



# SRUS Safety Interface Controller Installation Instructions

## 1. INTRODUCTION

Tapeswitch SRUS interface control units are designed to be used with B-Series Light curtains to form a complete safety system. Full system installation instructions are supplied with the light curtains.

## 2. PRODUCT DESCRIPTION

The SRUS interface unit operates from 24Vdc supply. The unit is housed in a DIN rail mounting enclosure with 16 integral terminals. This unit is intended to be mounted in an existing electrical enclosure on the machine. This existing enclosure must be sealed to minimum rating of IP54.

## 3. PRINCIPLE OF OPERATION

When power is first applied, relays K1 & K2 are de-energized and there is no path through the safety contacts 13-14 and 23-24. When the reset switch is closed (Y1 - Y2 ) there will still be no path through the safety contacts. When the reset switch is opened again the path through the safety contacts is established.

If the light curtain is then obstructed, its outputs go off and the safety contacts open. Even when the light curtain is clear again the safety outputs remain open until the reset is repeated.

The unit provides both a manual or auto reset function.

In manual reset mode, the reset function provides start and restart interlock functions as follows:

**START INTERLOCK** - When power is applied to the system, the output relays cannot be energized until a reset signal has been applied.

**RESTART INTERLOCK** - Once the light curtain has been obstructed and the output relays have de-energized, they cannot be energised again until the light curtain has been cleared and a reset signal has been applied.

The start/restart interlock function must be incorporated somewhere in the machine safety system. However this function may be provided by equipment other than the light curtain. i.e. It may already be included in the machine control circuit. In such a case the light curtain interface should function in an auto-reset mode.

In auto reset mode the output relays will be energized whenever power is applied to the system and the light curtain is clear, and the output relays will re-energize immediately after an interruption is cleared.

In manual or auto reset mode, reset will be prevented while the light curtain is obstructed, if there is a fault in the reset circuit or if the two output relays are in disparity.

The safety output contacts of the control unit are connected to the machine primary control element(s) in such a way that if either of the safety output relays is de-energized then the machine will be brought to rest regardless of the state of the other relay.

**NOTE:** A machine primary control element or MPCE is defined as 'an electrically controlled element which directly controls the normal operating motion of a machine such that it is the last (in time) to operate when motion is initiated or arrested'.

In addition, where the machine control system has two MPCEs, these devices can be monitored by connecting normally closed auxiliary contacts from each MPCE in series with the reset input. Disparity between the two MPCEs will prevent a reset.

## 4. INSTALLATION

### WARNING

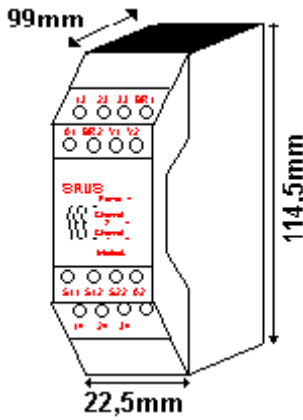
TAPESWITCH SAFETY SYSTEMS ARE DESIGNED TO PROTECT OPERATORS WORKING AT OR NEAR DANGEROUS MACHINES. THEY CAN ONLY PERFORM THAT FUNCTION IF THEY ARE CORRECTLY FITTED AND INTERFACED TO A SUITABLE MACHINE. EVERY EFFORT HAS BEEN MADE TO PROVIDE COMPREHENSIVE AND ACCURATE INFORMATION. IT IS THE RESPONSIBILITY OF THE USER TO ENSURE THAT ALL PERSONS INVOLVED IN THE INSTALLATION OF THE PRODUCT HAVE THE KNOWLEDGE, TRAINING AND EXPERIENCE NECESSARY AND THAT THEY ARE FULLY CONVERSANT WITH ALL LAWS, RULES, REGULATIONS AND CODES OF PRACTICE PERTAINING TO THEIR TASK.

### 4.1 MECHANICAL

#### 4.1.1 GENERAL

The SRUS interface unit should be mounted in the machine control unit on standard 'top hat' terminal rail type DIN EN 50 022-35. The machine control unit must provide sealing to IP54 according to IEC 529. The dimensions of the SRUS interface unit are shown in figure 1.

Mechanical vibrations greater than 5g / 33Hz should be avoided when in transportation and when in operation.



Terminal rail type DIN EN 50 022-35  
Figure 1 – Dimensions

### 4.1.2 RESET INPUT DEVICE

A normally open switch, preferably a 22 mm industrial pushbutton, should be used to provide the reset input. The switch should be housed in a suitable enclosure and should be mounted in such a position that it is safe from passing traffic and such that the person operating the switch can see all of the dangerous area.

## 4.2 ELECTRICAL

### 4.2.1 GENERAL

The connections for the SRUS interface unit are shown in Figure 4. Crimped ferrules should be fitted on all stranded wires. The exact cabling requirements are at the discretion of the installer and depend to a large extent on the siting of the various control system elements. In general, it is recommended that high voltage cables are routed away from low voltage cables.

