

CMOS激光传感器

型号E3AS-HL150□M□□/500□M□□系列

索引列表

IO-Link设定文件 (IODD文件)
请从本公司网站 (www.fa.omron.co.jp) 下载。

IO-Link

オムロン株式会社

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* 3 6 6 9 6 8 7 - 1 B *

3. 工序数据

bit	7	6	5	4	3	2	1	0
PD0	检测值输出 上位 8bit *1							
PD1	检测值输出 下位 8bit *1							
PD2	受光量输出 8bit (0 ~ 255)							

PD3								分配	详细
bit									
7	6	5	4	3	2	1	0	控制输出1	0: OFF 1: ON
								控制输出2	0: OFF 1: ON
								受光量不足警报	0: 稳定状态 1: 不稳定状态
								(Reserved)	0
								受光量不足报错	0: 稳定状态 1: 受光量不足
								(Reserved)	0
								轻度异常	因负载短路, EEPROM 的信息等可恢复原因而无法继续执行动作时的诊断输出 0: 正常 1: 异常
								严重异常	传感器内部硬件发生异常, 需更换或重启时的诊断输出 0: 正常 1: 异常

*1. 检测范围外的状态为 0x7FFC。

4. 服务数据

索引	子索引	项目	备份对象	格式	访问	数据长度	初始值	选择范围	备注
0	0	直接参数页面 1	-	Record	R/W	16byte	-	-	
1	0	直接参数页面 2	-	-	-	16byte	-	-	未使用
2	0	系统指令	-	UInteger	W	1byte	-	0x82: 设定初始化	
3	0	数据存储器	-	Record	R/W	-	-	-	*1
12	0	锁定存取设备	-	UInteger	R/W	2byte	0x0000	0x0000: 未锁定 0x0001: 参数锁定 0x0002: 锁定数据存储器	
16	0	厂商名称	-	String	R	64byte	-	OMRON Corporation	
17	0	厂商文本	-	String	R	64byte	-	OMRON Corporation	
18	0	产品名称	-	String	R	64byte	-	-	代表型号
19	0	产品 ID	-	String	R	64byte	-	-	完整型号
20	0	产品文本	-	String	R	64byte	-	CMOS Laser sensor	传感器种类
21	0	序列号 No.	-	String	R	8byte	-	-	
22	0	硬件版本	-	String	R	4byte	-	-	
23	0	固件版本	-	String	R	4byte	-	-	
24	0	用户可设定区域	○	String	R/W	32byte	All *****	任意	
36	0	设备状态	-	UInteger	R	1byte	-	0x00: 正常 0x01: 受光量不足报错 0x04: 内部故障	
37	1	设备详细状态	-	Record	R	3byte	-	内部故障	
	2			Record	R	3byte	-	服务数据异常	
	3			Record	R	3byte	-	控制输出 2 负载短路	
40	0	工序输入数据	-	Record	R	4byte	-	-	
59	0	示教状态	-	UInteger	R	1byte	0x00	0x00: IDLE 0x01: Output1 SUCCESS 0x02: Output2 SUCCESS 0x14: Output1 WAIT FOR COMMAND 0x44: Output2 WAIT FOR COMMAND 0x05: BUSY 0x07: ERROR	
60	1	输出 1 阈值 (SP1)	○	Integer	R/W	2byte	100.0 400	-160.0 ~ 160.0 (E3AS-HL150□□) -600 ~ 600 (E3AS-HL500□□)	仅在索引 61 的输出 1 模式, 为 [Window BGS] 或 [Window FGS] 时启用
	2	输出 1 阈值 (SP2)	○	Integer	R/W	2byte	80.0 350	-160.0 ~ 160.0 (E3AS-HL150□□) -600 ~ 600 (E3AS-HL500□□)	
61	1	输出 1 逻辑	○	UInteger	R/W	1byte	0x00	0x00: N.O.(Normally Open) 0x01: N.C.(Normally Close)	
	2	输出 1 模式	○	UInteger	R/W	1byte	0x01	0x01: Single Point 0x02: Window BGS 0x80: Window FGS 0x81: Distance and Intensity (Read Only)	
	3	输出 1 磁滞幅度	○	UInteger	R/W	2byte	1.0 10	0 ~ 150.0 (E3AS-HL150□□) 0 ~ 500 (E3AS-HL500□□)	仅在索引 166 的磁滞模式, 为 [User] 时启用
62	1	输出 2 阈值 (SP1)	○	Integer	R/W	2byte	100.0 400	-160.0 ~ 160.0 (E3AS-HL150□□) -600 ~ 600 (E3AS-HL500□□)	仅在索引 63 的输出 2 功能, 为 [Output2 Single Point] 时启用
63	1	输出 2 逻辑	○	UInteger	R/W	1byte	0x00	0x00: N.O.(Normally Open) 0x01: N.C.(Normally Close)	
	2	输出 2 功能	○	UInteger	R/W	1byte	0x80	0x01: Output2 Single Point 0x80: Output1 Invert 0x81: Error 0x82: Input	
	3	输出 2 磁滞幅度	○	UInteger	R/W	2byte	1.0 10	0 ~ 150.0 (E3AS-HL150□□) 0 ~ 500 (E3AS-HL500□□)	仅在索引 63 的输出 2 功能、为 [Output2 Single Point]、且索引 166 的磁滞模式为 [User] 时启用
64	0	厂商指令	-	UInteger	W	1byte	-	0x03: 输出 1 2 点示教 第 1 点 0x04: 输出 1 2 点示教 第 2 点 0x05: 输出 2 2 点示教 第 1 点 0x06: 输出 2 2 点示教 第 2 点 0x07: 输出 1 背景示教 0x08: 输出 2 背景示教 0x09: 输出 1 背景基准示教 *2 0x0A: 输出 1 工作示教 0x0B: 示教取消 0xA1: 激光投光 Off 0xA2: 激光投光 On 0xA3: 归零重置启用 0xA4: 归零重置取消 0xA5: 指示闪烁启用 0xA6: 指示闪烁禁用	

