

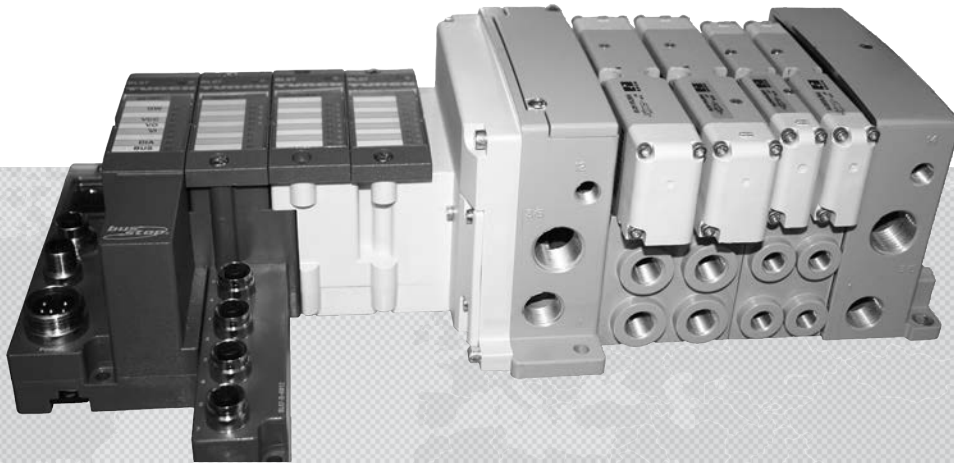


# PRODUCT INFORMATION

## SERIAL BUS COMMUNICATION

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### ROSS WITH TURCK SYSTEM



**ROSS CONTROLS**

### ROSS Serial Bus System with TURCK Modular I/O – KEY FEATURES

- A complete Centralized Serial Bus communication offering for ISO valves W65 and W66 Series
- I/O system based on the TURCK Modular Industrial I/O System BL 67
- Communication module supports up to 32 station modules each supporting up to 8 I/O modules
- Input modules accept signals from sensors, photo eyes, limits and other field input devices
- Output modules provide signals to remote solenoid valves and other field output devices
- UL, C-UL, and CE certified

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## The BL67 Solution

BL67 combines all the flexibility of an in-the-cabinet PLC I/O system with modularity, ruggedness and connectorization.

BL67 complements the AIM™, BL20 and piconet® product families to meet the needs of unique applications, such as small machine or conveyor systems requiring IP 67 protection.

## The BL67 Concept

The BL67 modular concept is a very flexible approach to connectorized I/O. The gateway, base and electronic modules provide many benefits to the user.

- The gateway provides communication between the fieldbus and I/O modules; modules are not dependent on the fieldbus protocol.
- DIN-rail or frame mountable base modules are available with eurofast® (M12), minifast® (7/8-16UN), M23 and picofast® (M8) connectors.
- Electronic modules are hot swappable.
- Power distribution module (24 volts DC) supplies the connected I/O signals.

BL67's openness, flexibility, connectorization, compact housing and ruggedness provide a viable alternative to in-the-cabinet I/O.

## Environmental Conditions

### Intended Application Environments

- BL67 does not need an enclosure
- Mount directly on machine or conveyor
- Rugged design provides protection against dirt, dust and liquids

### Not intended for These Environments

- Continuous submersion
- 100 percent humidity
- High pressure washdown

**Note:** For higher levels of protection consider fully potted AIM stations.

General Environmental	
Potential isolation	Via optocoupler
Operating temperature	32° to +131°F (0° to +55°C)
Storage temperature	-13° to +185°F (-25° to +85°C)
Relative humidity	5 to 95% (indoor), noncondensing
Vibration	1.0 g 5-10 Hz
Shock	15 g
Protection class	IP 67, NEMA 1, 3, 4, 12, 13
Electromagnetic compatibility (EMC)	According to EN 61131-2
Housing material	PC-V0 (Lexan), Nickel plated brass
Approvals	CE
	UL
	CSA

## Maximum Size of a BL67 Station

BL67 stations consist of a gateway and a maximum of 32 modules (equivalent to 1 m station length). Some high-tech and analog I/O modules may consume or produce large amounts of data, and therefore may limit the number of modules that may be used per system. It is highly recommended that the I/O assistant software is used when planning and commissioning BL67 systems. This program allows you to build the BL67 node on your computer and verify that all restrictions with regard to power and size are met. The free I/O assistant software is available for download from [www.turck.com](http://www.turck.com).

