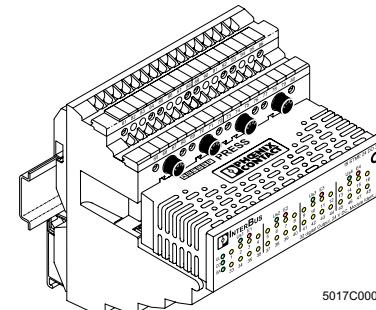


# IB ST (ZF) 24 DO 32/2

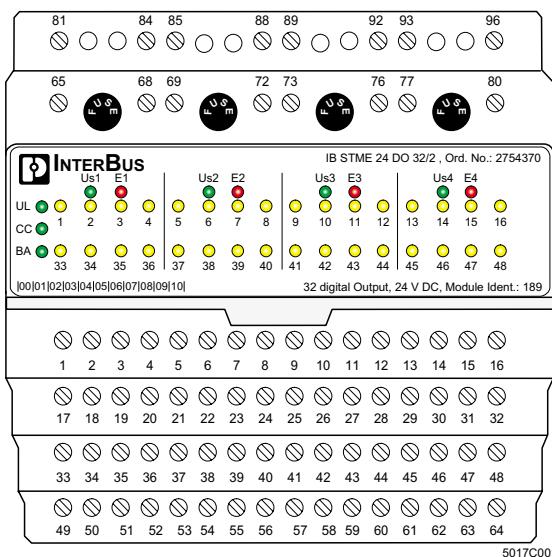
## Digital Output Module With 32 Channels

Data Sheet 5017C

03/2000



5017C000



5017C001

Figure1 IB ST 24 DO 32/2 module



This data sheet is intended to be used in conjunction with the IBS SYS PRO UM E I/O Systems Manual.



Ground the mounting rail. The module is grounded by snapping it onto the mounting rail.



The numbering of the yellow status indicators corresponds to the screw or spring-clamp terminal. It does not apply to the channel bit mapping.

### Terminal Assignment

Terminals	Assignment
1 through 16 and 33 through 48	Digital signal outputs
17 through 32 and 49 through 64	Ground contacts for actuators
65, 69, 73 and 77	Supply voltages for the module (Us1 through Us4)
81, 85, 89 and 93	Ground contacts for the module (Us1 through Us4)

### Local Diagnostic and Status Indicators

Des.	Color	Meaning
UL	Green	Supply voltage for the module electronics
CC	Green	Cable check
BA	Green	Bus active
Usn	Green	24 V I/O supply voltage, group n
En	Red	Error in group n
xx	Yellow	Output status (for the channel on terminal xx)

