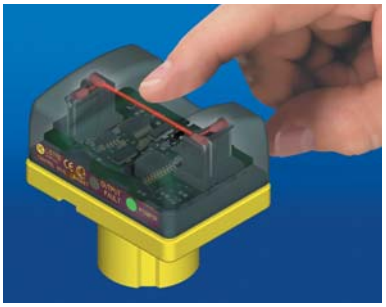
Two-Hand Control Modules

DUO-TOUCH® SG Two-Hand Control Modules . . **page 87**

- Monitors STB buttons or other actuators.
- Delivers highest level of safety for two-hand controls.
- Offers choice of operating voltages.



STB Self-Checking Touch Buttons . . . . . **page 94**

- Delivers highest level of safety for two-hand controls.
- Self-checks for internal problems.
- Features ergonomic design to prevent repetitive motion stress.

DUO-TOUCH® Two-Hand Control Modules . . . . . **page 97**

- Monitors OTB buttons or mechanical push buttons.
- Requires two hands on the controls.
- Responds in milliseconds.

OTB Optical Touch Buttons . . . . . **page 100**

- Replaces mechanical push buttons.
- Features ergonomic design to prevent repetitive motion stress.
- Senses light, not pressure.

Two-Hand Control Modules

Type	Model		Catalog Page	Type	Supply Voltage	Inputs	Safety Outputs	Output Rating	Auxiliary Outputs	Housing Width
DUO-TOUCH® SG	AT-FM-10K		Page 87	IIIC	24V ac/dc	2 STB*	**2 NO**	6 amps	—	22.5 mm
	AT-GM-13A		Page 87	IIIC	115V ac/ 24V dc	2 STB*	**4 NO**	6 amps	1 NPN, 1 PNP & 1 NC	45 mm
	AT-HM-13A		Page 87	IIIC	230V ac/ 24V dc	2 STB*	**4 NO**	6 amps	1 NPN, 1 PNP & 1 NC	45 mm
	AT-GM-11KM		Page 87	IIIC	115V ac/ 24V dc	2 STB* & Muting	**2 NO**	6 amps	1 NPN, 1 PNP & 1 NC	67.5 mm
	AT-HM-11KM		Page 87	IIIC	230V ac/ 24V dc	2 STB* & Muting	**2 NO**	6 amps	1 NPN, 1 PNP & 1 NC	67.5 mm
DUO-TOUCH®	AT-AM-2A		Page 97	IIIA/B	115V ac	2 OTB**	**2 NO**	4 amps	1 NC	45 mm
	AT-BM-2A		Page 97	IIIA/B	230V ac	2 OTB**	**2 NO**	4 amps	1 NC	45 mm
	AT-FM-2A		Page 97	IIIA/B	24V ac/dc	2 OTB**	**2 NO**	4 amps	1 NC	45 mm

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

DUO-TOUCH® SG

Two-hand Control Modules, STB Compatible

- Modules work with Banner STB self-checking touch buttons or can be retrofitted with existing mechanical palm buttons to create a complete, ergonomic two-hand control system.
- To ensure reliability, modules have a diverse-redundant microcontroller circuit and multiple redundant, force-guided (mechanically linked) output contacts.
- Anti-tiedown logic requires that both touch buttons are activated within one-half second of each other.
- Modules meet Safety Category 4 per ISO 13849-1 (EN 954-1) and functional Type IIIC two-hand control per EN 574.
- Removable terminal blocks allow convenient wiring and exchanging of modules without rewiring.
- Optional mute inputs allow release of actuating buttons during the non-hazardous portion of the machine cycle.
- Available kits include module and two STB touch buttons.
- STB touch buttons are far more ergonomic than mechanical and difficult-to-activate capacitive buttons.
- Available in ac and dc voltages: 24V ac/dc, 115V ac/24V dc or 230V ac/24V dc.

Use with STB Self-Checking Touch Buttons, ***Page 94 .***

QD CABLES
4- & 5-Pin Euro + 4- & 5-Pin Mini
PAGE 174
BRACKETS
PAGE190

AT-FM-10K Models
- 24V ac/dc
- 2 dual NO/NC inputs
- 2 safety outputs, 6 amps

Page 88.

AT-GM/HM-13A Models
- 115V ac/24V dc (GM)
- 230V ac/24V dc (HM)
- 2 dual NO/NC inputs
- 4 safety outputs, 6 amps
- Auxiliary outputs

Page 88.

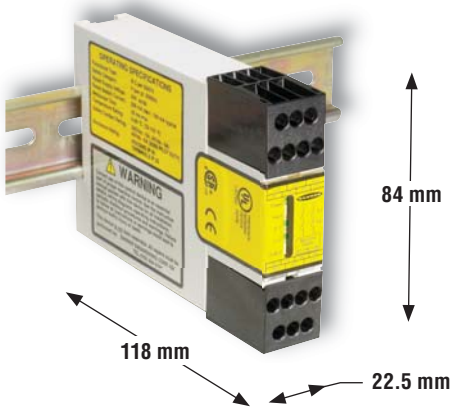
AT-GM/HM-11KM Models
- 115V ac/24V dc (GM)
- 230V ac/24V dc (HM)
- 2 NO/NC inputs
- 2 muting inputs
- 1 safety stop interface
- 2 safety outputs
- Auxiliary outputs

Page 88.

