

- On-Machine™ compact fieldbus I/O blocks
- EtherNet/IP™, Modbus® TCP or PROFINET slave
- Integrated Ethernet switch
- 10 Mbps/100 Mbps supported
- Two 4-pin, D-coded M12 connectors for fieldbus connection
- 2 rotary coding switches for node-address
- IP 69K
- M12 I/O ports
- LEDs indicating status and diagnostics
- Electronics galvanically isolated from the field level via optocouplers

<b>Type designation</b>	BLCEN-8M12LT-4IOL-4IOL
Ident no.	6811500
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<b>Nominal system voltage</b>	24 VDC
System power supply	Via auxiliary power
Voltage supply connection	2 x M12, 5-pin
Admissible range Vi	20...30VDC
Nominal current Vi	205 mA
Max. current Vi	2 A
Admissible range Vo	20...30VDC
Nominal current Vo	160 mA
Max. current Vo	4 A
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<b>Fieldbus transmission rate</b>	10/100 Mbps
Adjustment transmission rate	Automatic detection
Fieldbus address range	1...92 0 (192.168.1.254) 93 (BootP) 94 (DHCP) 95 (PGM) 96 (PGM-DHCP) *Recommended for PROFINET 97...98 (manufacturer specific)
Fieldbus addressing	2 dec. Rotary coding switches
Fieldbus connection technology	2 ← M12 4-pin, D-coded
Protocol detection	automatic
Web server	Integrated
Service Interface	Ethernet
Vendor ID	48
Product type	12
Product code	11500
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<b>Modbus TCP</b>	
Addressing	Static IP, BOOTP, DHCP
Supported function codes	FC1, FC2, FC3, FC4, FC5, FC6, FC15, FC16, FC23
Number of TCP connections	6
Input Data Size	max. 18 register
Input register start address	0 (0x0000 hex)
Output Data Size	max. 16 register
Output register start address	2048 (0x0800 hex)

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**EtherNet/IP™**

Addressing	acc. to EtherNet/IP™ specification
Device Level Ring (DLR)	supported
Number of CIP connections	6
Input Assembly Instance	103
Input Data Size	21 INT
Output Assembly Instance	104
Output Data Size	16 INT
Configuration Assembly Instance	106
Configuration Size	0
Comm Format	Data - INT

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**PROFINET**

Addressing	DCP
Conformance class	B (RT)
MinCycleTime	1 ms
Diagnostics	acc. to PROFINET alarm handling
Topology detection	supported
Automatic addressing	supported
Media Redundancy Protocol (MRP)	supported
Input Data Size	max. 32 BYTE
Output Data Size	max. 32 BYTE

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**Digital inputs**

Input type	from 4IOL PNP
Low level signal voltage	< 5 V
High level signal voltage	> 11 V
Low level signal current	< 1.5 mA DI, < 5 mA SIO
High level signal current	2.1 ... 3.7 mA DI / 5 ... 11 mA SIO

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**Digital outputs**

Output type	from 4IOL PNP
Sensor supply ( $V_{\text{Sens}}$ )	24 VDC
Output current per channel	0,5 A
Output voltage	24 VDC
Output delay	3 ms
Load type	ohmsch, induktiv, Lampenlast
Load resistance, resistive	> 48 $\Omega$
Load resistance, inductive	< 1.2 H
Lamp load	< 3 W
Switching frequency, resistive	< 200 Hz
Switching frequency, inductive	< 2 Hz
Switching frequency, lamp load	< 20 Hz
Short-circuit protection	yes

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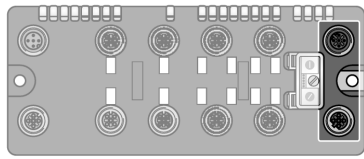
**Technology**

Signal type	IO-Link
Electrical isolation	Electronics and field level isolated via optocouplers

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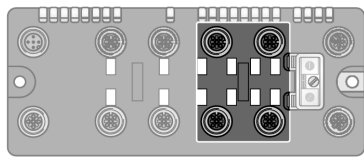
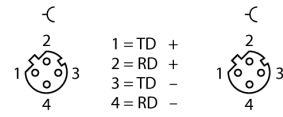
**Dimensions**

