

Relay, 3A, 16-way Output Module

Part Number 9735-4012

Features

- 16-way Output
- LED Output state indication
- Configurable Freeze/Fallback strategy
- Optical isolation
- Pluggable connections
- Communications and module status indication
- Single/Dual CAN network connections
- Supports all baud rates (1M to 10k)
- Din-rail mounting



The Relay output module for the GEM80-500 range of Programmable Logic Controllers provides 16 output points and is part of the GEMTEQ I/O range of products.

Contents

This box contains 9735-4012, Relay, 3A, 16-way Output Module, Dual CAN including shroud.

Related Documents

Information describing the specification of this product and the requirements for its installation, operation and maintenance are contained in the GEMTEQ I/O Technical Manual, publication T2031En.

Warning: Failure to comply with any of the general requirements for installation, operation and maintenance provided in the technical manuals and/or the additional instructions given overleaf will significantly increase the risk of maloperation, fire or electric shock.

1. Hazardous Voltages

Hazardous voltages and energy levels can exist on plant wiring to the module. Ensure that power and plant supplies are disconnected before fitting, removing or wiring to plant connectors. Also ensure that any shrouds or covers provided are securely replaced.

2. Plant Wiring

Due to the high concentration of plant wiring and terminations that may occur in a typical GEM80-500 system, All terminations to screw terminals should be terminated using bootlace ferrules.

All plant wiring must be suitably supported and restrained.

All plant wiring must be routed and segregated from other wiring categories as detailed in the appropriate Technical Manuals.

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Specifications

Environment

Humidity :	5% to 95% Relative Humidity, non condensing	
Temperature :	Operating	0°C to 50°C
	Storage	-20°C to 70°C
Atmospheric contamination :	The module must be totally protected from potentially corrosive atmospheres e.g. benzene, acid fumes, sulphur dioxide, hydrogen sulphide and nitrous oxide.	

Electrical Specification

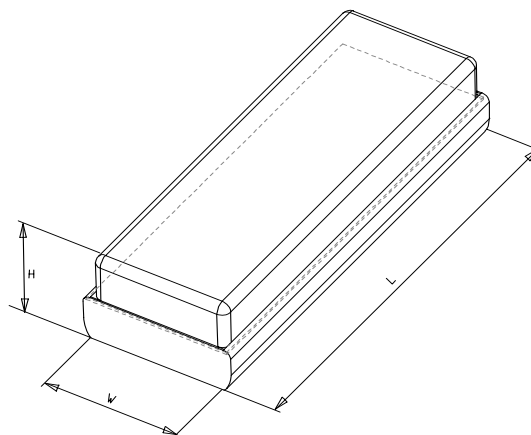
Module Supply	24 volts d.c. nominal, 300mA (max)
Module Supply Voltage Range	±10%, 21.6 to 26.4 V d.c.
Module Supply Fuse	2.5A 20x5mm Time Delay
Maximum Switchable Voltage	250 volts a.c./ 30 volts d.c.
Output Characteristics	
Max. Load Current	3 A a.c., 3 A d.c.
Max. Switchable Load	150W, 1250VA
Min. Switchable Load	10mA at 5V
Contact Resistance	100m ohms Max
Insulation Resistance at 500V d.c.	Greater than 10 ⁹ ohms
On response Time	10mS
Off response Time	5mS
Output Protection	No Protection (See note on page 8)
Power Dissipation all outputs ON	12W max
Isolation	Between field side and logic side 6000V pulse 3000V a.c. for 1 min
Number of Operations	Mechanical: 20,000,000 min Electrical: 100,000 min. (5 A at 250 VAC/30 VDC, resistive load) 300,000 min. (2 A at 250 VAC/30 VDC, resistive load)

Mechanical Specification

Dimensions & Weight

Length 286 mm
Width 113 mm
Height 72 mm

Weight 0.7kg



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Product Compliance

Standard

This product complies with the essential safety requirements of the Low Voltage Directive (1), and the Electromagnetic Compatibility Directive (2). However, it is outside the scope of the Electromagnetic Directive, and the CE Marking and Declaration of Conformity requirements of the Directives apply only to the Low Voltage Directive.

