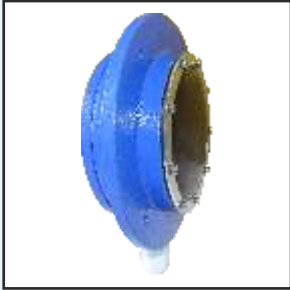




**SMART, INTELLIGENT,
LEVEL MANAGEMENT SOLUTIONS**



Our Customers



Smart sensors and Automations is leading suppliers of Level Switches & Transmitters , Conveyor Safety Switches and Control instruments for Level, Position, Speed, Flow, Temperature, Pressure measurement. We offer Control instruments for conveyor safety. Our Safety Pull Cord Switches with Rope break detection find application in all material handling plants. SMARTsaa is an associate company of Protocontrol Instruments I. Pvt. Ltd. SMARTsaa is formed by young and dynamic engineer in 2016 March. Initially was less known in industry but having clear attitude to excel. Those initial days were hard yards and were a testing ground for testing his skills and ability. Now it's a well known company having experienced success and accomplishment in every sphere. It is a transformation rather than a mere change.

The company has transformed from a product seller to VAR (value added re seller) to a knowledge based solution provider in the field of Level Measurement.

We are the first one to develop and offer:

1. India's most compact Vibrating Fork Level Switch for Liquid
2. India's first Vibrating rod level switch
3. Most compact RF Level Switch for all media application
4. Compact fuel level transmitter for diesel
5. Membrane / Diaphragm level switch for food grain hoppers and Bucket Elevator
6. Non contact level measurement of coal ash from outside the hopper in ESP Hoppers
7. Portable ESP Hopper Condition Monitoring System

Mission statement

It will be a consistent and continuous effort to be always a customer centric organization where every customer is treated with respect and served to meet all their process and field parameter measurement and control requirements. We will always try to offer best cost effective product to customer. Our innovation should be directed towards making our world better and better by offering products which help reducing lesser and lesser impact on environment.

Vision Statement

SMARTsaa will always be driven by the factor of opportunities .Hence we always be sourcing and developing new products and market to meet the need and demand. In this process we will ensure benefit of our employees.

Please send us your detailed requirement with application details so as to send you our offer.

- a. Application details
- b. Material whose level is to be detected
- c. Material details (Particle size for solids and density of liquid for liquid application)
- d. Tank / Hopper Size and dimensions
- e. Supply voltage
- f. O/P form

We are sure you will find SMARTsaa products cost saving and of superior quality.

Note:

Image and specification may change. Please consult us for more details

LEVEL SWITCHES AND TRANSMITTERS FOR LIQUIDS

Cable Ended Float Switch CEFS



Application Area :

Large Tank, Sump, slurry water, effluent treatment plants

Specification :

Material : PP
 Cable length : 5 Mtrs, PVC, 3 Core
 Contacts : 1 C/ O rated for 10 Amp resistive at 230 V AC
 Max Operating Temp : 70 °C
 Specific Gravity : 0.90 to 1.3
 Actuation : Internal steel roller ball and micro switch arrangement
 Position of stopper : Adjustable, 280 mm minimum from the end of float

Vertically Guided Single Point Float Level Switch VGLS SP PP



Application Area :

Point level Switch for liquid in all types of vessels. Suitable for corrosive chemicals, food industry, Lubricating systems for machine tools, printing & packing & SPM's, Ideal for monitoring level of liquid in small tanks

Specification :

Polypropylene Foam float
 Size : Dia. 24 mm x 21 mm,
 Lead Wire : 900 mm,
 Max Temp : 80 °C,
 Steam Length : 34 mm and 100 mm,
 Dia : 7.9 mm ,
 Suitable for clear liquids having specific gravity : 0.7 to 1
 SS 316 Float :
 Size : Dia. 28 mm x 28 mm,
 Lead wire : 2 Meter,
 Max Temp : 120 OC,
 Steam : SS 304, 40 mm and 100 mm below nut ,
 Dia : 8 mm ,
 Mounting : 1/8 NPT,
 Suitable for clear liquids having specific gravity : 0.8 to 1,
 Contact : 30VA, 240VAC Max
 Contact Form : SPST

Vertically Guided Multi Point Float Level Switch VGLS M SS



Application Area :