## IB ST (ZF) 24 DO 32/2

### Internal Circuit Diagram

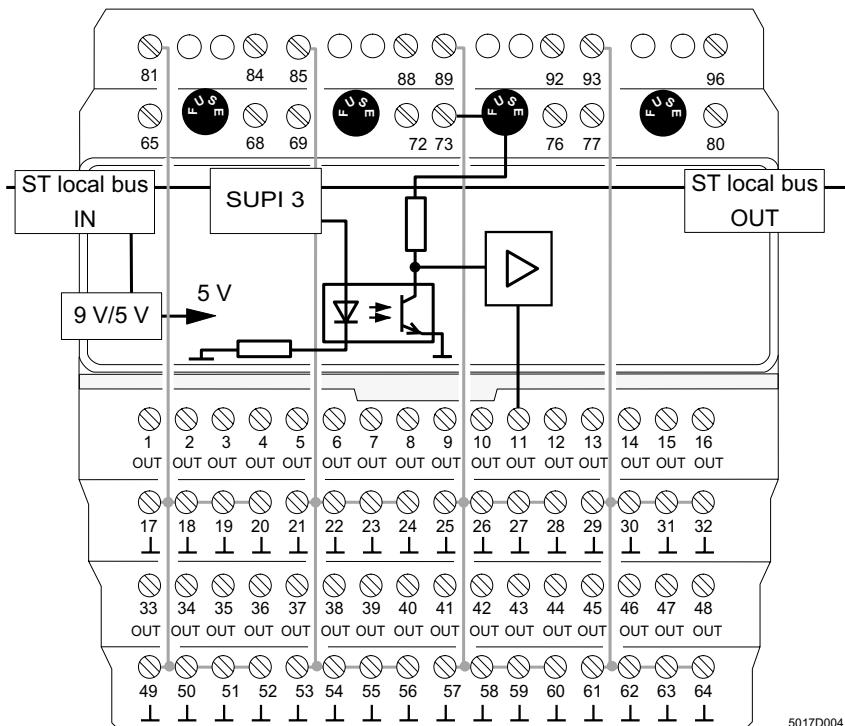


Figure 2 Internal wiring of the module terminals



The limit values of the electromagnetic noise emission according to EN 55011, Class A are only kept by the modules if they are installed in a grounded, metal control cabinet.

## IB ST (ZF) 24 DO 32/2

### Electrical Isolation of the Individual Function Areas

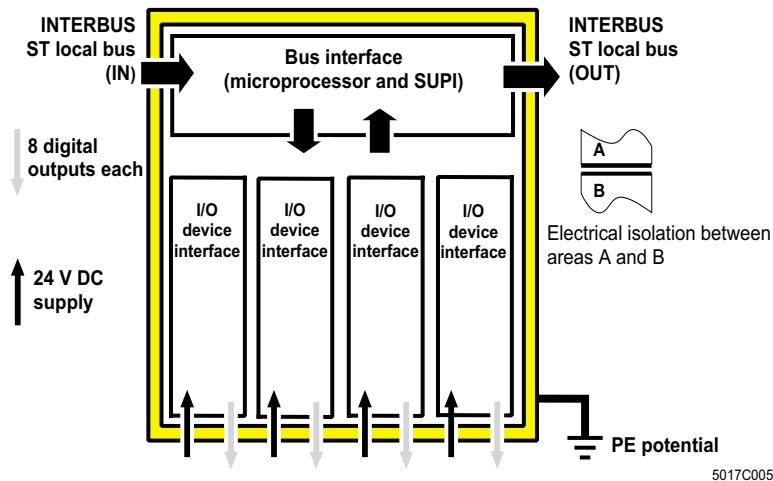


Figure 3 Electrical isolation of the single function areas

### Connection Examples

#### Connection of the Supply Voltage and Potential Jumpering

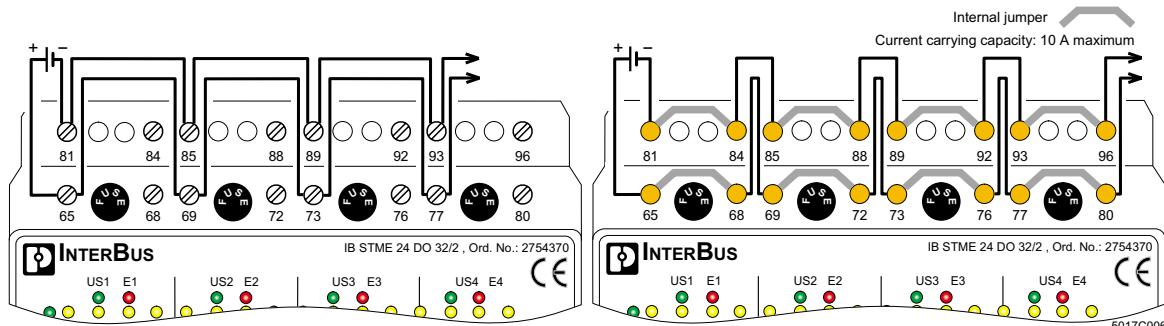


Figure 4 Connection of the supply voltage and potential jumpering



#### Potential jumpering:

Between terminals 65, 69, 73 and 77 ( $U_s$ 1 through  $U_s$ 4) and 81, 85, 89 and 93 ( $\perp$ ), an external jumper is required on the screw terminal module in order to supply all isolated groups from the same voltage source or to connect

additional modules.

