



## Two-Hand Control

Modules monitor the output of each Banner STB self-checking touch button or electromechanical button and deenergizes when the machine operator removes one or both hands from the buttons, providing protection for the worker actuating the hand controls.

Series	Description	Protection Rating	Power Supply
 <p><b>Two Hand-Control Module</b> page 840</p>	<p>Category 4 (module); Type IIIC</p>	<p>24 V ac/dc, 115 V ac/24 V dc or 230 V ac/24 V dc, depending on model</p>	
 <p><b>STB Buttons</b> page 844</p>	<p>Dependent on controller/module</p>	<p>10 - 30 V dc or 20-30 V ac/dc depending on model</p>	
 <p><b>Run Bar</b> page 848</p>	<p>Dependent on controller/module</p>	<p>10 to 30 V dc</p>	



## DUO-TOUCH® SG Two-Hand Control Modules

### Two-Hand Control

Modules work with existing electromechanical palm buttons or with Banner's STB Self-Checking Touch Buttons to create a complete, ergonomic two-hand control system.

- Anti-tiedown logic requires both touch buttons to be activated within one-half second or less of each other
- Modules easily interface with DUO-TOUCH® Run Bars with STBs for an economical, convenient means for actuation
- Designed to meet OSHA/ANSI Control Reliability requirements and Category 4 per ISO 13849-1 (EN 954-1) and functional Type IIIC Two-Hand Control per ISO 13851 (EN 574)
- Relay outputs are capable of reliably switching low or high current applications (depending on model)

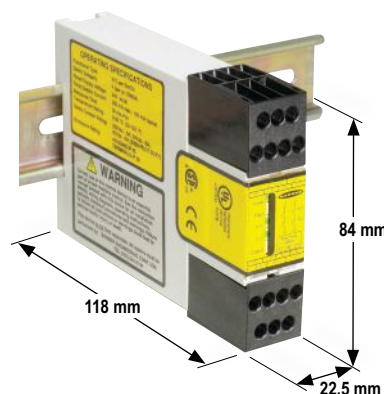
### DUO-TOUCH® SG Two-Hand Control Modules

Supply Voltage	Inputs	Safety Outputs	Output Rating	Auxiliary Outputs	Muting	Terminals	Model
24 V ac/dc	2 STB*	2 NO	6 amps	—	—	Removable	<b>AT-FM-10K</b>
115 V ac/24 V dc	2 STB*	4 NO	6 amps	1 NPN, 1 PNP & 1 NC	—	Removable	<b>AT-GM-13A</b>
230 V ac/24 V dc	2 STB*	4 NO	6 amps	1 NPN, 1 PNP & 1 NC	—	Removable	<b>AT-HM-13A</b>

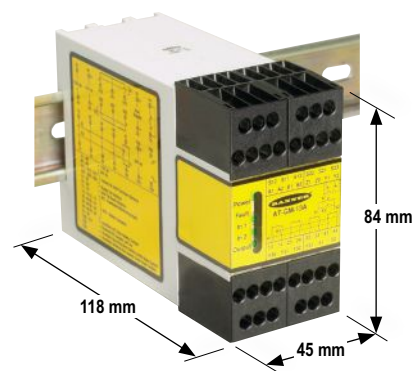
NC = Normally Closed, NO = Normally Open

\* May also use two electromechanical push buttons, each with one normally open (NO) and one normally closed (NC) contact (Form C). See data sheets for details.

NOTE: Kits are available which include one DUO-TOUCH SG Safety Module and two STB Touch Buttons. STB Touch Buttons are also available separately. See page 844.






