

9.5 DM438

9.5.1 Technical Data



Module ID	DM438
General Information	
Model Number	7DM438.72
Short Description	2003 digital mixed module, 8 inputs 24 VDC, 1 ms, sink/source, 8 transistor outputs 24 VDC, 0.5 A
C-UL-US Listed	in preparation
B&R ID Code	\$E7
Module Type	B&R 2003 I/O Module
Amount	
CP430, EX270	4
CP470, CP770 CP474, CP476, CP774 EX470, EX770 EX477, EX777	8
Voltage and Output Monitoring (LED: OK)	Yes Supply voltage >18 V, Outputs OK
Power Consumption	Max. 0.5 W
Inputs	
Number of Inputs	8
Wiring	Sink or source
Input Voltage	
Minimum	18 VDC
Nominal	24 VDC
Maximum	30 VDC
Switching Threshold	
LOW	<5 V
HIGH	>15 V

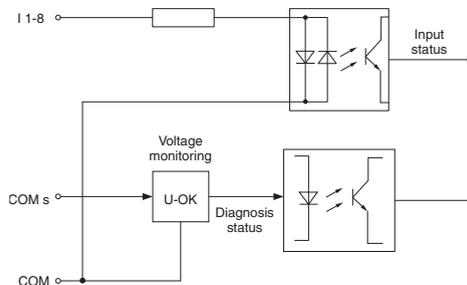
Module ID	DM438
Input Delay	Max. 1 ms
Input Current at Nominal Voltage	Approx. 8 mA
Electrical Isolation	Input - PCC
Outputs	
Number of Outputs	8
Type	Highside Driver IC (Transistor)
Switching Voltage	
Minimum	18 VDC
Nominal	24 VDC
Maximum	30 VDC
Continuous Current per Output Module	Max. 0.5 A Max. 4 A
Leakage Current when Switched Off	12 μ A
Overload Protection	Yes
Continuous Short Circuit Current	Typ. 4 A
Internal Protective Circuit	Yes
Negative Anode Potential when Switching Off Inductive Loads	47 V
Switching Delay	
log 0 - log 1	Max. 450 μ s
log 1 - log 0	Max. 450 μ s
Electrical Isolation	Output - PCC
Mechanical Properties	
Dimensions	B&R 2003 single width

9.5.2 Status LEDs

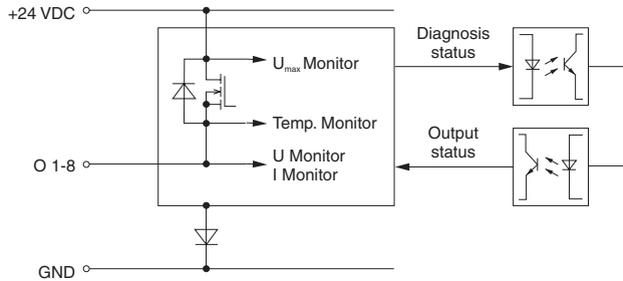
The green/orange status LEDs 1 - 8 show the logical state of the corresponding inputs/output.

The LED OK (orange) indicates that the supply voltage for the inputs and outputs is present. The LED is lit starting with a supply voltage of approx. 18 VDC.

9.5.3 Input Circuit Diagram

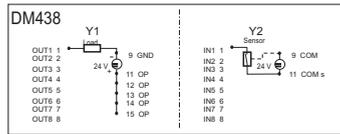


9.5.4 Output Circuit Diagram



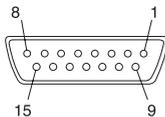
9.5.5 Legend Sheets

A legend sheet can be slid into the front of the module from above. The module circuit is shown on the back. The inputs/outputs can be labelled on the front.



9.5.6 Output Pin Assignments (Y1)

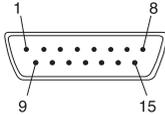
15 Pin D-Type Connector
Y1



Pin	Outputs – Socket Y1	
1	Output 1	
2	Output 2	
3	Output 3	
4	Output 4	
5	Output 5	
6	Output 6	
7	Output 7	
8	Output 8	
9	GND	Reference potential Y1
10	free	
11	+24 VDC	Output supply Y1
12	+24 VDC	Output supply Y1
13	+24 VDC	Output supply Y1
14	+24 VDC	Output supply Y1
15	+24 VDC	Output supply Y1

9.5.7 Pin Assignments for Inputs (Y2)

15 Pin D-Type Connector
Y2



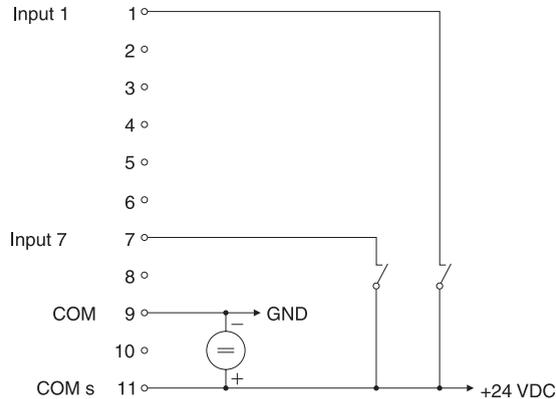
Pin	Inputs – Plug Y2
1	Input 1
2	Input 2
3	Input 3
4	Input 4
5	Input 5
6	Input 6
7	Input 7
8	Input 8
9	COM Reference potential Y2
10	free
11	COM s Input supply Y2
12	free
13	free
14	free
15	free

9.5.8 Input Wiring

Inputs can be wired as either sink or source circuits.

