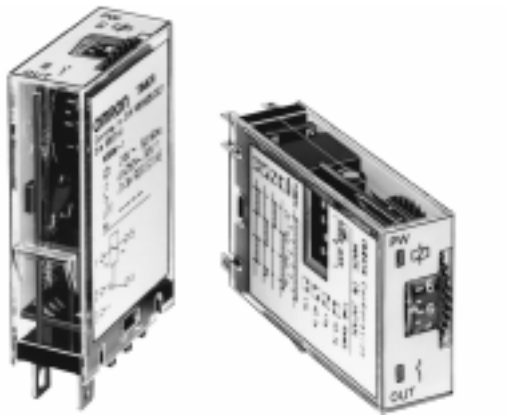
Solid-state Timer

H3RN

Ultra-slim Timer for G2R Relay Socket

- Multiple operating modes, DIP switch selectable, ON-delay, Interval, Repeat cycle ON-start/OFF-start
- Standard multiple time ranges:
  Short range (0.15 to 10 min)
  Long range (0.1 min to 10 hrs)
- Pin configuration compatible with G2R Relay and mounts to the P2R/P2RF Socket.



Ordering Information

Supply voltage	Time-limit contact	Short-time range model (0.1 s to 10 min)	Long-time range model (0.1 min to 10 h)
24 VAC; 12, 24 VDC	SPDT	**H3RN-1**	**H3RN-11**
	DPST-NO	**H3RN-2**	**H3RN-21**

Note: Specify both the model number and supply voltage when ordering.
Example: H3RN-1 24 VAC
Supply voltage

MODEL NUMBER LEGEND

H3RN - □ □
1 2

1. Output
1: SPDT
2: DPST-NO,

2. Time Range
None: Short-time range (0.1 s to 10 min)
1: Long-time range (0.1 min to 10 hrs)

ACCESSORIES (ORDER SEPARATELY)

Connecting Socket

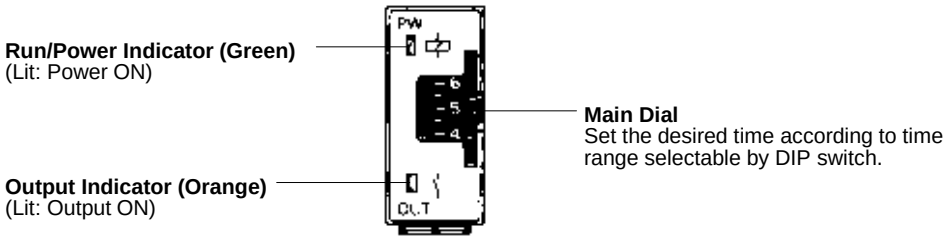
Timer	Track mounting/Front connecting socket
H3RN-1/-11	**P2RF-05-E**
H3RN-2/-21	**P2RF-08-E**

Specifications

Item		H3RN-1/-2	H3RN-11/-21
Time ranges		0.1 s to 10 min (1 s, 10 s, 1 min, or 10 min max. selectable)	0.1 min to 10 h (1 min, 10 min, 1 h, or 10 hrs max. selectable)
Supply voltage		24 VAC; 12, 24 VDC	
Operating mode		ON-delay, interval, Repeat cycle ON-start/OFF start selectable by DIP switch	
Operating voltage		85% to 110% of rated supply voltage (12 VDC: 90% to 110% of rated supply voltage) (see note)	
Power consumption		24 VAC: Relay ON: approx. 0.8 VA (at 24 VAC, 60 Hz) Relay OFF: 0.5 VA (at 24 VAC, 60 Hz) 12 VDC: Relay ON: approx. 0.4 W (at 12 VDC) Relay OFF: 0.1 W (at 12 VDC) 24 VDC: Relay ON: approx. 0.5 W (at 24 VDC) Relay OFF: 0.2 W (at 24 VDC)	
Control outputs		3 A at 250 VAC, resistive load (cosϕ = 1) (G6B-2□14P-FD-US used) The minimum applicable load is 10 mA at 5 VDC (P reference value).	
Repeat accuracy		±1% FS max. (1 s range: ±1%±10 ms max.)	
Setting error		±15%±50 ms FS max.	
Resetting time		Min. power-opening time: 12, 24 VDC: 0.1 s max. (including halfway reset) 24 VAC: 0.5 s max. (including halfway reset)	
Insulation resistance		100 MΩ min. (at 500 VDC)	
Dielectric strength		2,000 VAC, 50/60 Hz for 1 min (between operating circuit and control output, or contacts of different poles) 1,000 VAC, 50/60 Hz for 1 min (between non-continuous contacts)	
Vibration	Mechanical durability	10 to 55 Hz, 0.75-mm single amplitude	
	Malfunction durability	10 to 55 Hz, 0.5-mm single amplitude	
Shock	Mechanical durability	300 m/s^2 (approx. 30G)	
	Malfunction durability	100 m/s^2 (approx. 10G)	
Ambient temperature	Operating	−10°C to 55°C (with no icing)	
	Storage	−25°C to 65°C (with no icing)	
Humidity	Operating	35% to 85%	
Service life	Mechanical	10,000,000 operations min. (under no load at 1,800 operations/h)	
	Electrical	100,000 operations min. (3 A at 250 VAC, resistive load at 1,800 operations/h)	
Noise immunity		±1.5 kV, square-wave noise by noise simulator (pulse width: 100 ns/1 μs, 1-ns rise)	
Static immunity	Mechanical durability	8 kV	
	Malfunction durability	4 kV	
Enclosure rating		IP20	
Weight		Approx. 18 g	
Approvals		UL/CSA/CE (EMC) (LV)	