## Addressing

As a node on a network, BL67 stations are addressed dependent on the network system being used. Each network gateway has a set of rotary switches used to set the address for the node. DeviceNet™ and CANopen gateways may be addressed between 0 and 63 via two switches (one for the 10's digit and one for the 1's digit). For example, to set the address to 37 you would set the 10's switch to 3 and the 1's switch to 7. The third switch on the gateway may be used to set the communication rate of the network interface. PROFIBUS®-DP gateways may be set from 1 to 125 by using three switches (one for the 100's, one for the 10's and one for the 1's).

Ethernet gateways allow different addressing schemes depending on the Ethernet addressing method being used in the overall system. Dynamic addressing schemes include BootP and DHCP, while hard-coding a static address is also allowed.



## BL67 Power Distribution

### Power Overview

The power supply for a BL67 station is fed via the power connector on the PROFIBUS® gateway or directly from the network on the DeviceNet™ gateway. Power feeder modules can be added to the system at any point to provide a fresh isolated supply of power to all I/O connected to its right.

### Internal Power Consumption via Module Bus

The amount of BL67 modules that may be supplied via the internal module bus depends on the respective nominal current  $I_{MB}$  of the individual modules on the module bus. The sum of the nominal current inputs of the connected BL67 module must not exceed 1.5 A. If the I/O assistant software is used, an error message is generated automatically via the <Station - Verify> as soon as the system supply via the module bus is no longer sufficiently guaranteed.

To calculate current draw on DeviceNet: Add  $I_{MB(24)}$  for all modules. Then add  $V_I$  and  $V_O$  for electronic modules to the left of the first power feed module. Next, add the current draw of the I/O devices.

To calculate current draw on PROFIBUS gateway power connector for  $V_I$ : Add  $I_{MB}$  for all modules. Then add  $V_I$  current for all modules to the left of the first power feed module. Next, add the current draw of the input devices.

For  $V_O$ , add the  $V_O$  current for all modules to the left of the first power feed module. Next, add the current draw of the output devices.

$V_{MB}$  = Module bus power

$V_I$  = Input power

$V_O$  = Output power

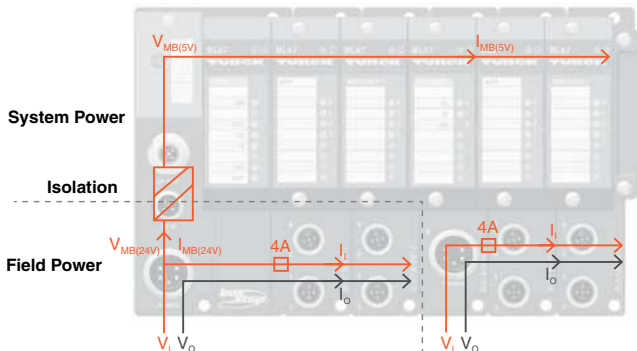
$I_{MB}$  = Module bus current

$I_{MB(24)}$  = Effective current draw from gateway at 24 volts DC supply.