Multipoint level switch for Clear water, Oil, Chemical, & coolant

Specification :

Suitable for clear liquids having specific gravity : 0.7 to 1
 Contact rating : 30 VA, 240 VAC Max
 Contact Form : SPST for each level
 Termination Head : Cast AI or DIN Connector

Side Mounted Liquid Level Switch, Miniature, Plastic SMLS P



Application Area:

Small tanks and vending machines. Machines for Process, food Industry

Specification

Mounting : Horizontal.
 MOC of float : PP
 Specific Gravity : Min 0.7
 Logic : SPST
 Contact Rating : 30 VA, 24 V DC

Side Mounted Liquid Level Switch, Miniature SS SMLS P OM



Application Area :

Liquid dispensing machines, Liquid Vending machines

Specification :

Mounting : Horizontal.
 MOC of float : SS
 Specific Gravity : Min 0.7
 Logic : SPST
 Contact Rating : 30 VA, 24 V DC

Vertically Guided Multi Point Float Level Switch VGLS M SS



Application Area :

Point Level switch for tanks and vessels

Specification :

Mounting : Horizontal.
 MOC of float : SS
 Length of float : 130 mm.
 Float Dia. : 44 mm.
 Specific Gravity : Min 0.7
 Logic : 1 C/O
 Contact Rating : 2 Amps resistive at 240 VAC
 Max. Temperature : Up to 120 °C
 Max Pressure : Up to 20 Kg / Cm²
 Mounting : Flanged, Diameter 120 mm, having four holes of 14 mm dia. at 92 PCD (Other Flange Sizes on request)

Conductivity Level Switch CLS MP



Application Area :

Suitable for liquids: Water, fruit Juice and chemicals and conducting liquid having conducting range up to 16 micro Siemens.

Specification :

Probe Length	: 45 mm
Control supply	: 12- 30 VDC, protected against short circuit
Output	: PNP,
Load current	: 100 mA
Ambient Temp	: -20to 60 °C max.
Temp in vessel	: max 80 degree cent
Enclosure	: SS 316 integral with probe
Mounting	: Screwed: ½ inch, ¾ inch, 1 inch , BSP / NPT

Electro Optic Point Level Switch EOPLS



Application Area:

Level sensing of clear liquids, oils and beverage. Liquid level sensing in closed pipeline. Leak detector sensor

Specification :

Power Supply	: 12 V DC
O/P	: PNP or NPN
Repeatability	: + - 1mm
Enclosure Prism	: Polysulfone, Various enclosures available considering specific liquid.

Capacitance Level Switches for Sticky, Pasty, High or Low Viscose material MCPS



Application Area :

Dairy, Food Processing Machines, Chemical and Pharmaceutical Industries.

Specification :

Power Supply	: 10-30 V DC, Three wire
O/P	: PNP or NPN
Load Current	: 100 mA
Repeatability	: + - 2 mm
Enclosure	: Stainless Steel
Operating Temp	: 60 °C

Compact Vibrating Fork Level Switch for liquids VFLS I



Application Area :

Most compact Level switch for Oil, Diesel, edible oil, gear oil, honey, water, juices, aerated drinks, milk and chemicals. Used in brewery, food processing, cosmetic, chemicals, pesticides, pharmaceutical, dairy and packaging

Specification :

Enclosure	: SS 316 L, Integral with fork
Max. Process temp	: 150 °
Ambient Temp	: -20 to 60 °C
Control supply	: 12 - 30 V DC,
Output	: PNP , max 100 mA
Mounting	: Screwed, 1/2 inch, 3/4 inch, 1 inch BSP / NPT Try-clamp flange models available.
Probe length	: 65 mm ,
Fork (Tong) length	: 44 mm

For liquids and slurries of density greater than 0.7 gm/cc and viscosity up to 10000 centipoise.

Level Transmitter for Liquid RFLT



Application Area :

Level Transmitter for conducting liquids like water, feed water, fruit juice, milk, wine & acids.