Operating temperature	168 x 71 x 32.5 mm -40...+70 °C
Storage temperature	-40...+85 °C
Relative humidity	15 to 95% (non-condensing)
Vibration test	acc. to IEC 61131-2
Extended vibration resistance - up to 20 g (at 10 up to 150 Hz)	For mounting on base plate or machinery
Shock test	acc. to IEC 61131-2
Electro-magnetic compatibility	acc. to IEC 61131-2
Protection class	IP67 IP69K
Housing material	Glass fiber reinforced nylon, nickel-plated connector
Housing color	Black
Window material	Lexan
Material screw	Nickel-plated brass
Material label	Polyester with polycarbonate overlay
Ground tab material	Nickel-plated brass
Weight	620 $\pm$ 20 g
Approvals and certificates	CE, cULus



### Ethernet

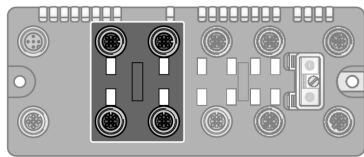
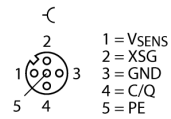
Fieldbus cable (IP67 example): RSSD RSSD 441-2M ID number U-02482 or RSSD-RSSD-441-2M/S2174 ID number 6914218



### Slot 1: IO-Link channels

Extension cable (example): RK 4.4T-2-RS 4.4T ident-no. U2445 or RKC4.4T-2-RSC4.4T/TEL ident-no. 6625208

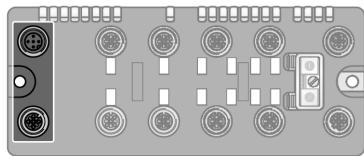
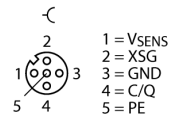
### Pin Assignment



### Slot 2: IO-Link channels

See slot 1

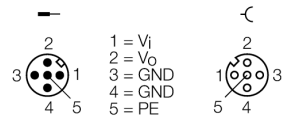
### Pin Assignment



### Auxiliary Power

Extension cable (example): RKC 4.4T-2-RSC 4.4T ident-no. U5264 or RKC4.4T-2-RSC4.4T/TEL ident-no. 6625208

### Pin Assignment



**Status: Station LED**

LED	Color	Status	Description
IOs		OFF	Power off
	RED	ON	Insufficient power supply
	RED	FLASHING (1Hz)	Deviating station configuration
	RED	FLASHING (4 Hz)	No module bus communication
	GREEN	ON	Station OK
	GREEN	FLASHING	Force mode active
BUS		OFF	Power Off
	GREEN	ON	Connected to Master
	GREEN	FLASHING	Ready
	RED	ON	Error
	RED	FLASHING	WINK
	YELLOW	ON	DHCP/BOOTP Search
IO	GREEN	ON	I/O slots OK
	GREEN	FLASHING (1Hz)	At least one I/O slot in idle state
	RED	ON	At least one faulty I/O slot
	RED	FLASHING	At least one I/O slot in faulty state

**Status: I/O LED, slot 1**

LED	Color	Status	Description
D1 *		OFF	Diagnostic disabled
	RED	ON	Station / module bus communication failure
	RED	FLASHING (0.5Hz)	Summarized diagnostic
I/O link mode channels 1 <sub>0</sub> ...1 <sub>3</sub>		OFF	Channel status x = "0" (OFF) no active diagnostics
	GREEN	Flashing	IO-Link communication, process data valid
	RED	ON	No I/O link communication
		Flashing	Process data invalid
DI mode channels 1 <sub>0</sub> ...1 <sub>3</sub>		OFF	Channel status x = 0 (OFF)
	GREEN	ON	Channel status x = 1 (ON)
XSG 1 <sub>0</sub> ...1 <sub>7</sub>		OFF	Channel status x = 0 (OFF)
	GREEN	ON	Channel status x = 1 (ON)