### 4.2.2 LIGHT CURTAIN CONNECTION

Connect the fail-safe PNP inputs from the B-Series light curtain terminals 4 & 5 (cable colors yellow & grey) to terminals S12 & S22, as shown in Figure 4.

### 4.2.3 POWER CONNECTION

Connect +24Vdc to terminal A1 (+) & connect 0V to terminal A2 (-) as shown in Figure 4. The power consumption is approximately 2.5VA.

### 4.2.4 RESET INPUT CONNECTION

If the machine has two MPCEs, a pair of normally closed auxiliary contacts from each MPCE can be connected in series as follows: For manual reset connect across terminals Y1 & Y2 see Figure 2. For Auto Reset connect across terminals Y1 & Y2 see Figure 3. This provides cross-monitoring of the MPCEs such that if they are in disparity due to a fault, reset will be prevented until the fault is rectified.

If there is no external monitoring, fit a link across the terminals.

## 4.2.5 SAFETY OUTPUT CONNECTION

Two normally open safety outputs are provided. In low to medium risk applications the machine is normally provided with a single MPCE. In such cases both safety outputs should be connected in series with the MPCE coil as shown in Figure 5. If the machine is fitted with two MPCEs one safety output should be connected in series with each MPCE coil as shown in Figure 6.

To protect the contacts of the safety output relays from the effects of switching inductive loads, it is recommended that arc suppressors should be fitted in parallel with the MPCE coils as shown Figures 5 and 6. Arc suppressors must not be fitted across the safety relay contacts.

To protect against the possibility of both safety outputs welding in, due to an overcurrent fault in the machine circuit, 6A quick blow, or 4A slow blow fuses should be fitted in series with the MPCE coils as shown in Figures 5 and 6. This limits the current through the safety output contacts to well below that which could cause the contacts to weld.

## 4.2.6 MONITOR OUTPUT

If auxiliary signal contacts are required, the normally open contacts across terminals 33 & 34 can be used.

**NOTE: All outputs of the SRUS are safety outputs and can be used in the machine stop circuit.**

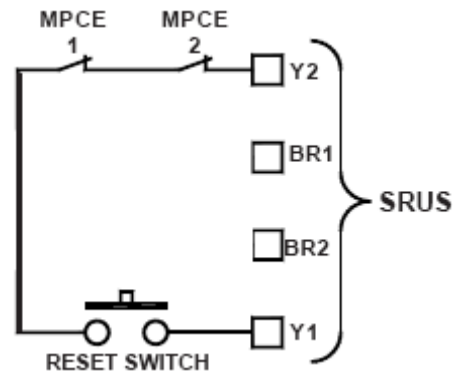


Figure 2- Cross-monitoring of MPCEs – Manual Reset

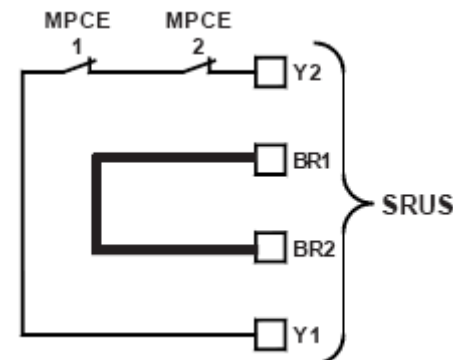
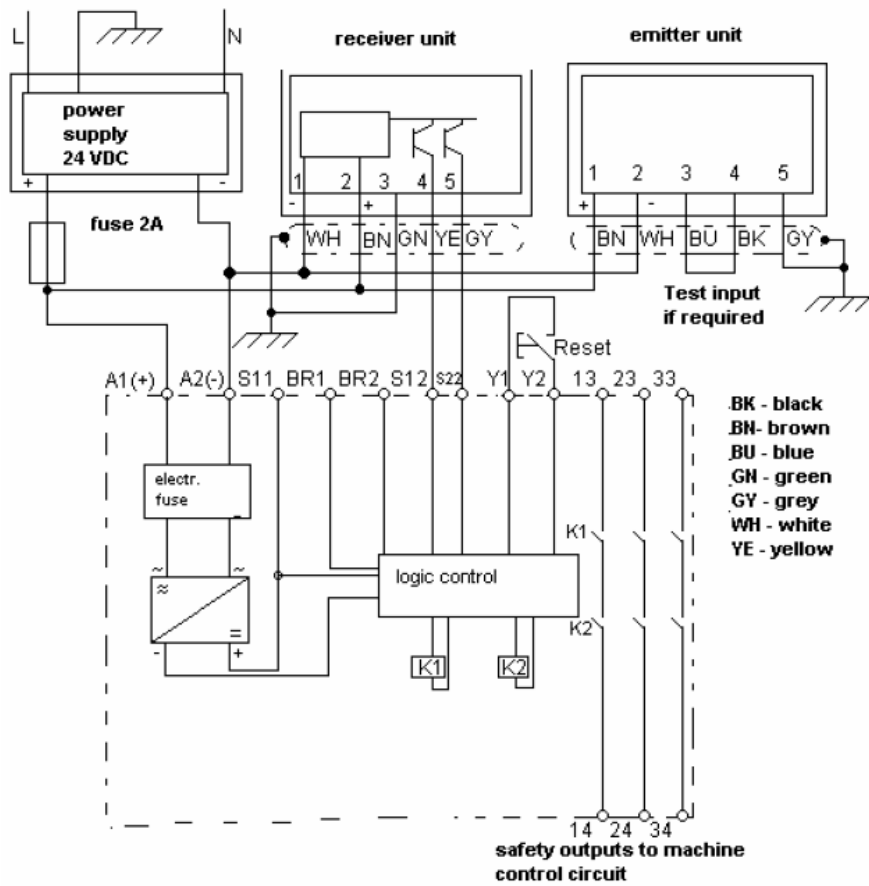
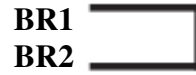


