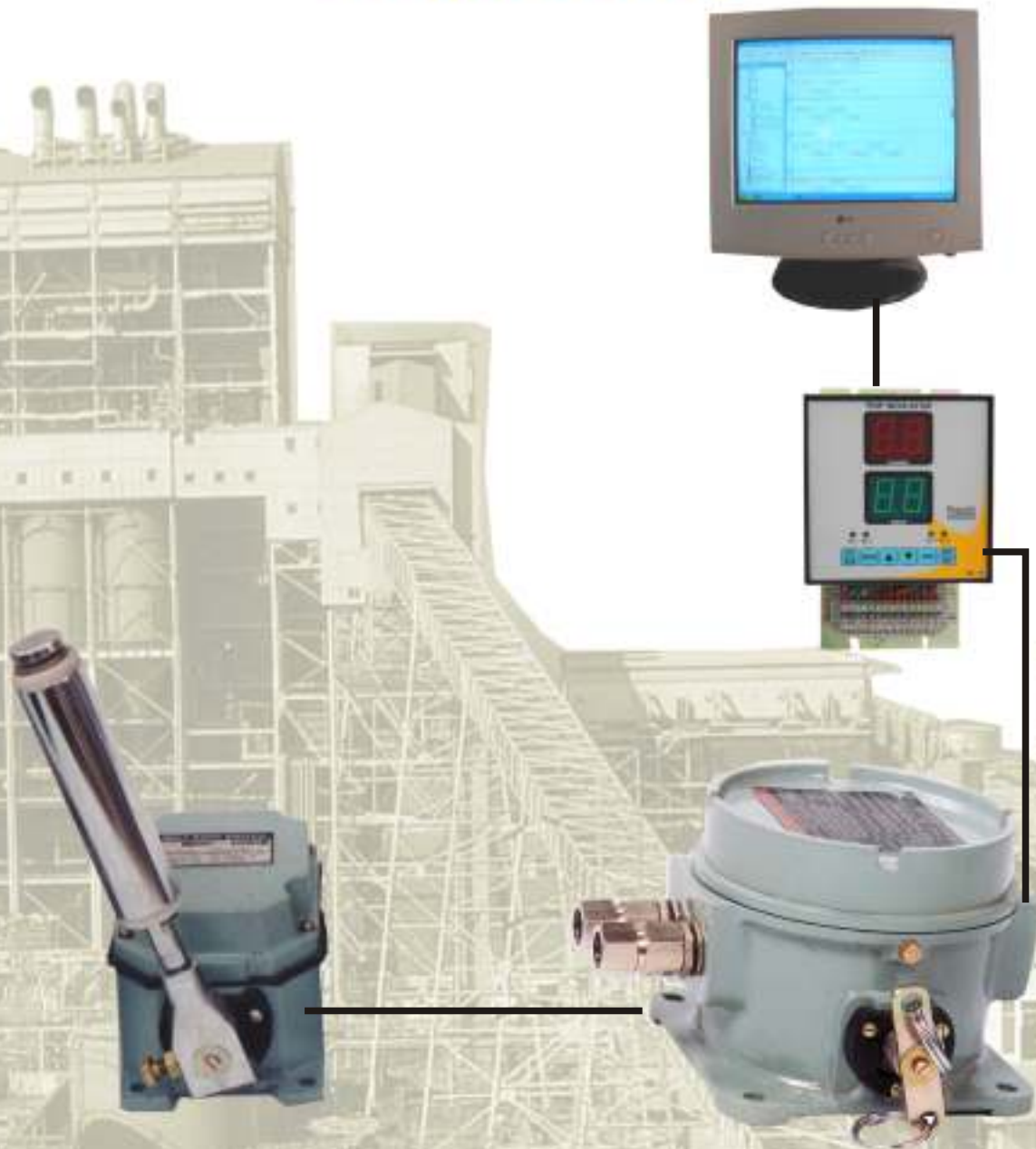


# CONVEYOR SAFETY SWITCHES WITH TRIP INDICATOR AND PC INTERFACE



**Proto  
Control**



# CONVEYOR SAFETY SWITCHES WITH TRIP INDICATOR AND PC INTERFACE

## DESCRIPTION :

PROTOCONTROL MAKE Pull Cord, Belt Sway, Heavy Duty Limit Switches are used for conveyor safety in material handling industries. Field switches are usually with different configurations of output contacts (1 NO + 1 NC or 2 NO + 2 NC).

Protocontrol now offers these safety switches with Trip Indicator & PC interface facility. Conventionally these switches are installed at 30 MTRS distance on a conveyor. NC contact of these switches is wired in circuit and taken to control room.