AT-FM-10K Model









AT-GM-13A & AT-HM-13A Models  
(AT-GM-13A shown)

**DUO-TOUCH® SG Kits — Solid-State STB Touch Buttons (Meets Category IIIC)**

Kit Components						Kit
DUO-TOUCH® SG Safety Module	STB Touch Buttons (see page 844)	Supply Voltage	Safety Outputs	Auxiliary Outputs	Connection	Includes 2 STB Touch Buttons & a DUO-TOUCH® SG Safety Module
 <b>AT-FM-10K</b>	STBVP6	24 V ac/dc	2 NO	–	2 m	<b>ATK-VP6</b>
	STBVP6Q				4-Pin Mini QD	<b>ATK-VP6Q</b>
	STBVP6Q5				4-Pin Euro QD	<b>ATK-VP6Q5</b>
 <b>AT-GM-13A</b>	STBVP6	115 V ac/ 24 V dc	4 NO	1 NPN, 1 PNP & 1 NC	2 m	<b>ATGMK-VP6</b>
	STBVP6Q				4-Pin Mini QD	<b>ATGMK-VP6Q</b>
	STBVP6Q5				4-Pin Euro QD	<b>ATGMK-VP6Q5</b>
 <b>AT-HM-13A</b>	STBVP6	230 V ac/ 24 V dc	4 NO	1 NPN, 1 PNP & 1 NC	2 m	<b>ATHMK-VP6</b>
	STBVP6Q				4-Pin Mini QD	<b>ATHMK-VP6Q</b>
	STBVP6Q5				4-Pin Euro QD	<b>ATHMK-VP6Q5</b>

