S22 Pro Touch Button with IO-Link Product Manual

Original Instructions
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Chapter Contents

Models 3

Chapter 1 Features



- IO-Link control allows access to full color, flashing, and dimming controls as well as advanced animations
- Bright, uniform touch button
- 22 mm threaded polycarbonate base
- Up to fourteen colors in one device (Green, Red, Yellow, Blue, White, Cyan, Magenta, Orange, Amber, Lime Green, Spring Green, Sky Blue, Violet, and Rose)
- Translucent polycarbonate surface
- Rugged IP67, IP69K per ISO 20653 and UL Type 4X and UL Type 13 design
- Excellent immunity to false triggering by water spray, detergents, oils, and other foreign materials
- Ergonomically designed to eliminate hand, wrist, and arm stresses associated with repeated switch operation; no physical force required to operate
- Can be actuated with bare hands or gloves; sensitivity can be adjusted

WARNING:

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

Models

Model Name	Style	Color and Input	Connector[1]
S22	**PT**	**K**	**Q**
	PT = Pro Touch Button	K = IO-Link	Q = Integral 5-pin M12 male quick-disconnect connector

[1] Models with a quick-disconnect connector require a mating cordset.

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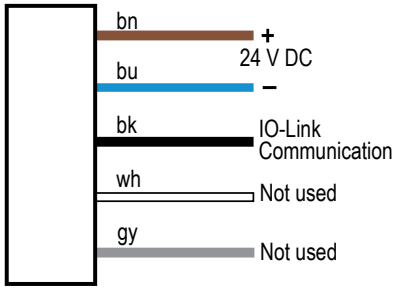
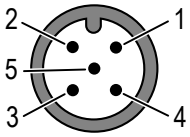
Chapter 2 Wiring

Diagram	Pinout
	 1 = Brown (bn) 2 = White (wh) 3 = Blue (bu) 4 = Black (bk) 5 = Gray (gy)

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Chapter 3 IO-Link Data Map

S22 Pro Touch Button with IO-Link

Vendor ID	451 (0x01c3)
Vendor Name	Banner Engineering Corporation
Vendor Text	More Sensors. More Solutions.
Vendor URL	www.bannerengineering.com/io-link
Device ID	393243 (0x06001b)
Device Family	S22 IOL

Features

Block Parameter	Yes
Data Storage	Yes
Supported Access Locks	Parameter: Yes Data Storage: Yes Local Parameterization: No Local User Interface: No

Communication

IO-Link Revision	V1.1
Transmission Rate	38400 bit/s (COM2)
Minimum Cycle Time	5 ms
SIO Mode Supported	No

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M-Sequence Capability	PREOPERATE = TYPE_0 with 1 octet on-request data
	OPERATE = TYPE_2_V with 1 octet on-request data
	ISDU supported

Device Variant

Description	S22 Pro Touch Button with IO-Link
Product ID	S22PTKQ
Connection Type	5-pin M12 male
Connection Description	IO-Link quick-disconnect connector
- Pin 1	Brown: L+
- Pin 2	White: Other
- Pin 3	(light) Blue: L-
- Pin 4	Black: C/Q
- Pin 5	Gray: Not used

Process Data: Multicolor Mode

Use process data to activate the defined device state. Use parameter data to define output settings, control delays, color, intensity, flash, and other animation types for State 1, State 2, State 3, and State 4.

Process Data In

Bit Length: 16

Data Type: 16-bit record (subindex access not supported)

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Name	Description
1	8	Boolean	false = Inactive true = Active	false	Output State	Output State. Related parameters are defined in the output and touch settings Parameter Data.
2	0	2-bit UInteger	0 = State 1 1 = State 2 2 = State 3 3 = State 4	0	State	Animation State. Related parameters are defined in Four State Full Logic and Multicolor Parameter Data.