1. 通信规格	2. 设备ID
型号	型号 设备ID E3AS-HL500 □MD□ □MT□ E3AS-HL150 □MD□ □MT□ 传输速度 COM2 (38.4kbps) COM3 (230.4kbps) 最小循环时间 3.5ms 1.2ms 工序数据长度 4byte 厂商 ID 612 (0x0264)

索引	子索引	项目	备份对象	格式	访问	数据长度	初始值	选择范围	备注
65	1	输出 1 延时模式	○	UInteger	R/W	1byte	0x00	0x00: 禁用 0x01: On 延迟 0x02: Off 延迟 0x03: 单触发	
	2	输出 1 延时时间	○	UInteger	R/W	2byte	5	1 ~ 9999 (单位: 1ms)	
66	1	输出 2 延时模式	○	UInteger	R/W	1byte	0x00	0x00: 禁用 0x01: On 延迟 0x02: Off 延迟 0x03: 单触发	仅索引 63 的输出 2 功能、为 [Output2 Single Point] 时启用
	2	输出 2 延时时间	○	UInteger	R/W	2byte	5	1 ~ 9999 (单位: 1ms)	
67	0	屏幕显示	○	UInteger	R/W	1byte	0x00	0x00: 通常 0x01: 简单 0x02: 进度条 0x03: ON/OFF	
68	0	屏幕反转	○	UInteger	R/W	1byte	0x00	0x00: Off 0x01: On	
69	0	屏幕亮度	○	UInteger	R/W	1byte	0x00	0x00: 通常 0x01: 灭灯	
70	0	详细设定	○	UInteger	R/W	1byte	0x00	0x00: Off 0x01: On	
71	0	按键锁定	○	UInteger	R/W	1byte	0x00	0x00: 禁用 0x01: 启用	
72	0	响应时间	○	UInteger	R/W	1byte	0x02	0x00: 1.5ms 0x01: 10ms 0x02: 50ms	
73	0	外部输入	○	UInteger	R/W	1byte	0x00	0x00: 激光投光 Off 0x01: 示教 0x02: 归零重置	仅索引 63 的输出 2 功能、为 [External Input] 时启用
74	0	归零重置存储器	○	UInteger	R/W	1byte	0x00	0x00: Off 0x01: On	仅在索引 64 中执行 [归零重置启用] 时启用
75	0	防相互干扰功能	○	UInteger	R/W	1byte	0x00	设置频道以防止相互干扰。 0x00: Channel 1 0x01: Channel 2 0x02: Channel 3 0x03: Channel 4	
76	0	保持功能	○	UInteger	R/W	1byte	0x00	0x00: 禁用 0x01: 启用	
80	0	示教选择 (3 秒长按时)	○	UInteger	R/W	1byte	0x00	0x00: 背景示教 0x01: 工件示教	可选择示教按键或外部输入 3 秒 ON 时的动作。
160	0	工作时间	-	UInteger	R	4byte	-	0 ~ 131071 (单位: 1h)	
161	0	背景基准示教切换	○	UInteger	R/W	1byte	0x00	0x00: 通常 0x01: 高灵敏度	
162	0	背景基准示教 (高灵敏度) 阈值	○	UInteger	R/W	1byte	90	0 ~ 100	
164	0	ABT 功能	○	UInteger	R/W	1byte	0x02	0x00: Off 0x01: 0.3sec 0x02: 1sec 0x03: 3min	相对于输出 1, 仅在执行「背景基准示教 (高灵敏度)」时启用
166	0	磁滞模式	○	UInteger	R/W	1byte	0x00	0x00: Auto 0x01: User	

