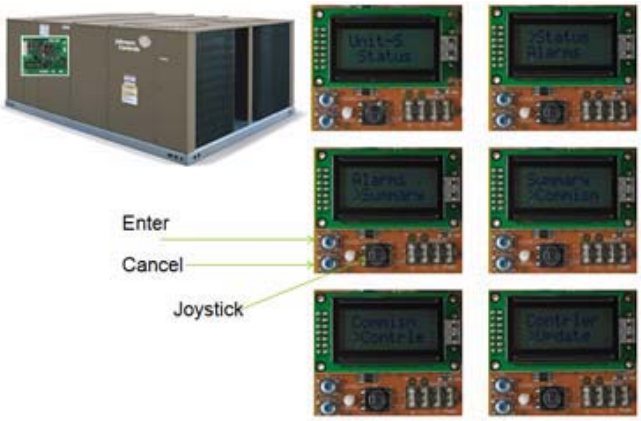

FIGURE 2 : Simplicity SE Local Display

Simplicity SE Network Architecture

The following figures highlight the typical equipment setup for different application requirements.

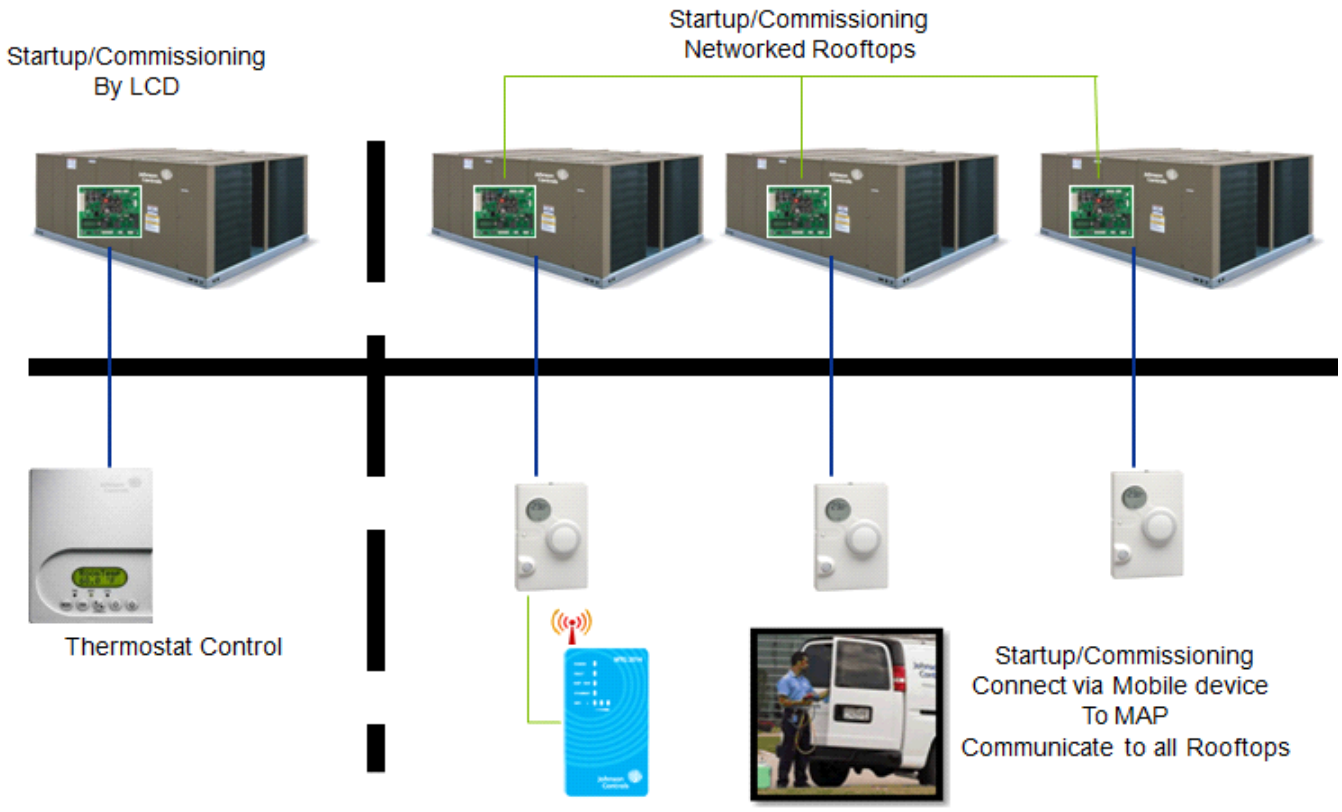

FIGURE 3 : Typical Setup for Stand-alone Thermostat or Networked Equipment with Network Sensors