Process Data Out

Bit Length: 48

Data Type: 48-bit record (subindex access not supported)

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Name	Description
1	40	2-bit UInteger	0 = State 1 1 = State 2 2 = State 3 3 = State 4	0	State	Animation State. Related parameters are defined in Four State Full Logic and Multicolor Parameter Data.

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Process Data: Four State Logic Full Logic Mode

Use process data to define the Job State and to read the touch button state and device state (Waiting State, Mispick State, Job State, Acknowledge State). Use parameter data to define color, intensity, flash, speed, select animation type, and define output settings.

Process Data In

Bit Length: 16

Data Type: 16-bit record (subindex access not supported)

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Name	Description
1	8	Boolean	false = Inactive true = Active	false	Output State	Output State. Related parameters are defined in the output and touch settings Parameter Data.
2	0	2-bit UInteger	0 = State 1 1 = State 2 2 = State 3 3 = State 4	0	State	Animation State. Related parameters are defined in Four State Logic Full Logic and Multicolor Parameter Data.

Process Data Out

Bit Length: 48

Data Type: 48-bit record (subindex access not supported)

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Name	Description
1	40	Boolean	false = Off true = On	false	Job Input	Job Input for Four State Logic Full Logic mode.

Process Data: Advanced Mode

Use process data to control color, intensity, flash, and other animation types. Use parameter data to create custom colors, intensity, speeds, and to define output and touch settings.

Process Data In

Bit Length: 16

Data Type: 16-bit record (subindex access not supported)

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Name	Description
1	8	Boolean	false = Inactive true = Active	false	Output State	Output State. Related parameters are defined in the output and touch settings Parameter Data.

Process Data Out

Bit Length: 48

Data Type: 48-bit record (subindex access not supported)

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Name	Description
1	40	3-bit UInteger	0 = Off 1 = Steady 2 = Flash 3 = Two Color Flash 4 = Intensity Sweep 5 = Color Sweep	0	Animation Type	The animation type.
2	43	3-bit UInteger	0 = Flash 1 = Strobe 2 = Three Pulse 3 = SOS 4 = Random	0	Animation Pattern	The pattern of the animation.
3	46	2-bit UInteger	0 = Slow 1 = Medium 2 = Fast 3 = Custom	0	Animation Speed	The speed of the animation.
4	8	5-bit UInteger	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0	Color 1	The main color of the animation. Custom Colors are defined in Parameter Data.
5	13	3-bit UInteger	0 = High 1 = Medium 2 = Low 3 = Off 4 = Custom	0	Color 1 Intensity	The intensity of Color 1. Custom Intensity is defined in Parameter Data.

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Name	Description
6	0	5-bit UInteger	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0	Color 2	The secondary color of the animation. Custom Colors are defined in Parameter Data.
7	5	3-bit UInteger	0 = High 1 = Medium 2 = Low 3 = Off 4 = Custom	0	Color 2 Intensity	The intensity of Color 2. Custom Intensity is defined in Parameter Data.

Index 0: Direct Parameters 1

Data Type: 128-bit Record

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	120	8-bit UInteger		0	RO	Reserved	
2	112	8-bit UInteger		0	RO	Master Cycle Time	
3	104	8-bit UInteger		0	RO	Min Cycle Time	
4	96	8-bit UInteger		0	RO	M-Sequence Capability	
5	88	8-bit UInteger		17	RO	IO-Link Version ID	
6	80	8-bit UInteger		0	RO	Process Data Input Length	
7	72	8-bit UInteger		0	RO	Process Data Output Length	
8	64	8-bit UInteger		0	RO	Vendor ID 1	
9	56	8-bit UInteger		0	RO	Vendor ID 2	
10	48	8-bit UInteger		0	RO	Device ID 1	
11	40	8-bit UInteger		0	RO	Device ID 2	
12	32	8-bit UInteger		0	RO	Device ID 3	