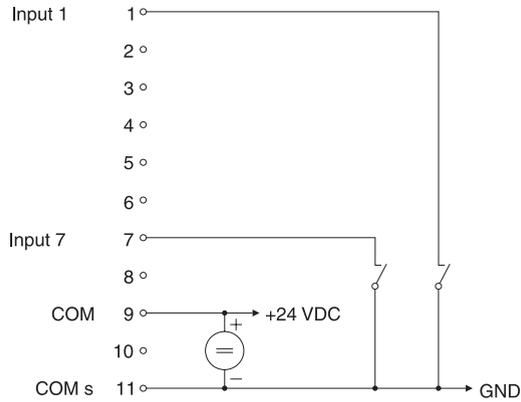
Sink Connection

For sink wiring (current consumer from the sensor's point of view), the COM connection is wired to GND and the inputs are connected to sensors that switch to 24 VDC.

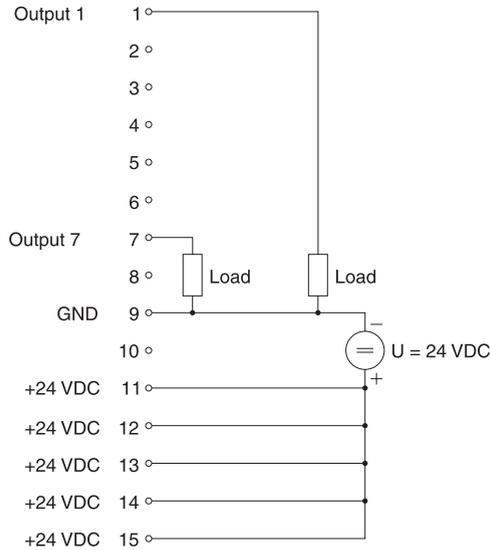


Source Connection

For source wiring (current supplier from the sensor's point of view), the COM connection is wired to +24 VDC and the inputs are connected sensors that switch to GND.



9.5.9 Output Wiring



9.5.10 Variable Declaration

The variable declaration is valid for the following controllers:

- 2003 PCC CPU
- Remote I/O Bus Controller
- CAN Bus Controller

The variable declaration is made in PG2000. The variable declaration is described in Chapter 4, "Module Addressing".

Automation Studio™ Support: See Automation Studio™ Help starting with V 1.40

Variable declaration with PCC 2003 CPU and remote slaves

Function	Variable Declaration				
	Scope	Data Type	Length	Module type	Chan.
Single digital input (channel x)	tc_global	BIT	1	Digit. In	1 ... 8
Single digital output (channel x)	tc_global	BIT	1	Digit. Out	1 ... 8
Module status	tc_global	BYTE	1	Status In	0

Variable declaration with CAN slaves

Function	Variable Declaration				
	Scope	Data Type	Length	Module type	Chan.
Single digital input (channel x)	tc_global	BIT	1	Digit. In	1 ... 8
Single digital output (channel x)	tc_global	BIT	1	Digit. Out	1 ... 8

Module status

The module status for CAN slaves can only be read using command codes. The command codes are explained in Chapter 5, "CAN Bus Controller Functions", section "Command Codes and Parameters". An example is provided in Chapter 4 "Module Addressing".

9.5.11 Access using CAN Identifiers

Access via CAN Identifiers is used if the slave is being controlled by a device from another manufacturer. Access via CAN Identifiers is described in an example in Chapter 4, "Module Addressing". The transfer modes are explained in Chapter 5, "CAN Bus Controller Functions".

Digital Inputs

A maximum of eight digital I/O modules can be operated in packed mode.

CAN ID ¹⁾	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
286	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Module 7	Module 8

¹⁾ CAN ID = 286 + (nd - 1) × 4 nd ... Node number of the CAN slave = 1

A maximum of four digital I/O module can be run in unpacked mode.

Module	CAN ID ¹⁾	Byte
1	286	Inputs 1 - 8
2	287	Inputs 1 - 8
3	288	Inputs 1 - 8
4	289	Inputs 1 - 8

¹⁾ CAN ID = 286 + (nd - 1) × 4 + (ma - 1) nd ... Node number of the CAN slave = 1
ma ... Module address of digital I/O modules = 1 - 4

Digital Outputs

A maximum of eight digital I/O modules can be operated in packed mode.

CAN ID ¹⁾	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
414	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Module 7	Module 8

¹⁾ CAN ID = 414 + (nd - 1) × 4 nd ... Node number of the CAN slave = 1

A maximum of four digital I/O module can be run in unpacked mode.

Module	CAN ID ¹⁾	Byte
1	414	Outputs 1 - 8
2	415	Outputs 1 - 8
3	416	Outputs 1 - 8
4	417	Outputs 1 - 8

¹⁾ CAN ID = 414 + (nd - 1) × 4 + (ma - 1) nd ... Node number of the CAN slave = 1
ma ... Module address of digital I/O modules = 1 - 4

For more information on ID allocation, see Chapter 5, "CAN Bus Controller Functions".

9.5.12 Module Status

Evaluation of the module status is explained using an example in Chapter 4 "Module Addressing".

	Bit	Description
	7	0No supply voltage or supply voltage too low for digital inputs 1Module voltage OK
	6	Digital module = 0
	5	0No error, the supply voltage for the digital outputs is OK 1Short circuit, over-temperature or the supply voltage for the digital outputs is not OK
	0 - 4	Module code = \$07
	7	0
		0
		0
		1
		1
		1
	0	