# KMN-5900E Series

## KMC Fusion® General Purpose Controller Data Sheet

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## DESCRIPTION

KMC Fusion® KMN-5900E Series general purpose controllers are designed to control HVAC equipment using the Niagara platform. With their Integrated alarming, scheduling, and trending, KMC Fusion controllers are powerful edge devices for the modern smart building ecosystem.

The flexible license model is optimized for secondary equipment control and can expand to manage large-scale primary equipment.

KMC Fusion's powerful architecture supports current and future Niagara upgrades. It leverages a Niagara Edge-based license with no software maintenance agreement (SMA) required, offering cost-effective flexibility.

To meet the most demanding building automation custom requirements, these controllers are also fully programmable.

The 10 inputs and 8 outputs can be expanded using CAN-5900-FSN Series Expansion Modules.

KMCFusion™

## APPLICATIONS

KMC Fusion controllers are intended for both primary and secondary equipment control. Examples include:

- Air handling units
- Boilers
- Chillers
- Chilled beams
- Cooling towers
- Fan coil units
- Heat pump units
- Pumps
- Roof top units
- Terminal Units
- Unit ventilators
- Variable Air Volume boxes
- Other HVAC and building automation system equipment

**NOTE:** Applications generally require custom programming.
See also **Sample Installation on page 6**.

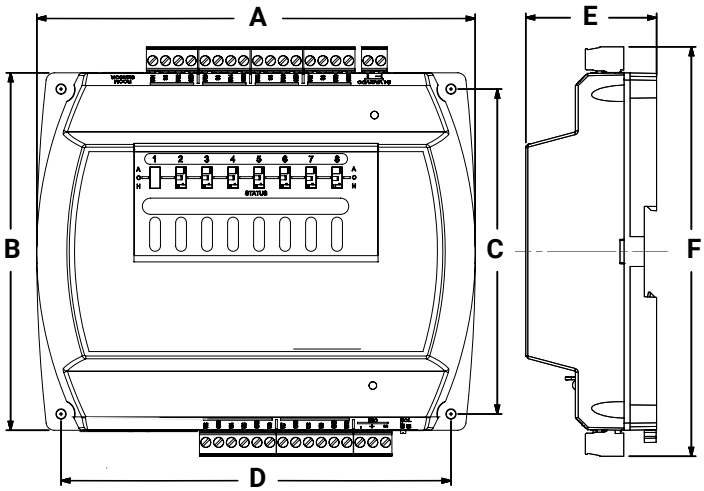
## MODEL

| MODEL | APPLICATIONS | INPUTS* | OUTPUTS* | NIAGARA GLOBAL CAPACITY | BACNET INTEGRATION |
|---|---|---|---|---|---|
| **KMN-5901E** | AHU, pumps, lighting, FCU, HPU, RTU, terminal units, unit ventilators, VAV, other HVAC | 10 total:<br>• 2 analog (temperature sensor port)<br>• 8 universal inputs (software configurable as analog, binary, or pulse input on terminals) | 8 universal:<br>• Software configurable as analog or binary<br>• Override boards allow additional options** | 1 Device<br>30 Points | |
| **KMN-5901E-EXP** | AHU, chillers, boilers, cooling towers, pumps, lighting, FCU, HPU, RTU, unit ventilators, other HVAC | 10 total:<br>• 2 analog (temperature sensor port)<br>• 8 universal inputs (software configurable as analog, binary, or pulse input on terminals) | 8 universal:<br>• Software configurable as analog or binary<br>• Override boards allow additional options** | 5 Devices<br>100 Points | ✓ |