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
13	24	8-bit UInteger		0	RO	Reserved	
14	16	8-bit UInteger		0	RO	Reserved	
15	8	8-bit UInteger		0	RO	Reserved	
16	0	8-bit UInteger	130 = Restore Factory Settings	0	WO	Standard Command	

Index 1: Direct Parameters 2

Data Type: 128-bit Record

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	120	8-bit UInteger		0		Device Specific Parameter 1	
2	112	8-bit UInteger		0		Device Specific Parameter 2	
3	104	8-bit UInteger		0		Device Specific Parameter 3	
4	96	8-bit UInteger		0		Device Specific Parameter 4	
5	88	8-bit UInteger		0		Device Specific Parameter 5	
6	80	8-bit UInteger		0		Device Specific Parameter 6	
7	72	8-bit UInteger		0		Device Specific Parameter 7	
8	64	8-bit UInteger		0		Device Specific Parameter 8	
9	56	8-bit UInteger		0		Device Specific Parameter 9	
10	48	8-bit UInteger		0		Device Specific Parameter 10	
11	40	8-bit UInteger		0		Device Specific Parameter 11	
12	32	8-bit UInteger		0		Device Specific Parameter 12	
13	24	8-bit UInteger		0		Device Specific Parameter 13	
14	16	8-bit UInteger		0		Device Specific Parameter 14	
15	8	8-bit UInteger		0		Device Specific Parameter 15	
16	0	8-bit UInteger		0		Device Specific Parameter 16	

Index 2: Standard Command

Data Type: 8-bit UInteger

Allowed Values: 130 = Restore Factory Settings

Access Rights: WO

Modifies other variables.

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Index 12: Device Access Locks

Data Type: 16-bit Record (subindex access not supported)

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	0	Boolean		FALSE		Parameter (write) Access Lock	
2	1	Boolean		FALSE		Data Storage Lock	
3	2	Boolean				Local Parameterization Lock	
4	3	Boolean				Local User Interface Lock	

Index 16: Vendor Name

Data Type: 30-octet String UTF-8

Default Value: "Banner Engineering Corporation"

Access Rights: RO

Index 17: Vendor Text

Data Type: 29-octet String UTF-8

Default Value: "More Sensors. More Solutions."

Access Rights: RO

Index 18: Product Name

Data Type: 32-octet String UTF-8

Access Rights: RO

Index 19: Product ID

Data Type: 32-octet String UTF-8

Access Rights: RO

Index 20: Product Text

Data Type: 32-octet String UTF-8

Default Value: "S22 Touch with IOL"

Access Rights: RO

Index 21: Serial Number

Data Type: 16-octet String UTF-8

Access Rights: RO

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Index 22: Hardware Version
Data Type: 64-octet String UTF-8

Access Rights: RO

Index 23: Firmware Revision
Data Type: 16-octet String UTF-8

Access Rights: RO

Index 24: Application Specific Tag
Data Type: 32-octet String UTF-8

Access Rights: RW

Index 36: Device Status
Data Type: 8-bit UInteger

Allowed Values:
- 0 = Device is OK
- 1 = Maintenance required
- 2 = Out of specification
- 3 = Functional check
- 4 = Failure
- 5..255 = Reserved

Access Rights: RO

Dynamic

Index 37: Detailed Device Status
Data Type: Array[6] of 3-octet OctetString (subindex access not supported)

Access Rights: RO

Dynamic

Index 80: Operation Mode
Description: Operation Mode

Data Type: 3-bit UInteger

Allowed Values:
- 0 = Multicolor
- 1 = Four State Logic Full Logic
- 2 = Advanced
- 3 = Demo (Cycles through color spectrum, two color sweep, and intensity sweep mode.)

Default Value: 2

Access Rights: RW

Index 81: Custom Animation Settings
Description: Settings

Data Type: 24-bit Record (subindex access not supported)

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Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	0	8-bit UInteger	0..100	100		Custom Intensity (0 - 100%)	Configure the desired custom intensity.
2	8	8-bit UInteger	5..255	15		Custom Flash Rate (0.5 - 25.5 Hz)	Configure the desired custom flash rate.
3	16	8-bit UInteger	0 = Off 1 = On	0		Restrict To Gamut	Turn on to show more consistent colors from device to device.

