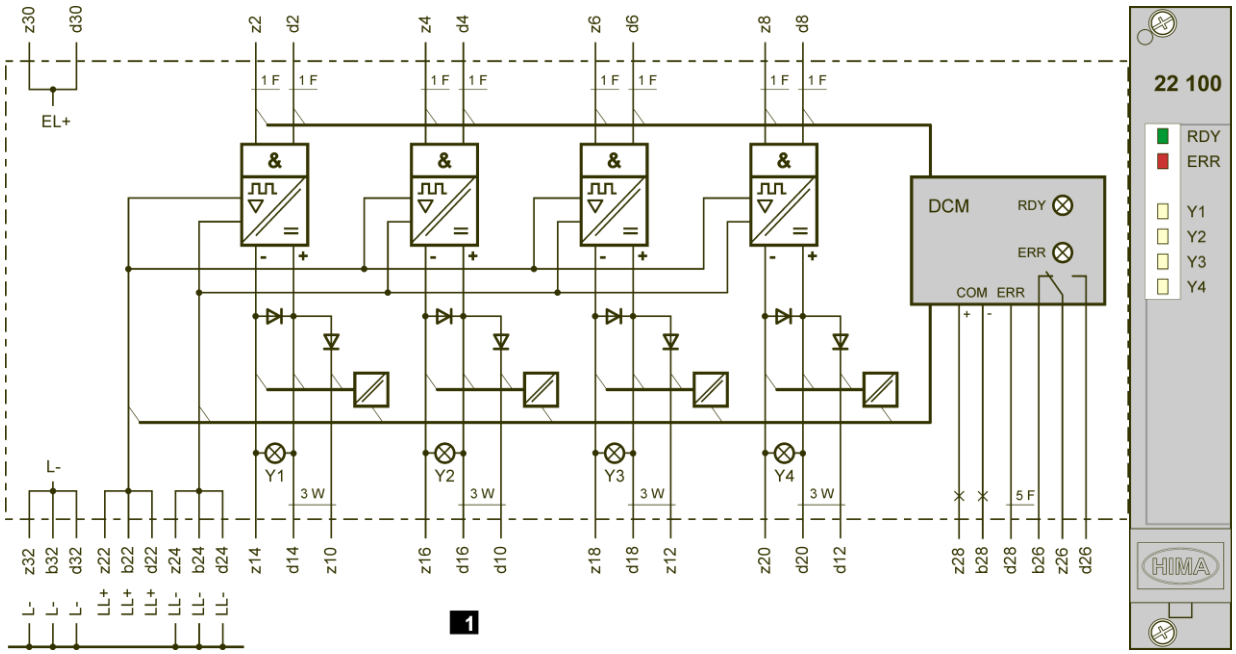
22 100: Output Module

- **Safety-related**
- 4 channels, 25 VDC / 3 W

The module is TÜV-tested for SIL 4 in accordance with IEC 61508.



1 Outputs are short-circuit-proof

Figure 1: Block Diagram

With 1-signal at the AND inputs, the output carries an almost regulated voltage of approx. 25 V, which can be loaded up to 3 W. This voltage is galvanically separated from the operating voltage and can also control inductive loads.

If the module is used as signal amplifier, connector z14 (z16, z18, z20) must be connected to reference pole L-. In such a case, take the minimum load into account, see below.

To increase availability, the functions of two modules can be controlled in parallel, and the outputs decoupled by diodes (z10, d10, z12, d12) can be connected in parallel.

All the module functions are monitored by a microcontroller.

If a malfunction occurs, the *ERR* LED is lit, output d28 is on 1-signal and relay contact z26-d26 opens.

Output z28-b28 is intended for connecting to the communication module, e.g., for transferring data to a distributed control system (DCS).

RDY (Ready) indicates the applied voltage (≥ 20 V).