NC = Normally Closed, NO = Normally Open

## DUO-TOUCH® SG AT-FM-10K Modules Specifications

Supply Voltage and Current	24 V dc $\pm 15\%$ @ 150 mA (use a SELV-rated supply according to EN IEC 60950, NEC Class 2) 24 V ac $\pm 15\%$ @ 150 mA, 50-60 Hz $\pm 5\%$ (use an NEC Class 2-rated transformer) To comply with UL and CSA standards, the installation's isolated secondary power supply circuit must incorporate a method to limit the overvoltage to 0.8 kV.													
Supply Protection Circuitry	Protected against transient voltages and reverse polarity													
Overvoltage Category	<b>Output relay contact voltage of 1 V to 150 V ac/dc:</b> Category III <b>Output relay contact voltage of 151 V to 250 V ac/dc:</b> Category II (Category III, if appropriate overvoltage reduction is provided, as described in data sheet.)													
Pollution Degree	2													
Safety Outputs	<p>Each normally open output channel is a series connection of contacts from two forced-guided (mechanically linked) relays, K1-K2.</p> <p><b>Contacts:</b> AgNi, 5 <math>\mu</math>m gold-plated</p> <p><b>Low Current Rating:</b> The 5 <math>\mu</math>m gold-plated contacts allow the switching of low current/low voltage. In these low-power applications, multiple contacts can also be switched in series (e.g., "dry switching"). <b>To preserve the gold plating on the contacts, do not exceed the following max. values at any time</b></p> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><b>Min. voltage:</b> 1V ac/dc</td> <td style="text-align: center;"><b>Max. voltage:</b> 60 V</td> </tr> <tr> <td style="text-align: center;"><b>Min. current:</b> 5 mA ac/dc</td> <td style="text-align: center;"><b>Max. current:</b> 300 mA</td> </tr> <tr> <td style="text-align: center;"><b>Min. power:</b> 5 mW (5 mVA)</td> <td style="text-align: center;"><b>Max. power:</b> 7 W (7 VA)</td> </tr> </table> <p><b>High Current Rating:</b> If higher loads must be switched through one or more of the contacts, the minimum and maximum values of the contact(s) changes to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; vertical-align: middle;">  </td> <td style="padding: 5px;"> <b>Minimum</b>  <b>Voltage:</b> 15 V ac/dc  <b>Current:</b> 30 mA ac/dc  <b>Power:</b> 0.45 W (0.45 VA)         </td> <td style="padding: 5px;"> <b>Maximum</b>            250 V ac/dc / 24 V dc, 6 A resistive            B300, R300 per UL508         </td> </tr> <tr> <td style="text-align: center; vertical-align: middle;">  </td> <td style="padding: 5px;"> <b>Minimum</b>  <b>Voltage:</b> 15 V ac/dc  <b>Current:</b> 30 mA ac/dc  <b>Power:</b> 0.45 W (0.45 VA)         </td> <td style="padding: 5px;"> <b>Maximum</b>            250 V ac/dc / 24 V dc, 6 A resistive            IEC 60947-5-1            AC15 230 V ac, 3A; DC-13: 24 V dc, 2A         </td> </tr> </table> <p><b>Mechanical life:</b> 20,000,000 operations  <b>Electrical life (switching cycles of the output contacts, resistive load):</b> 150,000 cycles @ 900 VA; 1,000,000 cycles @ 250 VA; 2,000,000 cycles @ 150 VA; 5,000,000 cycles @ 100 VA  <b>NOTE: Transient suppression is recommended when switching inductive loads. Install suppressors across load.</b>  <b>Never install suppressors across output contacts.</b></p>		<b>Min. voltage:</b> 1V ac/dc	<b>Max. voltage:</b> 60 V	<b>Min. current:</b> 5 mA ac/dc	<b>Max. current:</b> 300 mA	<b>Min. power:</b> 5 mW (5 mVA)	<b>Max. power:</b> 7 W (7 VA)		<b>Minimum</b> <b>Voltage:</b> 15 V ac/dc <b>Current:</b> 30 mA ac/dc <b>Power:</b> 0.45 W (0.45 VA)	<b>Maximum</b> 250 V ac/dc / 24 V dc, 6 A resistive B300, R300 per UL508		<b>Minimum</b> <b>Voltage:</b> 15 V ac/dc <b>Current:</b> 30 mA ac/dc <b>Power:</b> 0.45 W (0.45 VA)	<b>Maximum</b> 250 V ac/dc / 24 V dc, 6 A resistive IEC 60947-5-1 AC15 230 V ac, 3A; DC-13: 24 V dc, 2A
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Output Response Time	35 milliseconds maximum													
Input Requirements	Outputs from actuating devices must each be capable of switching 25 mA @ 24 V dc (nominal).													
Simultaneity Monitoring Period	$\leq 500$ milliseconds													
Status Indicators	<table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top;"> <b>4 green LEDs:</b>            Power ON            Input 1 energized            Input 2 energized            Output         </td> <td style="vertical-align: top; text-align: center;"> <b>1 red LED:</b>            Fault         </td> </tr> </table>		<b>4 green LEDs:</b> Power ON Input 1 energized Input 2 energized Output	<b>1 red LED:</b> Fault										
<b>4 green LEDs:</b> Power ON Input 1 energized Input 2 energized Output	<b>1 red LED:</b> Fault													
Construction	Polycarbonate housing													
Environmental Rating	IEC IP20													
Mounting	Mounts to standard 35 mm DIN rail track. Safety Module must be installed inside an enclosure rated NEMA 3 (IP54), or better.													
Vibration Resistance	10 to 55 Hz @ 0.35 mm displacement per IEC 60068-2-6													
Operating Conditions	<b>Temperature:</b> 0° to +50° C <b>Relative humidity:</b> 90% @ +50° C (non-condensing)													
Design Standards	 : Cat. 4 PL e, per EN ISO 13849-1; SIL 3 per IEC 61508 and IEC 62061; Type IIC per ISO 13851 (EN574) (when used with STBs or hard contacts)													
Certifications	 													





## Self-Checking Touch Buttons (STB) Two-Hand Control

STB Self-Checking Touch Buttons provide the highest level of safety for two-hand control input devices via redundant microprocessor and optical path.

- Features ergonomic design to prevent repetitive motion stress by responding to a finger blocking light rather than to pressure
- Includes yellow field cover to prevent unintended switching
- For safety applications, STB buttons must be used with DUO-TOUCH® SG Two-Hand control modules, Safety Controller or comparable control Type IIIC Two-Hand system


### STB Self-Checking Buttons – Solid-State Outputs, 10-30 V dc

Connection	Upper Housing	Solid-State Outputs	Models
2 m			STBVP6
4-Pin Mini QD	Polyetherimide	2 Complementary PNP (1 ON, 1 OFF)	STBVP6Q
4-Pin Euro QD			STBVP6Q5

### STB Self-Checking Buttons – e/m Relay Outputs, 20-30 V ac/dc

Connection	Upper Housing	Relay Outputs	Models
2 m			STBVR81
5-Pin Mini QD	Polyetherimide	2 Complementary SPST (1 NC, 1 NO)	STBVR81Q
5-Pin Euro QD			STBVR81Q6

For more specifications see page 847.