Figure 3- Cross-monitoring of MPCEs –Auto Reset



The diagram shows manual reset function with the B-Series guard. For automatic reset put a link between the contacts



and an additional link between



Figure 4 – SRUS Connection Details

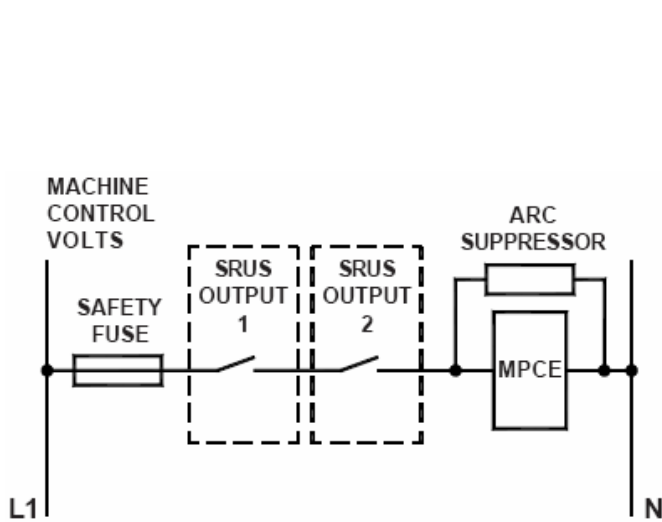


Figure 5 – Safety Output Connection (Single MPCE)

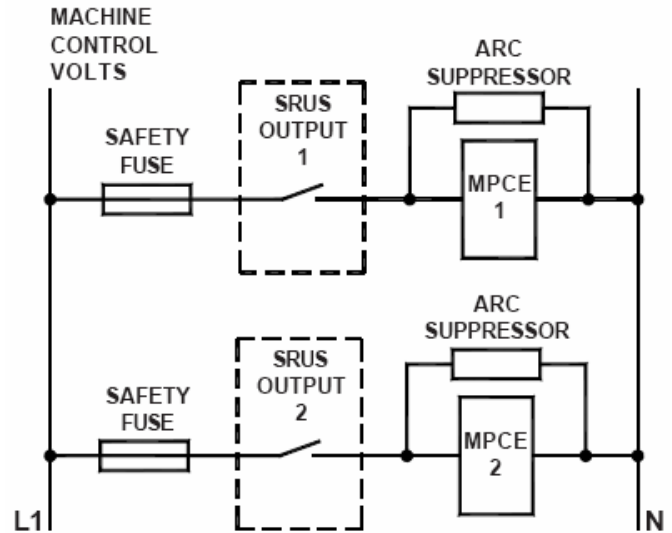


Figure 6 - Safety Output Connection (Two MPCEs)

## 5. TECHNICAL SPECIFICATION

<b>Operating Voltage</b>	<b>24 Vdc +/- 10%</b>
<b>Power Consumption</b>	<b>approx. 2.5 VA</b>
<b>Response Time</b>	<b>&lt; 30ms</b>
<b>Temperature Range: Operating</b>	<b>-25°C to +55°C</b>
<b>Reset Function</b>	<b>Manual or Auto</b>
<b>Contact Configuration</b>	<b>3 x N/O safety contacts</b>
<b>Contact Type</b>	<b>Relay positive guided</b>
<b>Max. Switching Capacity</b>	<b>1500 VA (resistand load)</b>
<b>Max. Switching Capacity</b>	<b>250 Vac, 24 Vdc</b>
<b>Switching Current</b>	<b>6A ac, 6A dc</b>
<b>Enclosure: Protection Rating Terminal Capacity Material</b>	<b>DIN 40050 (Terminal IP20) (Housing IP40) 2 x 2.5mm<sup>2</sup> solid wire DIN 26206 or 1 x 1.5mm<sup>2</sup> stranded wire with ferrule DIN 46228 Self-extinguishing according to UL 94 V-0</b>