HIMA Paul Hildebrandt GmbH, P.O. Box 1261, 68777 Brühl
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Minimum load	As signal amplifier 1.5 W (60 mA, 30 F, 420 Ω)
Switching time	Approx. 3 ms
Reset time	Approx. 15 ms at rated load
Operating data EL+	24 VDC / 165 mA
Operating data LL+	24 VDC / 0.7 A at rated load, min. fuse: 1 A time-lag (T)
Space requirement	3 RU, 4 HP

Communication via Modbus

Reading of Variables

Type BOOL: Function code 1

Type WORD: Function code 3

Events: Function codes 65, 66, 67

Relative address	Data type	Value	Description	Relative event no.
0	WORD	21 H	Module type 22 100	
1	BOOL	0	None	
2	BOOL	1	Module removed	
3	BOOL	1	Communication with module not ok	
4	BOOL	1	Module in slot, communication ok	
5	BOOL	1	Operating voltage too low, no RDY	
6	BOOL	1	Module fault, ERR	
7	BOOL	0	None	
8	BOOL	1	No voltage LL+ for amplifiers	
9	BOOL	1	1-signal at input z2	0
10	BOOL	1	1-signal at input d2	1
11	BOOL	1	1-signal at input z4	2
12	BOOL	1	1-signal at input d4	3
13	BOOL	1	1-signal at input z6	4
14	BOOL	1	1-signal at input d6	5
15	BOOL	1	1-signal at input z8	6
16	BOOL	1	1-signal at input d8	7
17…40	BOOL	0	None	
41	BOOL	1	1-signal at output d14 Y1	24
42	BOOL	1	1-signal at output d16 Y2	25
43	BOOL	1	1-signal at output d18 Y3	26
44	BOOL	1	1-signal at output d20 Y4	27
45…48	BOOL	0	None	

Table 1: Module Status via Modbus

Value:	0 always has the opposite meaning H: Hexadecimal value
Absolute address:	A = p * 256 + relative address
Absolute event no.:	E = (p - 1) * 32 + relative event no. p = Slot no. in the subrack

Reading of All Variables

Function code 3, 84 WORDS

Starting with address 2000 H, 3000 H or 4000 H

	WORD 0 (16-bit)		WORD 1 (16-bit)		WORD 2 (16-bit)		WORD 3 (16-bit)	
Relative address	0	8…1	24…17	16…9	40…33	32…25		48…41
Data	Module type	Module status	None	None	None	None	None	Outputs

For error-free data transfer, all 84 WORDS must be read. This ensures that the variables of all the modules within a subrack are transferred. 0 is transferred for unused module slots.

Communication via PROFIBUS DP

Reading of Variables

Relative addresses of WORD and BYTE type

WORD	Bit	BYTE	Bit	Value	Description
0	0…7	0	0…7	21 H	Module type 22 100
	8	1	0	0	None
	9		1	1	Module removed
	10		2	1	Communication with module not ok
	11		3	1	Module in slot, communication ok
	12		4	1	Operating voltage too low, no RDY
	13		5	1	Module fault, ERR
	14		6	0	None
	15		7	1	No voltage LL+ for amplifiers
1	0	2	0	1	1-signal at input z2
	1		1	1	1-signal at input d2
	2		2	1	1-signal at input z4
	3		3	1	1-signal at input d4
	4		4	1	1-signal at input z6
	5		5	1	1-signal at input d6
	6		6	1	1-signal at input z8
	7		7	1	1-signal at input d8
	8…15	3	0…7	0	None
2		4…5		0	None
3	0	6	0	1	1-signal at output d14 Y1
	1		1	1	1-signal at output d16 Y2
	2		2	1	1-signal at output d18 Y3
	3		3	1	1-signal at output d20 Y4
	4…7		4…7	0	None
	8…15	7	0…7	0	None

Table 2: Module Status via PROFIBUS DP

Value: 0 always has the opposite meaning
H: Hexadecimal value

Absolute address WORD: W = 4 * (p - 1) + relative address

Absolute address BYTE: B = 8 * (p - 1) + relative address
p = Slot no. in the subrack