Module	Nominal 1 Current at 5 V $I_{MB}$	Effective Draw 2 from Gateway at 24 VDC $I_{MB(24)}$	Nominal 3 Current from $V_I$	Nominal 4 Current from $V_O$
BL67-GW-DPV1	–	≤150 mA		
BL67-GW-DN	–	≤100 mA		
BL67-PF-24VDC	≤30 mA	≤9 mA		
BL67-4DI-P	≤30 mA	≤9 mA	≤40 mA	
BL67-8DI-P	≤30 mA	≤9 mA	≤40 mA	
BL67-4DO-0.5A-P	≤30 mA	≤9 mA		≤100 mA
BL67-4DO-2A-P	≤30 mA	≤9 mA		≤100 mA
BL67-8DO-0.5A-P	≤30 mA	≤9 mA		≤100 mA
BL67-2AI-V	≤35 mA	≤10 mA	≤12 mA	
BL67-2AI-I	≤35 mA	≤10 mA	≤12 mA	
BL67-2AI-TC	≤35 mA	≤10 mA	≤30 mA	
BL67-2AI-PT	≤45 mA	≤13 mA	≤45 mA	
BL67-2AO-I	≤40 mA	≤12 mA		≤50 mA
BL67-2AO-V	≤60 mA	≤17 mA		≤50 mA
BL67-1RS232	≤100 mA	≤28 mA	≤50 mA	
BL67-8XSG-PD	≤30 mA	≤9 mA		≤100 mA
BL67-1SSI	≤50 mA	≤15 mA	≤50 mA	
BL67-4DI-PD	≤30 mA	≤9 mA		≤100 mA
BL67-8DI-PD	≤30 mA	≤9 mA		≤100 mA

## Applying Power to BL67

### PROFIBUS®, Ethernet and CANopen System DeviceNet™ System



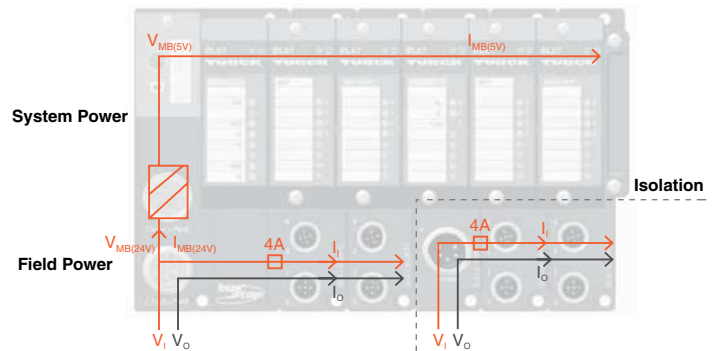
$V_I, V_O, V_{MB}$  from Power on Gateway

Isolation of Field Power  $V_I, V_O$

$I_{MB(5V)} < 1.5A$   
 $I_I < 4A$  (protected)  
 $I_O < 8A$

$V_{MB}$  = Module Bus Power  
 $V_I$  = Input Power  
 $V_O$  = Output Power

A power feeder module provides a new isolated segment for all modules to its right.



$V_I, V_O, V_{MB}$  from DeviceNet™

Isolation of Field Power  $V_I, V_O$

$I_{MB(5V)} < 1.5A$   
 $I_I < 4A$  (protected)  
 $I_O < 8A$

$V_{MB}$  = Module Bus Power  
 $V_I$  = Input Power  
 $V_O$  = Output Power

A power feeder module provides a new isolated segment for all modules to its right.



# Step 1

## Select Communication Module

# TURCK Serial Bus System

General Environmental	
DeviceNet Gateway	BL67-GW-DN
ModBus TCP/IP, Ethernet Gateways	BL67-GW-EN BL67-PG-EN (programmable)
Ethernet IP, Ethernet Gateways	BL67-GW-EN-IP BL67-PG-EN-IP (programmable)
Profinet, Ethernet Gateways	BL67-GW-EN-PN
PROFIBUS-DP Gateway	BL67-GW-DPV1 BL67-PG-DP (programmable)
CANopen Gateway	BL67-GW-CO
IP67 Certified. Reference the following Document for installation instructions: AXXXXX. See <a href="http://www.rosscontrols.com">www.rosscontrols.com</a>	



- Electrical:**
- Operating Current: <600 mA from  $V_{MB}$
  - Input Supply Current: <4 A (from  $V_i$ )
  - Output Supply Current: <8 A (from  $V_o$ )
  - Backplane Current: <1.5 A (from  $V_{MB}$ )
- Mechanical:**
- Operating Temperature: -12 to +55°C (-13 to +131°F)
  - Protection: IP 67
  - Vibration: 5 g @ 10-500 Hz