*1 与 IO-Link 主机之间执行备份、还原时使用。详情请参阅 IO-Link 规格: IO-Link interface and System Specification V1.1.2 (https://io-link.com)。

*2. 若要执行背景基准示教 (高灵敏度), 请在索引 161 的背景基准示教切换中预先选择 [高灵敏度]。

5. 状况功能

状况代码	状况名	种类	内容	措施・对策
0x1800 0x1803	内部故障	异常	可能是发生了传感器内部故障。	请重启传感器。如果再次发生异常, 则请更换传感器。
0x6320	服务数据异常	异常	在 IO-Link 通信中被写入的设定 (服务数据) 出现不匹配现象。	请执行系统指令的设定初始化, 将设定值恢复为初始化状态。 请参阅服务数据的索引 2。
0x7710	控制输出 2 负载短路	异常	控制输出 2 流过过电流。	请确认和传感器之间的配线, 确定负载电流在额定范围。

承诺事项

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(a) 需要高度安全性的用途 (例: 用于原子能控制设备, 焚烧设备。航空・宇宙设备, 铁道设备, 升降设备, 娱乐设备, 医用器, 安全装置, 或其他可能危及到生命・人身安全的用途)
(b) 需要高可靠性的用途 (例 煤气・水力・电力等的供给系统, 24 小时连续运转系统, 决策系统, 或其他牵涉到权力・财产的用途)
(c) 苛刻条件或环境下的用途 (例 室外设备, 易受化学污染的设备, 易受电磁干扰的设备, 易受震动・冲击的设备等)
(d) 产品手册里未记载的条件或环境下的用途
* 除上述 (a)~(d) 的记载事项, 本产品手册等记载的商品不适用于机动车 (包括两轮车, 以下相同)。请勿搭载于机动车上使用。机动车搭载用商品请咨询本公司销售人员。
* 以上是适用条件的一部分。详情请参阅记载于本公司最新版的综合产品目录, 使用手册上的保证・免责事项后再使用。

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OMRON Corporation

CMOS Laser sensor

Model E3AS-HL150□M□□/500□M□□ Series

INDEXLIST

Please download IO-Link setting file from company's official website (www.fa.omron.co.jp).

IO-Link

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3. Process data

bit	7	6	5	4	3	2	1	0	
PD0	Detection value output: Upper 8bit *1								
PD1	Detection value output: Lower 8bit *1								
PD2	Light intensity level: 8bit (0 ~ 255)								
PD3 bit		Assignment		Details					
7	6	5	4	3	2	1	0	Control Output1	0: OFF 1: ON
								Control Output2	0: OFF 1: ON
								Instability Alarm (Low Light Intensity)	0: Stable 1: Unstable
								(Reserved)	0
								Error (Insufficient Light Intensity)	0: Normal 1: Error
								(Reserved)	0
								Warning	Diagnostic output when the sensor cannot continue operation due to a recoverable factor such as a load short-circuit or a service data error
								Error	Diagnostic output when the sensor has an internal error and replacement is needed
									0: Normal 1: Error

*1. 0x7FFC when out of detection range.