\* D1 LED also indicates gateway diagnostic

**I/O LED Status Slot 2**

LED	Colour	Status	Description
D2 *		OFF	Diagnostic disabled
	RED	ON	Station / module bus communication failure
	RED	FLASHING (0.5Hz)	Summarized diagnostic
I/O link mode channels 2 <sub>0</sub> ...2 <sub>3</sub>		OFF	Channel status x = "0" (OFF) no active diagnostics
	GREEN	Flashing	IO-Link communication, process data valid
	RED	ON	No I/O link communication
		Flashing	Process data invalid
DI mode channels 2 <sub>0</sub> ...2 <sub>3</sub>		OFF	Channel status x = 0 (OFF)
	GREEN	ON	Channel status x = 1 (ON)
XSG 2 <sub>0</sub> ...2 <sub>7</sub>		OFF	Channel status x = 0 (OFF)
	GREEN	ON	Channel status x = 1 (ON)

\* The D2 LED also indicates gateway diagnosis

### Process Data Mapping of the Single Protocols

#### EtherNet/IP™ I/O and Diagnostic Data Mapping

INPUT	BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Digital	0	DI 1 <sub>7</sub>	DI 1 <sub>6</sub>	DI 1 <sub>5</sub>	DI 1 <sub>4</sub>	DI 1 <sub>3</sub>	DI 1 <sub>2</sub>	DI 1 <sub>1</sub>	DI 1 <sub>0</sub>
	1	OCDO 1 <sub>7</sub>	OCDO 1 <sub>6</sub>	OCDO 1 <sub>5</sub>	OCDO 1 <sub>4</sub>	DVS 1 <sub>3</sub>	DVS 1 <sub>2</sub>	DVS 1 <sub>1</sub>	DVS 1 <sub>0</sub>
	2...15	IO-Link Daten lesen (je nach Einstellung der Parameter)							
	16	DI 2 <sub>7</sub>	DI 2 <sub>6</sub>	DI 2 <sub>5</sub>	DI 2 <sub>4</sub>	DI 2 <sub>3</sub>	DI 2 <sub>2</sub>	DI 2 <sub>1</sub>	DI 2 <sub>0</sub>
	17	OCDO 2 <sub>7</sub>	OCDO 2 <sub>6</sub>	OCDO 2 <sub>5</sub>	OCDO 2 <sub>4</sub>	DVS 2 <sub>3</sub>	DVS 2 <sub>2</sub>	DVS 2 <sub>1</sub>	DVS 2 <sub>0</sub>
18...31	IO-Link Daten lesen (je nach Einstellung der Parameter)								
Diagnose	32	Modulnummer meldet Diagnose Daten							
	33	Austauschstation	-	Diagnose aktiv	-	-	-	-	-
Steckplatz X (Ref. Byte 32)	34	IOL X <sub>0</sub> EVT2	IOL X <sub>0</sub> EVTX	IOL X <sub>0</sub> PDINV	IOL X <sub>0</sub> HWER	IOL X <sub>0</sub> DSER	IOL X <sub>0</sub> CFGER	-	OCDO X <sub>0</sub>
	35	IOL X <sub>0</sub> GENER	IOL X <sub>0</sub> OVL	IOL X <sub>0</sub> VHIGH	IOL X <sub>0</sub> VLOW	IOL X <sub>0</sub> ULVE	IOL X <sub>0</sub> LLVU	IOL X <sub>0</sub> OTMP	IOL X <sub>0</sub> PRMER
	36	IOL X <sub>1</sub> EVT2	IOL X <sub>1</sub> EVT1	IOL X <sub>1</sub> PDINV	IOL X <sub>1</sub> HWER	IOL X <sub>1</sub> DSER	IOL X <sub>1</sub> CFGER	-	OCDO X <sub>1</sub>
	37	IOL X <sub>1</sub> GENER	IOL X <sub>1</sub> OVL	IOL X <sub>1</sub> VHIGH	IOL X <sub>1</sub> VLOW	IOL X <sub>1</sub> ULVE	IOL X <sub>1</sub> LLVU	IOL X <sub>1</sub> OTMP	IOL X <sub>1</sub> PRMER
	38	IOL X <sub>2</sub> EVT2	IOL X <sub>2</sub> EVTX	IOL X <sub>2</sub> PDINV	IOL X <sub>2</sub> HWER	IOL X <sub>2</sub> DSER	IOL X <sub>2</sub> CFGER	-	OCDO X <sub>2</sub>
	39	IOL X <sub>2</sub> GENER	IOL X <sub>2</sub> OVL	IOL X <sub>2</sub> VHIGH	IOL X <sub>2</sub> VLOW	IOL X <sub>2</sub> ULVE	IOL X <sub>2</sub> LLVU	IOL X <sub>2</sub> OTMP	IOL X <sub>2</sub> PRMER
	40	IOL X <sub>3</sub> EVT2	IOL X <sub>3</sub> EVTX	IOL X <sub>3</sub> PDINV	IOL X <sub>3</sub> HWER	IOL X <sub>3</sub> DSER	IOL X <sub>3</sub> CFGER	-	OCDO X <sub>3</sub>
	41	IOL X <sub>3</sub> GENER	IOL X <sub>3</sub> OVL	IOL X <sub>3</sub> VHIGH	IOL X <sub>3</sub> VLOW	IOL X <sub>3</sub> ULVE	IOL X <sub>3</sub> LLVU	IOL X <sub>3</sub> OTMP	IOL X <sub>3</sub> PRMER
OUTPUT	BYTE	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Digital	0	DO 1 <sub>7</sub>	DO 1 <sub>6</sub>	DO 1 <sub>5</sub>	DO 1 <sub>4</sub>	-	-	-	-
	1	-	-	-	-	-	-	-	-
	2...15	IO-Link Daten schreiben (je nach Einstellung der Parameter)							
	16	DO 2 <sub>7</sub>	DO 2 <sub>6</sub>	DO 2 <sub>5</sub>	DO 2 <sub>4</sub>	-	-	-	-
	17	-	-	-	-	-	-	-	-
18...31	IO-Link Daten schreiben (je nach Einstellung der Parameter)								