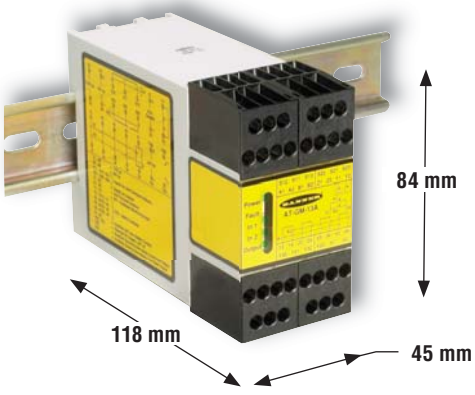
DUO-TOUCH® SG Two-Hand Control Modules, STB Compatible

- *24V ac/dc, 115V ac/24V dc, or 230V ac/24V dc*
- *Four green and one red LED indicators*
- *Minimum NEMA 3 (IEC IP20) polycarbonate housing*
- *Muting optional*
- *35 millisecond output response time*

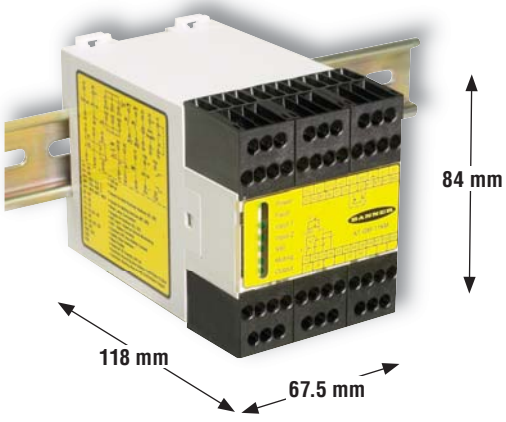
MORE INFO ONLINE Detailed Dimensions



AT-FM-10K Model



AT-..M-13A Models (AT-GM-13A shown)



AT-..M-11KM Models (AT-GM-11KM shown)

DUO-TOUCH® SG Two-Hand Control Modules, STB Compatible

MORE INFO ONLINE Download PDF

Model	Supply Voltage	Inputs	Safety Outputs	Output Rating	Auxiliary Outputs	Muting	Terminals	Timing Diagrams	Data Sheet
AT-FM-10K	24V ac/dc	2 STB*	**2 NO**	6 amps	—	—	Removable	TD001 (p. 239)	64137
AT-GM-13A	115V ac/24V dc	2 STB*	**4 NO**		1 NPN, 1 PNP & 1 NC	—	Removable	TD001 (p. 239)	67241
AT-HM-13A	230V ac/24V dc								
AT-GM-11KM	115V ac/24V dc	2 STB* & Muting	**2 NO**		1 NPN, 1 PNP & 1 NC	Yes	Removable	TD002 (p. 239)	109782
AT-HM-11KM	230V ac/24V dc								

NC = Normally Closed, NO = Normally Open
* May also use two mechanical 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 94.

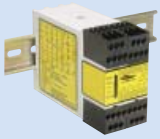
DUO-TOUCH® SG Kits — Solid-State STB Touch Buttons (Meets Category IIIC)

Kit	Kit Components				
Includes 2 STB Touch Buttons & a DUO-TOUCH SG Safety Module	DUO-TOUCH SG Safety Module	Supply Voltage	Safety Outputs	STB Touch Buttons	
				Model	Cable*
ATK-VP6	 AT-FM-10K	24V ac/dc	2 NO	STBVP6	2 m
ATK-VP6Q				STBVP6Q	4-Pin Mini QD
ATK-VP6Q5				STBVP6Q5	4-Pin Euro QD
ATGMK-VP6	 AT-GM-13A	115V ac/24V dc	4 NO	STBVP6	2 m
ATGMK-VP6Q				STBVP6Q	4-Pin Mini QD
ATGMK-VP6Q5				STBVP6Q5	4-Pin Euro QD
ATHMK-VP6	 AT-HM-13A	230V ac/24V dc	4 NO	STBVP6	2 m
ATHMK-VP6Q				STBVP6Q	4-Pin Mini QD
ATHMK-VP6Q5				STBVP6Q5	4-Pin Euro QD
ATGMKM-VP6	 AT-GM-11KM	115V ac/24V dc	2 NO	STBVP6	2 m
ATGMKM-VP6Q				STBVP6Q	4-Pin Mini QD
ATGMKM-VP6Q5				STBVP6Q5	4-Pin Euro QD
ATHMKM-VP6	 AT-HM-11KM	230V ac/24V dc	2 NO	STBVP6	2 m
ATHMKM-VP6Q				STBVP6Q	4-Pin Mini QD
ATHMKM-VP6Q5				STBVP6Q5	4-Pin Euro QD

NC = Normally Closed, NO = Normally Open

* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **ATK-VP6 W/30**). A model with a QD requires a mating cable. Order QD cables separately (see pages 174 & 178).

