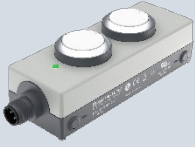


# IO-Link Parameter Datasheet



IO-Link push button box

ICA-F85E2-MC-IO-V1



Support: [fa-info@pepperl-fuchs.com](mailto:fa-info@pepperl-fuchs.com)  
Internet: [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

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## General Information

### Device Identification

Vendor ID	1 (0x0001)
Device ID	985089 (0x0F0801)

### Features

Data Storage	Yes
Block Parameterization	Yes

### Communication Characteristics

IO-Link revision	V1.1 (specification V1.1.2)
IO-Link backward compatibility	n/a
Data transmission rate	COM2 (38.4 kbit/s)
Min. cycle time	5 ms
Process data input	8 bit
Process data output	16 bit
SIO mode support	n/a
Compatible master port type	Class A, Class B (see NOTE)

NOTE: For use at master with port class B, use 3-pole adapter or 3-wire cable.

### Profile

Identification and Diagnosis	16384 (0x4000)
Firmware update	49 (0x0031)

## Supported Product Variants

Product ID	Product Name	Description	Connector
70148369	ICA-F85E2-MC-IO-V1	IO-Link push button box, 2 push buttons, multi-color, M12 plug, 4-pin	Plug, M12, 4-pin

## Connection

Connection Diagram	Description
	<b>Plug, M12, 4-pin</b> 1: L+ 2: n.c. 3: L- 4: C/Q

## Process Data

### Process Data Input

Sub	Name	Data type	Length	Bitoffs.	Value	Unit	Description
.1	Contact 1 - Button 1	Boolean	1 bit	0	0 1		Indicates the actuation status of push button 1 of contact 1. <i>Inactive</i> <i>Active</i>
.2	Reserved						Reserved
.3	Contact 1 - Button 2	Boolean	1 bit	2	0 1		Indicates the actuation status of push button 2 of contact 1. <i>Inactive</i> <i>Active</i>
.4	Reserved						Reserved
.5	Validity	Boolean	1 bit	7	0 1		Indicates if failures are pending and the device is not working properly. <i>False</i> <i>True</i>

### Process Data Output

Sub	Name	Data type	Length	Bitoffs.	Value	Unit	Description
.1	Button 1 - Illumination	Boolean	1 bit	0	0 1		Defines the illumination status of button 1. If activated, button 1 is illuminated. <i>Inactive</i> <i>Active</i>
.2	Button 1 - Color	UInteger	3 bit	1	0 1 2 3 4 5 6 7		Defines the color of the illumination of button 1. If a variable color is chosen, its configured RGB values are applied. <i>Red</i> <i>Green</i> <i>Blue</i> <i>White</i> <i>Yellow</i> <i>Variable Color 1</i> <i>Variable Color 2</i> <i>Variable Color 3</i>
.3	Button 1 - Blink Mode	Boolean	1 bit	4	0 1		Defines the blink mode status of button 1. If activated, the illumination of button 1 flashes according to the configured blink mode. <i>Inactive</i> <i>Active</i>
.4	Button 1 - Night Mode	Boolean	1 bit	5	0 1		Defines the night mode status of button 1. If activated, the illumination of button 1 is dimmed according to the configured night mode brightness. <i>Inactive</i> <i>Active</i>
.5	Button 2 - Illumination	Boolean	1 bit	8	0 1		Defines the illumination status of button 2. If activated, button 2 is illuminated. <i>Inactive</i> <i>Active</i>
.6	Button 2 - Color	UInteger	3 bit	9	0 1 2 3 4 5 6 7		Defines the color of the illumination of button 2. If a variable color is chosen, its configured RGB values are applied. <i>Red</i> <i>Green</i> <i>Blue</i> <i>White</i> <i>Yellow</i> <i>Variable Color 1</i> <i>Variable Color 2</i> <i>Variable Color 3</i>
.7	Button 2 - Blink Mode	Boolean	1 bit	12	0 1		Defines the blink mode status of button 2. If activated, the illumination of button 2 flashes according to the configured blink mode. <i>Inactive</i> <i>Active</i>
.8	Button 2 - Night Mode	Boolean	1 bit	13	0 1		Defines the night mode status of button 2. If activated, the illumination of button 2 is dimmed according to the configured night mode brightness. <i>Inactive</i> <i>Active</i>

NOTE: The process data input content can also be read via parameter 'Process Data Input' at index 40 (0x28).  
The process data output content can also be read via parameter 'Process Data Output' at index 41 (0x29).