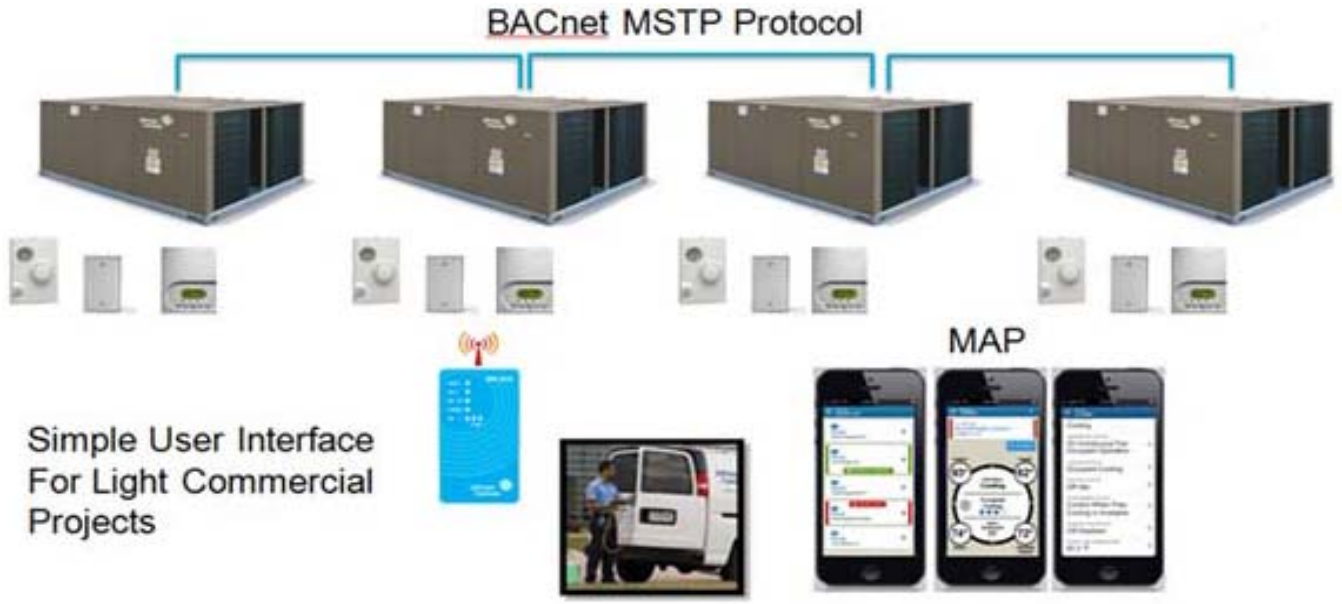

FIGURE 4 : Communicating Equipment with Zone Sensors, Network Sensors, or Thermostat Control