DUO-TOUCH® SG Kits – e/m Relay STB Touch Buttons (Meets Category IIIC)

Kit	Kit Components				
Includes 2 STB Touch Buttons & a DUO-TOUCH SG Safety Module	DUO-TOUCH SG Safety Module	Supply Voltage	Safety Outputs	STB Touch Buttons	
				Model	Cable*
ATK-VR81	 AT-FM-10K	24V ac/dc	2 NO	STBVR81	2 m
ATK-VR81Q				STBVR81Q	5-Pin Mini QD
ATK-VR81Q6				STBVR81Q6	5-Pin Euro QD
ATGMK-VR81	 AT-GM-13A	115V ac/24V dc	4 NO	STBVR81	2 m
ATGMK-VR81Q				STBVR81Q	5-Pin Mini QD
ATGMK-VR81Q6				STBVR81Q6	5-Pin Euro QD
ATHMK-VR81	 AT-HM-13A	230V ac/24V dc	4 NO	STBVR81	2 m
ATHMK-VR81Q				STBVR81Q	5-Pin Mini QD
ATHMK-VR81Q6				STBVR81Q6	5-Pin Euro QD
ATGMKM-VR81	 AT-GM-11KM	115V ac/24V dc	2 NO	STBVR81	2 m
ATGMKM-VR81Q				STBVR81Q	5-Pin Mini QD
ATGMKM-VR81Q6				STBVR81Q6	5-Pin Euro QD
ATHMKM-VR81	 AT-HM-11KM	230V ac/24V dc	2 NO	STBVR81	2 m
ATHMKM-VR81Q				STBVR81Q	5-Pin Mini QD
ATHMKM-VR81Q6				STBVR81Q6	5-Pin Euro QD

NC = Normally Closed, NO = Normally Open
* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **ATK-VR81 W/30**). A model with a QD requires a mating cable. Order QD cables separately (see pages 175 & 178).

DUO-TOUCH® SG AT-..M-13A Modules Specifications

Supply Voltage and Current	**Model AT-GM-13A:** 115V ac, ±15%; 50/60 Hz & 24V dc, ±15%, 10% max. ripple **Model AT-HM-13A:** 230V ac, ±15%; 50/60 Hz & 24V dc, ±15%, 10% max. ripple
Supply Protection Circuitry	Protected against transient voltages and reverse polarity
Safety Outputs	Outputs (K1 and K2): four redundant (total of eight) forced-guided safety relay contacts **Contact ratings:** **Max. voltage:** 250V ac or 250V dc — **Min. voltage:** 15V ac/dc **Max. current:** 6A ac or dc (resistive load) — **Min. current:** 30 mA **Max. power:** 1500 VA, 200 watts — **Min. power:** 5 VA, 5 watts **Mechanical life:** 50,000,000 operations **Electrical life:** 150,000 cycles (typically @ 1.5 kVA switching power) **NOTE: Transient suppression is recommended when switching inductive loads. Install suppressors across load. Never install suppressors across output contacts.**
Auxiliary Supply Voltage (for Solid-State outputs)	24V dc @ 1A (between Y30 & Y31)
Auxiliary Solid-State Output Current	500 mA max., short circuit protected (Y32 or Y31)
Output Response Time	35 milliseconds max. ON/OFF
Input Requirements	Outputs from actuating devices (1 NO and 1 NC) must each be capable of switching 20 mA @ 12V dc.
Simultaneity Monitoring Period	≤ 500 milliseconds
Z1/Z2 Courtesy Voltage	24V dc @ 150 mA (for STB button power)
External Device Monitoring (EDM)	One pair of terminals (Y1 and Y2) are provided to monitor the state of external devices controlled by the safety outputs. Each device must be capable of switching 15 to 30V dc at 10-50 mA.
Status Indicators	**4 green LED indicators:** Power ON Input 1 energized Input 2 energized Output **1 red LED indicator:** Fault
Housing	Polycarbonate. Rated NEMA 1; IEC IP20
Mounting	Mounts to standard 35 mm DIN rail track. Safety Module must be installed inside an enclosure rated NEMA 3 (IEC IP54), or better.
Vibration Resistance	10 to 55 Hz @ 0.35 mm displacement per IEC 68-2-6
Operating Conditions	**Temperature:** 0° to +50° C — **Relative humidity:** 90% @ +50° C (non-condensing)
Safety Category	4 per ISO 13849-1 (EN 954-1); Type IIIC per ISO 13851 (EN 574)
Certifications	For a list of certifications see page 236.
Wiring Diagrams	**AT-..M-13A models:** WD032 (p. 264) **AT-..M-13A to STB Buttons:** WD034 (p. 265)