## Parameter Data

Identification									
Index	Parameter	Access	Data type	Length	Default	Description	DS	R	
16 (0x10)	Vendor Name	ro	String	13 byte	Pepperl+Fuchs	The vendor name that is assigned to a Vendor ID.			
17 (0x11)	Vendor Text	ro	String	29 byte	www.pepperl-fuchs.com/io-link	Additional information about the vendor.			
18 (0x12)	Product Name	ro	String	max. 30 byte	See table Supported Product Variants	Complete product name.			
19 (0x13)	Product ID	ro	String	max. 16 byte	See table Supported Product Variants	Vendor-specific product or type identification (e.g., item number or model number).			
20 (0x14)	Product Text	ro	String	max. 30 byte	IO-Link push button box	Additional product information for the device.			
21 (0x15)	Serial Number	ro	String	max. 16 byte		Unique, vendor-specific identifier of the individual device.			
22 (0x16)	Hardware Revision	ro	String	max. 16 byte		Unique, vendor-specific identifier of the hardware revision of the individual device.			
23 (0x17)	Firmware Revision	ro	String	max. 16 byte		Unique, vendor-specific identifier of the firmware revision of the individual device.			
24 (0x18)	Application Specific Tag	rw	String	max. 32 byte	***	Possibility to mark a device with user- or application-specific information.	Y	F	
25 (0x19)	Function Tag	rw	String	max. 32 byte	***	Possibility to mark a device with function-specific information.	Y	F	
26 (0x1A)	Location Tag	rw	String	max. 32 byte	***	Possibility to mark a device with location-specific information.	Y	F	
17342 (0x43BE)	Hardware Identification Key	ro	String	max. 24 byte		Shall be used for the identification of valid FW-Update files.			

Diagnosis											
Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
32 (0x20)	Error Count	ro	UInteger	16 bit		0	0 .. 2 <sup>16</sup> -1		Number of errors that occurred in the technology-specific application since power on or restart.		
36 (0x24)	Device Status	ro	UInteger	8 bit			0 1 2 3 4		Indicator for the current device condition and diagnosis state. <i>Device is OK</i> <i>Maintenance required</i> <i>Out of specification</i> <i>Functional check</i> <i>Failure</i>		
37 (0x25)	Detailed Device Status	ro	Array <sup>SO</sup>	12 byte					List of all currently pending events in the device.		
.1	Element 1		Octetstr	3 byte	72						
.2	Element 2		Octetstr	3 byte	48						
.3	Element 3		Octetstr	3 byte	24						
.4	Element 4		Octetstr	3 byte	0						