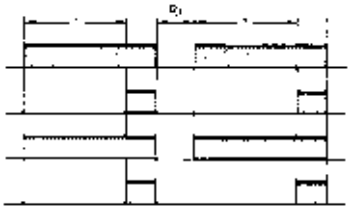
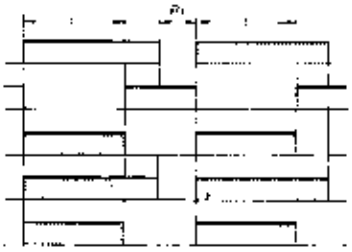
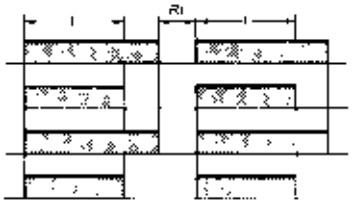
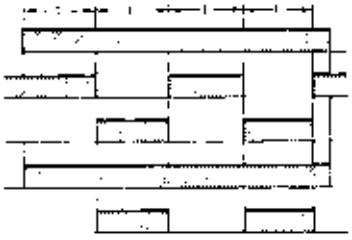
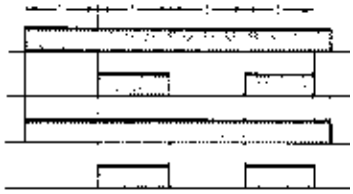
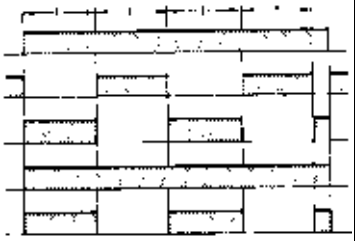
Note: When using the H3RN in any place where the ambient temperature is more than 50°C, supply 90% to 110% of the rated voltages (12 VDC: 95% to 110% of the rated voltage).

Nomenclature



Operation

■ TIMING CHART

Operating mode	Timing chart	
	H3RN-1/-11	H3RN-2/-21
ON-delay Power Output	Power (1-5) Time limit contact NC (4-2) Time limit contact NO (4-3) Run/Power indicator (PW) Output indicator (OUT) 	Power (1-8) Time limit contact NO (4-3, 5-6) Run/Power indicator (PW) Output indicator (OUT) 
Interval Power Output	Power (1-5) Time limit contact NC (4-2) Time limit contact NO (4-3) Run/Power indicator (PW) Output indicator (OUT) 	Power (1-8) Time limit contact NO (4-3, 5-6) Run/Power indicator (PW) Output indicator (OUT) 
Repeat cycle OFF-start Power Output	Power (1-5) Time limit contact NC (4-2) Time limit contact NO (4-3) Run/Power indicator (PW) Output indicator (OUT) 	Power (1-8) Time limit contact NO (4-3, 5-6) Run/Power indicator (PW) Output indicator (OUT) 
Repeat cycle ON-start Power Output	Power (1-5) Time limit contact NC (4-2) Time limit contact NO (4-3) Run/Power indicator (PW) Output indicator (OUT) 	Power (1-8) Time limit contact NO (4-3, 5-6) Run/Power indicator (PW) Output indicator (OUT) 

