

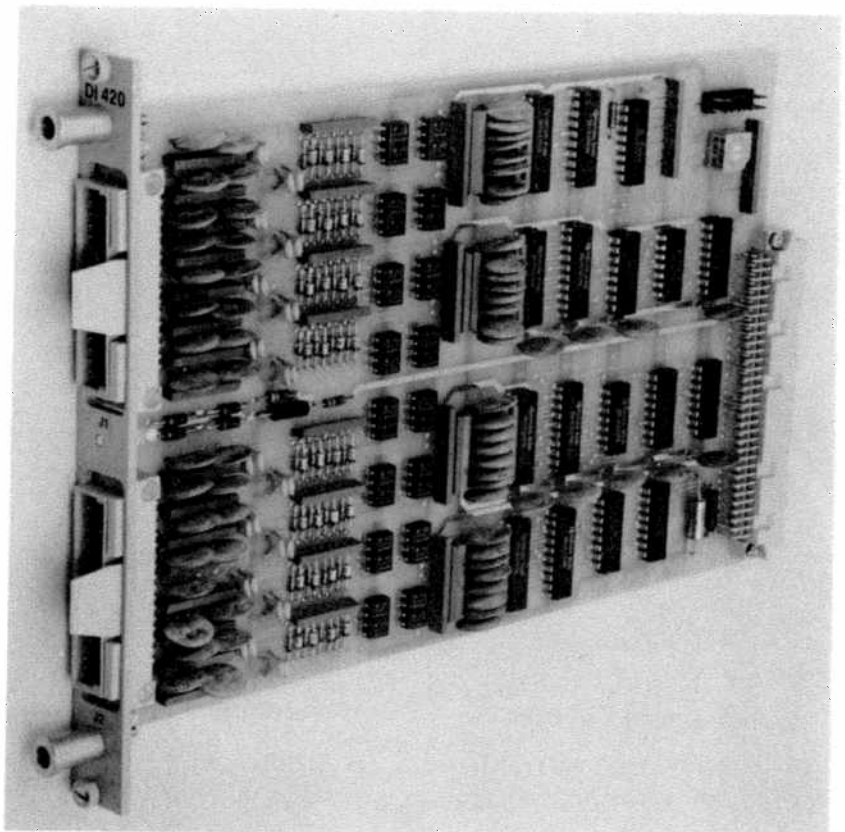
## OPERATING INSTRUCTIONS

### DIGITAL INPUT

DI 420

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### 1. INTRODUCTION

The DI 420 digital input module reads digital signals from limit switches, light barriers etc. The module contains 32 input stages with overvoltage and polarity reversal protection. These are galvanically isolated from the system ground by optocouplers. The standard interface for the BS 420 system bus allows program controlled reading of the input data.

## 2. FEATURES

- 32 inputs 24 V / 10 mA DC
- galvanically isolated from bus
- 8 input groups with 4 bits each
- common positive contact for each input group

## 3. SPECIFICATIONS

### General

Designation	DI 420
Parts list/order nr.	BG 512 830 -T
Diagram Nr.	BG 541 180 -S
Drawing Nr.	BG 512 831 -Z
Board format	SC 420 format
Space requirements	1 slot
Voltage supply	+ 5 V / 0.45 A typical

### Bus interface

as for BS 420

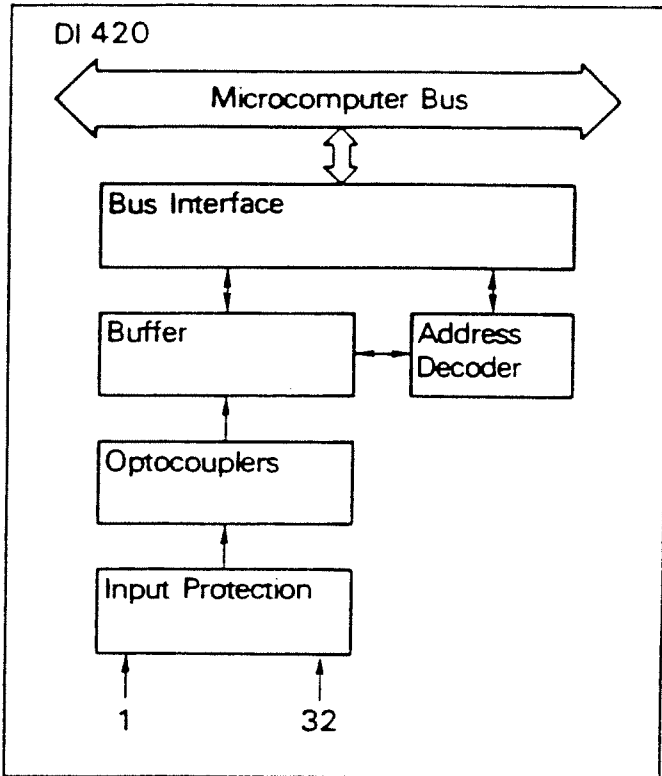
Bus load	1 DC load, 1 AC load
Addressing	whole IO page, selection with switches and jumpers
Registers	2 words with 16 bits each DIDBR0 for connector J1 DIDBR1 for connector J2
Data transfer	DATI (read only) DATO generates BRPLY, data irrelevant

