

# IM-T-9A and IM-T-11A Interface Modules

Interface modules for use with a primary safety device



- Interface Modules provide isolated safety output contacts for a primary safety device (e.g., a safety light screen or safety module) which has solid-state or hard contact outputs and external device monitoring (EDM) capability.
- Model IM-T-9A features three normally open 6 amp redundant-output channels.
- Model IM-T-11A features two normally open redundant-output channels and one normally closed non-safety auxiliary output channel, all rated at 6 amps.
- Normally closed outputs for connection to the primary safety device's monitoring input.
- 24V dc operation
- 22.5 mm (0.9") DIN-rail-mountable housing
- Convenient plug-in terminal blocks



## **WARNING: Not a Stand-Alone Safeguarding Device**

**This Banner device is not a stand-alone point-of-operation guarding device, as defined by OSHA regulations.** It is necessary to install point-of-operation guarding devices, such as safety light screens and/or hard guards, to protect personnel from hazardous machinery. **Failure to install point-of-operation guards on hazardous machinery can result in a dangerous condition which could lead to serious injury or death.**

## Overview

Interface Modules IM-T-9A and IM-T-11A (the Interface Modules) operate on 24V dc inputs and provide isolated redundant output channels for interfacing dc safety controls (such as safety light screens or other safety modules) to safety circuits. These modules can also be used to switch low power capacity of safety controls with low current output rating (see hookup figures and the output configuration specifications).

The outputs of the Interface Module will follow the action of the safety outputs from the primary safety device which control it, within a 20 millisecond switching delay time. The Interface Module's normally open outputs each are rated for up to 250V ac/dc at up to 6 amps.

The Interface Module offers a series connection of normally closed contacts (labeled Y1-Y2 and Y3-Y4) for monitoring by the external device monitoring (EDM) function of the primary safety device. These forced-guided (mechanically-linked) contacts allow the safety device to detect failures of the Interface Module, and at a minimum, must be monitored in applications requiring Control Reliability per OSHA/ANSI or Category 3 or 4 per ISO13849-1.

## Important... read this before proceeding

**The user is responsible for satisfying all local, state, and national laws,** rules, codes, and regulations relating to the use of this product and its application. Banner Engineering Corp. has made every effort to provide complete application, installation, operation, and maintenance instructions. Please direct any questions regarding the use or installation of this product to the factory applications department at the telephone numbers or address found at <http://www.bannerengineering.com>.

**The user is responsible** for making sure that all machine operators, maintenance personnel, electricians, and supervisors are thoroughly familiar with and understand all instructions regarding the installation, maintenance, and use of this product, and with the machinery it controls. The user and any personnel involved with the installation and use of this product must be thoroughly familiar with all applicable standards, some of which are listed within the specifications. Banner Engineering Corp. makes no claim regarding a specific recommendation of any organization, the accuracy or effectiveness of any information provided, or the appropriateness of the provided information for a specific application.

## Applicable U.S. Standards

ANSI B11 Standards for Machine Tools Safety



Contact: Safety Director, AMT – The Association for Manufacturing Technology, 7901 Westpark Drive, McLean, VA 22102, Tel.: 703-893-2900

ANSI NFPA 79 Electrical Standard for Industrial Machinery

Contact: National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101, Tel.: 800-344-3555

ANSI/RIA R15.06 Safety Requirements for Industrial Robots and Robot Systems

Contact: Robotic Industries Association, 900 Victors Way, P.O. Box 3724, Ann Arbor, MI 48106, Tel.: 734-994-6088

### Applicable International Standards

ISO 12100-1 & -2 (EN 292-1 & -2) Safety of Machinery – Basic Concepts, General Principles for Design

IEC 60204-1 Electrical Equipment of Machines Part 1: General Requirements

ISO 13849-1 (EN 954-1) Safety-Related Parts of Control Systems

Contact: Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112-5704, Tel.: 800-854- 7179

### Certificate of Adequacy

This Safety Module datasheet satisfies the requirements of Machinery Directive 2006/42/EC, Section 1.7.4 — instructions.

### Status Indicators

Two green indicator LEDs on the front of each Interface Module indicate the output status of internal relays K1 and K2.

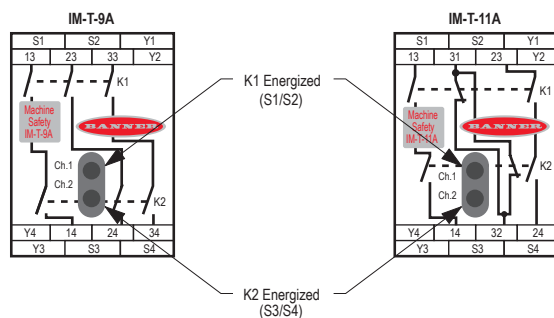


Figure 1. Interface Module Status Indicators

## Primary Safety Device Requirements

Interface Modules IM-T-9A and IM-T-11A are driven by one or two safety output channels of a primary safety device. For higher risk applications, the design of the primary safety device must meet OSHA/ANSI control reliability requirements (U.S. applications) or ISO/IEC/EN Category 3 or 4, Performance Level d or e, and SIL 2 or 3 requirements for European applications. IM-T-.A Modules must be used only with primary safety devices that have External Device Monitoring capability (see wiring figures and the Warning Interfacing MPCEs).

At a minimum, each output channel of the primary safety device must:

- Include one normally open forced-guided (mechanically linked) contact (FSD), or
- Include one solid-state 24V dc sourcing safety output (OSSD), and
- Be self-monitored to result in a safe (OFF) condition in the event of a failure, and
- Be capable of switching 50 mA @ 24V dc  $\pm$  15%.

NOTE: As OSSD solid-state outputs on primary safety devices very often are pulsed, it is possible that the relay coils will produce an audible buzzing. This relay buzzing does not affect the function of the Interface Module, as long as the pulse width is below 500  $\mu$ s (microseconds) and the duty cycle ( $t_1/t_2$ ) is greater than 500.

**Final Switching Device (FSD):** The component of the machine's safety-related control system that interrupts the circuit to the machine primary control element (MPCE) when the output signal switching device (OSSD) goes to the OFF-state.

**Output Signal Switching Device (OSSD):** The component of the electro-sensitive protective equipment (ESPE) connected to the control system of the machine which, when the sensing device is actuated during normal operation, responds by going to the OFF-state.