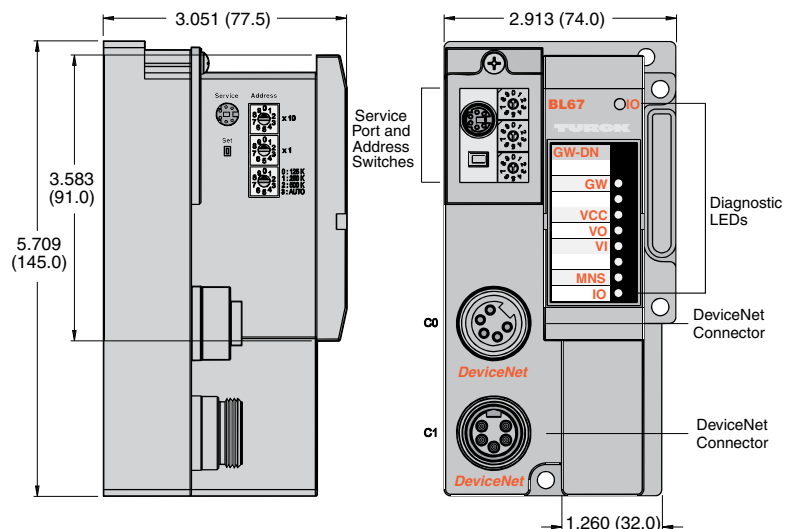
- Material:**
- Housing: PC-V0 (Lexan)

- Diagnostics (Logical)**
- Diagnostic information available through the DeviceNet I/O map

- Diagnostics (Physical)**
- LEDs to indicate status of DeviceNet and Module Bus communication

- Programmability**
- PG in model number designates a programmable gateway
  - Programmable according to IEC 61131.3 using CodeSys (includes ladder logic)
  - Use CodeSys to create logic programs to control local I/O

### Dimensions – inches (mm)



## Step 2

### Select Input/Output Module

## TURCK Serial Bus System

#### Power Distribution

Inputs:  $V_1$   
Outputs:  $V_0$   
Logic:  $V_{MB}$

#### Mechanical:

Operating Temperature: +32 to +131°F (0 to +55°C)  
Protection: NEMA 1,3,4,12,13 / IEC IP 67  
Vibration: 5 g @ 10 – 500 Hz

#### Material:

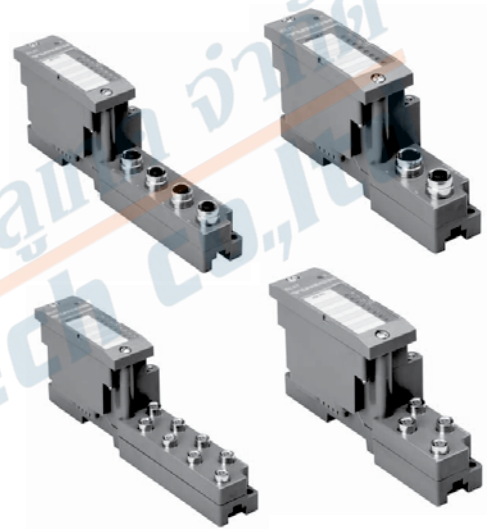
Connectors: Nickel-plated brass  
Housing PC-VO (Lexan)

#### Diagnostics (Logical)

Diagnostic information available through the fieldbus gateway

#### Diagnostics (Physical)

LEDs to indicate status of DeviceNet and Module Bus communication  
LEDs for each I/O point to indicate on/off status