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

Supply Voltage and Current	24V ac/dc ±15% @ 150 mA
Supply Protection Circuitry	Protected against transient voltages and reverse polarity
Safety Outputs	Outputs (K1 and K2): two redundant (total of four) forced-guided safety relay contacts **Contacts:** AgNi, 5 µm gold-plated **Low Current Rating:** **Caution: The 5 µm gold-plated contacts allow the switching of low current/low voltage.** To preserve the gold plating on the contacts, the following max. values should not be exceeded at any time: **Min. voltage:** 1V ac/dc — **Max. voltage:** 60V **Min. current:** 5 mA ac/dc — **Max. current:** 300 mA **Min. power:** 5 mW (5 mVA) — **Max. power:** 7 W (7 VA) **High Current Rating:** If higher loads must be switched through one or more of the contacts, the minimum and maximum values of the contact(s) changes to: **Max. voltage:** 250V ac/dc — **Min. voltage:** 15V ac/dc **Max. current:** 6 A ac or dc (resistive load) — **Min. current:** 30 mA **Max. power:** 200 W (1,500 VA) — **Min. power:** 5 W (5 VA) **Mechanical life:** 50,000,000 operations **Electrical life:** 150,000 operations typical, @ 200 W (1,500 VA) switched power, resistive load. **NOTE: Transient suppression is recommended when switching inductive loads. Install suppressors across load. Never install suppressors across output contacts.**
Output Response Time	35 milliseconds max. ON/OFF
Input Requirements	Outputs from actuating devices (1 NO and 1 NC) must each be capable of switching 20 mA @ 12V dc.
Simultaneity Monitoring Period	≤ 500 milliseconds
External Device Monitoring (EDM)	One pair of terminals (Y1 and Y2) are provided to monitor the state of external devices controlled by the safety outputs. Each device must be capable of switching 15 to 30V dc at 10-50 mA.
Status Indicators	**4 green LED indicators:** Power ON Input 1 energized Input 2 energized Output **1 red LED indicator:** Fault
Housing	Polycarbonate. Rated NEMA 1; IEC IP20
Mounting	Mounts to standard 35 mm DIN rail track. Safety Module must be installed inside an enclosure rated NEMA 3 (IEC IP54), or better.
Vibration Resistance	10 to 55 Hz @ 0.35 mm displacement per IEC 68-2-6
Operating Conditions	**Temperature:** 0° to +50° C — **Relative humidity:** 90% @ +50° C (non-condensing)
Safety Category	4 per ISO 13849-1 (EN 954-1); Type IIIC per ISO 13851 (EN 574)
Certifications	For a list of certifications see page 236.
Wiring Diagrams	**AT-FM-10K models:** WD029 (p. 262)

DUO-TOUCH® SG AT-..M-11KM with Muting Specifications

Supply Voltage and Current	**AT-GM-11KM:** 115V ac, ± 15%; 50/60Hz & 24V dc, +/- 15%, 10% max. ripple **AT-HM-11KM:** 230V ac, ± 15%; 50/60Hz & 24V dc, +/- 15%, 10% max. ripple
Power Consumption	Approx. 4 W / 7 VA
Supply Protection Circuitry	Protected against transient voltages and reverse polarity
Safety Outputs	**Outputs (K1 and K2):** two redundant (total of four) safety relay (forced-guided) contacts **Contact ratings:** **Max. voltage:** 250V ac or 250V dc **Max. current:** 6A ac or dc (resistive load) **Max. power:** 1500 VA, 200 watts **Mechanical life:** 50,000,000 operations **Electrical life:** 150,000 cycles (typically @ 1.5 kVA switching power) **NOTE: Transient suppression is recommended when switching inductive loads. Install suppressors across load. Never install suppressors across output contacts.**
Auxiliary Supply Voltage (for solid-state outputs)	24V dc @ 1A (applied between Y30 & Y31)
Auxiliary Solid-State Output Current	500 mA max., short circuit protected, Y32 is a PNP output, Y33 is an NPN output
Output Response Time	35 milliseconds max. ON/OFF
Input Requirements	Outputs from actuating devices must each be capable of switching up to 20 mA @ 12V dc.
Simultaneity Monitoring Period	≤ 500 milliseconds
Z1/Z2 Courtesy Voltage	24V dc @ 150 mA (for STB button power, separate from Auxiliary output, unregulated)
External Device Monitoring (EDM)	One pair of terminals (Y1 and Y2) are provided to monitor the state of external devices controlled by the safety outputs. Each device must be capable of switching 15 to 30V dc at 10-50 mA.
Muting Device Inputs (M1, M2)	The muting devices work as a pair (M1 and M2). The simultaneity requirement is that they be “closed” within 3 seconds of each other to initiate a mute condition or allow a mute cycle, assuming all other conditions are met. Each muting device must be capable of switching 15 to 30V dc at 10-50 mA.
Mute Enable Input (ME)	Mute Enable input must be closed in order to start a mute cycle. Opening this input after a mute cycle has begun has no effect. The switching device must be capable of switching 15 to 30V dc at 10-50 mA.
Safety Stop Interface (SSI)	This input consists of two concurrent channels (SSI-A and SSI-B) and is always active. Any time either or both channels open, the Safety Outputs will go OFF. When using the SSI, the external device must be capable of switching 15 to 30V dc at 10-50 mA.
Status Indicators	**6 green LED indicators** Power ON Input 1 energized Input 2 energized SSI inputs closed Muting activated Output **1 red LED indicator** Fault
Housing	Polycarbonate. Rated NEMA 1; IEC IP20
Mounting	Mounts to standard 35 mm DIN rail track. Safety Module must be installed inside an enclosure rated NEMA 3 (IEC IP54), or better.
Vibration Resistance	10 to 55Hz @ 0.35 mm displacement per IEC 68-2-6
Operating Conditions	**Temperature:** 0° to +50° C **Relative humidity:** 90% @ +50° C (non-condensing)
Safety Category	4 per ISO 13849-1; Type IIIC per ISO 13851 (EN 574)
Certifications	For a list of certifications see page 236.
Wiring Diagrams	**AT-..M-11KM models:** WD033 (p. 264) **AT-..M-11KM to STB Buttons:** WD034 (p. 265)

STB

Self-Checking Touch Buttons

- Provides highest level of safety for two-hand control input devices, per independent certification tests.
- Provides redundant microprocessor and optical path.
- Responds to a finger blocking light rather than to pressure.
- Features ergonomic design to prevent repetitive motion stress.
- Includes yellow field cover to prevent unintended switching.
- Immune to ambient light, EMI and RFI.
- Available with e/m relays rated for 1 amp switch capacity or solid-state outputs rated for 150 mA.
- Withstands exposure to a variety of chemicals, depending on model.

