

# MIERUZZO SERIES MANUAL

## INSTRUCTION MANUAL

### M16-600

## SENSOR INPUT DEVICE

Thank you for purchasing our product, M16-600.  
Please confirm that you have the correct device by checking the product label.  
Please read this instruction manual carefully before using this device to ensure correct usage.  
Please keep this instruction manual for future reference.



Please note that misuse of this device may lead to injury to the user or damage to the device.  
Please observe all safety precautions and warnings in this instruction manual.

Customer Service



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### ATTENTION!

- Do not use this device near machines that emit strong electromagnetic fields or object that store static electricity.
- Do not drop or subject this device to strong impact.
- Do not use or store this device where it will be exposed to water or any wet conditions.
- Do not attempt to disassemble or modify this device.
- Do not operate with a power source other than the one recommended in this manual or listed on the product labels.

### PRODUCT INTRODUCTION

The M16-600 Sensor Input Device provides interface between external sensors/inputs and Line Seiki counters with USB function (sold separately). This device reads each input and sends a command to the connected device using USB communication. The command contains the status of all inputs.

Up to 5 sensors or contact inputs can be connected to the input terminals of the Sensor Input Device. This device can also provide a DC12V power supply to the connected sensors.

The Sensor Input Device communicates with the counter device using the USB 2.0 protocol. It can power the connected device at DC5V, 100mA maximum.

#### ※ Important!

Please use a micro-B-to-A USB cable and an On-the-Go (OTG) micro-B-to-A receptacle cable to connect the M16-600 device to a tally counter device. (See Connection Diagram for reference in connection.)

This product is compatible with DK-5000 Series firmware version 11.0 or above.

To check the version number of DK-5000 device:

- Press 2 key while holding down the F key (F + 2) to go to ID settings.
- Press "# + F + 3" key, in this order, to view the firmware version.

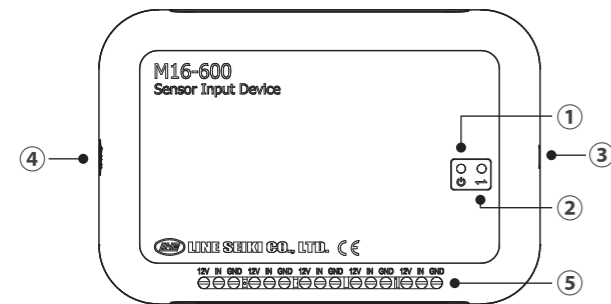
### POWER SUPPLY

Please use Line Seiki AC/DC Power Adapter for DK-5000 to power the device.

Upon initial connection to the power supply, the device will perform the start-up routine, with the data (↔) LED blinking *amber* for 5 - 7 seconds. After the start-up routine, the device will proceed to the initialization of the connected USB device then on **Active Mode**, after successful device enumeration.

(See OPERATION MODES for details.)

### LABELS



- Power Indicator
- USB Data Indicator
- USB 2.0 Port
- 5.5mm DC Jack
- Terminal Block

### OPERATION MODES

This device has two operation modes: Standby Mode and Active Mode.

#### ● Standby Mode

This is the default operation mode. After the start-up routine, the device automatically enters **Standby Mode** and wait for a valid USB device to be connected. The data indicator (↔) is off when the device is in **Standby Mode**.

#### ※ Important!

Input signals are ignored by the M16-600 Sensor Input Device while in Standby Mode.

#### ● Active Mode

The device enters **Active Mode** when it detects a supported USB device (DK-5000) is connected. (See the CONNECTION section for details.)

Input signals fed to the input terminals are recognized only during **Active Mode**. The Sensor Input Device sends a command to the connected USB device and the USB device interprets the received command as either a count increment or status input. If the communication between the USB device and the Sensor Input Device is successful, the data indicator will turn *green*. If an unsupported device is connected, the data indicator will change to *red* (blinking).

For DK-5000 Series device, Input keys 1~5 (or the first row for multi-row DK-5000 models) will be disabled during DK-5000 Recording Mode while connected to the Sensor Input Device.

M16-600 Sensor Input Device does not have its own memory for logging. Logging is expected to be performed by the DK-5000 tally counter. Input count values or status can be viewed thru the connected DK-5000 device.

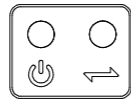
#### ※ Important!

Input signals will only be processed by M16-600 when a supported USB device (DK-5000) is connected.

This device will provide external input capability to Input 1~5 of the DK-5000 Series. External inputs for Input 6~30 of 10-key or 30-key DK-5000 device are not supported.

Input keys 1~5 of the DK-5000 device are disabled while connected to M16-600. Setting Mode and Memory Recall Mode are still accessible while the devices are connected.