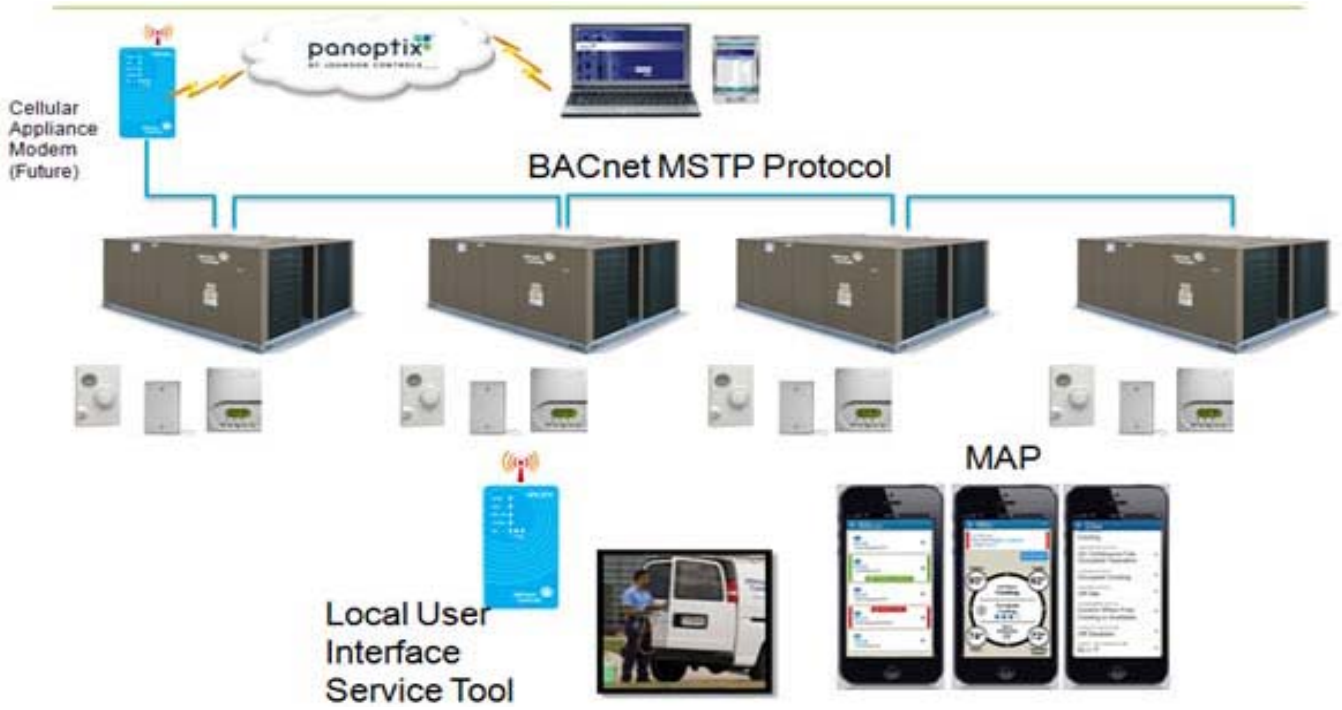

FIGURE 5 : Connect Equipment with Zone Sensors, Network Sensors, or Thermostat Control

Simplicity SE Controllers

The Simplicity SE control platform consists of multiple modular design controllers. The controllers provide equipment protection, advanced DDC, or simple thermostat.

Unit Control Board (UCB)

FIGURE 6 : Unit Control Boards

SE-SPU1001 (031-03480-000A / 1149498) 1-stage no Comm

SE-SPU1002 (031-03481-000A / 1149499) 2-stage no Comm

SE-SPU1011 (031-03030-000A / 1089066) 1-stage with Comm

SE-SPU1012 (031-03031-000A / 1089070) 2-stage with Comm

The UCB provides multiple options for equipment, such as several inputs and outputs that provide thermostat interface and control of heating and cooling stages. All safety circuits are wired to the UCB for equipment protection. The UCB design and core asset foundation are based on the Metasys system FEC controller platform. The local display on the UCB is the main UI that lets you configure, self test, view local information, and control the equipment.

The UCB offers a new USB drive feature that provides valuable access to history and trends that you can later view on any computer.

The USB port allows provisioning of the main controller software and pushes updates to all networked controllers on the SA Bus network. One simple command through the UCB display invokes a software upgrade to all control boards.

UCB features include:

- thermostat input
- safety control
- DDC controller
- local LCD
- all control output for cooling and heating
- all input for sensors (space, return air, outside air, supply air, and smoke)
- Sensor Actuator (SA) bus to communicate with network sensors
- pluggable communication card for standard protocols, including BACnet, MS/TP, Modbus®, and N2
- super application to meet all application requirements
- BTL certified

Economizer Controller

FIGURE 7 : Economizer Controller SE-ECO1001-0 ((031-03488-000B / 1154013)

The Simplicity SE Economizer controller is a newly designed controller that meets the requirements of the Series Package Equipment. The new economizer controller replaces the existing third-party economizer controller.

The economizer controller communicates via standard SA bus to the main controller of the RTU, the UCB. When the economizer is installed as a field option, the controller is factory mounted with a wiring harness that is necessary for connection. Once connected, the economizer controller receives power and communication from the UCB. No additional programming is required in the field.

The UCB self-discovers the Economizer controller. After self-discovery, the Economizer application executes based on the factory default settings. Use the local display to make any configuration changes. You can also accomplish this using the Mobile Access Portal (MAP) gateway.