(1) Low Voltage Directive 2006/95/EC

(2) Electromagnetic Compatibility Directive 2004/108/EC

EMC Emissions

EN55011

Conducted and Radiated
"Industrial Scientific & Medical Equipment
(Group 1, Class A)

EMC Immunity

EN61000-4-2

Electrostatic Discharge
8KV Air, 4KV Contact

IEC61000-4-3

RF Susceptibility
10V / m

EN61000-4-4

Fast Transient Burst
2KV

IEC61000-4-5

Surge Withstand
a.c. supply 1KV line to line
2KV line to earth
d.c. supply 0.5KV line to line
0.5KV line to earth
I/O 1KV line to earth

IEC61000-4-6

Conducted RF
10V

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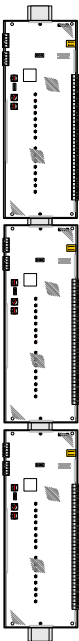
Module Installation

The GEMTEQ I/O modules are designed to be mounted on a single section of 7.5mm x 35mm DIN-rail, in either a horizontal or vertical orientation.

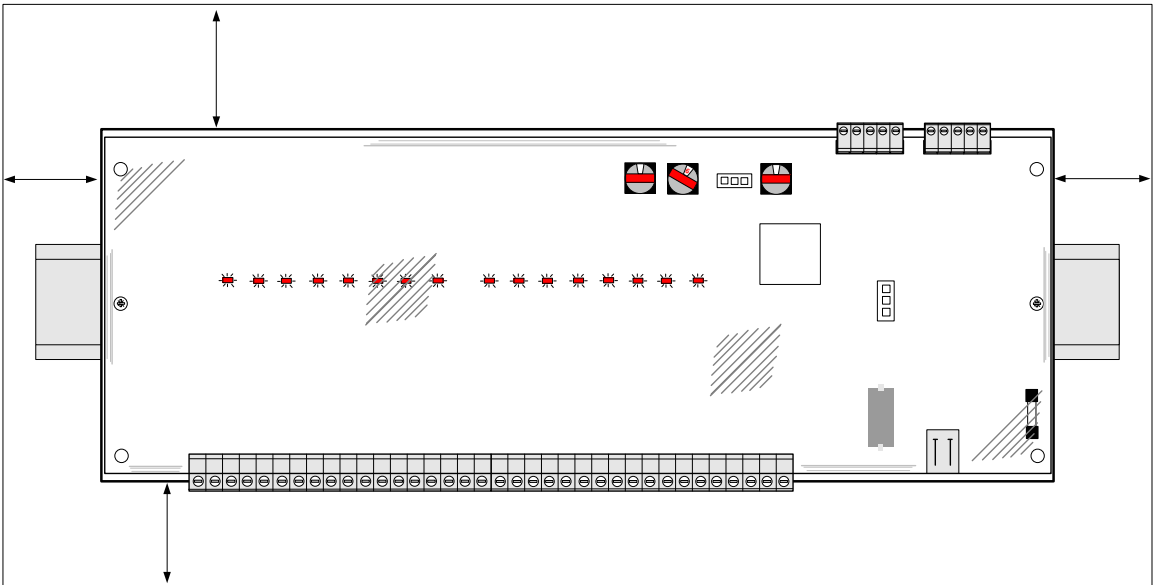
Horizontal Mounting



Vertical Mounting



The modules should be mounted with adequate space for ventilation. The minimum spacing to adjacent equipment should be:



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Module Configuration Information