QD CABLES
4- & 5-Pin Euro +
4- & 5-Pin Mini
PAGE 174

BRACKETS
PAGE 190

STB Self-Checking Touch Buttons

- *EN 574-compliant*
- *LED power, output and fault indicators*
- *10-30V dc or 20-30V ac/dc*
- *2 m or 9 m integral cable or quick-disconnect fitting*
- *Housing sealed to IEC IP66*
- *Optional field cover colors*

MORE INFO ONLINE Detailed Dimensions

STB models

STB models with cover

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

Models	Cable*	Upper Housing	Solid-State Outputs	Data Sheet
STBVP6 STBVP6Q STBVP6Q5	2 m 4-Pin Mini QD 4-Pin Euro QD	Polysulfone	2 Complementary PNP (1 ON, 1 OFF)	64136
STBVP6L STBVP6LQ STBVP6LQ5	2 m 4-Pin Mini QD 4-Pin Euro QD	Polycarbonate		

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

Models	Cable*	Upper Housing	e/m Relay Outputs	Data Sheet
STBVR81 STBVR81Q STBVR81Q6	2 m 5-Pin Mini QD 5-Pin Euro QD	Polysulfone	2 Complementary SPST (1 NC, 1 NO)	64136
STBVR81L STBVR81LQ STBVR81LQ6	2 m 5-Pin Mini QD 5-Pin Euro QD	Polycarbonate		

NC = Normally Closed, NO = Normally Open
* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **STBVP6 W/30**). A model with a QD requires a mating cable (see pages 174-175 & 178).

STB Self-Checking Buttons Specifications

Supply Voltage and Current	**STBVP6 Models:** 10 to 30V dc; Power Consumption: approx. 1.8 W @ 24V dc (with no output load) **STBVR81 Models:** 20 to 30V ac/dc; Power Consumption: approx. 1.8 W/1.8 VA @ 24V ac/dc
Supply Protection Circuitry	Protected against transient voltages and reverse polarity
Output Configuration	**STBVP6 Models:** Complementary PNP (sourcing) open-collector transistors **STBVR81 Models:** Complementary electromechanical relay
Output Rating	**STBVP6 Models (solid-state outputs):** **Max. load:** 150 mA **On-state saturation voltage:** ≤ 15V @ full load **Off-state leakage current:** less than 1 µA **STBVR81 Models (electromechanical relay):** **Max. voltage:** 150V dc, 125V ac **Max. switching current:** 1A **Max. resistive load power:** 60 VA or 30 W dc **Mechanical life of relay:** 50,000,000 **Electrical life of relay:** 150,000 (typically @ 1.5 kVA switching power)
Output Protection	All models protected against false pulse on power-up. Models with solid-state outputs have overload and short-circuit protection.
Response Time	20 milliseconds ON/OFF
Indicators	**2 green LED indicators:** **Power:** ON – power applied OFF – power off **Output/fault:** 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 polysulfone or red polycarbonate upper housing (see Application Notes, page 96); 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; IEC IP66

STB Self-Checking Buttons Specifications (cont'd)

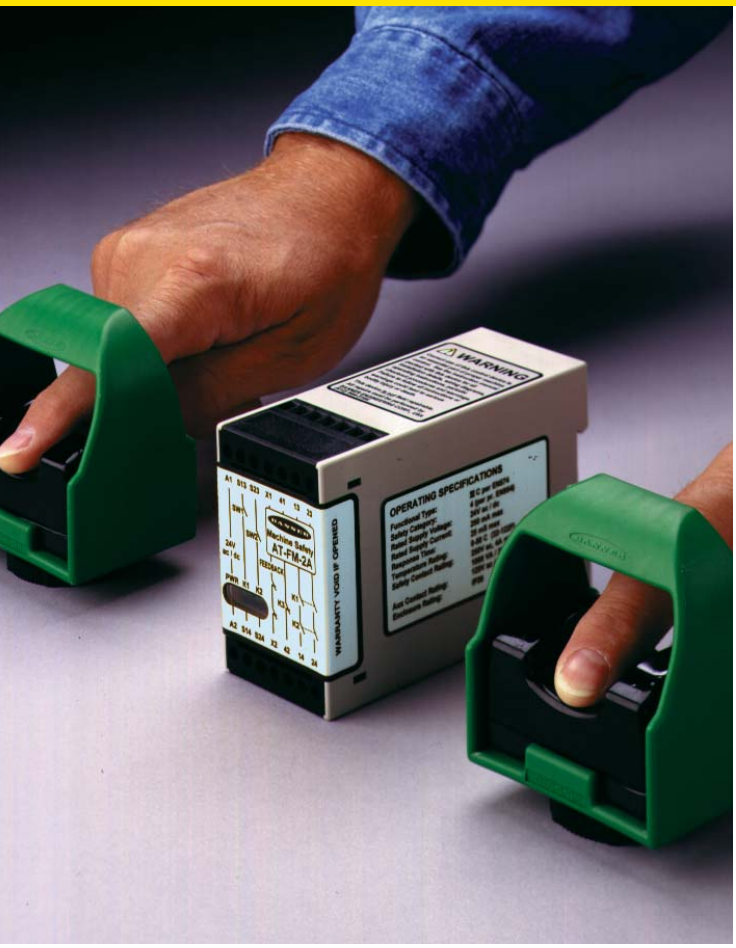
Connections	PVC-jacketed 2 m cables standard on integral-cable kits; QD fitting, depending on model. Accessory QD mating cables required for QD models. QD cables are ordered separately. See pages 174-175 & 178. **STBVP6 Models:** 4-wire (4-pin Mini-style QD, add suffix **Q** or 4-pin Euro-style QD, add suffix **Q5**) **STBVR81 Models:** 5-wire (5-pin Mini-style QD, add suffix **Q** or 5-pin Euro-style QD, add suffix **Q6**) Integral 9 m cables are also available by adding suffix **W/30** to the 2 m model number.
Ambient Light Immunity	Up to 100,000 lux
EMI/RFI Immunity	Immune to EMI and RFI noise sources per IEC 947-5-2
Operating Conditions	**Temperature:** 0° to +50° C **Relative humidity:** 90% @ +50° C (non-condensing)
Application Notes	**STB Self-Checking Touch Buttons by themselves are not stand alone devices.** They must be installed to prevent accidental actuation (example, use of field covers). The environment in which they are installed must not adversely affect the means of actuation (example, severe contamination). See DUO-TOUCH SG module manuals for information on two-hand control safety applications. **Environmental considerations for models with polysulfone upper housings:** The polysulfone 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. Clean periodically using mild soap solution and a soft cloth. **Environmental considerations for models with polycarbonate upper housings:** Avoid prolonged exposure to hot water and moist high-temperature environments above 66° C. Avoid contact with aromatic hydrocarbons (such as xylene and toluene), halogenated hydrocarbons and strong alkalis. Clean periodically using mild soap solution and a soft cloth.
Certifications	For a list of certifications see page 236.
Hookup Diagrams	**STB Solid State (PNP):** WD032 (p. 264) **STB e/m Relay:** WD034 (p. 265)

