



# Installation and Operation Guide



## KMD-5220 Input Module

*For use with KMD-5210*

**Important notices**

©2013, KMC Controls, Inc.

WinControl, NetSensor, and the KMC logo are registered trademarks of KMC Controls, Inc.

TotalControl, BACstage, and FullBAC are trademarks of KMC Controls, Inc.

All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form by any means without the written permission of KMC Controls, Inc.

Printed in U.S.A.

**Disclaimer**

The material in this manual is for information purposes only. The contents and the product it describes are subject to change without notice. KMC Controls, Inc. makes no representations or warranties with respect to this manual. In no event shall KMC Controls, Inc. be liable for any damages, direct or incidental, arising out of or related to the use of this manual.

**KMC Controls**

P.O. Box 497

19476 Industrial Drive

New Paris, IN 46553

U.S.A.

TEL: 1.574.831.5250

FAX: 1.574.831.5252

E-mail: [info@kmccontrols.com](mailto:info@kmccontrols.com)

# Contents

## Section 1

### **Introduction**

Specifications .....	5
Accessories .....	7
Safety considerations .....	8

## Section 2

### **Installation**

Mounting .....	9
Planning for input modules .....	9
Module installation .....	10
Connecting inputs .....	11

## Section 3

### **Operation**

Status LED .....	13
Auxiliary power fuse .....	14
Power On/Off .....	14
Maintenance .....	14



# SECTION 1

---

## Introduction

This section provides an introduction to the KMD-5220 Input Module. You will also find Safety Considerations included in this section. Review this material in its entirety before installing or operating the module.

---

The KMD-5220 Input Module is an auxiliary device for the KMD-5210 LAN Controller. The Input Module takes up to 16 separate inputs and processes the information for input to the LAN Controller. The module can process active, passive, current loop or pulse inputs.

The module also provides a fused, auxiliary power terminals for connecting up to 6 external transducers.

The KMD-5220 Input Module is designed to accept digital or analog inputs from active and passive sensor and control devices and process those inputs for use by the KMD-5210 LAN Controller.

## Specifications

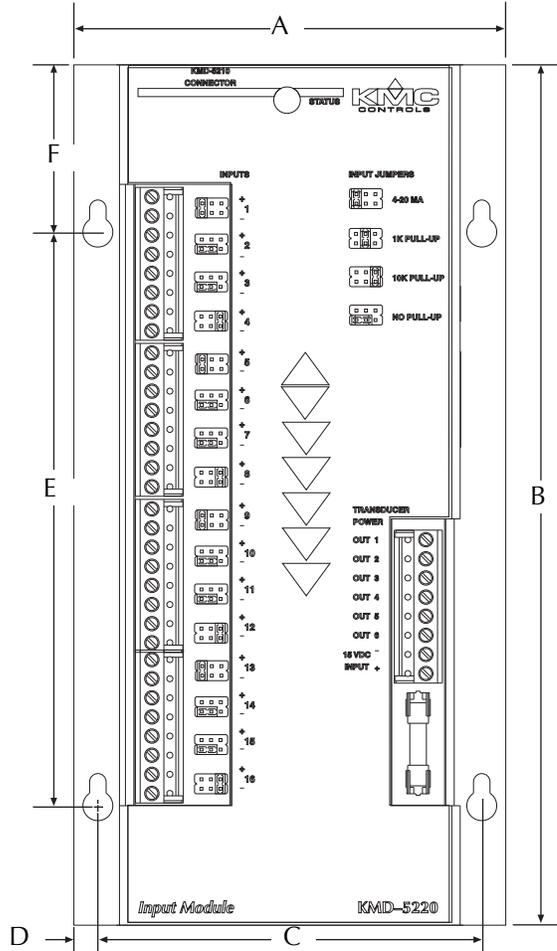
---

<b>Input</b>	
<b>Universal inputs</b>	16
<b>Key features</b>	Each input software selectable for analog or digital signals. Standard and custom units of measure. Pull-up resistors for switch contacts and other unpowered equipment.
<b>Connector</b>	Removable screw terminal block, wire size 14–22 AWG
<b>Pull-up resistors</b>	Selected by moveable jumper for 1K $\Omega$ , 10K $\Omega$ 4–20mA or none.
<b>Input impedance</b>	1K $\Omega$ or 10K $\Omega$ for 1K $\Omega$ or 10K $\Omega$ pullup 250 $\Omega$ for 4–20 mA 100K $\Omega$ without jumper
<b>Overvoltage protection</b>	24 volts AC, continuous
<b>Input range</b>	0–5 volts DC
<hr/>	
<b>Weight</b>	16 ounces (454 grams)
<hr/>	
<b>Indicators</b>	Status LED flashes when card is accessed
<hr/>	
<b>Ambient Limits</b>	
<b>Operating</b>	0 to 120°F (–18 to 49°C)
<b>Shipping</b>	–40 to 140°F (–40 to 60°C)
<b>Humidity</b>	0–95% RH, non-condensing