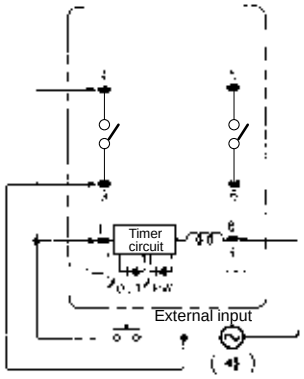
Note: t: Set time
Rt: Reset time

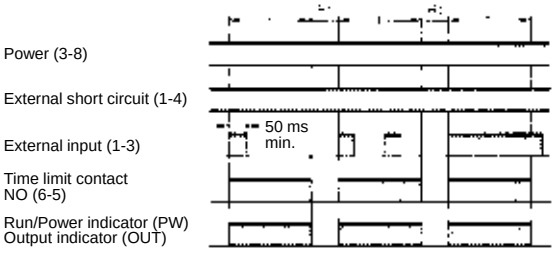
■ PULSE OPERATION

A pulse output for a certain period can be obtained with a random external input signal.

Use the H3RN in interval mode as shown in the following timing charts.

H3RN-2/-21





Note: t: Set time
Rt: Reset time

⚠ Caution

Be careful when connecting wires.

Mode	Terminals
Pulse operation	Power supply between 3 and 8 Short-circuit between 4 and 1 Input signal between between 3 and 1
Operating mode: interval and all other modes	Power supply between 1 and 8

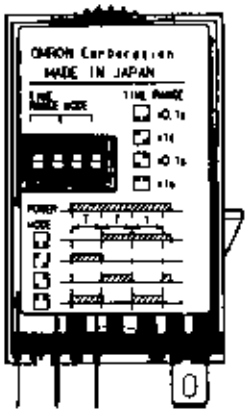
■ DIP SWITCH SETTINGS

The 1-s range and ON-delay mode for H3RN-1/-2, 1-min range and ON-delay mode for H3RN-11/-21 are factory-set before shipping.

Time Ranges

Model	Time range	Time setting range	Setting	Factory-set
H3RN-1, H3RN-2	1 s	0.1 to 1 s		Yes
	10 s	1 to 10 s		No
	1 min	0.1 to 1 min		No
	10 min	1 to 10 min		No
H3RN-11, H3RN-21	1 min	0.1 to 1 min		Yes
	10 min	1 to 10 min		No
	1 h	0.1 to 1 h		No
	10 h	1 to 10 h		No

Note: The left two DIP switch pins are used to select the time ranges.



Operating Modes

Operating mode	Setting	Factory-set
ON-delay		Yes
Interval		No
Repeat cycle OFF-start		No
Repeat cycle ON-start		No

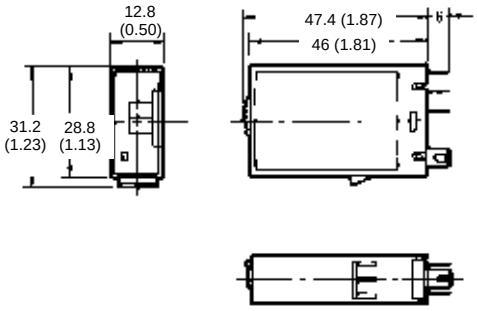
Note: The right two DIP switch pins are used to select the operating modes.

Dimensions

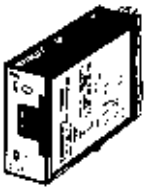
■ TIMERS

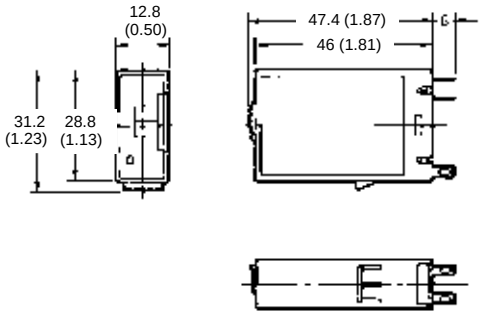
Unit: mm (inch)

