# IO-Link Data Map

This document refers to the following IODD file: Banner_Engineering-B25_PD-20241017-IODD1.1.xml.

The IODD file and support files can be found on www.bannerengineering.com under the download section of the product family page.

## Communication Parameters

The following communication parameters are used.

| Parameter | Value | | Parameter | Value |
|---|---|---|---|---|
| IO-Link revision | V1.1 | | Port class | A |
| Process Data In length | 16 bits | | SIO mode | Yes |
| Process Data Out length | N/A | | Smart sensor profile | Yes |
| Bit Rate | 38400 bps | | Block parameterization | Yes |
| Minimum cycle time | 2.9 ms | | Data Storage | Yes |
| Device ID | 0x070100 | | | |

## IO-Link Process Data In (Device to Master)

Process Data In is transmitted cyclically to the IO-Link master from the IO-Link device

The B25 IO-Link Process Data is 16 bits and can be configured using parameter data to include the output state, the alarm state, and the device signal. This information is sent to the IO-Link master every 2.9 ms.

## Process Data Configuration

| Subindex | Name | Number of Bits | Data Values |
|---|---|---|---|
| 1 | Output State | 1 | 0 = inactive, 1 = active |
| 2 | Alarm State | 1 | 0 = inactive, 1 = active |
| 3 | Signal Level | 8 | |

| Octet 0 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Subindex | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Bit offset | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 |
| Value | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |

| Octet 1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Subindex | - | - | - | - | - | - | 2 | 1 |
| Bit offset | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Value | n/a | n/a | n/a | n/a | n/a | n/a | 0 | 1 |

### Example based upon the Value above:

Output State = Active
Health Alarm State = Inactive
Signal = 100

## IO-Link Process Data Out (Master to Device)

Not applicable.





243322
p/n: 243322 Rev. A

# Parameters Set Using IO-Link

These parameters can be read from and/or written to an IO-Link model of the B25 sensor. Also included is information about whether the variable in question is saved during Data Storage and whether the variable came from the IO-Link Smart Sensor Profile. Unlike Process Data In, which is transmitted from the IO-Link device to the IO-Link master cyclically, these parameters are read or written acyclically as needed.

| Index | Subindex | Name | Length | Value Range | Default | Access Rights | Data Storage? | Smart Sensor Profile |
|---|---|---|---|---|---|---|---|---|
| 0 | 1–16 | Direct Parameter Page 1 (incl. Vendor ID & Device ID) | | | | ro | | |
| 1 | 1–16 | Direct Parameters Page 2 | | | | rw | | |
| 2 | | Standard Command | | 65 = Single Value Teach<br>71 = Start Dynamic Teach<br>72 = Stop Dynamic Teach<br>79 = Cancel Teach<br>129 = Application Reset<br>162 = Start discovery<br>163 = Stop discovery<br>164 = Set to High Gain Mode | | wo | | y |
| 3 | | Data Storage Index (device-specific list of parameters to be stored) | | | | rw | | |
| 4–11 | | *reserved by IO-Link Specification* | | | | | | |
| **12** | | **Device Access Locks** | | | | | | |
| 12 | 1 | Parameter Write Access Lock | | 0 = off, 1 = on | 0 | rw | y | |
| 12 | 2 | Data Storage Lock | | 0 = off, 1 = on | 0 | rw | y | |
| 12 | 3 | Local Parameterization Lock | | 0 = off, 1 = on | 0 | rw | y | |
| 12 | 4 | Local User Interface Lock | | 0 = off, 1 = on | 0 | rw | y | |
| 13 | | Profile Characteristic | | | | ro | | |
| 14 | | PDInput Descriptor | | | | ro | | |
| 15 | | PDOutput Descriptor | | | | ro | | |
| 16 | | Vendor Name string | 64-octet string | Banner Engineering Corporation | | ro | | |
| 17 | | Vendor Text string | 64-octet string | More Sensors. More Solutions | | ro | | |
| 18 | | Product Name string | 64-octet string | B25 | | ro | | |
| 19 | | Product ID string | | | | ro | | |
| 20 | | Product Text string | | | | ro | | |
| 21 | | Serial Number | | | | ro | | |
| 22 | | Hardware Version | | | | ro | | |
| 23 | | Firmware Version | | | | ro | | |
| 24 | | App Specific Tag (user defined) | | | | rw | y | |
| 25 | | Function Tag | | | | rw | y | |
| 26 | | Location Tag | | | | rw | y | |
| 27–35 | | *reserved* | | | | | | |