**Regulatory**

UL 916 Energy Management Equipment listed  
CE compliant  
FCC Class B, Part 15, Subpart B  
SASO PCP Registration KSA R-103263

**Dimensions**



**Table 1-1 Dimensions**

A	B	C	D	E	F	Height (not shown)
4.50 in.	9.00 in.	4.00 in.	0.25 in.	6.00 in.	1.50 in.	0.98 in.
114 mm	229 mm	102 mm	6 mm	152 mm	38 mm	25 mm

## Accessories

---

### Ribbon cables

<b>KMD-5660</b>	6 inch (15 cm) ribbon cable
<b>KMD-5668</b>	9 inch (23 cm) ribbon cable
<b>KMD-5661</b>	14 inch (36 cm) ribbon cable
<b>KMD-5662</b>	19 inch (48 cm) ribbon cable
<b>KMD-5663</b>	24 inch (61 cm) ribbon cable

## Safety considerations

KMC Controls assumes the responsibility for providing you a safe product and safety guidelines during its use. Safety means protection to all individuals who install, operate, and service the equipment as well as protection of the equipment itself. To promote safety, we use hazard alert labeling in this manual. Follow the associated guidelines to avoid hazards.



### **Danger**

Danger represents the most severe hazard alert. Bodily harm or death will occur if danger guidelines are not followed.



### **Warning**

Warning represents hazards that could result in severe injury or death.



### **Caution**

Caution indicates potential personal injury or equipment or property damage if instructions are not followed.



### **Note**

Notes provide additional information that is important.



### **Detail**

Provides programming tips and shortcuts that may save time.

# SECTION 2

## Installation

This section provides important instructions and guidelines for installing the KMD-5220 Input Module. Carefully review this information before installing a KMD-5220 module.

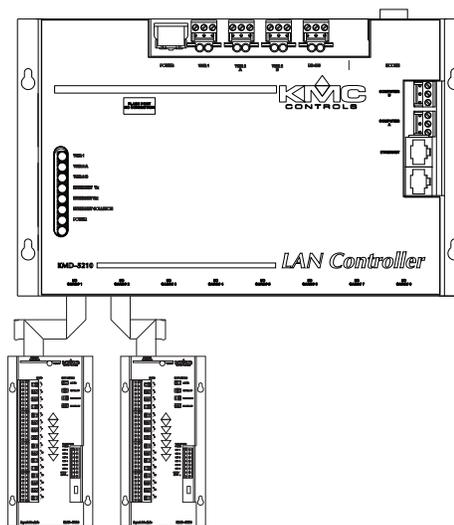
### Mounting

Mount KMD-5220 input modules and the KMD-5210 to which they are connected inside of a metal enclosure. KMC Controls recommends using a UL-approved Enclosed Energy Management Equipment Panel such as a KMC model HCO-1034, HCO-1035 or HCO-1036. Use the two mounting holes on each side of the module to fasten it securely to a flat surface with #6 or #8 hardware. See [Dimensions on page 6](#) for mounting hole locations and dimensions. To maintain RF emissions specifications, use either shielded connecting cables or enclose all cables in conduit.

### Planning for input modules

To connect input devices to a KMD-5210 controller, use one or more KMD-5220 input modules. The KMD-5210 controller includes eight universal I/O ports for up to eight KMD-5220 input modules, eight KMD-5221 output modules or any combination of up to eight modules.

Each module connects to the controller using a flat ribbon cable. Connect the first KMD-5220 input module to connector *I/O Card 1*; continue adding input modules from left to right.



**Illustration 2-1** Input module connections

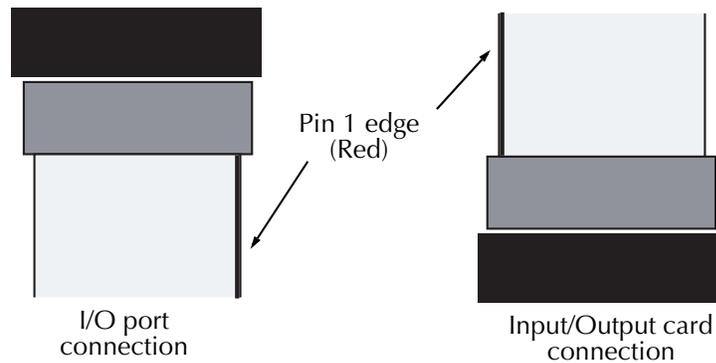
## Module installation

1. Position and mount the modules near the KMD-5210 to which it will connect. Input modules connect at position *I/O Card #1*.
2. Connect the ribbon cable to the KMD-5210 LAN Controller. Estimate the required cable length and select from one of the cables from KMC Controls. See [Ribbon cables on page 7](#) in the Accessories section.