H3RN-1/-11



H3RN-2/-21

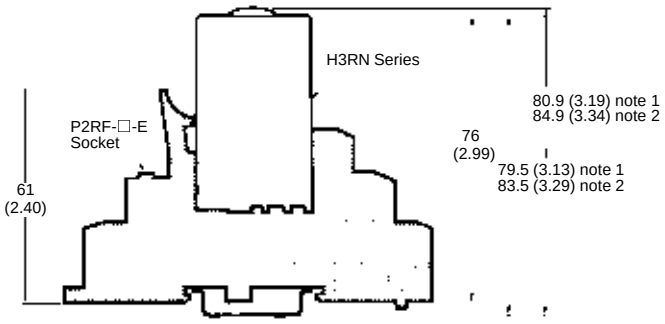




Mounting Height

Use the P2RF-□-E or P2R-□7P to mount the H3RN. When ordering any one of these sockets, replace "□" with "05" for SPDT or "08" for DPST-NO.

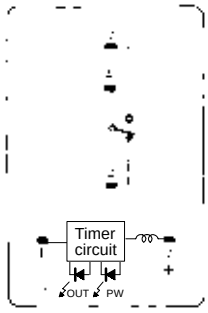
P2RF-□-E



Note:
1. The value shown indicates the dimension for the P2RF-05-E with the PFP-□N Mounting Rail. The value is 71.5 mm (2.81) when using the PFP-N□2.
2. This value indicates the dimension for the P2RF-08-E with the PFP-□N Mounting Rail. The value is 75.5 mm (2.97) when using the PFP-N□2.

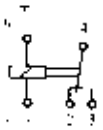
Connections

H3RN-1/-11

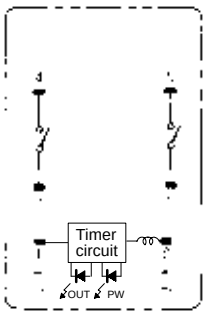


Bottom View

DIN Indication



H3RN-2/-21



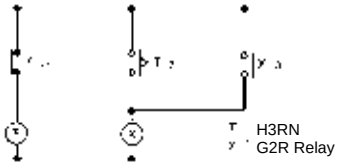
Bottom View

DIN Indication

Precautions

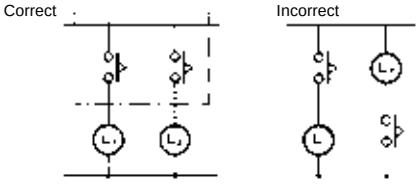
When using the H3RN in any place where the ambient temperature is more than 50°C, supply 90% to 110% of the rated voltages (at 12 VDC: 95% to 110%).

Do not leave the H3RN in time-up condition for a long period of time (for example, more than one month in any place where the ambient temperature is high), otherwise the internal parts may become damaged. Therefore, the use of the H3RN with a relay as shown in the following circuit diagram is recommended.

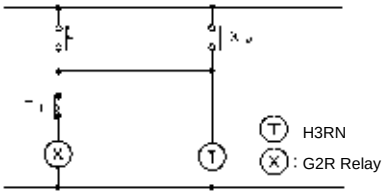


The H3RN must be disconnected from the socket when setting the DIP switch, otherwise the user may touch a terminal imposed with a high voltage and get an electric shock.

Do not connect the H3RN as shown in the following circuit diagram on the right hand side, otherwise the H3RN's internal contacts different from each other in polarity may become short-circuited.

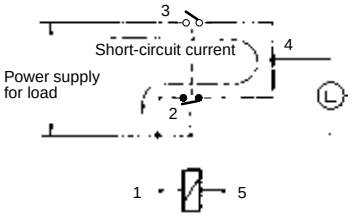


Use the following safety circuit when building a self-holding circuit with the H3RN and an auxiliary relay, such as a G2R Relay, in combination.



In the case of the above circuit, the H3RN will be in pulse operation.

Do not use the SPDT contact in a circuit which may cause short-circuiting at three points (otherwise, short-circuiting of the power supply may occur) because the SPDT contact of H3RN-1/-11 is composed of an SPST-NC contact.



Do not set to the minimum setting in the flicker modes, otherwise the contact may be damaged.

Do not use the H3RN in places where there is excessive dust, corrosive gas, or direct sunlight.

Do not mount more than one H3RN closely together, otherwise the internal parts may become damaged. Make sure that there is a space of 5 mm or more between any H3RN Models next to each other.

The internal parts may become damaged if a supply voltage other than the rated ones is imposed on the H3RN.

Precautions for VDE Conformance

The H3RN as a built-in timer conforms to VDE 0435/P2021 provided that the following conditions are satisfied.