 **Connection options:** A model with a QD requires a mating cordset (see page 845).

For 9 m cable, add suffix **W/30** to the 2 m model number (example, **STBVP6 W/30**).

## Cordsets


### Euro QD to Flying Leads


See page 906

Length	Straight		Right-Angle	
	4-Pin	5-Pin	4-Pin	5-Pin
1.83 m	 MQDC-406	MQDC1-506	 MQDC-406RA	MQDC1-506RA
4.57 m	MQDC-415	MQDC1-515	MQDC-415RA	MQDC1-515RA
9.14 m	MQDC-430	MQDC1-530	MQDC-430RA	MQDC1-530RA
15.2 m	MQDC-450	—	MQDC-450RA	—

### Mini QD to Flying Leads

See page 921


Length	Straight	
	4-Pin	5-Pin
1.83 m	 MBCC-406	MBCC-506
3.66 m	MBCC-412	MBCC-512
9.14 m	MBCC-430	MBCC-530

 Additional cordset information available. See page 902

## Brackets

### STB

See page 872	See page 872	See page 873	See page 873	See page 873
SMB30A	SMB30MM	SMB30SC	SMBAMS30P	SMBAMS30RA
				

 Additional brackets and information available. See page 852

## Field Covers

### OTB/LTB

Black	OTC-1-BK		OTCL-1-BK	
Green	OTC-1-GN		OTCL-1-GN	
Red	OTC-1-RD		OTCL-1-RD	
Yellow	OTC-1-YW		OTCL-1-YW	

Field covers are designed to prevent inadvertent activation of buttons due to objects (loose clothing, debris, etc.) which might accidentally block their sensing beams. Field covers are constructed of rugged polypropylene and are highly resistant to abrasion and to damage by most chemicals. Standard STB model numbers are shipped with a yellow cover.







