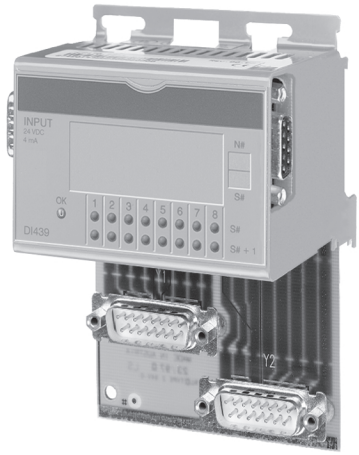
7.9 DI439.72

7.9.1 Technical Data



Module ID	DI439.72
General Information	
Model Number	7DI439.72
Short Description	2003 digital input module, 16 inputs 24 VDC, 1 ms, sink/source, 2 electrically isolated input groups
C-UL-US Listed	in preparation
B&R ID Code	$E9
Amount [1)] CP430, EX270 CP470, CP770 EX470, EX770 EX477, EX777 CP474, CP774 CP476	 2 4 6 8
Static Characteristics	
Module Type	B&R 2003 I/O Module
Number of Inputs Total in 2 Groups of	 16 8
Wiring	Sink or source
Input Voltage Minimum Nominal Maximum	 18 VDC 24 VDC 30 VDC

Module ID	DI439.72
Switching Threshold LOW HIGH	 <5 V >15 V
Input Delay	Max. 1 ms (at 18 - 30 V)
Input Current at Nominal Voltage	Approx. 4 mA (sink/source)
Voltage Monitoring (LED: U-OK)	Yes Supply voltage >18 V
Power Consumption	Max. 0.4 W
Operating Characteristics	
Electrical Isolation Input - PCC Group - Group	 Yes Yes
Mechanical Characteristics	
Dimensions	B&R 2003 single width

[1] Two logical module slots are required by the module.

7.9.2 General Information

The digital I/O modules are all 8 channel modules. The 16 channel module DI439 operates like two 8 channel modules next to each other. Each DI439 therefore reduces the number of digital I/O modules needed by one.

Module Address

Each DI439 needs two module addresses that come immediately after each other.

Inputs	Module Address
1 - 8	Module address
9 - 16	Module address + 1

Examples

Module Type	DI435	DI435	DI435	DI435	DI439		DI439	
Module Addr.	1	2	3	4	5	6	7	8
Module No.	Module 1	Module 2	Module 3	Module 4	Module 5 I 1 - 8	Module 5 I 9 -16	Module 6 I 1 - 8	Module 6 I 9 -16

Module Type	DM435	DM435	DI439		DI439		DO435	DO435
Module Addr.	1	2	3	4	5	6	7	8
Module No.	Module 1	Module 2	Module 3 I 1 - 8	Module 3 I 9 -16	Module 4 I 1 - 8	Module 4 I 9 -16	Module 5	Module 6

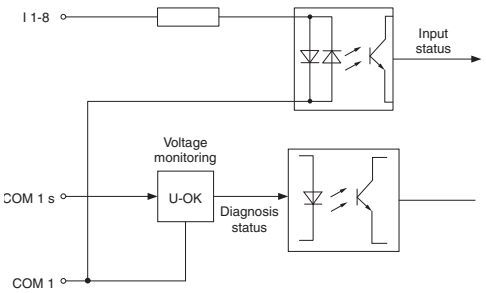
7.9.3 Status LEDs

The green Status LEDs arranged in two rows show the logical state of the respective input.
LEDs marked with S# correspond to the inputs of group 1 (Y1). LEDs marked with S#+1 correspond to the inputs of group 2 (Y2).

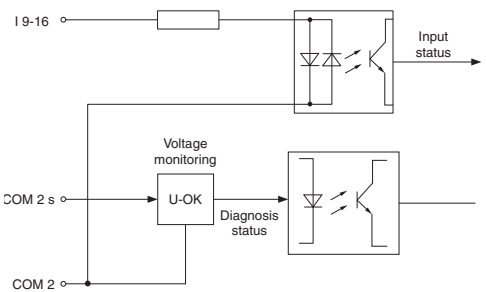
The LED OK (orange) indicates that the input supply voltage is present. The LED is lit for input voltages from 15 to 18 VDC.

7.9.4 Input Circuit Diagram

Group 1 - Y1

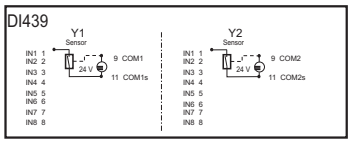


Group 2 - Y2



7.9.5 Legend Sheets

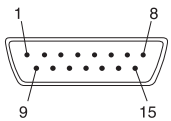
A legend sheet can be slid into the front of the module from above. The module circuit is shown on the back. The inputs can be labelled on the front.