Handling

Do not touch the DIP switch while power is supplied to the H3RN.

Before dismounting the H3RN from the socket, make sure that no voltage is imposed on any terminal of the H3RN.

Wiring

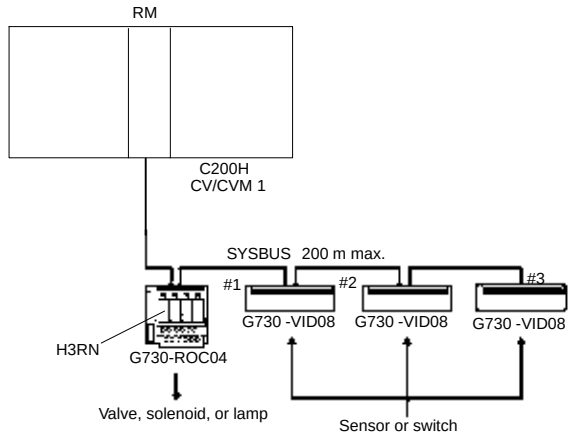
Only a load with basic isolation can be connected to the output contact. The H3YN is a model with basic isolation. Therefore, the H3YN and the load will ensure reinforced isolation, thus meeting VDE standards.

Insulation requirement: Overvoltage category II,
pollution degree 2
(with a clearance of 1.5 mm and a creepage distance of 2.5 mm at 240 VAC)

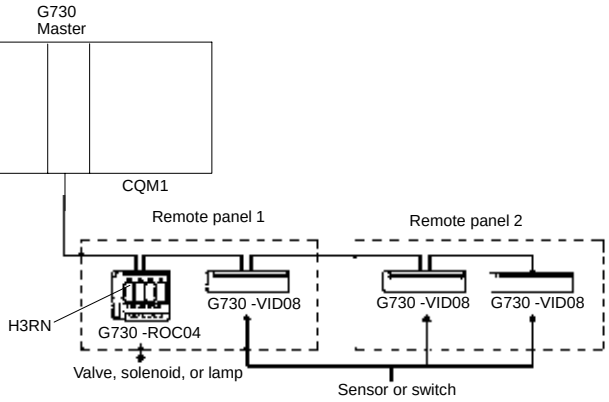
Application Examples

Omron's package-type PC saves wiring efforts when used in combination with Remote I/O products.