\* If both slots of the module are diagnosable, the display of continuous diagnostic (scheduled diagnostic) switches every 125 ms between slot 1 and 2.

#### Legend

GENER	Common error	EVT1	Maintenance Events
VHIGH	Overvoltage	HWER	Hardware Error
ULVE	Upper Limit Value Exceeded	CFGER	Wrong or Missing Device
OTMP	Overtemperature	DVS	Data Valid Signal
EVT2	Out of Specification Error	OC	Over Current
PDINV	Process input data invalid	DIAG	Diagnostics
DSER	Data Storage Error	DO	Digital Output
OVL	Overload	DI	Digital Input
VLOW	Undervoltage	COM	Communication Lost Bit
LLVU	Lower Limit Value Underrun	CFG	Configuration Error
PRMER	Parameterization Error		

#### Modbus TCP Register Mapping

	REG	Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 9	Bit 8	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Eingänge (RO)	0x0000	OCDO 1 <sub>7</sub>	OCDO 1 <sub>6</sub>	OCDO 1 <sub>5</sub>	OCDO 1 <sub>4</sub>	DVS 1 <sub>3</sub>	DVS 1 <sub>2</sub>	DVS 1 <sub>1</sub>	DVS 1 <sub>0</sub>	DI 1 <sub>7</sub>	DI 1 <sub>6</sub>	DI 1 <sub>5</sub>	DI 1 <sub>4</sub>	DI 1 <sub>3</sub>	DI 1 <sub>2</sub>	DI 1 <sub>1</sub>	DI 1 <sub>0</sub>
	0x0001... 0x0007	IO-Link Daten lesen (je nach Einstellung der Parameter)															
	0x0008	OCDO 2 <sub>7</sub>	OCDO 2 <sub>6</sub>	OCDO 2 <sub>5</sub>	OCDO 2 <sub>4</sub>	DVS 2 <sub>3</sub>	DVS 2 <sub>2</sub>	DVS 2 <sub>1</sub>	DVS 2 <sub>0</sub>	DI 2 <sub>7</sub>	DI 2 <sub>6</sub>	DI 2 <sub>5</sub>	DI 2 <sub>4</sub>	DI 2 <sub>3</sub>	DI 2 <sub>2</sub>	DI 2 <sub>1</sub>	DI 2 <sub>0</sub>
	0x0009... 0x000F	IO-Link Daten lesen (je nach Einstellung der Parameter)															
Status (RO)	0x0010	-	FCE	-	-	CFG	COM	VI low	VI high	VO low	VO high	OCVI	-	-	-	-	DIAG