Index 82: Input Settings

Description: User Input Settings

Data Type: 24-bit Record (subindex access not supported)

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	0	2-bit UInteger	0 = Low 1 = Standard 2 = High	1		Touch Sensitivity	Defines the sensitivity of the touch button. High sensitivity will allow easier actuation. Low sensitivity will prevent false actuation.
2	2	Boolean	false = Momentary true = Latched	FALSE		Function	In Momentary mode, the output is active only while the user/ touch input is activated. In Latching mode, the output is active each time the input/touch is activated.
3	3	Boolean	false = Off true = On	FALSE		Mute Enable	Prevents the user/ touch input from activating the output.
4	8	16-bit UInteger	0..65535	0		On Delay (ms)	The length of time the user/touch input needs to be activated to trigger the active state.

Index 83: Output Settings

Description: Output Settings

Data Type: 24-bit Record (subindex access not supported)

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	0	Boolean	false = Normally Closed true = Normally Open	TRUE		Output State	When defined as normally open, the output is active with a user/touch input. When defined as normally closed, the output is inactive with a user/ touch input.

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
2	1	Boolean	false = Leading Edge true = Trailing Edge	FALSE		Off Delay Type	A leading edge delay is triggered on the rising edge of a user/touch input. A trailing edge delay is triggered on the falling edge of a user/touch input.
3	8	16-bit UInteger	0..65535	0		Off Delay (ms)	The length of time before the device returns to the inactive state after user/touch input is released.

Index 84: State Parameters 1

Description: State 1 Parameters

Data Type: 48-bit Record

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	0	3-bit UInteger	0 = Off 1 = Steady 2 = Flash 3 = Two Color Flash 4 = Intensity Sweep 5 = Color Sweep	1		Animation Type	The animation type.
2	3	3-bit UInteger	0 = Flash 1 = Strobe 2 = Three Pulse 3 = SOS 4 = Random	0		Animation Pattern	The pattern of the animation.
3	6	2-bit UInteger	0 = Slow 1 = Medium 2 = Fast 3 = Custom	1		Animation Speed	The speed of the animation.
4	8	Boolean	false = Leading Edge true = Trailing Edge	FALSE		Off Delay Type	A leading edge delay is triggered on the rising edge of a user/touch input. A trailing edge delay is triggered on the falling edge of a user/touch input.
5	16	16-bit UInteger	0..65535	0		Off Delay (ms)	The length of time before the device returns to the inactive state after user/touch input is released.

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
6	32	5-bit UInteger	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0		Color 1	The main color of the animation. Custom Colors are defined in Parameter Data.
7	37	3-bit UInteger	0 = High 1 = Medium 2 = Low 3 = Off 4 = Custom	0		Color 1 Intensity	The intensity of Color 1. Custom Intensity is defined in Parameter Data.
8	40	5-bit UInteger	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0		Color 2	The secondary color of the animation. Custom Colors are defined in Parameter Data.

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
9	45	3-bit UInteger	0 = High 1 = Medium 2 = Low 3 = Off 4 = Custom	0		Color 2 Intensity	The intensity of Color 2. Custom Intensity is defined in Parameter Data.