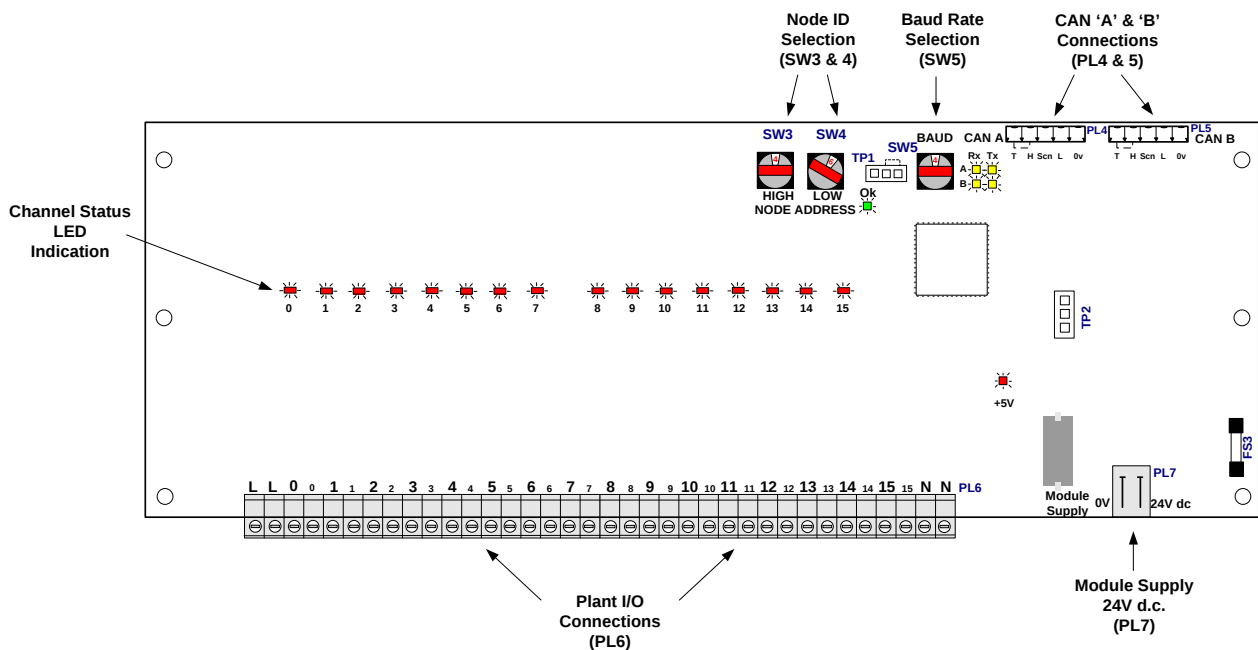
For the I/O module to be active on the GEMCAN network, the Baud Rate must be set the same as all other devices upon the network and a unique Node ID configured.

Warning:

Before removing the shroud to set the Node ID and Baud Rate switches, all power should be removed from the module by un-plugging the Power Supply (PL7) and Plant I/O Connections (PL6).

The shroud should be replaced before any power is re-applied to the module.

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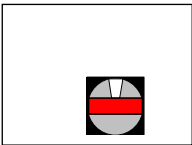


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CAN Baud Rate

This is setup on the hexadecimal switch SW5.

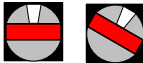
SW5	Baud Rate
0	1M baud
1	800k baud
2	500k baud
3	250k baud
4	125k baud
5	100k baud
6	50k baud
7	20k baud
8	10k baud
9-F	Not used



CAN Node ID

This is setup on the hexadecimal switches SW3 and SW4.

SW3 / SW4 Switch Position	Value
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15



Node ID = (SW3 *16) + SW4

e.g.