STB Self-Checking Buttons Field Covers

MORE INFO ONLINE Download PDF

Models	Description		Data Sheet
OTC-1-BK	Black cover		28436
OTC-1-GN	Green cover		
OTC-1-RD	Red cover		
OTC-1-YW	Yellow cover		

Field covers are designed to prevent inadvertent activation of optical touch 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 model numbers are shipped with a yellow cover.



DUO-TOUCH®

Two-Hand Control Modules, OTB Compatible

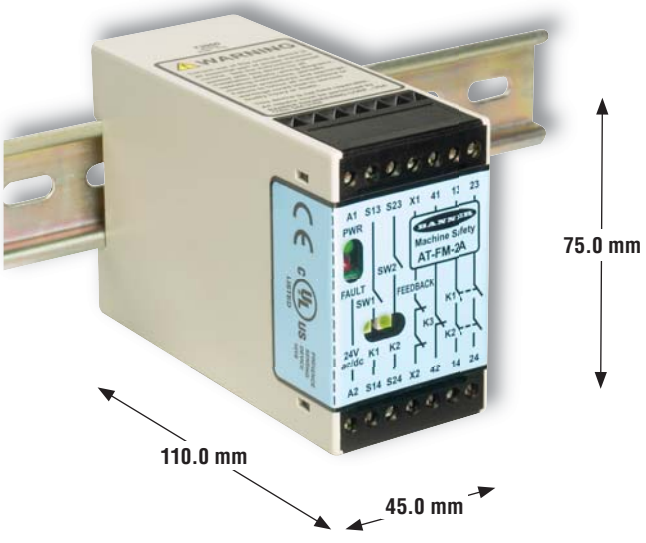
- Monitors a pair of mechanical push buttons or OTB optical touch buttons.
- Permits machine operation only when the operator has both hands on the controls.
- Responds in 25 milliseconds or less.
- Meets Type IIIA/B requirements for Safety Category 1 and 3.
- Monitors the status of machine control elements.

QD CABLES 4- & 5-Pin Mini PAGE 178
BRACKETS PAGE 190

DUO-TOUCH® Two-Hand Control Modules, OTB Compatible

- *24V ac/dc, 115V ac, or 230V ac*
- *Three green and one red LED indicators*
- *NEMA 1 polycarbonate housing*
- *Standard 35 mm DIN rail track mounting*

MORE INFO ONLINE Detailed Dimensions



AT-..M-2A Models
(AT-FM-2A Module shown)

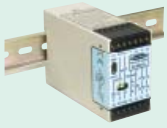
DUO-TOUCH® Two-Hand Control Modules, OTB Compatible

MORE INFO ONLINE Download PDF

Models	Supply Voltage	Inputs	Safety Outputs	Output Rating	Auxiliary Outputs	Terminals	Timing Diagrams	Data Sheet
AT-AM-2A	115V ac	2 OTB*	2 NO	4 amps	1 NC	Fixed	TD003 (p. 239)	47550
AT-BM-2A	230V ac							
AT-FM-2A	24V ac/dc							

NC = Normally Closed, NO = Normally Open
* May also use two mechanical push buttons, each with one normally open (NO) contact. See data sheet for details.
NOTE: Kits are available which include one DUO-TOUCH Safety Module and two OTB Touch Buttons. OTB Touch Buttons are also available separately. See page 100.