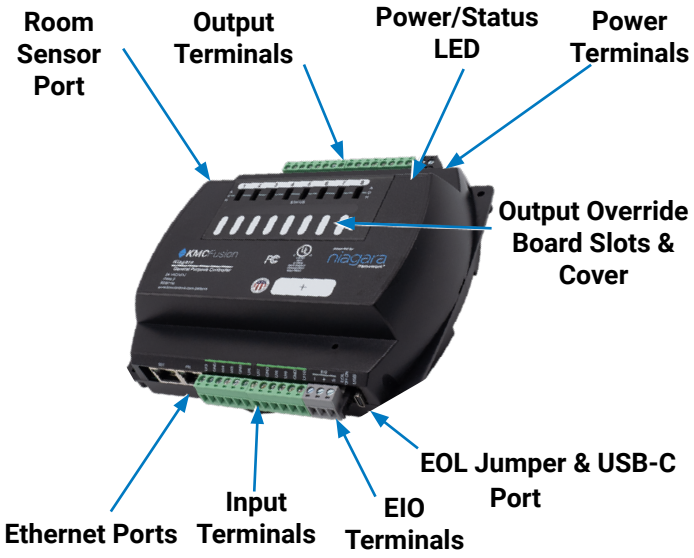
*Up to four CAN-5900-FSN Series I/O expansion modules can be used with KMN-5900E Series controllers, which provides an additional 64 physical inputs and 32 outputs.

**HPO-6700 series output override board series provide options (triac, NC/NO relays, 4–20 mA, adjustable 0–10 VDC) for devices that cannot be powered from a standard universal output. These boards can also be used with the CAN-5901-FSN.

# SPECIFICATIONS




| DIMENSIONS | | |
|---|---|---|
| **A** | 6.750 inches | 171 mm |
| **B** | 5.500 inches | 140 mm |
| **C** | 5.000 inches | 127 mm |
| **D** | 6.000 inches | 152 mm |
| **E** | 2.012 inches | 51 mm |
| **F** | 6.300 inches | 160 mm |




| TERMINAL COLOR CODE | |
|---|---|
| **Black** | 24 VAC/VDC Power |
| **Gray** | CAN Communications |
| **Green** | Inputs and Outputs |

## Inputs and Outputs

### Inputs, Universal (8 on Terminal Blocks)

| | |
|---|---|
| Universal inputs | Configurable as analog, binary, or pulse input objects |
| Termination | 1K and 10K ohm sensors, 0–12 VDC, or 0–20 mA (without need for an external resistor) |
| Resolution | 16-bit analog-to-digital conversion |
| Protection | Overvoltage protection (24 VAC, continuous) |
| Wire size | 12–24 AWG, copper, in removable screw terminal blocks |

### Input, Dedicated Room Sensor Port

| | |
|---|---|
| Connector | Modular connector for STE-9xx1 series digital wall sensors or STE-6010/6014/6017 analog temperature sensors |
| Cable | Uses standard Ethernet patch cable up to 150 feet (45 meters) |

### Outputs, Universal (8 on Terminal Blocks)

| | |
|---|---|
| Universal outputs | Configurable as an analog (0 to 12 VDC) or binary object (0 or 12 VDC, on/off); alternatively, an output override board is installed for devices that cannot be powered from a standard universal output |
| Power/protection | Each short-circuit protected universal output capable of driving up to 100 mA (at 0–12 VDC) or 300 mA total for all outputs |
| Resolution | 12-bit digital-to-analog conversion |
| Wire size | 12–24 AWG, copper, in removable screw terminal blocks |

## Communications

| | |
|---|---|
| Expansion (EIO) | One CAN serial bus connection (terminal block) for daisy-chaining I/O expansion modules up to 200 feet (61 meters) from the controller via standard shielded twisted-pair wire |
| Ethernet | Two 10/100BaseT Ethernet connectors; up to 328 ft (100 m) between controllers (using T568B Category 5 or better cable) |
| Other | One USB-C port |

## Configurability

| OBJECTS* | MAXIMUM # |
|---|---|
| **Inputs and Outputs** | |
| Analog, binary, or pulse input | 74 |
| Analog or binary output | 40 |
| **User-defined Values** | |
| Analog value | 50 |
| Binary value | 30 |
| Multi-state value | 10 |

*Configuration allows creation and deletion of objects (with the maximum number of objects shown). Additional system objects are provided and can be discovered within the Niagara application.

## Programming

KMC Fusion controllers are fully programmable using KMC Workbench software compatible with the Niagara framework.