Specification :

Rod Type, Loop Powered, Insulated Probe,

Housing	: Cast Al, weather-proof, IP 65
Cable gland	: 1 x PG 13.5
Supply	: 12-30V DC, Loop Powered
Output	: 4-20mA,
Maxi. Temp.	: 60 °C
Probe type	: Rod
Probe	: SS 304,
Sensing probe	: 8mm dia.
Mounting	: 1/2" BSP, SS 304
Insulation	: PTFE
Probe length	: Please specify (Up to 3000 mm)

Fuel Level Transmitter FUELtrans



Application Area :

Level Transmitter for non conducting liquids like oil , and hydrocarbons like Acetone, Ammonia, Benzene and Chemicals.

Specification:

Rod Length	up to 1500 mm
Housing Head	: Al
Cable gland	: M12
Supply	: 12/24 DC,
Output	: 1.5 to 4.5 VDC , 1.5 -10 V DC /
loop powered	: 4-20 mA
Accuracy	: + - 1 % FSD ,
Out Put Current	: < 20 mA
Temp.	: -20 to 85 %°Cent
Probe type	: Rod, Dia. 20 mm
Probe	: AI / SS
Mounting	: Threaded/ Flanged
Warm up time after power on	< 10 Sec Maxi.

Level Indicator LIC



Application Area :

For Remote indication of level
Hi-Low contact setting

Specification :

Power Supply Input	: 90 to 270 V AC, 50 Hz : From Level Transmitter , loop powered / 3 wire / 4 wire (Please specify)
Range	: Programmable
Display	: 4 Digit, 0.5" red LED
Tx. Power Supply	: 24 V DC, 30 mA
Relay Contacts	: 2 C/O,(1 C/O for high and 1 C/O for low) 5A
Communication port	: RS 485 with Half Duplex MODBUS protocol : Optional
Mounting Cutout	: Flush on Panel , : 92 X 92 mm

Power Supply Relay Unit PSR W



Application Area :

For powering Level Switches working at 24 V DC with Aux supply 230 V.

Specification :

For powering Level switch having supply voltage of 24 V DC	
I/P	: From Level Switch, PNP / NPN (Please specify)
Voltage O/P to level switch	: 24 V DC, 100 mA
O/P	: 1 C/O relay Contact,
Contact Rating	: 5 Amp resistive at 230 V AC
Enclosure	: DIN rail, Plastic enclosure / Field Mounting IP 65
Aux Supply Voltage	: 230 V AC

Pump Controller DLC



Application Area :

For powering two Level Switches (fitted at Top and bottom) With pump control logic.

Specification :

For powering two Level Switches fitted at top and bottom of the tank with logic O/P.	
Supply voltage	: 230 VAC
I/P	: From two Level Switch, PNP
Voltage O/P to level switch	: 24 V DC, 100 mA
O/P	: 1 C/O
Contact Rating	: 5 Amp at 230 V AC
Enclosure	: DIN rail, Plastic / Field Mounting IP 65
Aux Supply Voltage	: 230 V AC

Logic of operation :

DLC-F : Filling level controller, The relay energizes (Pump ON) when level reaches bottom and de-energizes (Pump OFF) when level reaches top
DLC-E : Emptying Level Controller The relay energizes (Pump ON) when level reaches top level and de-energizes (Pump OFF) when level reaches bottom .

LEVEL SWITCHES AND TRANSMITTERS FOR POWDER, GRAINS AND BULK SOLIDS

Capacitive Level Switch CLS M P



Application Area :

Suitable for : Food grain, Plastic Chips, wood chips, saw dust, sugar, Cement, Detergent, wheat flour, chemical, powder, oil, Detection of granular solids and powder, over fill and dry run

Specification :

Power supply	: 12-30 V DC , Enclosure : SS 316,
Ambient Temp	: -20 to 80 °C,
Probe Length	: 35 mm,
O/P	: PNP, NO,
Process Connection	: 1/2 inch, 3/4 inch, 1 inch
BSP/ NPT O/P	: 100 m A Max, Protected against short Circuit of load,
Process Temp	: 80 °C max , Sensor face : PTFE insulated

Special Note :

Not recommended for sticky & conductive material

RF Admittance Level Switch Rod Probe RFLS R



Application Area :

Suitable for level sensing of coal, iron ore, powder having particle size less than 30 mm. Can also be used for higher size lump provided it also contains fines to cover the sensor face completely

Specification :