Model Description	Inputs	Outputs	Model Number	Operating Current			Output Current from $V_0$	Type
				from $V_{MB}$	from $V_1$	from $V_0$		
<b>Inputs</b>								
Discrete Inputs	4		BL67-4DI-P	<30 mA	<40 mA			PNP
Discrete Inputs	4		BL67-4DI-N	<30 mA	<1 mA			NPN
Discrete Inputs	8		BL67-8DI-P	<30 mA	<40 mA			PNP
Discrete Inputs	8		BL67-8DI-N	<30 mA	<1 mA			NPN
Discrete Inputs	4		BL67-4DI-PD	<30 mA	<100 mA			PNP
Discrete Inputs	8		BL67-8DI-PD	<30 mA	<100 mA			PNP
Analog Inputs	2		BL67-2AI-V	<35 mA	<12 mA			-10/0 to 10V
Analog Inputs	2		BL67-4DI-I	<35 mA	<12 mA			0/4 to 20mA
Analog Inputs	2		BL67-4DI-V/I	<35 mA	<12 mA			-10/0 to 10V, 0/4 to 20mA
Temperature Inputs	2		BL67-2AI-TC	<35 mA	<30 mA			Thermocouple
Temperature Inputs	2		BL67-2AI-PT	<45 mA	<30 mA			RTD
<b>Outputs</b>								
Discrete Outputs		4	BL67-4DO-0.5A-P	<30 mA		<100 mA	<0.5 A	PNP
Discrete Outputs		4	BL67-4DO-2A-P	<30 mA		<100 mA	<2 A	PNP
Discrete Outputs		4	BL67-4DO-2A-N	<30 mA		<100 mA	<2 A	NPN
Discrete Outputs		8	BL67-8DO-0.5A-P	<30 mA		<100 mA	<0.5 A	PNP
Discrete Outputs		16	BL67-16DO-0.5A-P	<30 mA		<100 mA	<0.5 A	PNP
Analog Outputs		2	BL67-2AO-V	<60 mA	<50 mA			-10/0 to 10V
Analog Outputs		2	BL67-2AO-I	<40 mA	<50 mA			0/4 to 20mA
<b>Inputs / Outputs</b>								
Discrete Inputs /Outputs	8	8	BL67-8XSG-P	<30 mA		<100 mA	<0.5 A	PNP
Discrete Inputs /Outputs	8	8	BL67-8XSG-PD	<30 mA		<100 mA	<0.5 A	PNP
Discrete Inputs /Outputs	4	4	BL67-4DI4DO-PD	<30 mA		<100 mA	<0.5 A	PNP



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**Select Optional CANopen Interface / Serial Communication Modules**

**Power Distribution**

Inputs:  $V_1$   
Outputs:  $V_0$   
Logic:  $V_{MB}$

**Mechanical:**

Operating Temperature: +32 to +131°F (0 to +55°C)  
Protection: NEMA 1,3,4,12,13 / IEC IP 67  
Vibration: 5 g @ 10 – 500 Hz

**Material:**

- Connectors: Nickel-plated brass
- Housing: PC-VO (Lexan)

**Diagnostics (Logical):**

- Diagnostic information available through the fieldbus gateway

**Diagnostics (Physical):**

- LED to indicate module bus communication status as well as I/O diagnostics
- LEDs for each I/O point to indicate on/off status

**Functional Description:**

- Connect up to 8 CANopen slaves to this module
- Map the slaves into any available fieldbus



Shown with  
BL67-B-4M12 base

**C**  
**C3**

Model Description	Model Number	Operating Current		
		from $V_{MB}$	from V	from V Supply
<b>Inputs</b>				
Discrete Inputs	BL67-4DI-P	<30 mA	<50 mA	<100 mA
<b>Outputs</b>				
Discrete Outputs	BL67-1RS485/422	<140 mA	<50 mA	
Discrete Outputs	BL67-1RS232	<60 mA	<50 mA	
Discrete Outputs	BL67-1SSI	<50 mA	<50 mA	

**Select Optional CANopen Interface / Serial Communication Modules**

**Electrical:**

Operating Current Inputs:  $V_1$   
Outputs:  $V_0$   
Logic:  $V_{MB}$

**Power Distribution:**

Accepts 24 volts DC supply to provide  $V_1$  and  $V_0$  for downstream modules

**Material:**

Connectors: Nickel-plated brass  
Housing PC-VO (Lexan)

**Diagnostics (Logical)**

Diagnostic information available through the fieldbus gateway

**Diagnostics (Physical)**

LEDs to indicate status of DeviceNet and Module Bus communication  
LEDs for each I/O point to indicate on/off status