7.9.6 Pin Assignment Group 1 (Y1)

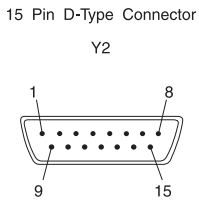
15 Pin D-Type Connector

Y1



Pin	Group 1 – Plug Y1	
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 1	Reference potential Y1
10	free	
11	COM 1 s	Input supply Y1
12	free	
13	free	
14	free	
15	free	

7.9.7 Pin Assignment Group 2 (Y2)



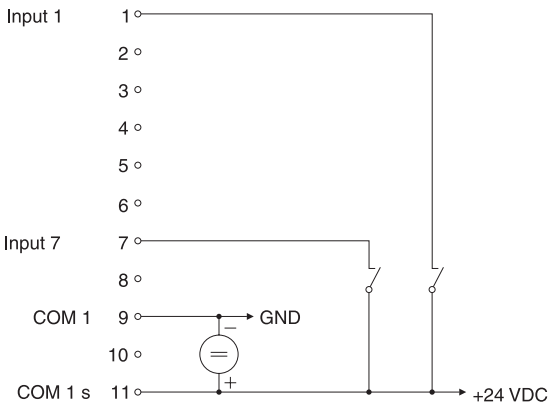
Pin	Group 2 – Plug Y2	
1	Input 9	
2	Input 10	
3	Input 11	
4	Input 12	
5	Input 13	
6	Input 14	
7	Input 15	
8	Input 16	
9	COM 2	Reference potential Y2
10	free	
11	COM 2 s	Input supply Y2
12	free	
13	free	
14	free	
15	free	

7.9.8 Sink/Source Wiring

The input module DI439 can be connected as either a sink or source circuit.

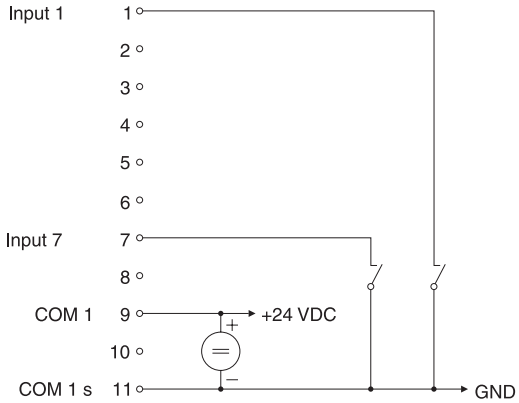
Sink Connection

For sink wiring (current consumer from the sensor's point of view), the COM connection for an input group is connected to GND and the inputs are connected to 24VDC switching sensors.



Source Connection

For source wiring (current supplier from the sensor's point of view), the COM connection of an input group is connected to +24VDC, and the inputs are connected to GND switching senors.



7.9.9 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

Designation	VD Data Type	VD Module Type	VD Chan.	R	W	Description
Digital inputs 1 - 8	BIT	Digit. In	1 ... 8	●		Level of digital inputs 1 - 8
Module status	BYTE	Status In	0	●		Module status / diagnose function
Digital inputs 9 -16 (module address + 1)	BIT	Digit. In	1 ... 8	●		Level of digital inputs 9 -16

Variable declaration with CAN slaves

Designation	VD Data Type	VD Module Type	VD Chan.	R	W	Description
Digital inputs 1 - 8	BIT	Digit. In	1 ... 8	●		Level of digital inputs 1 – 8
Digital inputs 9 -16 (module address + 1)	BIT	Digit. In	1 ... 8	●		Level of digital inputs 9 -16

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".

7.9.10 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".

CAN ID Packed

A maximum of eight digital I/O modules can be operated in packed mode.
The 16 channel module DI439 operates like two 8 channel modules next to each other. If two DI439 modules are used, only six additional digital I/O modules can be used.
The following example shows the structure of the CAN object if four DI435 and two DI 439 modules are used.

CAN ID [1]	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
286	DI435	DI435	DI435	DI435	DI439 I 1 - 8	DI439 I 9 - 16	DI439 I 1 - 8	DI439 I 9 - 16

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

CAN ID Unpacked

A maximum of four digital I/O module can be run in unpacked mode.
The following example shows the structure of the CAN object if two DI435 and one DI439 modules are used.

Module	CAN ID [1)]	Byte
DI435	286	Inputs 1 - 8
DI435	287	Inputs 1 - 8
DI439	288	Inputs 1 - 8
	289	Inputs 9 - 16

[1)] CAN ID = 286 + (nd - 1) x 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".

7.9.11 Module Status

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

Bit	Description
7	0 ....Module voltage not present or too low 1 ....Module voltage OK
6	Digital module = 0
5	x ....Not defined, masked out
0 - 4	Module code = $09

	0	x	0	1	0	0	1

7 0