Diag. (RO)	0x0011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	S2 DIAG	S1 DIAG
Ausgänge (RW)	0x0800	-	-	-	-	-	-	-	-	-	DO 1 <sub>7</sub>	DO 1 <sub>6</sub>	DO 1 <sub>5</sub>	DO 1 <sub>4</sub>	-	-	-	
	0x0801... 0x0807	IO-Link Daten schreiben (je nach Einstellung der Parameter)																
	0x0808	-	-	-	-	-	-	-	-	-	-	DO 2 <sub>7</sub>	DO 2 <sub>6</sub>	DO 2 <sub>5</sub>	DO 2 <sub>4</sub>	-	-	
	0x0809... 0x080F	IO-Link Daten schreiben (je nach Einstellung der Parameter)																
I/O Diag (RO)	0xA000	IOL 1 <sub>0</sub> GEN- ER	IOL 1 <sub>0</sub> OVL	IOL 1 <sub>0</sub> VHIGH	IOL 1 <sub>0</sub> VLOW	IOL 1 <sub>0</sub> ULVE	IOL 1 <sub>0</sub> LLVU	IOL 1 <sub>0</sub> OTMP	IOL 1 <sub>0</sub> PRMEREVT2	IOL 1 <sub>0</sub> EVT1	IOL 1 <sub>0</sub> PDINV	IOL 1 <sub>0</sub> HWER	IOL 1 <sub>0</sub> DSER	IOL 1 <sub>0</sub> CFGGER	-	OC DO 1 <sub>4</sub>		
	0xA001	IOL 1 <sub>1</sub> GEN- ER	IOL 1 <sub>1</sub> OVL	IOL 1 <sub>1</sub> VHIGH	IOL 1 <sub>1</sub> VLOW	IOL 1 <sub>1</sub> ULVE	IOL 1 <sub>1</sub> LLVU	IOL 1 <sub>1</sub> OTMP	IOL 1 <sub>1</sub> PRMEREVT2	IOL 1 <sub>1</sub> EVT1	IOL 1 <sub>1</sub> PDINV	IOL 1 <sub>1</sub> HWER	IOL 1 <sub>1</sub> DSER	IOL 1 <sub>1</sub> CFGGER	-	OC DO 1 <sub>5</sub>		
	0xA002	IOL 1 <sub>2</sub> GEN- ER	IOL 1 <sub>2</sub> OVL	IOL 1 <sub>2</sub> VHIGH	IOL 1 <sub>2</sub> VLOW	IOL 1 <sub>2</sub> ULVE	IOL 1 <sub>2</sub> LLVU	IOL 1 <sub>2</sub> OTMP	IOL 1 <sub>2</sub> PRMEREVT2	IOL 1 <sub>2</sub> EVT1	IOL 1 <sub>2</sub> PDINV	IOL 1 <sub>2</sub> HWER	IOL 1 <sub>2</sub> DSER	IOL 1 <sub>2</sub> CFGGER	-	OC DO 1 <sub>6</sub>		
	0xA003	IOL 1 <sub>3</sub> GEN- ER	IOL 1 <sub>3</sub> OVL	IOL 1 <sub>3</sub> VHIGH	IOL 1 <sub>3</sub> VLOW	IOL 1 <sub>3</sub> ULVE	IOL 1 <sub>3</sub> LLVU	IOL 1 <sub>3</sub> OTMP	IOL 1 <sub>3</sub> PRMEREVT2	IOL 1 <sub>3</sub> EVT1	IOL 1 <sub>3</sub> PDINV	IOL 1 <sub>3</sub> HWER	IOL 1 <sub>3</sub> DSER	IOL 1 <sub>3</sub> CFGGER	-	OC DO 1 <sub>7</sub>		
	0xA004	IOL 2 <sub>0</sub> GEN- ER	IOL 2 <sub>0</sub> OVL	IOL 2 <sub>0</sub> VHIGH	IOL 2 <sub>0</sub> VLOW	IOL 2 <sub>0</sub> ULVE	IOL 2 <sub>0</sub> LLVU	IOL 2 <sub>0</sub> OTMP	IOL 2 <sub>0</sub> PRMEREVT2	IOL 2 <sub>0</sub> EVT1	IOL 2 <sub>0</sub> PDINV	IOL 2 <sub>0</sub> HWER	IOL 2 <sub>0</sub> DSER	IOL 2 <sub>0</sub> CFGGER	-	OC DO 2 <sub>4</sub>		
	0xA005	IOL 2 <sub>1</sub> GEN- ER	IOL 2 <sub>1</sub> OVL	IOL 2 <sub>1</sub> VHIGH	IOL 2 <sub>1</sub> VLOW	IOL 2 <sub>1</sub> ULVE	IOL 2 <sub>1</sub> LLVU	IOL 2 <sub>1</sub> OTMP	IOL 2 <sub>1</sub> PRMEREVT2	IOL 2 <sub>1</sub> EVT1	IOL 2 <sub>1</sub> PDINV	IOL 2 <sub>1</sub> HWER	IOL 2 <sub>1</sub> DSER	IOL 2 <sub>1</sub> CFGGER	-	OC DO 2 <sub>5</sub>		
	0xA006	IOL 2 <sub>2</sub> GEN- ER	IOL 2 <sub>2</sub> OVL	IOL 2 <sub>2</sub> VHIGH	IOL 2 <sub>2</sub> VLOW	IOL 2 <sub>2</sub> ULVE	IOL 2 <sub>2</sub> LLVU	IOL 2 <sub>2</sub> OTMP	IOL 2 <sub>2</sub> PRMEREVT2	IOL 2 <sub>2</sub> EVT1	IOL 2 <sub>2</sub> PDINV	IOL 2 <sub>2</sub> HWER	IOL 2 <sub>2</sub> DSER	IOL 2 <sub>2</sub> CFGGER	-	OC DO 2 <sub>6</sub>		
	0xA007	IOL 2 <sub>3</sub> GEN- ER	IOL 2 <sub>3</sub> OVL	IOL 2 <sub>3</sub> VHIGH	IOL 2 <sub>3</sub> VLOW	IOL 2 <sub>3</sub> ULVE	IOL 2 <sub>3</sub> LLVU	IOL 2 <sub>3</sub> OTMP	IOL 2 <sub>3</sub> PRMEREVT2	IOL 2 <sub>3</sub> EVT1	IOL 2 <sub>3</sub> PDINV	IOL 2 <sub>3</sub> HWER	IOL 2 <sub>3</sub> DSER	IOL 2 <sub>3</sub> CFGGER	-	OC DO 2 <sub>7</sub>		