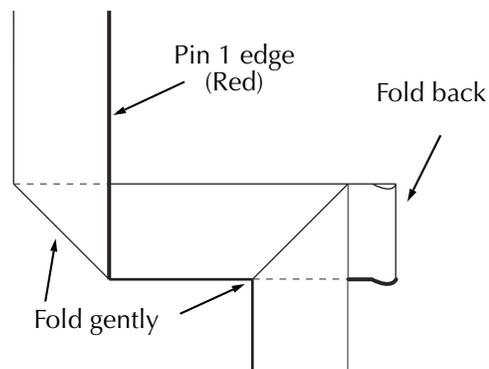
### Note

Observe the orientation of the cable header. If the pin 1 edge is reversed, the controller will not communicate with the module.



**Illustration 2-2 Ribbon cable orientation**

3. Connect the other end of the ribbon cable to the input module. You may find it necessary to fold the cable to properly route it to the module. To accommodate turns, fold the cable gently to change direction. To make a fold, overlay the cable at a right angle and press gently until the cable holds the fold as shown in Illustration 2-3.



**Illustration 2-3 Ribbon cable fold**



### Caution

Do not crimp the cable in a tight fold. This may result in separation of cable strands and result in unreliable operation of the module.

4. Connect input devices to the modules.

## Connecting inputs

The controllers include 16 universal inputs. Each input can be configured with software to receive either analog or digital signals. By using the optional pullup resistors, either passive or active devices may be connected to the inputs. For additional information, see *Appendix C, Connecting Inputs and Outputs* in the WinControl XL Plus manual.

### Pull-up resistors

For passive input signals, such as thermistors or switch contacts, use a pull-up resistor. For KMC thermistors and most other applications place the moveable jumper in the *10K* position. For 1k $\Omega$  platinum RTD sensors, place the moveable jumper in the *1K* position.

### Pulse inputs

Connect pulse inputs under the following conditions:

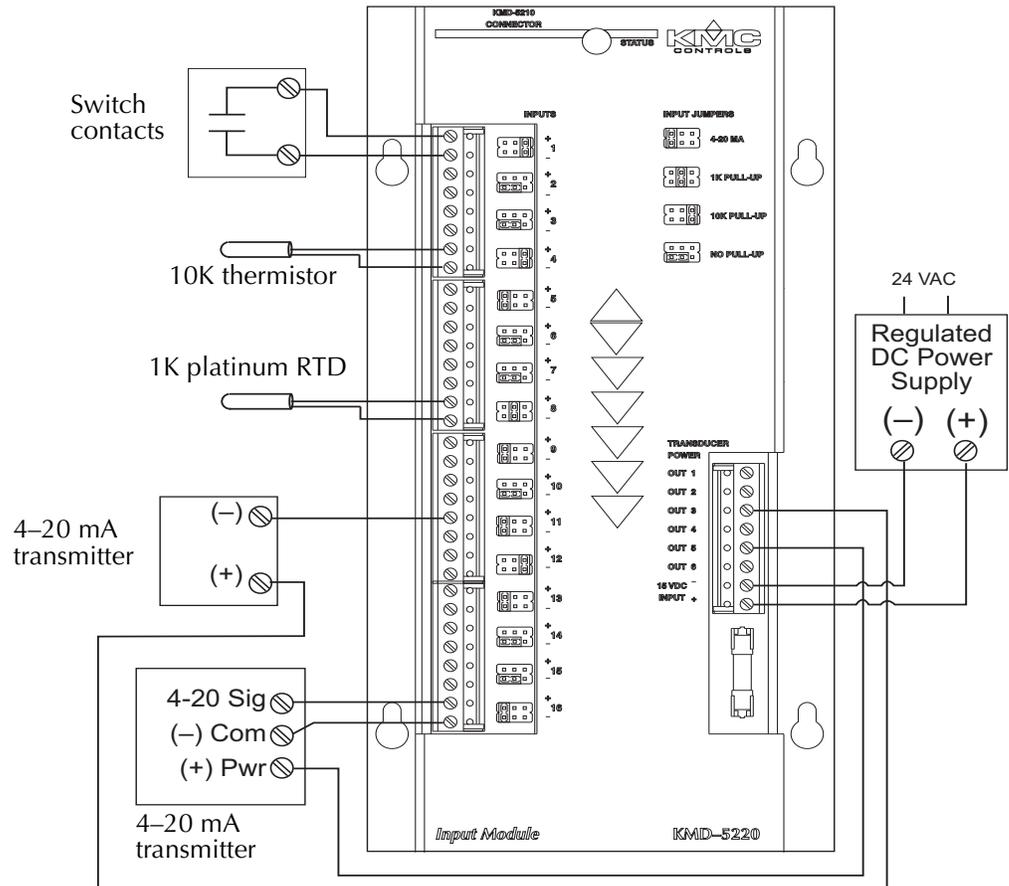
- ◆ Use only the input module installed in the card #1 position for pulse inputs.
- ◆ If the pulse input is a passive input such as switch contacts, then place the input pull-up in the *10K* position.
- ◆ If the pulse is an active voltage (up to a maximum of +5 volts DC ), then place the input pull-up jumper in the *None* position.