Index 85: State Parameters 2

Description: State 2 Parameters

Data Type: 48-bit Record

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	0	3-bit UInteger	0 = Off 1 = Steady 2 = Flash 3 = Two Color Flash 4 = Intensity Sweep 5 = Color Sweep	1		Animation Type	The animation type.
2	3	3-bit UInteger	0 = Flash 1 = Strobe 2 = Three Pulse 3 = SOS 4 = Random	0		Animation Pattern	The pattern of the animation.
3	6	2-bit UInteger	0 = Slow 1 = Medium 2 = Fast 3 = Custom	1		Animation Speed	The speed of the animation.
4	8	Boolean	false = Leading Edge true = Trailing Edge	FALSE		Off Delay Type	A leading edge delay is triggered on the rising edge of a user/touch input. A trailing edge delay is triggered on the falling edge of a user/touch input.
5	16	16-bit UInteger	0..65535	0		Off Delay (ms)	The length of time before the device returns to the inactive state after user/touch input is released.

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
6	32	5-bit UInteger	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0		Color 1	The main color of the animation. Custom Colors are defined in Parameter Data.
7	37	3-bit UInteger	0 = High 1 = Medium 2 = Low 3 = Off 4 = Custom	0		Color 1 Intensity	The intensity of Color 1. Custom Intensity is defined in Parameter Data.
8	40	5-bit UInteger	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0		Color 2	The secondary color of the animation. Custom Colors are defined in Parameter Data.

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
9	45	3-bit UInteger	0 = High 1 = Medium 2 = Low 3 = Off 4 = Custom	0		Color 2 Intensity	The intensity of Color 2. Custom Intensity is defined in Parameter Data.

Index 86: State Parameters 3

Description: State 3 Parameters

Data Type: 48-bit Record

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	0	3-bit UInteger	0 = Off 1 = Steady 2 = Flash 3 = Two Color Flash 4 = Intensity Sweep 5 = Color Sweep	1		Animation Type	The animation type.
2	3	3-bit UInteger	0 = Flash 1 = Strobe 2 = Three Pulse 3 = SOS 4 = Random	0		Animation Pattern	The pattern of the animation.
3	6	2-bit UInteger	0 = Slow 1 = Medium 2 = Fast 3 = Custom	1		Animation Speed	The speed of the animation.
4	8	Boolean	false = Leading Edge true = Trailing Edge	FALSE		Off Delay Type	A leading edge delay is triggered on the rising edge of a user/touch input. A trailing edge delay is triggered on the falling edge of a user/touch input.
5	16	16-bit UInteger	0..65535	0		Off Delay (ms)	The length of time before the device returns to the inactive state after user/touch input is released.

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
6	32	5-bit UInteger	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0		Color 1	The main color of the animation. Custom Colors are defined in Parameter Data.
7	37	3-bit UInteger	0 = High 1 = Medium 2 = Low 3 = Off 4 = Custom	0		Color 1 Intensity	The intensity of Color 1. Custom Intensity is defined in Parameter Data.
8	40	5-bit UInteger	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0		Color 2	The secondary color of the animation. Custom Colors are defined in Parameter Data.

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
9	45	3-bit UInteger	0 = High 1 = Medium 2 = Low 3 = Off 4 = Custom	0		Color 2 Intensity	The intensity of Color 2. Custom Intensity is defined in Parameter Data.

Index 87: State Parameters 4

Description: State 4 Parameters

Data Type: 48-bit Record

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	0	3-bit UInteger	0 = Off 1 = Steady 2 = Flash 3 = Two Color Flash 4 = Intensity Sweep 5 = Color Sweep	1		Animation Type	The animation type.
2	3	3-bit UInteger	0 = Flash 1 = Strobe 2 = Three Pulse 3 = SOS 4 = Random	0		Animation Pattern	The pattern of the animation.
3	6	2-bit UInteger	0 = Slow 1 = Medium 2 = Fast 3 = Custom	1		Animation Speed	The speed of the animation.
4	8	Boolean	false = Leading Edge true = Trailing Edge	FALSE		Off Delay Type	A leading edge delay is triggered on the rising edge of a user/touch input. A trailing edge delay is triggered on the falling edge of a user/touch input.
5	16	16-bit UInteger	0..65535	0		Off Delay (ms)	The length of time before the device returns to the inactive state after user/touch input is released.