### Digital inputs

Signal voltage	24 V DC +/- 25% *)
Switching threshold	10.6 ... 16 V typical *)
Input current	10 mA
Signal delay	40 $\mu$ s typical, dependent on the signal duty cycle.
Overvoltage protection	35 V normal polarity continuous 30 V reverse polarity 100 V / 1 sec max.
Isolation	Between the bus and input groups and between the individual input groups Operation: 42.4 V (DC peak) Test voltage: 200 V peak with reference to the instruments ground
RF filter	820 Ohm / 1 nF to chassis *)
Connector	two 32 pole male connectors as per DIN 41612, C/2 styling, for 16 inputs each

\*) refer to Section 9 for other input voltages

#### 4. DESCRIPTION



The signals input at pins J1 and J2 are conducted to the optocouplers over interference suppression and protective circuits. The optocouplers isolate the inputs from the instrument ground and transfer the input data to the peripheral registers (DI data buffer DIDBR) from where the data are read into the computer via the bus interface.

An external 24 V DC voltage supply is necessary to drive the inputs.

#### 5. CONFIGURATION

##### 5.1 Factory configuration

The positions of the address jumpers and switch S1 can be taken from the layout (Appendix A).

DI 420 standard address: DIDBR0 – 176000 (octal)

Address octal	Jumpers							Switch S 1
	A12	A11	A10	A9	A8	A7	A6	
174 600	OUT	OUT	IN	IN	OUT	OUT	IN	0

The address is the only selection necessary for the DI 420.



## 6. INSTALLATION

### 6.1 Installation in the SC 420

Refer to the section "Installing modules" in the SC 420 operating instructions

#### CAUTION:

- Before any manipulations are made on the module or its connections, the unit and any external voltage supplies must be turned off
- Don't use cables from other modules!

### 6.2 Connections

Pin assignment for input connectors J1 and J2:

	not assigned	row pin		
	a	c	Nr.	
leer	o	o	16	IN15
SOURCE14	+--	o	15	IN14
SOURCE13	--	o	14	IN13
SOURCE12	+--	o	13	IN12
SOURCE11	+-	o	12	IN11
SOURCE10	-	o	11	IN10
SOURCE9	-	o	10	IN9
SOURCE8	+-	o	9	IN8
SOURCE7	+--	o	8	IN7
SOURCE6	--	o	7	IN6
SOURCE5	--	o	6	IN5
SOURCE4	+--	o	5	IN4
SOURCE3	+-	o	4	IN3
SOURCE2	-	o	3	IN2
SOURCE1	-	o	2	IN1
SOURCE0	+-	o	1	IN0