4. Service data

Index	Sub-Index	Name	Backup target	Format	Access	Length	Default value	Range	Remark
0	0	Direct Parameter Page1	-	Record	R/W	16byte	-	-	Unused
1	0	Direct Parameter Page2	-	-	-	16byte	-	-	
2	0	System Command	-	UInteger	W	1byte	-	0x82: Restore Factory Settings	
3	0	Data Storage	-	Record	R/W	-	-	-	
12	0	Device Access Locks	-	UInteger	R/W	2byte	0x0000	0x0000: Unlocked 0x0001: Parameter Locked 0x0002: Data Storage Locked	
16	0	Vendor Name	-	String	R	64byte	-	OMRON Corporation	
17	0	Verdor Text	-	String	R	64byte	-	OMRON Corporation	
18	0	Product Name	-	String	R	64byte	-	-	Model
19	0	Product ID	-	String	R	64byte	-	-	Model
20	0	Product Text	-	String	R	64byte	-	CMOS Laser sensor	Sensor Type
21	0	Serial Number	-	String	R	8byte	-	-	
22	0	Hardware Version	-	String	R	4byte	-	-	
23	0	Firmware Version	-	String	R	4byte	-	-	
24	0	Application Specific Tag	○	String	R/W	32byte	All *****	Optional	
36	0	Device Status	-	UInteger	R	1byte	-	0x00: Operating properly 0x01: Error (Insufficient Light Intensity) 0x04: Breakdown	
37	1	Detailed Device Status	-	Record	R	3byte	-	Breakdown	
	2			Record	R	3byte	-	Parameter Error	
	3			Record	R	3byte	-	Control Output2 short-circuit	
40	0	Process Data Input	-	Record	R	4byte	-	-	
59	0	Teaching Status	-	UInteger	R	1byte	0x00	0x00: IDLE 0x01: Output1 SUCCESS 0x02: Output2 SUCCESS 0x14: Output1 WAIT FOR COMMAND 0x44: Output2 WAIT FOR COMMAND 0x05: BUSY 0x07: ERROR	
60	1	Output1 Setpoint SP1	○	Integer	R/W	2byte	100.0 400	-160.0 ~ 160.0 (E3AS-HL150□) -600 ~ 600 (E3AS-HL500□)	
	2	Output1 Setpoint SP2	○	Integer	R/W	2byte	80.0 350	-160.0 ~ 160.0 (E3AS-HL150□) -600 ~ 600 (E3AS-HL500□)	Valid only when "Output1 Switchpoint Mode" in index 61 is [Window BGS] or [Window FGS]
61	1	Output1 Switchpoint Logic	○	UInteger	R/W	1byte	0x00	0x00: N.O.(Normally Open) 0x01: N.C.(Normally Close)	
	2	Output1 Switchpoint Mode	○	UInteger	R/W	1byte	0x01	0x01: Single Point 0x02: Window BGS 0x80: Window FGS 0x81: Distance and Intensity (Read Only)	
	3	Output1 Switchpoint Hysteresis Value	○	UInteger	R/W	2byte	1.0 10	0 ~ 150.0 (E3AS-HL150□) 0 ~ 500 (E3AS-HL500□)	Valid only when "Hysteresis Mode" in index 166 is [User]
62	1	Output2 Setpoint SP1	○	Integer	R/W	2byte	100.0 400	-160.0 ~ 160.0 (E3AS-HL150□) -600 ~ 600 (E3AS-HL500□)	
63	1	Output2 Switchpoint Logic	○	UInteger	R/W	1byte	0x00	0x00: N.O.(Normally Open) 0x01: N.C.(Normally Close)	Valid only when "Output2 Switchpoint Mode" in index 63 is [Output2 Single Point]
	2	Output2 Switchpoint Mode	○	UInteger	R/W	1byte	0x80	0x01: Output2 Single Point 0x80: Output1 Invert 0x81: Error 0x82: Input	
	3	Output2 Switchpoint Hysteresis Value	○	UInteger	R/W	2byte	1.0 10	0 ~ 150.0 (E3AS-HL150□) 0 ~ 500 (E3AS-HL500□)	Valid only when "Output2 Switchpoint Mode" in index 63 is [Output2 Single Point] and "Hysteresis Mode" in index 166 is [User]
64	0	Vendor Command	-	UInteger	W	1byte	-	0x03: Output1 2-point teaching(1st Point) 0x04: Output1 2-point teaching(2nd Point) 0x05: Output2 2-point teaching(1st Point) 0x06: Output2 2-point teaching(2nd Point) 0x07: Output1 Background teaching 0x08: Output2 Background teaching 0x09: Output1 Background Reference teaching *2 0x0A: Output1 Object teaching 0x0B: Teach cancel 0xA1: Laser Off 0xA2: Laser On 0xA3: Zero Reset On 0xA4: Zero Reset Off 0xA5: LED Blink On 0xA6: LED Blink Off	

2. Device ID

Model	Device ID
E3AS-HL500MD	65557 (0x010015)
E3AS-HL500MT	65558 (0x010016)
E3AS-HL500LMD	65560 (0x010018)
E3AS-HL500LMT	65561 (0x010019)
E3AS-HL150MD	65563 (0x01001B)
E3AS-HL150MT	65564 (0x01001C)
E3AS-HL150LMD	65566 (0x01001E)
E3AS-HL150LMT	65567 (0x01001F)