## Hardware Features

### Processor, Memory, and Clock

| | |
|---|---|
| Processor | NPX i.MX8M-PLUS 1.6 GHz Quad Core |
| Memory | 1 GB RAM, 8 GB Flash. |
| RTC | Real time clock with (capacitor) power backup for 72 hours for network time synchronization or full stand-alone operation |

### Indicators and Isolation

| | |
|---|---|
| LED indicators | Power/status, EIO (CAN) communication, Ethernet status |
| EOL (End of Line) Jumper | EIO (CAN bus) |

## Installation

### Power

| | |
|---|---|
| Supply voltage | 24 VAC (50/60 Hz) or 24 VDC; –15%, +20%; Class 2 only; non-supervised (all circuits, including supply voltage, are power limited circuits) |
| Required power | 14 VA, plus external loads |
| Wire size | 12–24 AWG, copper, in a removable screw terminal block |

### Enclosure and Mounting

| | |
|---|---|
| Weight | 13.8 ounces (0.39 kg) |
| Case material | Black, flame-retardant plastic |
| Mounting | Direct mounting to panels or DIN rails |

### Environmental Limits

| | |
|---|---|
| Operating | 32 to 120° F (0 to 49° C) |
| Shipping | –40 to 160° F (–40 to 71° C) |
| Humidity | 0 to 95% relative humidity (non-condensing) |

## Warranty, Protocol, and Approvals

### Warranty

| | |
|---|---|
| KMC Limited Warranty | 5 years (from mfg. date code) |

### CAN (External Inputs Outputs) Protocol

| | |
|---|---|
| CAN | CAN (Controller Area Network) bus on (EIO) terminals |

### Regulatory Approvals

| | |
|---|---|
| UL | UL 916 Energy Management Equipment listed |
| RoHS 2 | RoHS 2 compliant |
| FCC | FCC Class A, Part 15, Subpart B and complies with Canadian ICES-003 Class A* |

*This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

# ACCESSORIES

**NOTE:** For accessory details, see the respective product data sheets and installation guides.

## Communications

| | |
|---|---|
| **BAC-5051AE** | BACnet router with dual Ethernet/IP and single MS/TP ports |
| **HSO-9001** | Ethernet patch cable, 50 feet |
| **HSO-9011** | Ethernet patch cable, 50 feet, plenum rated |
| **HSO-9012** | Ethernet patch cable, 75 feet, plenum rated |

## I/O Expansion and Output Override Boards

| | |
|---|---|
| **CAN-5901-FSN** | 8-input, 8-output expansion module* |
| **CAN-5902-FSN** | 16-input expansion module* |
| **HPO-6701** | Triac output w/ zero-cross switching (AC only) |
| **HPO-6702** | 0–10 VDC analog with adjustable override potentiometer |
| **HPO-6703** | Relay, NO contacts (AC/DC) |
| **HPO-6704** | 4–20 mA DC current loop with adjustable override potentiometer** |
| **HPO-6705** | Relay, NC contacts (AC/DC) |

***NOTE:** Up to four CAN-5900-FSN Series I/O expansion modules can be used with KMN-5900E Series controllers, which provides an additional 64 physical inputs and up to 32 outputs.

## Miscellaneous Hardware

| | |
|---|---|
| **HCO-1103** | Steel control enclosure (single controller) with DIN rail mounting, 10 × 7.5 × 2.5 inches (257 × 67 × 193 mm) |
| **HCO-1035** | Steel control enclosure, 20 × 24 × 6 inches (508 × 610 × 152 mm)* |
| **HCO-1036** | Steel control enclosure, 24 × 36 × 6 inches (610 × 914 × 152 mm) |
| **HPO-0063** | Replacement output (override board) jumper, 2-pin (pack of 5) |
| **HPO-9901** | Controller replacement parts kit with terminal blocks (1 gray, 1 black, 2 green 3-terminal, 4 green 4-terminal, 2 green 5-terminal, 2 green 6-terminal) and DIN clips (2 small for router and 1 large for controllers) |