The economizer control meets Title 24 Standards. The economizer has the ability to report up to five dedicated Fault Detection Diagnostics (FDD) through the local LCD, network sensor, thermostat with the X output for faults, or MAP Gateway. In cases of equipment integration into a BMS, the same faults are communicated via the standard communication protocols. Table 2 describes the Title 24 Fault Codes.

Table 2: FDD Codes

Fault Code	Description
01	Problem with one of the air temperature sensors. Check Outdoor Air, Return Air, or Supply Air sensors.
02	The economizer is not using outdoor air when it should.
03	The economizer is allowing outdoor air inside when the conditions are not suitable for economizer operation.
04	The economizer damper is not able to modulate properly. Check damper, linkage to actuator, or the actuator.
05	The economizer is allowing excess outdoor air inside.

Economizer features include:

- replaces existing Honeywell® Economizer
- plug-and-play via BACnet communication
- Factory- or field-mounted
- meets Title 24 requirements

Fault Detection Diagnostics Controller

FIGURE 8 : FDD Controller SE-FDD1001-0 (031-03033-000A / 1034522)

The Fault Detection Diagnostics (FDD) board is new and unique for the light commercial product market. The FDD controller lets the package equipment predict faults before they become a major failure, cause comfort issues, or result in efficiency problems. The FDD controller is one of the key components of the platform.

Embedded algorithms continuously run within the FDD controller. The algorithms monitor the types of inputs to precisely indicate the faults and recommend how to correct them. The

FDD controller meets all of the pending California Energy Code Regulations (Title 24).

During the startup process, the FDD controller calculates the efficiency and capacity of the equipment and generates a baseline for future measurements. The algorithms provide this type of information during the equipment life cycle. You can view this information from the UCB local display, MAP, or through a BMS connection. These two calculated values, efficiency and capacity, enable you to make smart decisions regarding your equipment. You can quickly and easily see when the equipment is not performing to the startup and commissioning efficiency calculation.

Table 3 shows all the refrigeration circuit FDDs.

Table 3: Refrigeration Circuit FDDs

FDD
Refrigerant Low
Excessive Refrigerant Flow
Inefficient Compressor
Refrigerant Flow Restriction
High Side Heat Transfer Problem
Low Side Heat Transfer Problem
Reduce Evaporator Airflow
Add Charge
Insufficient Refrigerant Flow
Recover Charge
Safe And Reasonable Performance
Non-Condensible Present
Efficiency Index
Capacity Index

The Efficiency index and Capacity index are added features from the FDD controller. You can use the indexes for the entire suite of the Packaged Equipment.

Four-Stage Controller

FIGURE 9 : Four-Stage Controller SE-SPU1004-0 (031-03032-000A / 1034521)

The four-stage controller of the Simplicity SE family enables 25-40 ton of packaged equipment for two additional stages of cooling and one additional stage of heating. Similar to all components of SEC, the four-stage expansion controller communicates via BACnet MS/TP and is simply plug-and-play to the UCB. The four-stage expansion control board communicates via Modbus to the gas ignition controller. The gas ignition controller is a third-party supported product.

Four-stage features include:

- plug-and-play via BACnet communication bus
- two additional cooling stages
- one additional heating stage
- Modbus connection to gas ignition controller

Communication Card

FIGURE 10 : Communication Board SE-COM1001-0

The Communication card comes with a connector that enables communication to a BMS. This card supports BACnet MS/TP, Modbus, and N2 communication types. For LONWORKS networks, an external gateway is required from the BACnet device to the Modbus network.

Communication card features include:

- support for multiple communication types
- plug-in on the UCB
- real-time clock chip
- communication traffic LEDs and on-board end-of-line switch

NS Network Sensor with Fault Code Capability

FIGURE 11 : NS Sensor with Fault Code Capability

The surface-mounted NS Series Network Sensor with Fault Code Capability is an electronic zone sensor designed to function directly with Johnson Controls BACnet MS/TP digital controllers in controls. Models in this series monitor the temperature setpoint and zone temperature and transmit this data to a field controller on the Sensor Actuator (SA) Bus.

This sensor is designed to assist with the California Energy Code (Title 24) providing a visual indication of operational faults with rooftop equipment. The NS Series sensor displays codes that may indicate the system is operating inefficiently. Fault codes include: air temperature sensor failure or fault, not economizing properly, economizer return air, economizer not using outdoor air, outdoor air not suitable, and damper not modulating.