DUO-TOUCH® Kits – e/m Relay OTB Touch Buttons

Kit	Kit Components				
Includes 2 OTB Touch Buttons & a DUO-TOUCH Safety Module	DUO-TOUCH Safety Module	Supply Voltage	Safety Outputs	OTB Touch Buttons	
				Model	Cable*
AT-AM-K5	 AT-AM-2A	115V ac	2 NO	OTBA5	2 m
AT-AM-K5Q				OTBA5QD	5-Pin Mini QD
AT-BM-K5	 AT-BM-2A	230V ac	2 NO	OTBB5	2 m
AT-BM-K5Q				OTBB5QD	5-Pin Mini QD
AT-FM-K81	 AT-FM-2A	24V ac/dc	2 NO	OTBVR81	2 m
AT-FM-K81Q				OTBVR81QD	5-Pin Mini QD

NC = Normally Closed, NO = Normally Open
* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **AT-AM-K5 W/30**). A model with a QD requires a mating cable. QD cables are ordered separately (see page 178).

DUO-TOUCH® Kits – Solid-State OTB Touch Buttons

Kit	Kit Components				
Includes 2 OTB Touch Buttons & a DUO-TOUCH Safety Module	DUO-TOUCH Safety Module	Supply Voltage	Safety Outputs	OTB Touch Buttons	
				Model	Cable*
AT-FM-K6	 AT-FM-2A	24V ac/dc	2 NO	OTBVN6 & OTBVP6	2 m
AT-FM-K6Q				OTBVN6 & OTBVP6	4-Pin Mini QD

NC = Normally Closed, NO = Normally Open
* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **AT-FM-K6 W/30**). A model with a QD requires a mating cable. QD cables are ordered separately (see page 178).

DUO-TOUCH® Safety Modules Specifications

Supply Voltage and Current	**Model AT-AM-2A:** 115V ac ±15% at 100 mA **Model AT-BM-2A:** 230V ac ±15% at 50 mA **Model AT-FM-2A:** 24V ac/dc ±15% at 250 mA
Supply Protection Circuitry	Protected against transient voltages and reverse polarity (dc hookup is without regard to polarity)
Safety Outputs	**Outputs (K1 and K2):** Two redundant (total of four) safety relay (forced-guided) contacts **Contact ratings:** **Max. voltage:** 250V ac or 250V dc **Max. current:** 4A ac or dc (resistive load) **Max. power:** 1000 VA, 200 watts **Mechanical life:** 10,000,000 operations **Electrical life:** 100,000 cycles (typically @ 1.0 kVA switching power) **NOTE: Transient suppression is recommended when switching inductive loads. Install suppressors across load. Never install suppressors across output contacts.** **Auxiliary Monitor Output (K3):** One non-safety relay contact **Maximum switching voltage:** 125V ac or dc **Maximum switching current:** 500 mA (resistive load)
Output Response Time	25 milliseconds maximum
Input Requirements	Outputs from actuating devices must each be capable of switching 40 to 100 mA @ 12 to 18V dc.
Simultaneity Monitoring Period	300 milliseconds (typical) < 500 milliseconds under single-fault conditions
Status Indicators	**3 green LED indicators:** Power ON K1 energized K2 energized **1 red LED indicator:** Fault
Housing	Polycarbonate. Rated NEMA 1; IEC IP20
Mounting	Mounts to standard 35 mm DIN rail track. Safety Module must be installed inside an enclosure rated NEMA 3 (IEC IP54), or better.
Vibration Resistance	10 to 55Hz @ 0.35 mm displacement per IEC 68-2-6
Operating Conditions	**Temperature:** 0° to +50° C **Relative humidity:** 90% @ +50° C (non-condensing)
Safety Category	1 and 3 per ISO 13849-1; Type IIIA/B per ISO 13851 (EN574) (Dependent on hookup and installation of the hand controls)
Certifications	For a list of certifications see page 236.
Wiring Diagrams	**AT-..M-2A models:** WD035 (p. 266) **AT-..M-2A to OTB Buttons:** WD037 (p. 267)

OTB

Optical Touch Buttons

- Responds to a finger blocking light rather than to pressure.
- Features ergonomic design to prevent repetitive motion stress.
- Includes field cover to prevent unintended switching.
- Available with e/m relay rated for 7 amp switching capacity.
- Withstand exposure to a variety of chemicals, depending on model.

QD CABLES
4- & 5-Pin Mini
PAGE 178
BRACKETS
PAGE 190

OTB Optical Touch Buttons

- *10 to 30V dc, 20 to 30V ac/dc, 105 to 130V ac, or 210-250V ac*
- *One red LED indicator*
- *Polysulfone or polycarbonate upper housing*
- *2 m or 9 m integral cable or quick-disconnect fitting*
- *Housing sealed to IEC IP66*
- *Optional field cover colors*

MORE INFO ONLINE Detailed Dimensions

OTB models

OTB models with cover

OTB Momentary Action – Solid-State Outputs, 10-30V dc

Models	Cable*	Upper Housing	Solid-State Outputs	DUO-TOUCH Compatibility	Data Sheet
OTBVN6 **OTBVN6QD**	2 m 4-Pin Mini QD	Polysulfone	**NPN**	AT-FM-2A (requires one NPN and one PNP model OTB)	28436
OTBVN6L **OTBVN6LQD**	2 m 4-Pin Mini QD	Polycarbonate			
OTBVP6 **OTBVP6QD**	2 m 4-Pin Mini QD	Polysulfone	**PNP**		
OTBVP6L **OTBVP6LQD**	2 m 4-Pin Mini QD	Polycarbonate			