Parameterization & Configuration											
Index .sub	Parameter	Access	Data type	Length	Bitoffs.	Default	Value	Unit	Description	DS	R
100 (0x64)	Button 1 Config - Night Mode Brightness	rw	UInteger	8 bit		1	0 1 2		Defines the brightness of the night mode in percent for button 1 25 % 50 % 75 %	Y	F
101 (0x65)	Button 2 Config - Night Mode Brightness	rw	UInteger	8 bit		1	0 1 2		Defines the brightness of the night mode in percent for button 2. 25 % 50 % 75 %	Y	F
120 (0x78)	Button 1 Config - Blink Mode	rw	UInteger	8 bit		0	0 1 2 3		Defines the blink mode for button 1. 1 Hz / 50 % Duty Cycle 2 Hz / 50 % Duty Cycle 1 Hz / 80 % Duty Cycle 2 Hz / 80 % Duty Cycle	Y	F
121 (0x79)	Button 2 Config - Blink Mode	rw	UInteger	8 bit		0	0 1 2 3		Defines the blink mode for button 2. 1 Hz / 50 % Duty Cycle 2 Hz / 50 % Duty Cycle 1 Hz / 80 % Duty Cycle 2 Hz / 80 % Duty Cycle	Y	F
140 (0x8C)	Variable Color 1 Config - RGB R-value	rw	UInteger	8 bit		255	0 .. 255		Defines the RGB R-value of the variable color 1.	Y	F
141 (0x8D)	Variable Color 1 Config - RGB G-value	rw	UInteger	8 bit		140	0 .. 255		Defines the RGB G-value of the variable color 1.	Y	F
142 (0x8E)	Variable Color 1 Config - RGB B-value	rw	UInteger	8 bit		0	0 .. 255		Defines the RGB B-value of the variable color 1.	Y	F
143 (0x8F)	Variable Color 2 Config - RGB R-value	rw	UInteger	8 bit		54	0 .. 255		Defines the RGB R-value of the variable color 2.	Y	F
144 (0x90)	Variable Color 2 Config - RGB G-value	rw	UInteger	8 bit		204	0 .. 255		Defines the RGB G-value of the variable color 2.	Y	F
145 (0x91)	Variable Color 2 Config - RGB B-value	rw	UInteger	8 bit		204	0 .. 255		Defines the RGB B-value of the variable color 2.	Y	F
146 (0x92)	Variable Color 3 Config - RGB R-value	rw	UInteger	8 bit		255	0 .. 255		Defines the RGB R-value of the variable color 3.	Y	F
147 (0x93)	Variable Color 3 Config - RGB G-value	rw	UInteger	8 bit		0	0 .. 255		Defines the RGB G-value of the variable color 3.	Y	F
148 (0x94)	Variable Color 3 Config - RGB B-value	rw	UInteger	8 bit		255	0 .. 255		Defines the RGB B-value of the variable color 3.	Y	F
12 (0x0C)	Device Access Locks	rw	Record <sup>50</sup>	2 byte					The access to the device parameters can be restricted by setting appropriate flags within this parameter.	Y	F
.1	Parameter Write Access	rw	Boolean	1 bit	0	0	0 1		This lock prevents the write access to all read/write parameters of the device except for the parameter 'Device Access Locks'. <b>Note: Setting this feature to 'Locked', may lead to an unexpected system behavior, as any user application or engineering tool will not have write permissions for device configuration settings.</b> Unlocked Locked	Y	F
.2	Data Storage	rw	Boolean	1 bit	1	0	0 1		This lock prevents the write access to the device parameters via the data storage mechanism. <b>Note: This feature is implemented only for compatibility reasons. Do not set this flag to 'Locked', as this will inhibit the function Data Storage between master and device and lead to an unintended system behavior.</b> Unlocked Locked	Y	F

Parameterization & Configuration											
<i>Index</i> <i>.sub</i>	<i>Parameter</i>	<i>Access</i>	<i>Data type</i>	<i>Length</i>	<i>Bitoffs.</i>	<i>Default</i>	<i>Value</i>	<i>Unit</i>	<i>Description</i>	<i>DS</i>	<i>R</i>
190 (0xBE)	FW-Update Feature Config	rw	UInteger	8 bit		2	0 1 2		Defines the FW-Update feature configuration. <i>FW-Update feature enabled</i> <i>Disable FW-Update feature</i> <i>FW-Update feature disabled</i>		
17341 (0x43BD)	Firmware password	wo	StringT	max. 64 byte					The Device expects the correct password value to be written to this index prior to the unlocking of the firmware/bootloader.		
17343 (0x43BF)	Bootmode status	ro	UInteger	8 bit			0 1		Indicates whether the Bootloader is active or inactive. <i>Bootloader is inactive</i> <i>Bootloader is active</i>		