You may adjust the setpoint while the sensor displays the fault. You must reset the fault at the equipment controller. The sensor cannot reset the fault. All models feature a temperature setpoint dial and LCD designed to make adjusting the temperature setpoint and viewing the zone temperature easier.

Mobile Access Portal (MAP) Gateway

FIGURE 12 : MAP Gateway

MAP Gateway is an intuitive controller commissioning tool that simplifies how users can access the UPG family of products. The MAP Gateway enables users to leverage the power of mobility using smart phones, tablets, and laptop PCs to interact with building automation equipment controls and HVAC equipment.

Offering many-to-one, multi-client connectivity, the MAP Gateway gives users access to any device with an equipment model number that is on a connected BACnet MS/TP field bus. The MAP Gateway solution is conveniently sized; has a built-in wireless access point; and lets personnel to use an intuitive, browser-based interface to access advanced features like alarms, schedules, and point configuration.

The wireless connection on the MAP Gateway lets users be up to 100 ft. (30.48 m line of sight) away indoors and up to 300 ft. (91.44 m line of sight) away outdoors while using a supported mobile device. Power may be supplied via the SA bus or Field Controller (FC) bus, an Ethernet connection, a supplied external power supply, or a micro USB port.

You can use the MAP gateway as a mobile commissioning tool for all products that have the Simplicity SE Unit Control Board.

Ordering Information

Table 4: Ordering Information

Product Code Number	Description
SE-SPU1001 (031-03480-000A / 1149498)	Single-stage UCB, 9 analog inputs (AIs), 13 Binary inputs (BIs), 5 binary outputs (BOs)
SE-SPU1002 (031-03481-000A / 1149499)	Dual-stage Unit Control Board (UCB), 12 AIs, 16 BIs, 8 BOs, 1 AO
SE-SPU1011 (031-03030-000A / 1089066)	Single-stage Unit Control Board with Comm., 9 AIs, 13 BIs, 5 BOs
SE-SPU1012 (031-03031-000A / 1089070)	Dual-stage Unit Control Board with Comm., 12 AIs, 16 BIs, 8 BOs, 1 AO
SE-SPU1004-0 (031-03032-000A / 1034521)	Four-stage Expansion Control Board, 7 AIs, 12 BIs, 6 BOs, 5 AIs
SE-FDD1001-0 (031-03033-000A / 1034522)	Fault Detection Diagnostics Board, 8 AIs, 2 BIs, 2 AOs
SE-ECO1001-0 (031-03488-000B / 1154013)	Economizer, 8 AIs, 2 BIs, 2 AOs, 3 BOs
SE-COM1001-0	Isolated Field Bus Expansion daughter card

Accessories

Table 5: Accessories

Product Code Number	Description
NS-ATA7F03-0 (S1-33103489000)	NS Sensor with Fault Code Capability (80 x 80)
NS-BTB7F03-0 (S1-33103490000)	NS Sensor with Fault Code Capability (80 x 120)
S1-MP-PRTKIT-0P	Metasys®/FX Portable MAP Gateway (Includes MAP Gateway, RJ-12 cable, bumper guard, and lanyard.) US-compatible countries. Last digit (x) represents non-US country requirements.

Technical Specifications

Table 6: Unit Control Board

Product Code Number	**SE-SPU1001 (031-03480-000A / 1149498)** – Single-stage Unit Control Board **SE-SPU1002 (031-03481-000A / 1149499)** – Dual-stage Unit Control Board
Power Supply Requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety
Power Consumption	15 VA maximum **Note:** VA ratings do not include any power supplied to the peripheral devices connected to binary outputs (BOs).
Ambient Conditions	Operating: -40 to 158°F (-40 to 70°C); 10 to 90% RH non-condensing UI Operating: -4 to 158°F (-20 to 70°C); 10 to 90% RH non-condensing Storage: -40 to 194°F (-40 to 85°C); 5 to 95% RH non-condensing
Processor	RX631 Renesas® microcontroller
Memory	2 MB internal program flash, 32 KB internal E2Data flash, 4 MB external serial flash memory

Table 6: Unit Control Board (Continued)