STB models



STB models with cover

## STB Self-Checking Buttons Specifications

Supply Voltage and Current	<b>STBVP6 Models:</b> 10 to 30 V dc @ 75 mA, typical <b>STBVR81 Models:</b> 20 to 30 V ac/dc or 20 V to 30 V ac (peak-to-peak value), (50/60 Hz $\pm$ 5%) @ 75 mA
Supply Protection Circuitry	Protected against transient voltages and reverse polarity
Output Configuration	<b>STBVP6 Models:</b> Complementary PNP (sourcing) open-collector transistors <b>STBVR81 Models:</b> Complementary electromechanical relay
Output Rating	<b>STBVP6 Models (solid-state outputs):</b> <b>Max. load:</b> 150 mA <b>ON-state saturation voltage:</b> $+V_{(supply)} - 1.5V$ <b>OFF-state leakage current:</b> less than 1 $\mu A$  <b>STBVR81 Models (electromechanical relay):</b> <b>Max. switching voltage:</b> 125 V dc/150 V ac <b>Max. switching current:</b> 1A @ 24 V dc; 0.4A @ 125V ac (resistive loads) <b>Max. resistive load power:</b> 24 W dc; 50 VA ac <b>Mechanical life of relay:</b> 10 <sup>9</sup> cycles <b>Electrical life of relay:</b> 1.5 x 10 <sup>5</sup> cycles at 1 amp 24 V resistive
Output Protection	All models protected against false pulse on power-up. Models with solid-state outputs have overload and short-circuit protection.
Output Response Time	20 milliseconds ON/OFF
Indicators	<b>2 green LED indicators:</b> <b>Power:</b> ON –power applied OFF –power off <b>Output/fault:</b> ON –button is activated OFF –button is deactivated Flashing –internal fault or blocked button on power-up detected
Construction	Totally encapsulated, non-metallic enclosure. Black Polyetherimide (PEI) upper housing; fiber-reinforced PBT polyester base. Electronics fully epoxy-encapsulated. Supplied with polypropylene (TP) field cover.
Environmental Rating	Meets NEMA standards 1, 3, 4, 4X, 12 and 13; IP66
Connections	PVC-jacketed 2 m cables standard on integral-cable kits; QD fitting, depending on model. Accessory QD mating cordsets required for QD models. QD cordsets are ordered separately. See page 845. <b>STBVP6:</b> 4-wire (4-pin Mini-style QD, add suffix <b>Q</b> or 4-pin Euro-style QD, add suffix <b>Q5</b> ) <b>STBVR81:</b> 5-wire (5-pin Mini-style QD, add suffix <b>Q</b> or 5-pin Euro-style QD, add suffix <b>Q6</b> ) Integral 9 m cables are also available by adding suffix <b>W/30</b> to the 2 m model number.
Ambient Light Immunity	Up to 100,000 lux
Applicable Agency Standards	(Used with an <b>AT-FM-10K</b> module or an <b>SC22-3</b> Safety Controller) Analysis of measures for fault avoidance and fault control according to SIL3 (IEC 61508 and IEC 62061) and Category 4 (EN ISO 13849-1) passes EMI/RFI test levels as specified in IEC61496 and IEC62061.
Operating Conditions	<b>Temperature:</b> 0° to +50° C <b>Relative humidity:</b> 90% @ +50° C (non-condensing)
Application Notes	<b>Environmental considerations for models with Polyetherimide (PEI) upper housings:</b> The Polyetherimide upper housing will become brittle with prolonged exposure to outdoor sunlight. Window glass effectively filters ultraviolet light and provides excellent protection from sunlight. Avoid contact with strong alkalis, hydrocarbons and fuels. Clean periodically using mild soap solution and a soft cloth.
Two-Hand Control System Note	When the <b>STBVP6</b> is used with Banner's <b>SC22-3</b> Safety Controller in a two-hand control system, the power supply to the <b>STBVP6</b> must be of the same voltage that is used to power the Safety Controller and they must have a common supply ground.
Certifications	 



## DUO-TOUCH® Run Bar with STBs

### Two-Hand Control

DUO-TOUCH® Run Bars provide a convenient and economical means for safeguarding when interfaced with DUO-TOUCH® Two-Hand Control Modules or comparable control systems.

- Minimizes risk of defeat and accidental machine actuation
- Offers ergonomic design for reduced hand, wrist and arm stress
- Constructed of robust, 13-gauge cold-rolled steel
- Provides knockouts for wiring flexibility and installation of accessories such as EZ-LIGHT™ indicators
- Meets ANSI B11.19 and ISO 13851 (EN 574) standards when monitored by Type IIIC Two-Hand Control logic device (e.g., AT series Two-Hand Control modules, see page 840)

### DUO-TOUCH® Run Bars with STB Self-Checking Touch Buttons

Connection	STB Touch Buttons		Environmental Rating	E-Stop Button	Models*
	Model	Output			
Terminal Strip	STBVP6	Solid-State	IP20	Not included	<b>STBVP6-RB1</b>
8-pin Mini QD**		Complementary PNP		Not included	<b>STBVP6-RB1Q8</b>
Terminal Strip	STBVP6	Solid-State Complementary PNP	IP20	Model <b>SSA-EBM-02L</b> E-stop button (two NC safety contacts)	<b>STBVP6-RB1E02</b>
Terminal Strip	STBVP6	Solid-State	IP65	Not included	<b>STBVP6-RB2</b>
8-pin Mini QD**		Complementary PNP		Not included	<b>STBVP6-RB2Q8</b>
Terminal Strip	STBVP6	Solid-State Complementary PNP	IP65	Model <b>SSA-EBM-02L</b> E-stop button (two NC safety contacts)	<b>STBVP6-RB2E02</b>

\* DUO-TOUCH Run Bar kits available with two-hand control module. Contact factory for combinations.

\*\* Order QDS-8..C cordsets separately, see page 849.