However, for the spring-clamp terminal module, external jumpers are required between terminals 68 and 69, 72 and 73 and 76 and 77 for  $U_s$ 1 through  $U_s$ 4 and 84 and 85, 88 and 89 and 92 and 93 for ground ( $\perp$ ).

## IB ST (ZF) 24 DO 32/2

### Typical Connection of the Supply and Actuators

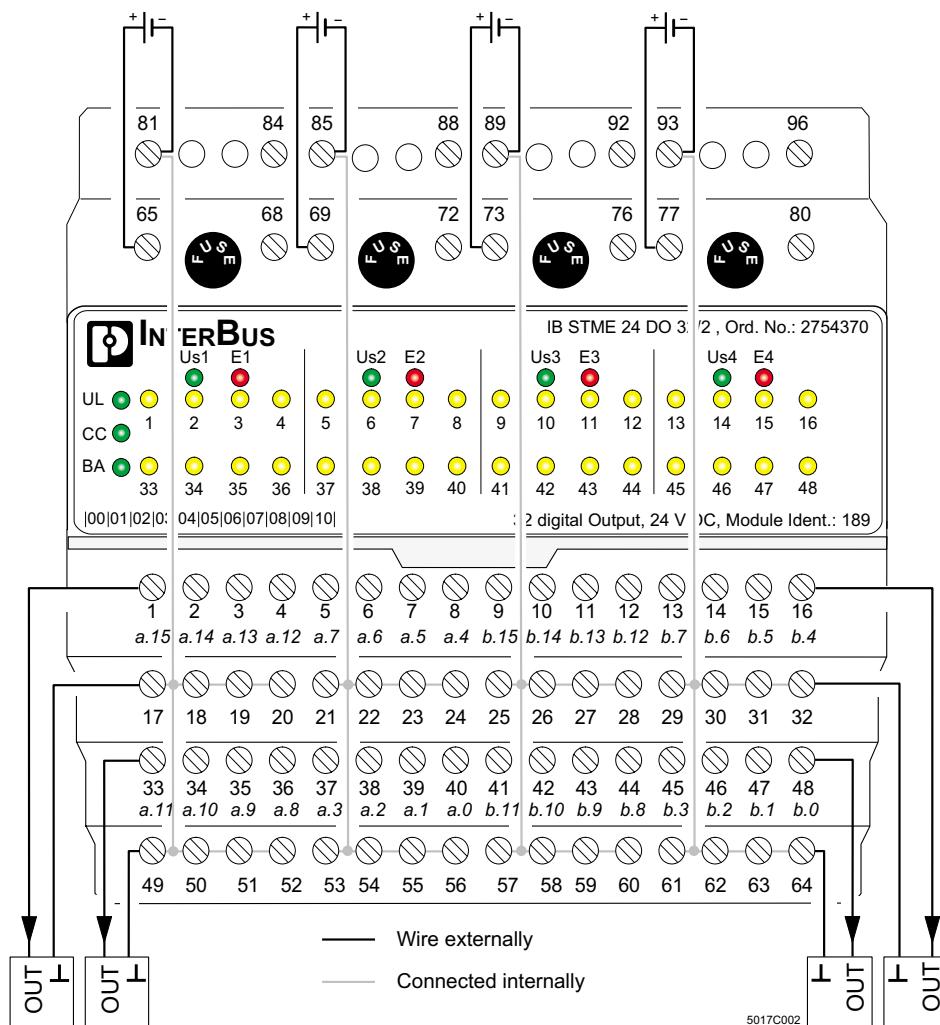


Figure 5 Typical digital actuator connections



Do not supply an external voltage to an output. Otherwise, the module may be damaged.