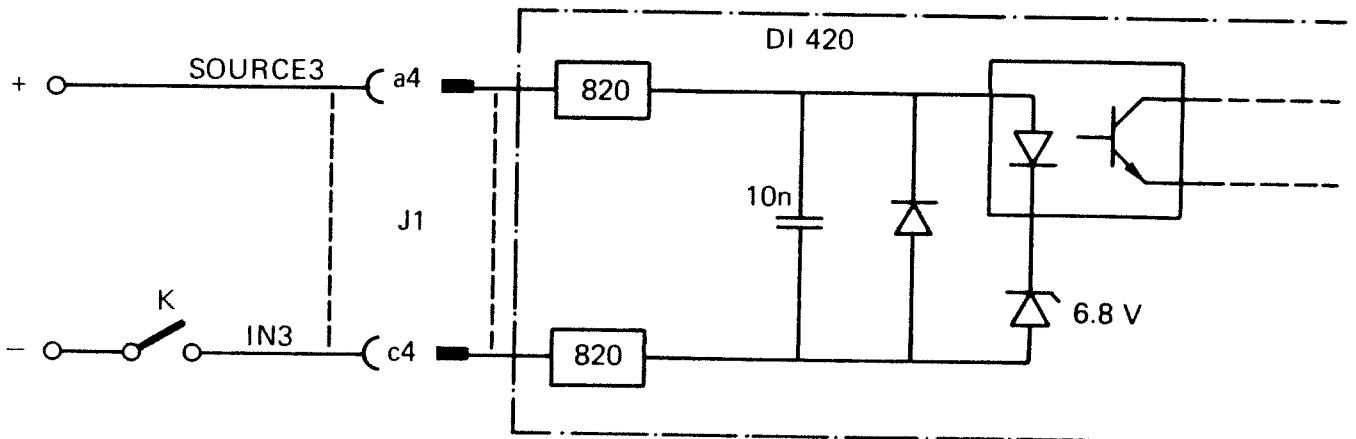
– J1 upper / J2 lower

– View of the back of the module (pins)

– SOURCE 0,1,2,3  
SOURCE 4,5,6,7  
SOURCE 8,9,10,11  
SOURCE 12,13,14,15  
are common within the groups

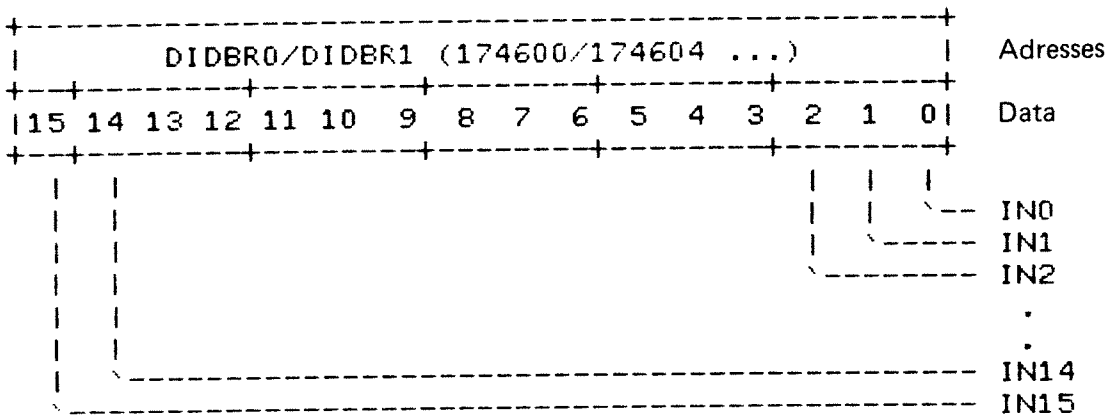
– SOURCE15 does not have its own pin

Connection example: Control contact K at input IN3 on connector J1.



## 7. PROGRAMMING

Reading inputs IN0 ... IN15 (connector J1 or J2)



Function:

INn = 0: no input current

INn = 1: Input current flowing

Strictly speaking this is a read/write register, but the data written have no significance.

## 8. MAINTENANCE

No periodic maintenance is necessary

### 8.1 Troubleshooting

For testing purposes, the individual inputs can be checked and simulated over the DT 020 (digital IO tester). Some program packages allow the inputs to be operated directly in service mode. For units without a service mode, each input bit can be easily tested via the ODT (refer to LSI 11 documentation).

## 9. DETAILED DESCRIPTION

The 32 input circuits, arranged in groups of four, are identical. The numbering in the following description refers to the IN0 receiver (Connector J1).

The positive pole of the external control voltage is connected to contact J1/a1. If the control contact at J1/C1 connected to the negative pole is closed an input current flows from J1/a1 over resistor R49 (5, 6) to resistor R48 (7, 8) and optocoupler A9 (3, 4). The current returns over Zener diode D68 and resistor R49 (7, 8) to contact J1/c1).

Together with the optocoupler LED and resistors R49 (5, 6), R48 (7, 8), R49 (7, 8), Zener diode D68 defines the switching threshold. Diode D67 serves as the input protection in case of reverse polarity.



ADR  
JUMPERS