1. Physical layer

Model	E3AS-HL500	E3AS-HL500
	□MD□	□M T □
	E3AS-HL150	E3AS-HL150
Baud rate	COM2	COM3
	(38.4kbps)	(230.4kbps)
	3.5ms	1.2ms
Minimum cycle time	4byte	
Process data length	4byte	
Vendor ID	612 (0x0264)	

Index	Sub-Index	Name	Backup target	Format	Access	Length	Default value	Range	Remark
65	1	Output1 Timer (Mode)	○	UInteger	R/W	1byte	0x00	0x00: Off 0x01: On Delay 0x02: Off Delay 0x03: One Shot	
	2	Output1 Timer (Time)	○	UInteger	R/W	2byte	5	1 ~ 9999 (Unit: 1ms)	
66	1	Output2 Timer (Mode)	○	UInteger	R/W	1byte	0x00	0x00: Off 0x01: On Delay 0x02: Off Delay 0x03: One Shot	Valid only when "Output2 Switchpoint Mode" in index 63 is [Output2 Single Point]
	2	Output2 Timer (Time)	○	UInteger	R/W	2byte	5	1 ~ 9999 (Unit: 1ms)	
67	0	Display Sellation	○	UInteger	R/W	1byte	0x00	0x00: Standard 0x01: Simple 0x02: Bar 0x03: ON/OFF	
68	0	Display Reverse	○	UInteger	R/W	1byte	0x00	0x00: Off 0x01: On	
69	0	Display Brightness	○	UInteger	R/W	1byte	0x00	0x00: Normal 0x01: Dark	
70	0	Advanced Settings	○	UInteger	R/W	1byte	0x00	0x00: Off 0x01: On	
71	0	Key Lock	○	UInteger	R/W	1byte	0x00	0x00: Unlock 0x01: Lock	
72	0	Response Time	○	UInteger	R/W	1byte	0x02	0x00: 1.5ms 0x01: 10ms 0x02: 50ms	
73	0	Input Function	○	UInteger	R/W	1byte	0x00	0x00: Laser Off 0x01: Teach 0x02: Zero Reset	Valid only when "Output2 Swichpoint Mode" in index 63 is [External Input]
74	0	Zero Reset Memory	○	UInteger	R/W	1byte	0x00	0x00: Off 0x01: On	Valid only when "Zero Reset On" in index 64 is executed
75	0	Mutual Interference Prevention Function	○	UInteger	R/W	1byte	0x00	Set a channel for the mutual interference prevention. 0x00 : Channel 1 0x01 : Channel 2 0x02 : Channel 3 0x03 : Channel 4	
76	0	Keep Function	○	UInteger	R/W	1byte	0x00	0x00: Off 0x01: On	
80	0	Teaching Select	○	UInteger	R/W	1byte	0x00	0x00: Background 0x01: Object	Teach select when teach button / external input push & hold for 3 second.
160	0	Operating Hours	-	UInteger	R	4byte	-	0 ~ 131071 (Unit: 1h)	
161	0	Background Reference Teaching Select	○	UInteger	R/W	1byte	0x00	0x00: Normal 0x01: Sensitive	
162	0	Background Reference Teaching (Sensitive) Threshold	○	UInteger	R/W	1byte	90	0 ~ 100	Valid only when "Output1 Background Reference teaching (Sensitive)" is executed
164	0	ABT Function	○	UInteger	R/W	1byte	0x02	0x00: Off 0x01: 0.3sec 0x02: 1sec 0x03: 3min	
166	0	Hysteresis Mode	○	UInteger	R/W	1byte	0x00	0x00: Auto 0x01: User	

*1. Use when backing up or restoring the settings to/from the IO-Link master unit. Details please refer to the specification : IO-Link interface and System Specification V1.1.2 (https://io-link.com)

*2. When "Background reference teaching (Sensitive)" is executed , select [Sensitivite] of "Background Reference Teaching Select" in index 161.

5. Event function

Event Code	Event Name	Type	Description	Action
0x1800	Breakdown	Error	The sensor might be broken internally.	Start up (turn ON) the sensor again, If the error occurs again, replace the sensor.
0x1803				
0x6320	Parameter error	Error	Inconsistency has occurred on the settings (service data) written in by the IO-Link communications.	Execute the system command to "Restore the factory settings" to initialize the settings. Refer to Index 2 of the service data.
0x7710	Control Output2 short-circuit	Error	Control output 2 is in the load short-circuit condition.	Check the wiring, and make sure that the load current is within ratings. If the error occurs again, replace the sensor.

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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