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Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
6	32	5-bit UInteger	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0		Color 1	The main color of the animation. Custom Colors are defined in Parameter Data.
7	37	3-bit UInteger	0 = High 1 = Medium 2 = Low 3 = Off 4 = Custom	0		Color 1 Intensity	The intensity of Color 1. Custom Intensity is defined in Parameter Data.
8	40	5-bit UInteger	0 = Green 1 = Red 2 = Orange 3 = Amber 4 = Yellow 5 = Lime Green 6 = Spring Green 7 = Cyan 8 = Sky Blue 9 = Blue 10 = Violet 11 = Magenta 12 = Rose 13 = White 14 = Custom1 15 = Custom2	0		Color 2	The secondary color of the animation. Custom Colors are defined in Parameter Data.

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Continued from page 21

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
9	45	3-bit UInteger	0 = High 1 = Medium 2 = Low 3 = Off 4 = Custom	0		Color 2 Intensity	The intensity of Color 2. Custom Intensity is defined in Parameter Data.

Index 89: Custom Color 1 Configuration

Description: Custom Color 1

Data Type: 24-bit Record (subindex access not supported)

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	0	8-bit UInteger	0..255	255		Red	The red value for Custom Color 1.
2	8	8-bit UInteger	0..255	255		Green	The green value for Custom Color 1.
3	16	8-bit UInteger	0..255	255		Blue	The blue value for Custom Color 1.

Index 90: Custom Color 2 Configuration

Description: Custom Color 2

Data Type: 24-bit Record (subindex access not supported)

Access Rights: RW

Subindex	Bit Offset	Data Type	Allowed Values	Default Value	Acc. Restr.	Name	Description
1	0	8-bit UInteger	0..255	255		Red	The red value for Custom Color 1.
2	8	8-bit UInteger	0..255	255		Green	The green value for Custom Color 1.
3	16	8-bit UInteger	0..255	255		Blue	The blue value for Custom Color 1.

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Chapter Contents

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Chapter 4 Specifications

Supply Voltage

18 V DC to 30 V DC

Supply Current

25 mA maximum current at 18 V DC

20 mA maximum current at 24 V DC

20 mA maximum current at 30 V DC

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Touch Dwell Time

If touch dwells for longer than 60 seconds, the output will revert back to the untouched state.

Connections

Integral 5-pin M12 male quick-disconnect connector

Models with a quick-disconnect connector require a mating cordset

Mounting

M22 by 1.5 threaded base, maximum torque 2.25 N·m (20 inch·lbf)

Mounting nut included

Default Indicator Characteristics

Color	Dominant Wavelength (nm) or Color Temperature (CCT)	Color Coordinates[2]		Lumen Output (Typical at 25 °C)
		x	y	
Green	527	0.178	0.7	0.175
Red	625	0.699	0.297	0.075
Yellow	572	0.438	0.5	0.25
Blue	465	0.141	0.056	0.025
White	5700K	0.328	0.337	0.24
Cyan	492	0.192	0.336	0.195
Magenta	–	0.354	0.149	0.095
Amber	585	0.52	0.434	0.165
Rose	–	0.506	0.213	0.085
Lime Green	557	0.35	0.564	0.21
Sky Blue	485	0.167	0.24	0.165
Orange	597	0.594	0.379	0.13
Violet	424	0.184	0.085	0.045
Spring Green	507	0.167	0.517	0.18

[2] Refer to the CIE 1930 (x,y) Chromaticity Diagram, to show equivalent color with indicated color coordinates.

Construction

Base, Dome, and Nut: Polycarbonate

Vibration and Mechanical Shock

Meets IEC 60068-2-6 requirements (Vibration: 10 Hz to 55 Hz, 1.0 mm amplitude, 5 minutes sweep, 30 minutes dwell)

Meets IEC 60068-2-27 requirements (Shock: 30G 11 ms duration, half sine wave)

Operating Conditions

–40 °C to +50 °C (–40 °F to +122 °F)

90% at +50 °C maximum relative humidity (non-condensing)

Storage Temperature: –40 °C to +70 °C (–40 °F to +158 °F)

Environmental Rating

IP67, IP69K per ISO 20653

Certifications

Banner Engineering BV
Park Lane, Culliganlaan 2F bus 3
1831 Diegem, BELGIUM

Required Overcurrent Protection

WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.

Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.

Supply wiring leads < 24 AWG shall not be spliced.

For additional product support, go to www.bannerengineering.com.

Supply Wiring (AWG)	Required Overcurrent Protection (A)	Supply Wiring (AWG)	Required Overcurrent Protection (A)
20	5.0	26	1.0
22	3.0	28	0.8
24	2.0	30	0.5

FCC Part 15 Class B for Unintentional Radiators

(Part 15.105(b)) This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate

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radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

(Part 15.21) Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

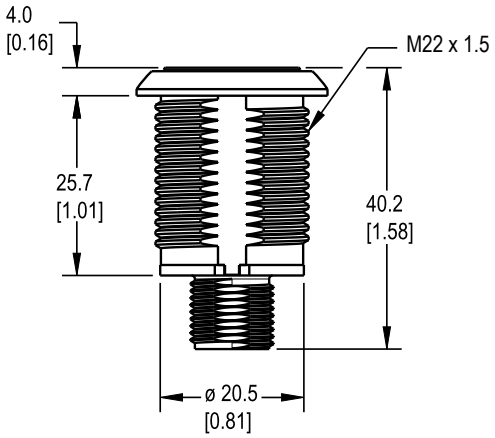
Industry Canada ICES-003(B)

This device complies with CAN ICES-3 (B)/NMB-3(B). Operation is subject to the following two conditions: 1) This device may not cause harmful interference; and 2) This device must accept any interference received, including interference that may cause undesired operation.

Cet appareil est conforme à la norme NMB-3(B). Le fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne peut pas occasionner d'interférences, et (2) il doit tolérer toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité du dispositif.

Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise. The measurements provided are subject to change.



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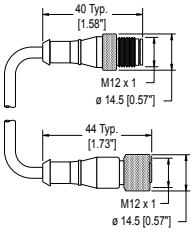
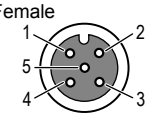
Chapter Contents

Cordsets 25
Brackets 25

Chapter 5 Accessories

Cordsets

4-pin A-Code Double-Ended M12 Female to M12 Male Cordsets (datasheet p/n 236186)				
Model	**Length**	**Dimensions (mm)**	**Pinouts**	
BC-M12F4-M12M4-22-1	1 m (3.28 ft)		Female  Male 	1 = Brown 2 = White 3 = Blue 4 = Black 5 = Unused c UL us LISTED
BC-M12F4-M12M4-22-2	2 m (6.56 ft)			
BC-M12F4-M12M4-22-3	3 m (9.84 ft)			
BC-M12F4-M12M4-22-4	4 m (13.12 ft)			
BC-M12F4-M12M4-22-5	5 m (16.4 ft)			
BC-M12F4-M12M4-22-10	10 m (30.81 ft)			
BC-M12F4-M12M4-22-15	15 m (49.2 ft)			

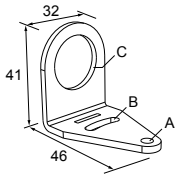
Brackets

All measurements are listed in millimeters, unless noted otherwise. The measurements provided are subject to change.