OTB Momentary Action – e/m Relay Outputs, 20-30V ac or dc

Models	Cable*	Upper Housing	e/m Relay Outputs	DUO-TOUCH Compatibility	Data Sheet
OTBVR81 **OTBVR81QD**	2 m 5-Pin Mini QD	Polysulfone	**SPDT**	AT-FM-2A (requires two OTBs)	28436
OTBVR81L **OTBVR81LQD**	2 m 5-Pin Mini QD	Polycarbonate			

OTB Momentary Action – e/m Relay Outputs, 120V ac

Models	Cable*	Upper Housing	e/m Relay Outputs	DUO-TOUCH Compatibility	Data Sheet
OTBA5 **OTBA5QD**	2 m 5-Pin Mini QD	Polysulfone	**SPDT**	AT-AM-2A (requires two OTBs)	28436
OTBA5L **OTBA5LQD**	2 m 5-Pin Mini QD	Polycarbonate			

OTB Momentary Action – e/m Relay Outputs, 220/240V ac

Models	Cable*	Upper Housing	e/m Relay Outputs	DUO-TOUCH Compatibility	Data Sheet
OTBB5 **OTBB5QD**	2 m 5-Pin Mini QD	Polysulfone	**SPDT**	AT-BM-2A (requires two OTBs)	28436
OTBB5L **OTBB5LQD**	2 m 5-Pin Mini QD	Polycarbonate			

* For 9 m cable, add suffix **W/30** to the 2 m model number (example, **OTBVN6 W/30**). A model with a QD requires a mating cable (see page 178).

OTB Specifications

Supply Voltage and Current	**OTBVR81 models:** 20 to 30V ac/dc **OTBA5 models:** 105 to 130V ac, 50-60 Hz **OTBB5 models:** 210 to 250V ac, 50-60 Hz **OTBVN6/VP6 models:** 10 to 30V dc All models require less than 25 mA (exclusive of load)
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	**OTBVR81, OTBA5, and OTBB5 models:** SPDT electromechanical relay **OTBVN6 models:** Complementary (SPDT) NPN (sinking) open-collector transistor; 1 normally open (NO) and 1 normally closed (NC) **OTBVP6 models:** Complementary (SPDT) PNP (sourcing) open-collector transistors; 1 normally open (NO) and 1 normally closed (NC)
Output Rating	**Models with electromechanical relay:** **Max. switching current:** 7 amps (resistive load), 1 HP maximum **Min. load:** 0.05 watts (dc), 0.05 VA (ac) **Mechanical life of relay:** 50,000,000 operations (minimum) **Electrical life of relay:** 100,000 operations (min.) at full resistive load Transient suppression is recommended when switching inductive loads. **Models with solid-state outputs:** 150 mA maximum load (each output) **On-state saturation voltage:** less than 1 volt at signal levels; less than 1.5 volts at full load **Off-state leakage current:** less than 1 microamp
Response Time	100 milliseconds
Output Protection	All models protected against false pulse on power-up. Models with solid-state outputs have overload and short circuit protection.
Indicators	**Two red indicator LEDs:** One lights whenever power is applied; the other lights whenever the switch is activated making the normally-open (NO) output conduct.
Construction	Totally encapsulated, non-metallic enclosure. Black polysulfone or red polycarbonate upper housing (see Application Notes below); fiber-reinforced thermoplastic polyester base. Electronics fully epoxy-encapsulated. Supplied with a field cover of polypropylene (TP).
Environmental Rating	Meets NEMA standards 1, 3, 4, 4X, 12 and 13; IEC IP66
Connections	PVC-jacketed 2 m or 9 m cables, or Mini-style quick-disconnect (QD) fitting are available. QD cables are ordered separately. See page 178.
Ambient Light Immunity	120,000 lux (direct sunlight)
EMI/RFI Immunity	Immune to both single and mixed EMI and RFI noise sources
Operating Conditions	**Temperature:** -20° to +50° C **Relative humidity:** 90% at 50° C (non-condensing)
Application Notes	**OTB Optical Touch Buttons by themselves are not stand alone devices.** They must be installed to prevent accidental actuation (example, use of field covers). The environment in which they are installed must not adversely affect the means of actuation (example, severe contamination). See DUO-TOUCH module manuals for information on two-hand control safety applications. **Environmental considerations for models with polysulfone upper housings:** The polysulfone upper housing will become embrittled with prolonged exposure to outdoor sunlight. Window glass effectively filters longer wavelength ultraviolet light and provides excellent protection from sunlight. **Environmental considerations for models with polycarbonate upper housings:** Avoid prolonged exposure to hot water and moist high-temperature environments above 66° C. Avoid contact with aromatic hydrocarbons (such as xylene and toluene), halogenated hydrocarbons and strong alkalis. Clean periodically using mild soap solution and a soft cloth. Avoid strong alkaline materials.
Certifications	For a list of certifications see page 236.
Wiring Diagrams	**Solid State NPN/PNP:** WD036 (p. 266)

OTB Optical Touch Buttons Field Covers

Models	Description		Data Sheet
OTC-1-BK	Black cover		28436
OTC-1-GN	Green cover		
OTC-1-RD	Red cover		
OTC-1-YW	Yellow cover		

Field covers are designed to prevent inadvertent activation of optical touch 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 model numbers are shipped with a black cover.

Next Section