### PROFINET® Process Data

Eingänge	0	DI 1 <sub>7</sub>	DI 1 <sub>6</sub>	DI 1 <sub>5</sub>	DI 1 <sub>4</sub>	DI 1 <sub>3</sub>	DI 1 <sub>2</sub>	DI 1 <sub>1</sub>	DI 1 <sub>0</sub>
	1	OCDO 1 <sub>7</sub>	OCDO 1 <sub>6</sub>	OCDO 1 <sub>5</sub>	OCDO 1 <sub>4</sub>	DVS 1 <sub>3</sub>	DVS 1 <sub>2</sub>	DVS 1 <sub>1</sub>	DVS 1 <sub>0</sub>
	2...15	IO-Link Daten lesen (je nach Einstellung der Parameter)							
	16	DI 2 <sub>7</sub>	DI 2 <sub>6</sub>	DI 2 <sub>5</sub>	DI 2 <sub>4</sub>	DI 2 <sub>3</sub>	DI 2 <sub>2</sub>	DI 2 <sub>1</sub>	DI 2 <sub>0</sub>
	17	OCDO 2 <sub>7</sub>	OCDO 2 <sub>6</sub>	OCDO 2 <sub>5</sub>	OCDO 2 <sub>4</sub>	DVS 2 <sub>3</sub>	DVS 2 <sub>2</sub>	DVS 2 <sub>1</sub>	DVS 2 <sub>0</sub>
18...31	IO-Link Daten lesen (je nach Einstellung der Parameter)								
Ausgänge	0	DO 1 <sub>7</sub>	DO 1 <sub>6</sub>	DO 1 <sub>5</sub>	DO 1 <sub>4</sub>	-	-	-	-
	1	-	-	-	-	-	-	-	-
	2...15	IO-Link Daten schreiben (je nach Einstellung der Parameter)							
	16	DO 2 <sub>7</sub>	DO 2 <sub>6</sub>	DO 2 <sub>5</sub>	DO 2 <sub>4</sub>	-	-	-	-
	17	-	-	-	-	-	-	-	-
18...31	IO-Link Daten schreiben (je nach Einstellung der Parameter)								