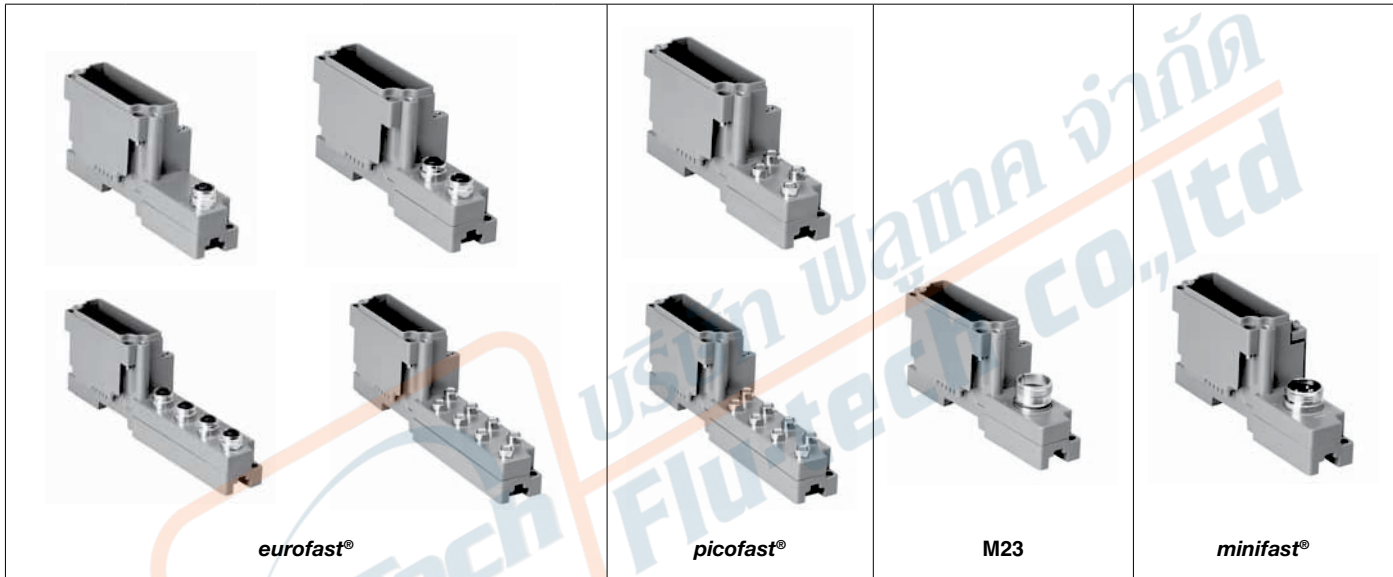
Model Description	Model Number	Operating Current	
		from $V_{MB}$	for downstream I/O
Power Feeding Module	BL67-PF-24 volts DC	<30 mA	<10 mA



# Step 6

## Select Base Modules for BL67 I/O

## TURCK Serial Bus System



Connector Type	Number of Connectors	Number of Pins	Model Number	Description
eurofast®	2	2 (ea)	BL67-B-2M12	When used with 4 input or 4 output modules, each connector has 2 I/O points.
eurofast®	2	2 (ea)	BL67-B-2M12-P	Each connector has 2 I/O points, paired so consecutive points are on the same connector.
eurofast®	4	2 (ea)	BL67-B-2M12	When used with 8 input or 8 output modules, each connector has 2 I/O points.
eurofast®	4	2 (ea)	BL67-B-2M12-P	Each connector has 2 I/O points, paired so consecutive points are on the same connector.
eurofast®	1	5	BL67-B-1M12	Typically used with serial I/O modules.
eurofast®	1	8	BL67-B-1M12-8	Typically used with serial I/O modules.
picofast®	4		BL67-B-4M8	Typically used with 4-input or 4-output modules.
picofast®	8		BL67-B-8M8	Typically used 8-input or 8-output modules with.
M23	1	12	BL67-B-1M23	Typically used with 8-output or SSI Modules.
M23	1	12	BL67-B-1M23-VI	Base module that allows full 4 A available from V+ pins.
M23	1	19	BL67-B-1M23-19	For use with 16-output module.
minifast®	1	5	BL67-B-1RSM	For use with the power feeding module, five wire power scheme.
minifast®	1	4	BL67-B-1RSM-4	For use with the power feeding module, four wire power scheme.