In conventional system, if any of the installed safety switch is actuated, there is no indication of location in control room. Operator has to rush at field for detection of safety switch to check and locate the actuated switch.

Now Protocontrol make Embedded technology has solved this problem and given the solution. Switches are now offered with communication facility. So that, sitting in the control room, operator can detect address and location of actuated switch. Every switch is to be fitted with separate communication card. With this feature every switch can be assigned with specific addressing code.

When any particular safety switch gets actuated specific indication will be available in the control room. Thus operator can directly go to the place where the pull cord / belt sway / heavy-duty limit switch has actuated and can take further action.

## FUNCTIONAL DESCRIPTION :

The Trip Indicator unit consists of indicator unit located in control room and one communication card to be mounted in each safety switch located in the field. Number of switches that can be interfaced to Trip Indicator vary with each model of Trip Indicator.

When particular switch is operated, the number of operated switch is displayed in the control unit. The trip indicator is also provided with relay contact output. The NO contact of trip indicator is to be wired in interlock circuit. In healthy state

(i.e. when control supply to trip indicator is ON and all safety switches are also in healthy state) this NO contact is normally in 'closed' condition.

In any fault condition like

- Switch operate
- Wire break / short (communication failure)
- No power to Trip Indicator,

This NO contact gets open, tripping the conveyor.

It has also special PC / PLC interface facility with which information can be made available in any PC / PLC.

Trip Indicator is offered in two main different models.

1. TRD MODEL (BASIC)
2. TRS MODEL (ADVANCED FEATURE)

## COMMON FEATURES :

- Globally proven EMBEDDED technology is used which works in adverse environment.
- Already established safety switch technology with state of art communication facility.
- Uses only one pair of field cables (No new cable is required in case of existing conveyor.) In case of failure in communication line, the conveyor is tripped and human safety is ensured.
- Signal cabling can be done by two core cable only.
- Specific No. of actuated switch can be directly displayed. Every switch will have specific address code, this eliminates the search for switch operated. Operator sitting in control room will recognize the number of operated switch immediately and will rush directly to that particular location.
- Existing potential free 'NO' or 'NC' contact of pull cord switch can be used in Trip Indicator depending on model.
- Auto reset facility i.e. when pull cord is reset system will reset automatically..

- Communication cards are interchangeable & addressable from main Control unit.
- Miniature communication card fits in any make switch.
- Time required in manual search for the operated switch is eliminated. This saves time to take further action.
- With PC interface, data storage facility can also be provided along with necessary software. So old record of operated switch details can be accessed.
- Software for display of PCS operation and historical data keeping/ printing is also available.
- Instant tripping with fail safe design concept.
- Weatherproof enclosure can be provided to suit in industrial environment.
- The system requires no extra PLC / PLC Supply. Hence no added or hidden cost.
- Communication with PC is available.
- RS 485 MODBUS RTU SLAVE OUTPUT to communication for PLC / DCS in all models.
- Special detection circuit against water contamination in rainy season in pull cord switch.

## 1. TRD MODELS:

Digital models, versatile design.

Basic model for general use. Economical, best suitable for small conveyors.

### Standard features :-

- NO' contact of PCS can only be used.
- Scrolling facility is not available.
- Only nearest station will be displayed.
- Grouping is possible as per models specified.
- Max. no. of groups are 4.

TRD models are available in two different models.

A. TRD 40 : On each conveyor max pull cords are 40

B. TRD 80 : On each conveyor max pull cords are 80

### Communication cards :

TRD CC:-

- TRD CC communication cards can be used for only TRD models.
- These Communication cards can be interchangeable in TRD models only.
- Size 38 x 12 mm .Totally sealed with IP 67 protection

## 2. TRS MODELS :

Advanced feature model, latest high speed embedded technology with built in memory. Suitable for long conveyors with all sophisticated features.

### Standard features :-

- 'NO' or 'NC' contact of PCS can be used and is selectable by user.
- Scrolling facility is available to scroll no. of operated PCS.
- All operated PCS will be displayed one by one.
- Auto reset facility for removing indication of reseted PCS.
- No restriction on the distance between switches and control room.
- Skip channel no. with bypass facility is available.
- For cable short or open separate fault relay output with option for conveyor tripping.
- Grouping is possible.
- Max. no. of PCS are 999 and can be divided in 1 to 4 groups.

TRS models are available in five different models.