SW3 = 0, SW4 = A

Node ID = 10

SW3 = 1, SW4 = 6

Node ID = (1*16) + 6 = 22

SW3 = 7, SW4 = D

Node ID = (7*16) + 13 = 125

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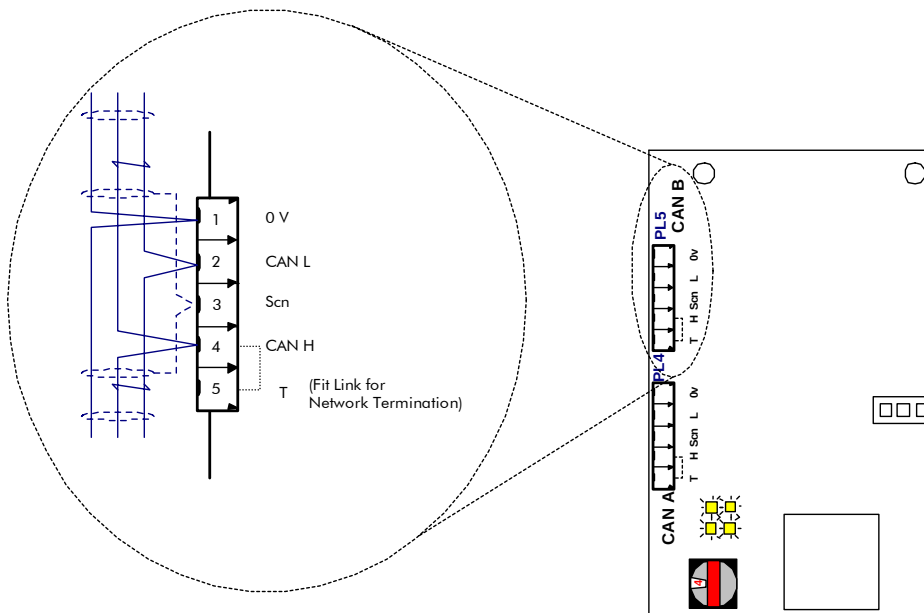
Field Wiring Information

Three types of field wiring need to be made to the GEMTEQ I/O module; CAN 'A' and/or 'B' connections, power supply and plant I/O connections.

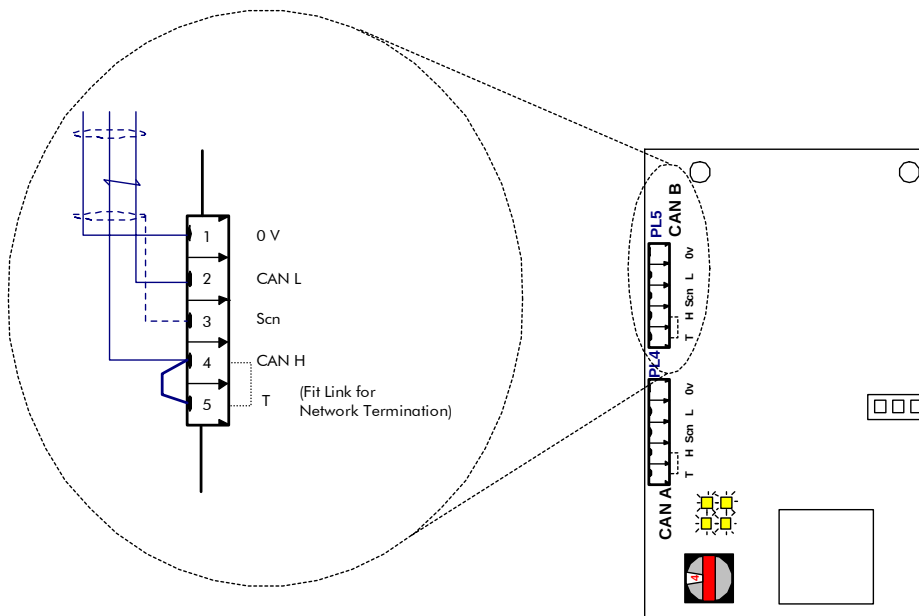
Good wiring practices, including segregation and earthing, should be adopted to ensure reliable system operation. Suitable strain relief should be provided for all field wiring.

CAN Network Connections

In line connection



End of line connection



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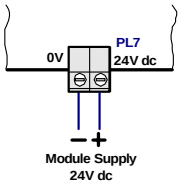
CAN cable has a single twisted pair with an overall screen. CAN has a specified colour code and it is strongly recommended that this code is used. For further information on cabling CAN networks, please refer to the CAN in Automation web site www.can-cia.de.

Cable	Data signal	Terminal	Description
Drain Wire	0V	1	Zero volts
Blue	CAN-L	2	CAN-Low data line
Braided Shield	Screen	3	Cable Screen
White	CAN-H	4	CAN-High data line
	T	5	Termination Resistor when linked to 4.