The module terminals are assigned to the two process data words. The label a.xx/b.xx refers to the process data word. The numbering refers to the bit of the process data words.

## IB ST (ZF) 24 DO 32/2

### Increasing the Current Carrying Capacity

To increase the current carrying capacity for ohmic or lamp load, two or more channels can be connected in parallel. Connect **each** of the channels with a serial diode (see Figure 6). When selecting the diodes, ensure a sufficient current carrying capacity (minimum 500 mA) and do not exceed the maximum total current of

4 A per group. All channels connected in parallel must have the same reference ground. Changes to the status of the parallel connected channels (set or reset) must always be simultaneous because staggered changes in status could lead to an overload on the outputs.

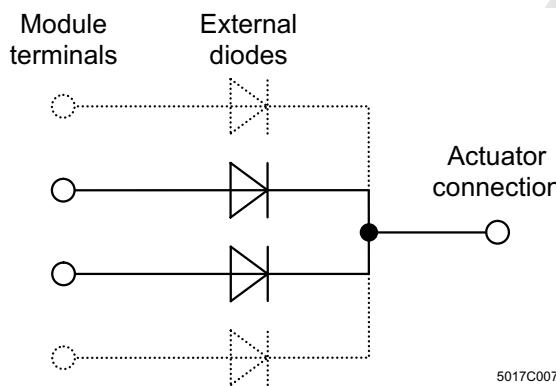


Figure 6 Parallel connection of outputs via external protective diodes

### Installation Check With External Voltage



If an external voltage is connected to the actuators during the installation check, the module electronics must be removed from the terminal block. Otherwise, the module may be damaged.

## IB ST (ZF) 24 DO 32/2

### Programming Data

ID code	BD <sub>hex</sub> (189 <sub>dec</sub> )
Length code	02 <sub>hex</sub>
Input address area	0 bytes
Output address area	4 bytes
Parameter channel (PCP)	0 bytes
Register length (bus)	4 bytes

### Assignment of the Module Terminals to the INTERBUS Reference

INTERBUS reference	Word	Word x															
	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	Byte	Byte 0								Byte 1							
	Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Terminal	Terminal (signal)	1	2	3	4	33	34	35	36	5	6	7	8	37	38	39	40
	Terminal point (ground)	17	18	19	20	49	50	51	52	21	22	23	24	53	54	55	56

INTERBUS reference	Word	Word x + 1															
	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	Byte	Byte 0								Byte 1							
	Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
Terminal	Terminal (signal)	9	10	11	12	41	42	43	44	13	14	15	16	45	46	47	48
	Terminal point (ground)	25	26	27	28	57	58	59	60	29	30	31	32	61	62	63	64

IB ST (ZF) 24 DO 32/2

## Technical Data

General	
Housing dimensions (width x height x depth)	118 mm x 116 mm x 117 mm (4.646 in. x 4.567 in. x 4.606 in.)
Weight	790 g, typical
Connection type of the actuators	2-wire technology
Operating mode	Process data operation with 2 words
Total power consumption	See Table "Power Consumption" on page 8
Permissible operating temperature	0°C to 55°C (32°F to 131°F)
Permissible storage temperature	-20°C to 70°C (-4°F to 158°F)
Humidity	75% on average; 85% occasionally, no condensation
Air pressure (operation)	From 86 kPa to 108 kPa, 1500 m (4921.260 ft.) above sea level
Electrical isolation (via optocoupler)	Test voltage
Bus/output groups	500 V AC, 1 min, 50 Hz
Output groups/protective conductor	500 V AC, 1 min, 50 Hz
Output group/output group	500 V AC, 1 min, 50 Hz
Degree of protection	IP 20, IEC 60529
Class of protection	Class 3, VDE 0106; IEC 60536
Protective ground connection	Via DIN rail
Preferred installation position	Panel mounting
Interface	
INTERBUS ST interface	ST cable (supplied with the module)