- A. TRS 50
- B. TRS 99
- C. TRS 200
- D. TRS 400
- E. TRS 999

#### Communication cards:

TRS CC:-

- TRS CC communication cards can be used for only TRS models.
- These Communication cards can be interchangeable in TRS models only.
- Size 38 x 12 mm. Totally sealed IP 67 grade protection.

#### GROUPING :

- | Grouping of number of switches with location is possible.
- | Grouping is normally done for multiple small conveyors i.e. one Trip Indicator can be used for multiple conveyors.
- | One C/O relay output per conveyor / group.
- | For more no. of channels or groups, conveyor tripping will be instant but delay in display or indication.

**SPECIAL NOTE :** *Though grouping is possible it has disadvantage that if for any reason there is fault in control unit or control unit supply / cable faults etc, all OK conveyors will trip causing unwanted production / time loss Therefore it is recommended that each conveyor would be with separate Trip indicator*

#### ENCLOSURE :

1. Special back panel mounting enclosed type termination for IP 30 models.
2. For IP 55 models specially developed enclosure with glass window.

#### ADAPTER :

Since only two core cable is to be used and it is a data signal therefore it is not recommended to use additional power cable. However for extra safety separate hardware tripping (though 'NC' contact in series) is to be used, It is recommend to use separate Protocontrol make ADAPTER unit along with Trip Indicator unit.

This ADAPTER unit is to be mounted near to Trip indicator or control contactor so as to trip individual conveyor against pull cord operation. Separate NC contacts are to be hardwired in series so as to achieve hardwire switching as an additional safety. Adapter unit can be used along with any model of trip indicator. Din rail mounted / field mounted models are available.

Separate panel with one trip indicator & one Adapter is also available.

#### Adapter Models

- A. AD-R: Din rail mounted with 2 C/O relay contacts
- B. AD-F: Field mounted with 2 C/O relay contacts

#### Advantages :-

- Extra safety due to low current switching.
- No malfunction possibility due to mixing of 230 VAC and data cable of Trip Indicator which is not recommended as per International Standard.

- Fail safe circuit. i.e. conveyor will trip due to adapter as well as trip indicator also incase of power fail/ loose connection etc conveyor will trip.
- Since current is very low no armored cable is required. This will save cable cost also.

#### TRIP INDICATOR FOR BELT SWAY SWITCH :

Trip Indicator for BS is only available in TRS models with or without grouping.

MOMENTARY OVER TRAVEL OR OVER SWAY OF BELT SWAY SWITCH MAY BE ALLOWED so tripping can be delayed. Predefined settable time facility is provided to delay the actual tripping of conveyor.

Separate group or separate trip indicator is recommended for Belt sway switches.

#### INSTALLATION :

Installation will be part of supply package only. Protocontrol team will install the units as per site requirement.

Since each communication card is to be addressed, checked and tested at site for individual operation it is essential to allow proto control team to install all communication cards / address / test / program the system at site. Existing pull cord switches / cable etc can be used or for new projects all work can be carried out under Protocontrol supervision.

#### PC COMMUNICATION :

All trip indicators are provided with RS 485 Modbus RTU Protocol.

All Trip indicators will be in Slave mode. Suitable address map will be given in the Manual with which client can establish communication with any suitable PLC / SCADA / Master Unit etc.

#### PROJECTS :

PROTOCONTROL team is trained, experienced in execution of total turnkey package for multi conveyors system. All field instruments/ zero speed switches / belt sway / pull cord switches, separate MCC / Instrumentation / Electrical panels, Display options, cable laying, Drives / PLC / SCADA / Communication etc. can be offered & over all package can be taken on Turnkey basis.

Since Trip indicator is a major part of such packages

Protocontrol is now one stop solution for all such turnkey packages.

## MODEL SELECTION CHART : TRD SERIES.

1. Series	TRD	
2. No. of channels (PCS)	40	40
	80	80
3. Grouping		
	00	00
	02	02
	03	03
	04	04
4. Mounting		
Back panel		B (IP 30)
Wall mounting		W (IP 55)
5. Communication Card	TRD CC	TRD CC

## MODEL SELECTION CHART : TRS SERIES.

1. Series	TRS	
2. No. of channels (PCS)	50	50
	99	99
	200	200
	400*	400
	999*	999
3. Grouping		
	00	00
	02	02
	03	03
	04	04
4. Mounting		
Back panel		B (IP 30)
Wall mounting		W (IP 55)
5. Communication Card	TRS CC	TRS CC

- \* NOTE :**
- a. TRS 400, max. No. of groups are 2 no.
  - b. TRS 999 is without grouping

### ADAPTER

Adapter	
AD-R	AD-R
AD-F	AD-F



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