Continued on page 3

Continued from page 2

| Index | Subindex | Name | Length | Value Range | Default | Access Rights | Data Storage? | Smart Sensor Profile |
|---|---|---|---|---|---|---|---|---|
| 36 | | Device Status | 8-bit integer | 0 = Device is OK<br>1 = Maintenance required<br>2 = Out of specification<br>3 = Functional check<br>4 = Failure<br>5..255 *Reserved* | | ro | | |
| 37 | | Detailed Device Status | Array[6] of 3-octet | | | ro | | |
| 38–39 | | *reserved* | | | | | | |
| 40 | | Process Data Input | | *see Process Data In* | | ro | | |
| 41 | | Process Data Output | | *see Process Data Out* | | ro | | |
| 42–58 | | *unused/reserved* | | | | | | |
| **59** | | **Teach-In Status** | | | | | | |
| 59 | 1 | Teach State | 4-bit integer | 0 = Idle<br>1 = SP1 Success<br>2 = SP2 Success<br>3 = SP1 SP2 Success<br>4 = Wait for Command<br>5 = Busy<br>7 = Error | | ro | | y |
| **64** | | **Configuration** | | | | | | |
| 64 | 1 | Sensor Button Lockout | 8-bit integer | 0 = Unlocked, 1 = locked | 0 | rw | y | y |
| 64 | 2 | Sensitivity | 8-bit integer | 0 = Low<br>1 = Standard<br>2 = High | 1 | rw | y | y |
| 64 | 3 | Pin2/Channel2 Function | 8-bit integer | 0 = Disabled<br>1 = Remote Teach<br>2 = Detection Output<br>3 = Complementary Output<br>4 = Health Output<br>5 = Alarm Output | 3 | rw | y | y |
| 64 | 4 | Pin2/Pin4 Polarity | 8-bit integer | 0 = NPN<br>1= PNP<br>2 = Pin 2 PNP, Pin 4 Push/Pull | 2 | rw | y | y |
| 64 | 5 | Output Logic | 8-bit integer | 0 = Light Operate, 1 = Dark Operate | 1 | rw | y | y |
| 64 | 6 | Output Delay mode | 8-bit integer | 0 = No Delay, 1 = On/Off Delay | 0 | rw | y | y |
| 64 | 7 | Output On Delay | 8-bit integer | | 10 ms | rw | y | y |
| 64 | 8 | Output Off Delay | 8-bit integer | | 10 ms | rw | y | y |
| 64 | 9 | Dynamic Teach Timeout Mode | 8-bit integer | 0 = Cancel Teach, 1 = Stop Teach | 1 | rw | y | y |
| 64 | 10 | Dynamic Teach Timeout Duration | 8-bit integer | | 120 s | rw | y | y |

Continued on page 4

Continued from page 3

| Index | Subindex | Name | Length | Value Range | Default | Access Rights | Data Storage? | Smart Sensor Profile |
|---|---|---|---|---|---|---|---|---|
| 64 | 11 | Alarm Threshold | 8-bit Uinteger | | 25 | rw | y | y |
| 64 | 12 | Display Disable | 8-bit Uinteger | 0 = Display Enabled, 1 = Display disabled | 0 | rw | y | y |
| 64 | 13 | Drift Filter | 8-bit Uinteger | 0 = Disabled, 1 = Enabled | 1 | rw | y | y |
| 64 | 14 | Signal Mode | 8-bit Uinteger | 0 = Signal, 1 = Switch Point Centric Signal | 0 | rw | y | y |
| **67** | | **Status** | | | | | | |
| 67 | 1 | Output state | 8-bit Uinteger | 0 = Inactive<br>1 = Active | | ro | | |
| 67 | 2 | Signal Level | 8-bit Uinteger | | | ro | | |
| 67 | 3 | Internal Temperature Measurement | 32-bit integer | | | ro | | |
| 67 | 4 | Internal Temperature Measurement the last time device was taught | 32-bit integer | | | ro | | |
| 67 | 5 | Quality of Teach | 8-bit Uinteger | 0 = Not Taught, 1 = Good, 2 = Bad, 3 = High Gain | | ro | | |
| 67 | 6 | Alarm State | 8-bit Uinteger | 0 = No Alarm, 1 = Alarm | | ro | | |
| 67 | 7 | Sensor Health | 8-bit Uinteger | | | ro | | |
| **69** | | **All-Time Run Time** | | | | | | |
| 69 | 1 | Run counter | 32-bit integer | | | rw | y | |
| **70** | | **Resettable Run Time** | | | | | | |
| 70 | 1 | Run counter | 32-bit integer | | | rw | y | |
| **76** | | **All-Time Run Time Event Time** | | | | | | |
| 76 | 1 | Event Time | 32-bit integer | 0–2147483647 | | rw | y | |
| **77** | | **Resettable Run Time Event Time** | | | | | | |
| 77 | 1 | Event Time | 32-bit integer | 0–2147483647 | | rw | y | |

# IO-Link Events

Events are acyclic transmissions from the IO-Link device to the IO-Link master. Events can be error messages and/or warning or maintenance data.

| Code | Type | Name | Description |
|---|---|---|---|
| 25376 (0x6320) | Error | Parameter error | Check data sheet and values. |
| 36000 (0x8ca0) | Warning | All-time Run Time Event | Event indicating the corresponding configured running time has elapsed. |
| 36001 (0x8ca1) | Warning | Resettable Run Time Event | Event indicating the corresponding configured running time has elapsed. |
| 36003 (0x8ca3) | Notification | Teach Completed Event | Event indicating a teach has been completed. |
| 36004 (0x8ca4) | Notification | Factory Settings Restored Event | Event indicating that the factory settings have been restored. |
| 36007 (0x8ca7) | Notification | Teach Failed Event | Event indicating an invalid target condition was attempted to be taught. Taught setpoint was not updated. |
| 36097 (0x8d01) | Error | System Fault Event | Contact Banner Engineering to resolve. |