Input and Output Capabilities	**SE-SPU1001 (031-03480-000A / 1149498):** 9 AIs: 7: 10k RTD, 1: 0 to 10 VDC, 1: 24 VAC voltage monitor 13 BIs: 24 VAC input with contact cleaning circuits 5 BOs: 4: relay outputs, 1: Transistor output **SE-SPU1002 (031-03481-000A / 1149499):** 12 AIs: 9: 10k RTD, 2: 0 to 10 VDC, 1: 24 VAC Voltage Monitor 1 AOs: 2 to 10 VDC, 10 mA maximum 16 BIs: 24 VAC input with contact cleaning circuits 8 BOs: 7: relay outputs, 1: transistor output
Housing	Unpackaged printed circuit board (PCB) with silkscreen labels
Mounting	Mounted with Nylon Standoffs
Dimensions (Height x Width x Depth)	1.44 x 6.5 x 5.27 in. (36 x 165 x 133 mm)
Shipping Weight	**SE-SPU1001 (031-03480-000A / 1149498)** – 3.3 lb (1.50 kg) **SE-SPU1002 (031-03481-000A / 1149499)** – 3.4 lb (1.54 kg)
Compliance	**United States:** UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B
	Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized

Table 7: Unit Control Board with BACnet Communication

Product Code Number	**SE-SPU1011 (031-03030-000A / 1089066)** – Single-stage Unit Control Board with Field Bus Expansion Module **SE-SPU1012 (031-03031-000A / 1089070)** – Dual-stage Unit Control Board with Field Bus Expansion Module
Power Supply Requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety
Power Consumption	15 VA maximum **Note:** VA ratings do not include any power supplied to the peripheral devices connected to binary outputs (BOs).
Ambient Conditions	Operating: -40 to 158°F (-40 to 70°C); 10 to 90% RH non-condensing UI Operating: -4 to 158°F (-20 to 70°C); 10 to 90% RH non-condensing Storage: -40 to 194°F (-40 to 85°C); 5 to 95% RH non-condensing
Processor	RX631 Renesas® microcontroller
Memory	2 MB internal program flash, 32 KB internal E2Data flash, 4 MB external serial flash memory
Input and Output Capabilities	**SE-SPU1011 (031-03030-000A / 1089066):** 9 AIs: 7: 10k RTD, 1: 0 to 10 VDC, 1: 24 VAC voltage monitor 13 BIs: 24 VAC input with contact cleaning circuits 5 BOs: 4: relay outputs, 1: Transistor output **SE-SPU1012 (031-03031-000A / 1089070):** 12 AIs: 9: 10k RTD, 2: 0 to 10 VDC, 1: 24 VAC Voltage Monitor 1 AOs: 2 to 10 VDC, 10 mA maximum 16 BIs: 24 VAC input with contact cleaning circuits 8 BOs: 7: relay outputs, 1: transistor output
Housing	Unpackaged printed circuit board (PCB) with silkscreen labels
Mounting	Mounted with Nylon Standoffs

Table 7: Unit Control Board with BACnet Communication (Continued)

Dimensions (Height x Width x Depth)	1.44 x 6.5 x 5.27 in. (36 x 165 x 133 mm)
Shipping Weight	**SE-SPU1011 (031-03030-000A / 1089066)** – 3.6 lb (1.63 kg) **SE-SPU1012 (031-03031-000A / 1089070)** – 3.7 lb (1.68 kg)
Compliance	**United States:** UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B
	Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized

Table 8: Four-Stage Expansion Controller

Product Code Number	SE-SPU1004-0 **(031-03032-000A / 1034521)** – Four-stage Expansion Control Board
Power Supply Requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety
Power Consumption	15 VA maximum **Note:** VA ratings do not include any power supplied to the peripheral devices connected to binary outputs (BOs).
Ambient Conditions	**Operating:** -4 to 158°F (-20 to 70°C); 10 to 90% RH non-condensing **Storage:** -40 to 194°F (-40 to 85°C); 5 to 95% RH non-condensing
Processor	RX630 Renesas® microcontroller
Memory	2 MB internal program flash, 32 KB internal E2Data flash, 4 MB external serial flash memory
Input and Output Capabilities	7 AIs: 6: 10k RTD, 1: 24 VAC Voltage Monitor 12 BIs: 24 VAC input with contact cleaning circuits 6 BIs: 6: relay outputs 5 AOs: 2 to 10 VDC Analog Output 10 mA maximum
Housing	Unpackaged printed circuit board (PCB) with silkscreen labels
Mounting	Mounted with Nylon Standoffs
Dimensions (Height x Width x Depth)	1.44 x 6.5 x 5.27 in. (36 x 165 x 133 mm)
Shipping Weight	**2.2 lb (1.0 kg)**
Compliance	**United States:** UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B
	Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized