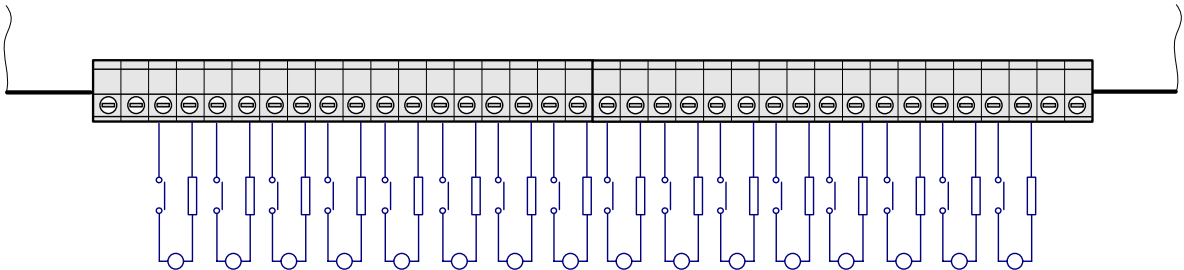
Note: Please refer to the GEMTEQ I/O Technical Manual (T2031En) for full details of the CAN network wiring, including the earth requirements.

Power Supply Connections

Module power supply connections should be made as follows:-



Plant I/O Connections



Note:

Outputs are volt-free contacts and should be protected by external fusing of no greater than 3A rating.

Care must be taken to protect output contacts from damage by high inrush, inductive and capacitance discharge loads. Under switching or transient conditions, the specified switching values must not be exceeded.

High inrush currents caused by capacitive load changing or discharging through the contact may be limited by the addition of series resistance.

DC inductive loads may be suppressed by the addition of a suitably rated peak inverse voltage diode in parallel with the load (cathode of the diode being connected to the positive potential).

AC inductive loads should have a network in parallel with the load, consisting of a capacitor and resistor in series. The values of the network are a function of the resistance and inductance of the load.

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CAN Network Data

The GEMTEQ I/O module transmits data to and receives data from the CAN network via Process Data Objects (PDOs).

Each GEMTEQ I/O module occupies 16 C/D tables.

The table below shows which C/D tables are used by this module and the function they perform.

Data Transmitted to the CAN Network by the 9735-4012 I/O Module

TxPDO	Host Controller C-Table Data	Description
0	Cx+0	
	Cx+1	
	Cx+2	
	Cx+3	
1	Cx+4	
	Cx+5	
	Cx+6	
	Cx+7	
2	Cx+8	
	Cx+9	
	Cx+10	
	Cx+11	
3	Cx+12	
	Cx+13	
	Cx+14	
	Cx+15	

Cx

This is determined by :-
(Node ID -1) * 16

Data Received from the CAN Network by the 9735-4012 I/O Module

RxPDO	Host Controller D-Table Data	Description
0	Dx+0	Digital Output Data
	Dx+1	
	Dx+2	
	Dx+3	
1	Dx+4	
	Dx+5	
	Dx+6	
	Dx+7	
2	Dx+8	
	Dx+9	
	Dx+10	
	Dx+11	
3	Dx+12	
	Dx+13	Freeze/Fallback Timeout (mS) 0 = 500 mS (Default)
	Dx+14	Freeze (1) / Fallback (0) 1 bit per channel
	Dx+15	

Dx

This is determined by :-
(Node ID -1) * 16

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Module Replacement Guidelines

Should the I/O module require replacement for any reason:-

- 1 Ensure that the host PLC and plant are placed in a safe condition, in accordance with local operating procedures.
- 2 Remove all power from the I/O module.
- 3 Disconnect Module Supply, CAN Connections and Plant I/O Connections from the module.
- 4 Ensure that the replacement module has correct Node ID and Baud Rate switch settings.
(**Warning:-** Make certain the shroud is re-fitted correctly)
- 5 Mount the replacement I/O module, re-connect all connections and apply power.
- 6 Monitor host PLC Module Presence and Fault Indications to ensure correct operation.

Note: Please refer to the GEMTEQ I/O Technical Manual (T2031En) for full details of the diagnostics available.

Order Codes

9735-4012 Relay, 3A, 16-way Output Module, dual CAN including shroud

Customer Support and Training

Please refer to your local technical support centre if you have any queries about this product. Contact telephone numbers are shown below.

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