### 4–20 mA inputs

To use a 4–20 current loop input, place the moveable jumper in the *4-20mA* position. This places a 250 ohm resistor across the input terminals which will convert the current input to a voltage which can be read by the controller's analog-to-digital converter.

### Ground terminals

Ground terminals (-) are located next to each input terminal. Up to two wires, size 12–22 AWG, can be clamped into each ground terminal. If more than two wires must be joined at a common point, use an external terminal strip to accommodate the additional wires.



**Illustration 2-4 Typical input configurations**

### Auxiliary transducer power

The KMD-5220 Input Module has provisions for supplying power to six external transducers. These terminals are located on the lower right side of the module. The maximum output of all six outputs cannot exceed 1 ampere or the fuse will open.

The negative power supply terminal is common to the analog input grounds. For example, on a two-wire device the power is drawn from one of the six outputs and the return goes to one of the inputs terminals. On a three-wire transducer, the input negative can be run to the transducer to provide a power supply reference. See Illustration 2-4 for example of input connections.

# SECTION 3

## Operation

This section provides general operating instructions for your KMD-5220 input module. Carefully review this information before operating the module.

Once the input module is wired and powered up, operation is automatic.

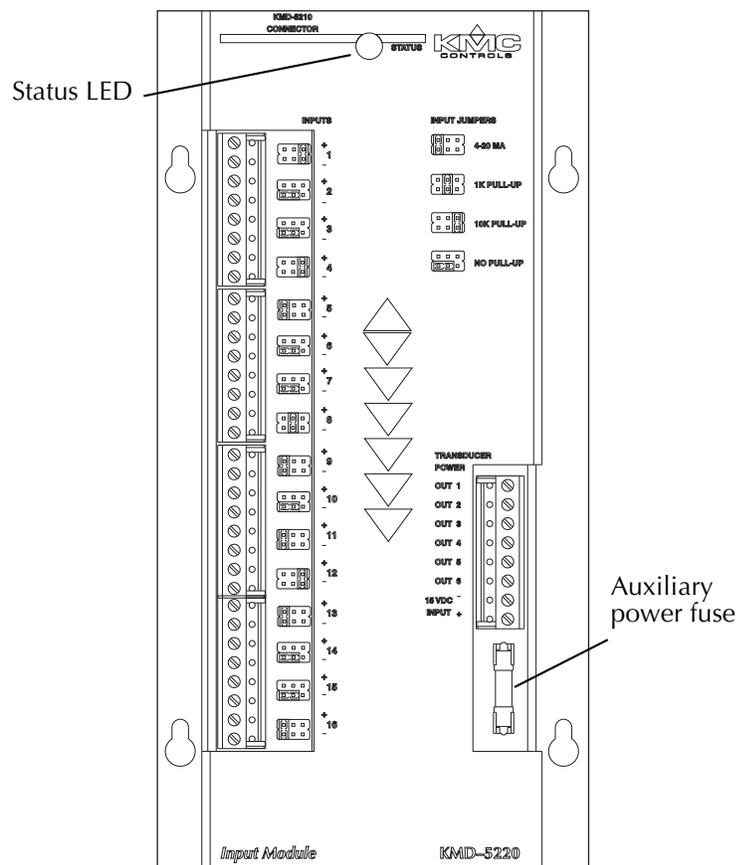


Illustration 3-1

### Status LED

The status LED at the top of the module will illuminate when the module is communicating with the LAN controller to which it is connected. Under normal operation the LED blinks at a regular rate. The LED glows steady until the LAN controller to which it is connected is programmed in HCM *and* at least one input is configured with WinControl XL Plus.

## Auxiliary power fuse

If the output of all six auxiliary power terminals exceeds 1 ampere, the fuse will open. The fuse must be replaced with a fuse of equivalent rating.



### Caution

Do not use a larger rated fuse as this may result in damage to the KMD-5220.

## Power On/Off

The input module does not use an On/Off switch or a power jumper. After the module is connected to a LAN controller and the LAN controller is powered, the module is also powered.

## Maintenance

The KMD-5220 does not require routine maintenance. If cleaning is required, wipe with a soft, damp cloth and mild soap.