## Room Sensors, Analog

| | |
|---|---|
| **STE-6010W10** | Temperature sensor, white |
| **STE-6014W10** | Sensor with rotary setpoint dial, white |
| **STE-6017W10** | Sensor with rotary setpoint dial and override button, white |
| **HPO-9005** | Room sensor adapter allows other sensors and optional setpoint potentiometers (with wire leads or terminal blocks) to be used instead of STE-601x sensor models with modular jacks |

**NOTE:** Other STE-6000 series sensors are not fully compatible with the dedicated sensor port. However, various other models can be used with an HPO-9005 adapter or with the controller screw terminals. See the STE-6000 series data sheet for more information. For digital sensor information, see the STE-9000 series.

**NOTE:** To order the STE-601x sensor with light almond color instead of white, omit the “W” at the end of the model number (e.g., STE-6010W is white and STE-6010 is light almond).

## Room Sensors, Digital (LCD Display)

| | |
|---|---|
| **STE-9000 Series** | KMC NetSensor digital room temperature sensors for viewing, configuring, and optional humidity, occupancy, and $CO_2$ sensing |

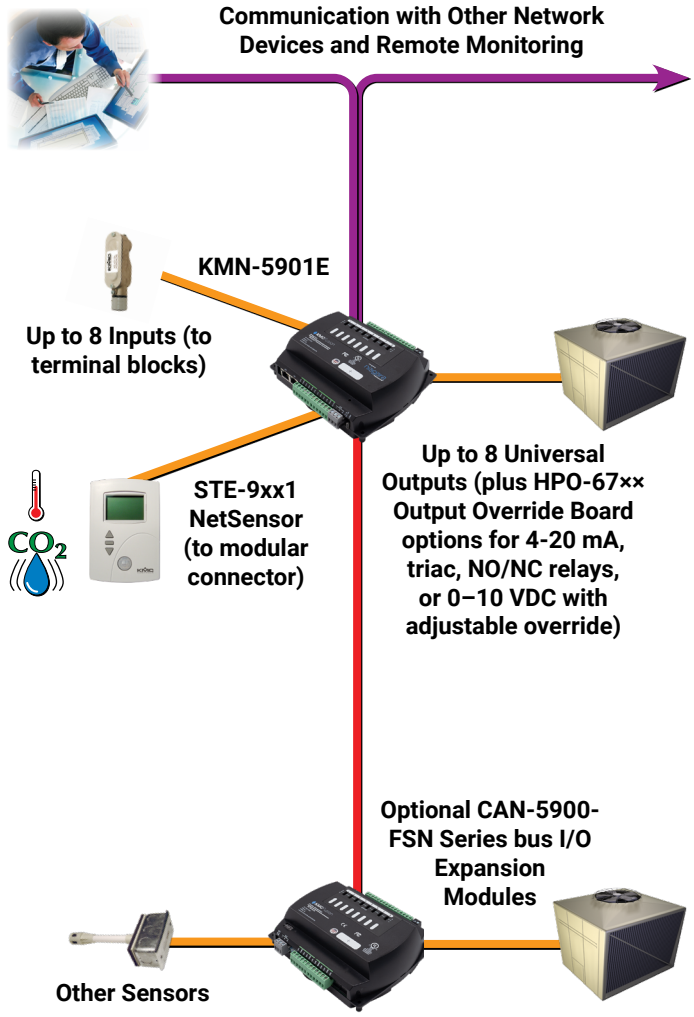
## Sensors, Miscellaneous

| | |
|---|---|
| **STE-1405** | DAT sensor with plenum-rated cable |
| **STE-1451** | OAT sensor |

## Transformers, 120 to 24 VAC

| | |
|---|---|
| **XEE-6111-050** | 50 VA, single-hub |
| **XEE-6112-050** | 50 VA, dual-hub |

## SAMPLE INSTALLATION




For more information about installation and operation, see:

- **KMN-5900E Series Controller Installation Guide**
- **KMN-5900E Controller Application Guide**



## SUPPORT

Additional resources for installation, configuration, application, operation, programming, upgrading, and much more are available on the web at **www.kmccontrols.com**. Log-in to see all available files.