Table 9: Fault Detection Diagnostics (FDD) Controller

Product Code Number	**SE-FDD1001-0 (031-03033-000A / 1034522)** – Fault Detection Diagnostics Board
Power Supply Requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety
Power Consumption	15 VA maximum **Note:** VA ratings do not include any power supplied to the peripheral devices connected to binary outputs (BOs).
Ambient Conditions	**Operating:** -4 to 158°F (-20 to 70°C); 10 to 90% RH non-condensing **Storage:** -40 to 194°F (-40 to 85°C); 5 to 95% RH non-condensing
Processor	RX630 Renesas® microcontroller
Memory	1.5 MB internal program flash, 32 KB internal E2Data flash, 4 MB external serial flash memory
Input and Output Capabilities	8 AIs: 4: 10k RTD, 4: 0 to 10 VDC 2 BIs: 24 VAC input 2 AOs: 15 V +/- 10% sensor supply outputs
Housing	Unpackaged printed circuit board (PCB) with silkscreen labels
Mounting	Mounted with Nylon Standoffs
Dimensions (Height x Width x Depth)	1.44 x 6.5 x 5.27 in. (36 x 165 x 133 mm)
Shipping Weight	**1.9 lb (0.9 kg)**
Compliance	**United States:** UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B
	Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized

Table 10: Economizer Controller

Product Code Number	**SE-ECO1001-0 (031-03488-000B / 1154013)** – Economizer
Power Supply Requirement	24 VAC (nominal, 20 VAC minimum/30 VAC maximum), 50/60 Hz, Power Supply Class 2 (North America), Safety
Power Consumption	10 VA maximum
Ambient Conditions	**Operating:** -4 to 158°F (-20 to 70°C); 10 to 90% RH non-condensing **Storage:** -40 to 194°F (-40 to 85°C); 5 to 95% RH non-condensing
Processor	RX630 Renesas® microcontroller
Memory	1.5 MB internal program flash, 32 KB internal E2Data flash, 4 MB external serial flash memory
Input and Output Capabilities	8 AIs: 1: 10k RTD, 7: 0 to 10 VDC 2 AOs: 15 V +/- 10% sensor supply outputs 2 BIs: 24 VAC input with contact cleaning circuits 3 BOs: 3 Triac outputs
Housing (Enclosure)	Noryl® UL94-V0 self-extinguishing, UL2043 Plenum Rated, Protection Class: IP20 (IEC529)
Mounting	DIN Rail mounting, or with screws utilizing the DIN rail clips in the extended position

Table 10: Economizer Controller (Continued)

Dimensions (Height x Width x Depth)	5.8 x 6.5 x 1.73 in. (147 x 165 x 44 mm)
Shipping Weight	**4.1 lb (65 oz; 1.9 kg)**
Compliance	**United States:** UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B
	Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized

Table 11: Communication Card (for BACnet MS/TP)

Product Code Number	**SE-COM1001-0** – Isolated field bus expansion daughter card
Power Supply Requirement	Power drawn from host controller internal power supply
Power Consumption	4 VA maximum
Ambient Conditions	**Operating:** -40 to 194°F (-40 to 85°C); 10 to 90% RH non-condensing **Storage:** -40 to 194°F (-40 to 85°C); 5 to 95% RH non-condensing
Housing	Unpackaged printed circuit board (PCB)
Mounting	Mounts to host controller with two plastic standoffs and dual row connector
Dimensions (Height x Width x Depth)	2.35 x 6.5 x 1.25 in. (59 x 165 x 31 mm)
Shipping Weight	**0.3 lb (0.13 kg)**
Compliance	**United States:** UL Recognized, File E107041, UL 916, Energy Management Equipment, UL1995, Heating and Cooling Equipment; FCC Compliant to CFR47, Part 15, Subpart B, Class B
	Canada: UL Recognized, File E107041, CSA 22.2 No. 236, Signal Equipment Industry Canada, ICES-003 – Recognized

5127913-UTG-A-0515
Supersedes: Nothing

York International Corporation
5005 York Drive
Norman, OK 73069