Observation											
<i>Index</i> <i>.sub</i>	<i>Parameter</i>	<i>Access</i>	<i>Data type</i>	<i>Length</i>	<i>Bitoffs.</i>	<i>Default</i>	<i>Value</i>	<i>Unit</i>	<i>Description</i>	<i>DS</i>	<i>R</i>
32 (0x20)	Error Count	ro	UInteger	16 bit					Number of errors that occurred in the technology-specific application since power on or restart. <i>See Diagnosis – Error Count.</i>		
36 (0x24)	Device Status	ro	UInteger	8 bit					Indicator for the current device condition and diagnosis state. <i>See Diagnosis – Device Status.</i>		
40 (0x28)	PD Input	ro	Record <sup>S0</sup>	8 bit					Last valid process input data of the device. <i>See Process Data Input.</i>		
41 (0x29)	PD Output	ro	Record <sup>S0</sup>	16 bit					Last valid process output data written to the device. <i>See Process Data Output</i>		

NOTE 1: The parameter data provide the attributes DS (Data Storage) and R (Reset behavior). The following rules apply:

DS: Parameter marked with 'Y' (yes) are exchanged with the master via the data storage mechanism.

R: Parameter marked with 'F' are reset to the default value upon reception of the command 'Restore Factory Settings'.

NOTE 2: Parameter with datatype Record or Array, which are marked with 'S0' can only be accessed over subindex 0 (whole parameter object). Subindex access to single items is not possible.

## Command Interface

Index	Parameter	Access	Data type	Length	Value	Description
2 (0x02)	System Command	wo	UInteger	8 bit	See command value	Command interface for applications. A positive acknowledge indicates the complete and correct finalization of the requested function.

Command Value	Command	Description
130 (0x82)	Restore Factory Settings	The parameter of the device are reset to factory settings. Note: A download of the data storage may be executed on the next power cycle and overwrite the factory default settings!
80 (0x50)	BM_UNLOCK_S	Start unlocking sequence
81 (0x51)	BM_UNLOCK_F	Unlocking command 1
82 (0x52)	BM_UNLOCK_T	Unlocking command 2
160 (0xA0)	Disable Update	Disable FW-Update feature

## Error Codes

Code	Additional code	Name	Description
128 (0x80)	17 (0x11)	Index not available	Read or write access attempt to a non-existing index.
128 (0x80)	18 (0x12)	Subindex not available	Read or write access attempt to a non-existing subindex of an existing index.
128 (0x80)	32 (0x20)	Service temporarily not available	Parameter not accessible due to the current state of the technology-specific application.
128 (0x80)	33 (0x21)	Service temporarily not available - local control	Parameter not accessible. The device is currently in an ongoing, locally controlled operation.
128 (0x80)	34 (0x22)	Service temporarily not available - device control	Parameter not accessible. The technology-specific application is currently in a remotely triggered operation.
128 (0x80)	35 (0x23)	Access denied	Write access to a read-only parameter or read access to write-only parameter.
128 (0x80)	48 (0x30)	Parameter value out of range	Written parameter value is outside of the permitted value range.
128 (0x80)	49 (0x31)	Parameter value above limit	Written parameter value is above its specified value range.
128 (0x80)	50 (0x32)	Parameter value below limit	Written parameter value is below its specified value range.
128 (0x80)	51 (0x33)	Parameter length overrun	Written parameter is longer than specified.
128 (0x80)	52 (0x34)	Parameter length underrun	Written parameter is shorter than specified.
128 (0x80)	53 (0x35)	Function not available	Written command is not supported by the technology-specific application.
128 (0x80)	54 (0x36)	Function temporarily unavailable	Written command is unavailable due to the current state of the technology-specific application.
128 (0x80)	64 (0x40)	Invalid parameter set	Written single parameter value collides with other existing parameter settings.
128 (0x80)	65 (0x41)	Inconsistent parameter set	Parameter set inconsistencies at the end of block parameter transfer. Device plausibility check failed.

## Event Codes

Code	Type	Name	Description
4096 (0x1000)	Error	General malfunction	Unknown error
6160 (0x1810)	Error	Illumination Error	The illumination is not working properly and fails.
16384 (0x4000)	Error	Temperature fault	Overload
16928 (0x4220)	Warning	Device temperature underrun	Insulate device
20752 (0x5110)	Warning	Primary supply voltage overrun	Check valid voltage range
20753 (0x5111)	Warning	Primary supply voltage underrun	Check valid voltage range