SMB22A

- Right-angle bracket with curved slot for versatile orientation
- 12-ga. stainless steel
- Mounting hole for 22 mm sensor
- CAD Files: DXF, PDF, IGS, STP

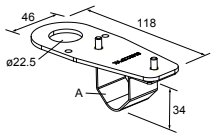
Hole center spacing: A to B = 26.0
Hole size: A = ø 4.6, B = 4.6 x 16.9, C = 22.2



SMB22FVK

- V-clamp, flat bracket and fasteners for mounting to pipe or extensions
- Clamp accommodates 28 mm diameter tubing or 1 in. square extrusions
- 22 mm hole for mounting sensor
- CAD Files: DXF, PDF, IGS, STP

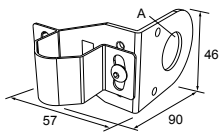
Hole size: A = ø 22.5



SMB22RAVK

- V-clamp, right-angle bracket and fasteners for mounting to pipe or extensions
- Clamp accommodates 28 mm diameter tubing or 1 in. square extrusions
- 22 mm hole for mounting sensor
- CAD Files: DXF, PDF, IGS, STP

Hole size: A = ø 22.5



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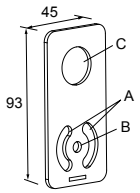
SMBAMS22P

- Flat SMBAMS series bracket with 22 mm hole for mounting sensors
- Articulation slots for 90+° rotation
- 12-ga. (2.6 mm) cold-rolled steel
- CAD Files: DXF, PDF, IGS, STP

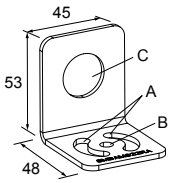
Hole center spacing: A = 26.0, A to B = 13.0
Hole size: A = 26.8 x 7.0, B = ø 6.5, C = ø 22.5



SMBAMS22RA

- Right-angle SMBAMS series bracket with 22 mm hole for mounting sensors
- Articulation slots for 90+° rotation
- 12-ga. (2.6 mm) cold-rolled steel
- CAD Files: DXF, PDF, IGS, STP

Hole center spacing: A = 26.0, A to B = 13.0
Hole size: A = 26.8 x 7.0, B = ø 6.5, C = ø 22.5



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Chapter 6 Product Support and Maintenance

Animation Definitions

The following table describes the definitions for device states.

Name	Description
Animation Type:	
Off	Indicator is off
Steady	Color 1 is solid on at defined intensity
Flash	Color 1 flashes at defined speed, color intensity, and pattern
Two Color Flash	Color 1 and Color 2 flash alternately at defined speed, color intensities, and pattern
Intensity Sweep	Color 1 repeatedly increases and decreases intensity between 0% to 100% at defined speed and color intensity
Color Sweep	Color 1 and Color 2 transition alternately at defined speed and color intensities
Animation Pattern	Defines the flash pattern for flash and two color flash animations (normal, strobe, three pulse, SOS, or random)
Animation Speed	Defines the animation speed (slow, medium, fast, or custom)
Off Delay Type	Defines if the Off Delay should be measured from when the conditions for the State began (Leading Edge) or from when the conditions ended (Trailing Edge)
Off Delay (ms)	The duration of the animation Off Delay. Leading Edge Off Delays can be used to ensure the animation is active for at least a minimum amount of time.
Color 1	Defines Color 1 of defined animation
Color 1 Intensity	Defines the intensity of Color 1 in the animation (high, medium, low, off, or custom)
Color 2	Defines Color 2 of defined animation
Color 2 Intensity	Defines the intensity of Color 2 in the animation (high, medium, low, off, or custom)

Clean with Mild Detergent and Warm Water

Wipe down the device with a soft cloth dampened with a mild detergent and warm water solution. Do not use any other chemicals for cleaning.

Repairs

Contact Banner Engineering for troubleshooting of this device. **Do not attempt any repairs to this Banner device; it contains no field-replaceable parts or components.** If the device, device part, or device component is determined to be defective by a Banner Applications Engineer, they will advise you of Banner's RMA (Return Merchandise Authorization) procedure.

> **IMPORTANT:** If instructed to return the device, pack it with care. Damage that occurs in return shipping is not covered by warranty.

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Contact Us

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For worldwide locations and local representatives, visit www.bannerengineering.com.

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