### Labels for labeling electronic modules

**BL67-Label/DIN-A4-50-PCS**

**Programming Cable -  
For connecting the BL20/BL67 system to  
the I/O Assistant software  
XN-PS2-CABLE**

DIN A4 sheet size



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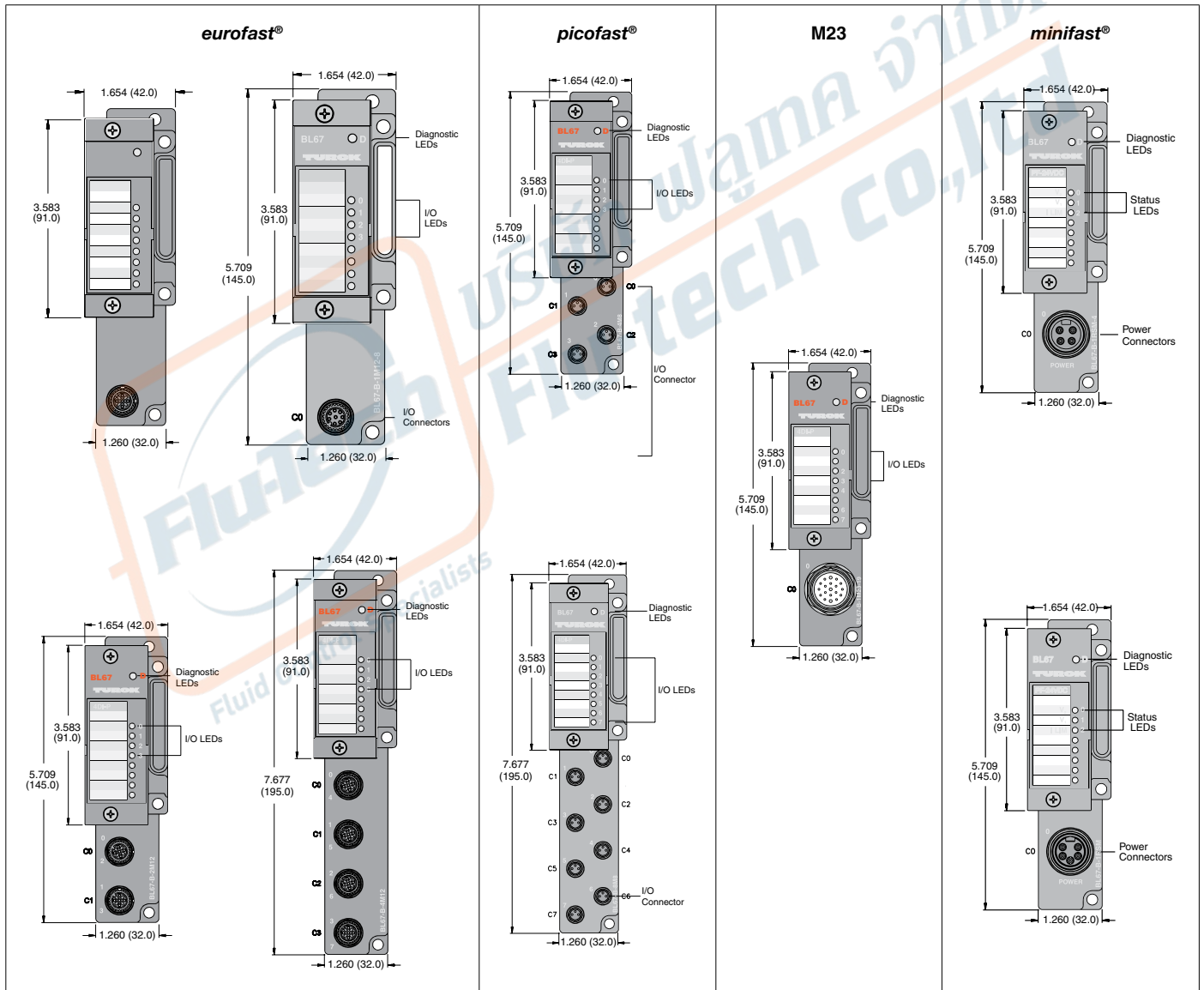
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# Base Module Dimensions and Pinouts

# TURCK Serial Bus System

Dimensions – inches (mm)



C

C3



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