### INDICATOR



Power: RED (always ON if powered)  
Communication: RED, GREEN, AMBER

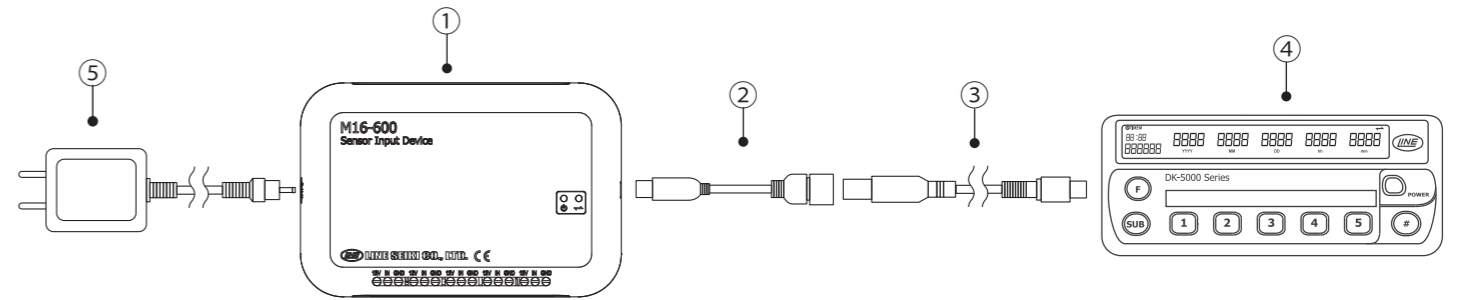
During device initialization or after power on, the Communication LED indicator blinks amber light for 5~7 seconds.

COMMUNICATION INDICATOR	TYPE OF EVENT - COMMUNICATION MODE
OFF	No USB device connected; No device enumerated
Amber Light ON	USB Device enumeration
Green Light ON	Connected USB device is supported USB Communication on-going
Red Light Blinking	Connected USB device is NOT supported USB Communication Failure

#### ※ Important!

External input sensor signals will only be processed if the DK-5000 unit is in count mode (in the case of DK-5000B / C / D), regardless if green LED light is already turned ON.

### CONNECTION



#### ※ Important!

DK-5000 series does not need an external power supply when connected to the Sensor Input Device. Please connect the AC/DC Power Adapter to M16-600 instead.

Connect the OTG cable to the sensor input device and the Micro USB cable to the DK-5000 unit. Connect the USB Type A connector of the Micro USB cable to the OTG Type A receptacle.

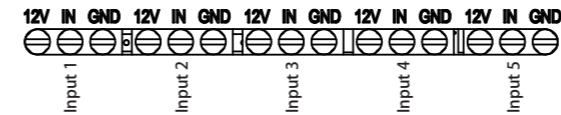
The USB cables must not be interchanged. Doing so will cause the device to malfunction.

Using a USB cable greater than 2 meter in length might cause communication error. Only up to 2 meter USB cable is recommended.

- M16-600 Sensor Input Device
- OTG Host cable: micro-B to USB A receptacle
- Micro B-to-A USB cable
- Line Seiki Counter with USB (i.e. DK-5000, sold separately)
- AC/DC Power Adapter for DK-5000

### WIRING DIAGRAM

#### ● Input Terminal Array



- ※ All 12V terminals are connected internally.
- ※ All ground (GND) terminals are connected internally.

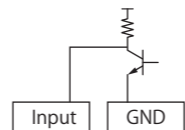
#### ● Input Circuit: Non-voltage Input (NPN Input)

< Contact Input >      < Open-Collector Input >



- ※ signal for contact input is ON.
- ※ signal for transistor is ON.

< NPN Voltage Input >



- ※ signal for transistor is ON.

#### ⚠ Caution!

Maximum voltage that can be connected to the input terminals of the device is up to DC30V.  
Excessive voltage may damage the internal circuitry.  
There is also risk of electrical shock so please exercise caution.

### SPECIFICATIONS

Model	M16-600
Input Mode	Contact / Open-Collector Input
Input	Non-contact Input: Open Collector (Sink Current approx. 1.5mA) L: <1.4V Contact Input: Relay, Microswitch, others (Sink Current approx. 1.5mA)
Input Speed	Count Input: 10Hz (Duty 1:1) State Input: 1sec min. pulse width <sup>1</sup>
Sensor Power Supply	For External Sensor: DC12V (100mA)
Sensor Input Terminal	Terminal Screw
Power Source	AC/DC Power Adapter for DK-5000
DK-5000 Connection	USB 2.0 (USB Micro-B)
Operating Humidity	35 ~ 85% RH (Non-condensing)
Operating Temperature	0 ~ 50°C (Non-freezing)
Storage Temperature	-10 ~ 60°C (Non-freezing)
Weight	150 (L) x 100 (W) x 32 (H) mm / approx. 240g
Accessories	Instruction Manual x 1, USB On-the-Go (OTG) Host Cable x 1, Micro B-to-A USB Cable x 1, AC/DC Power Adapter x 1
Compliance	CE, RoHS

Note 1: Applicable for DK-5000 Type D application only.

For more details, please visit our website at <http://www.lineseiki.com>