IB ST (ZF) 24 DO 32/2

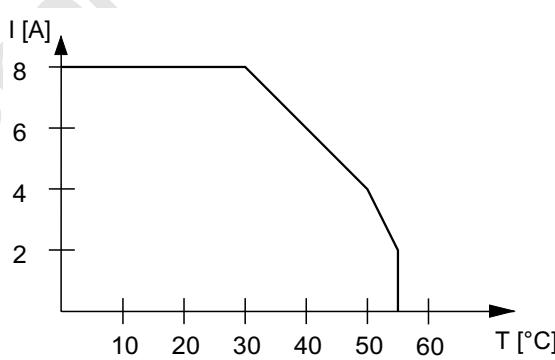
Power Consumption	
Logic voltage	9 V DC
Current consumption from the local bus	100 mA, maximum
Power consumption from the local bus	1 W, maximum
I/O supply voltage $U_S$	24 V DC
Current consumption of $U_S$	200 mA, typical

Supply of the Module Electronics Through the Bus Terminal Module	
Logic voltage	9 V
Current consumption	100 mA, maximum
Power consumption	1.0 W, maximum

I/O Supply Voltage ( $U_S$ )	
Nominal value	24 V DC
Permissible voltage range	20 V DC to 30 V DC, ripple included
Permissible ripple	3.6 V <sub>pp</sub> within the permissible voltage range
Number of isolated groups	4
Electrical isolation to the bus	Through optocouplers
Test voltage	500 V AC (50 Hz for 1 min.)
Protection against polarity reversal	Through diode and fuse connected in series
Surge voltage protection	Fuses in the terminal block base IBS TR5 5 AT

Digital Outputs	
Number	32 (8 for each group)
Minimum output voltage at nominal current	$U_S$ minus 1 V
Short-circuit protection	Electronic, for each channel
Nominal current per channel	0.5 A, maximum
Short-circuit current protection	0.75 A, minimum
Minimum output current	1 mA
Output current per group	4 A for four channels, maximum
Output current per module	8 A, maximum
Short-circuit protection	Electronic, for each channel

IB ST (ZF) 24 DO 32/2

<b>Digital Outputs</b> (Continued)	
Coincidence factor	50% at 24 V DC
Permissible load per output	Ohmic load 12 W Lamp load 12 W Inductive load (1.2 H; 48 Ohm) 12 VA
Permissible inductive breaking energy	200 mJ maximum
Limitation of the demagnetization voltage induced on circuit interruption	$U_S$ minus 45 V minimum
Behavior on overload	Autorestart
Behavior when ground connection interrupted	Disconnection of outputs
Permissible switching frequency	On ohmic load (48 Ohm), maximum 300 Hz On inductive load (1.2 H; 48 Ohm), maximum 0.5 Hz
Derating curve for total output current (maximum 4 A per group)	 <p>5017C003</p>

<b>Module Error Messages</b>	
Failure of the I/O supply voltage	No
Breakdown of the fuse for the I/O supply voltage	No
Overtemperature of the output driver	Yes
Short circuit/overload of an output	Yes

## IB ST (ZF) 24 DO 32/2

### Ordering Data

Description	Order Designation	Order No.
Digital output module (screw-clamp terminals)	IB ST 24 DO 32/2	27 54 32 5
Digital output module (spring-clamp terminals)	IB ST ZF 24 DO 32/2	27 50 63 3
Module electronics	IB STME 24 DO 32/2	27 54 37 0
Replacement terminal block (screw-clamp terminals)	IB STTB 24 DO 32/2	27 53 03 8
Replacement terminal block (spring-clamp terminals)	IB STTB ZF 24 DO 32/2	27 50 52 3

IB ST (ZF) 24 DO 32/2

---

onlinecomponents.com

IB ST (ZF) 24 DO 32/2

---

Onlinecomponents.com

© Phoenix Contact 03/2000 TNR 92 65 69 7