■ APPLICATION 1: SYSMAC BUS REMOTE I/O

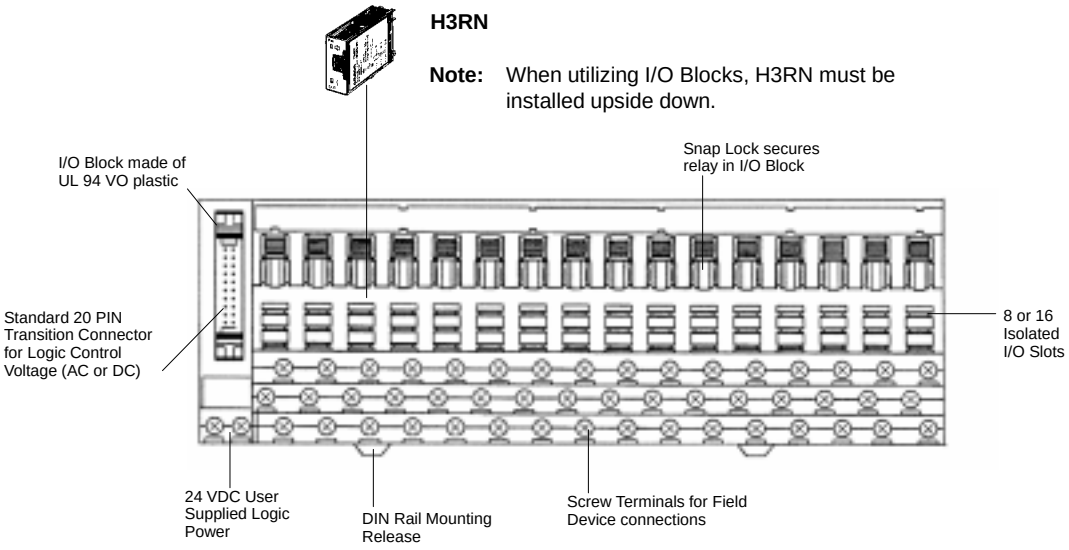


APPLICATION 2: CQM1 G730 MASTER



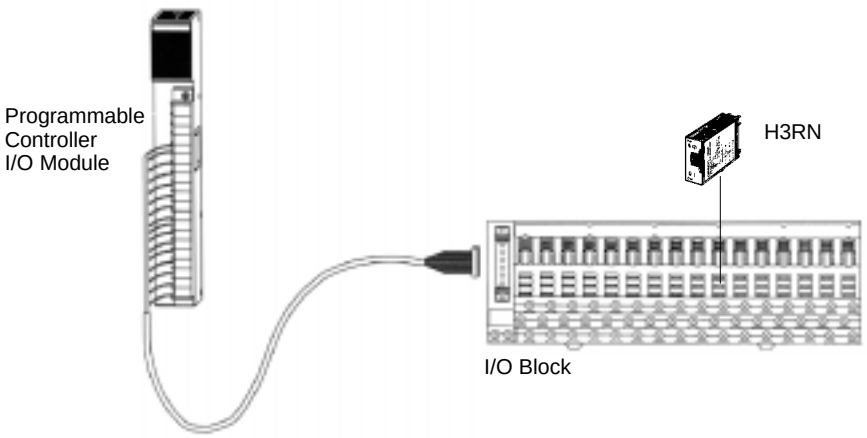
APPLICATION 3: UNIVERSAL I/O BLOCKS

Omron Universal I/O Blocks provide industrial I/O to connect to *any* controller or device requiring a hardened I/O structure for isolation from field signals and high level voltages.



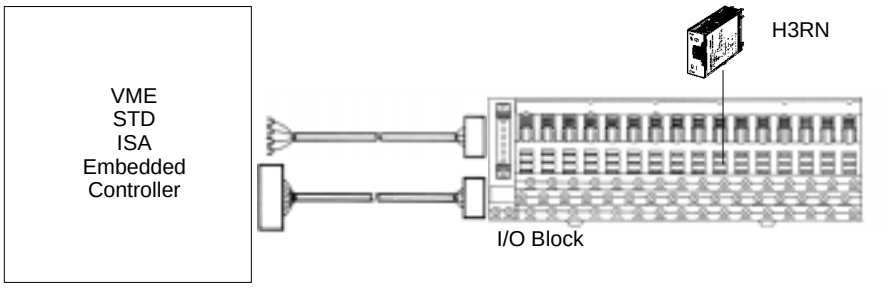
Note: LED indicators on P7TF/G7TC Models only.

Programmable Controller I/O Modules



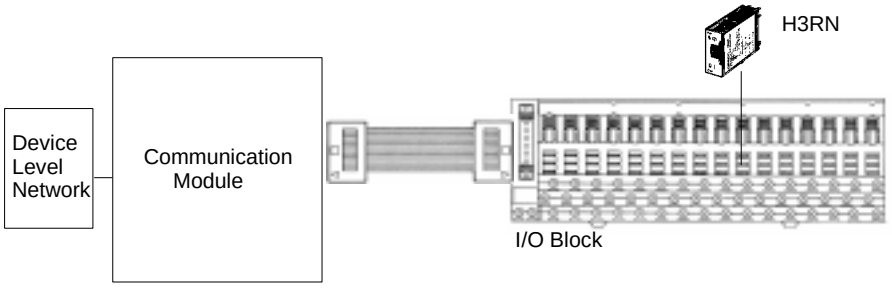
- Connect to any manufacturers PLC module
- Mix voltages on a single PLC I/O module
- Isolate field signals—reduce rack space
- Reduce wiring, installation, and maintenance costs
- Accessory cables available

Computers & Embedded Controllers



- Connect I/O Blocks to VME, STD, ISA, and other computer types
- Isolate field signals from sensitive computer and control logic in harsh industrial environments

Device Level Network Interfaces



- I/O Blocks connect to any communication interface
- Device level network
- Examples include LonWorks, DeviceNet, ASI Bus, INTERBUS-S, SERIPLEX, and others
- Accessory cables available or use standard ribbon cable connection

NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

OMRON®

OMRON ELECTRONICS, INC.
One East Commerce Drive
Schaumburg, IL 60173
1-800-55-OMRON

OMRON CANADA, INC.
885 Milner Avenue
Scarborough, Ontario M1B 5V
416-286-6465

Cat. No. GC TI8 11/97 Specifications subject to change without notice. Printed in U.S.A.