Rod Probe, Teflon Insulation, Control Unit : Integral	
Control Circuit	: Integral with Probe
Enclosure	: Cast Al, IP 65
Control supply	: 230 V AC, 50 Hz.
Control Unit	: Temp up to 60 °C
Output	: 2 C/O relay contact, 5 Amps.
Probe Type	: Rod
Rod	: SS, 16 mm dia,
Insulation	: PTFE , Teflon,
Rod Length	: Please specify in mm,
Mounting	: Screwed, 1 1/2 inch BSP, M,
Operating Temp	: (for probe) : 150°C

Special Note :

With special coat guard amplifier circuit which will ignore effects of built up on probe. Field selectable operation logic configurable high or low point switching. Models with: Ceramic insulation for temp up to 450 degree cent. Remote models for high ambient temp.

RF Admittance Level Switch Rope Probe RFLS C



Application Area :

Top mounted heavy duty level switch for bunkers and hoppers. Stock Pile level sensor for stacker declaimer.

Specification :

Other specifications as Rod Probe Level Switch except	
Probe Type	: Rope probe,
Insulation	: PTFE, Teflon,
Rope Length	: 1000 mm, GI wire (approx 12 mm diameter) with MS counter weight, Other rope length also available

**RF Admittance Level Switch
Disc Probe
RFLS D**



Application Area :
Chute Block Switch
Material Plug Switch for discharge hopper

Specification :
Other specifications as Rod Probe Level Switch except
Sensor Probe : Heavy Duty Disc Probe, MOC :
Sensor : SS, Shield / Ground : MS,
Insulation : UHMWPE / HDPE,
Mounting : flanged
Operating Temp (for probe) : 150 °C,

The material should be dry and moisture contains should not be more than 5-6 % (The material should not form layer more than 6 mm on the face of the switch)

**Vibrating Fork Level Switch For Powder
VFLS**



Application Area :
Heavy duty Level Switch for free flowing powder.

Specification :
Enclosure : Cast Al, IP 65
(Max. operating temp 60°
Control supply : 230 V AC, / 110 V AC 50
Hz please specify any one
Output : 2 C/O relay contact,
Contact Rating : 5 Amp. Resistive at 230 V AC.
Switch status display : By LED
Mounting : Screwed , 1 1/2 inch BSP
Suitable for free flowing
powder and granules having
size less than 10 mm
Fork Length : 250 mm , other length on
request
Ambient Temp : 60 °C
Max Temp in vessel : 120 °C
Particle size should be less than 10 mm and to be free
flowing.

**Vibrating Rod Level Switch For powder
VFLS R**



Application Area :
Suitable for : Cement, Powdered milk, flour,
Spices, coffee beans, coffee powder, tobacco,
clay, coal ash, plastic granules, sand, foundry
sand, animal food etc.

Specification :
Enclosure : SS 316 Ambient Temp
: 60 °C max, Process Temp
: Up to 150 °C (200 °C on
request)
Control supply : 12-30 V DC / 90-230 V AC
Output : PNP, NO, max 100 mA,
Protected against short circuit
of load / Relay O/P
Mounting : Screwed , 1 1/2 inch BSP /
NPT (Please specify). Flanged
mounting (2 inch ANSI/ ASA ,
also available).
Rod Length : 250 mm, (models with higher
rod length up to 2000 mm)
Ambient Temp : -20 to 60 °C
Max Temp in
vessel : Up to 150 °C

**Rotating Paddle Type Level Switch
PLS**



Application Area : Heavy duty Level Switch for free
flowing powder and bulk solids and food grains.

Specification :
Suitable for free flowing powder and granules
Enclosure : Cast Al, IP 65
Control supply : 230 V AC, 50 Hz.
Output : 1 C/O contact,
Contact Rating : 5 Amps. Resistive at 230 V AC.
Mounting : Screwed , 1 1/2 inch BSP,
SS 304
Rod : 150 mm, 12 mm diameter. Other
rod length available. Various
paddle designs available for
different materials
Max Temp in vessel : 80 °C

**Diaphragm Type Boot Level Switch /
Membrane Level Switch
DLS**



Application Area :
Suitable for free flowing powder and grains having
density up to 0.3 to 2.5 g/cm³, Density up to 0.05
Kg/dm³ (50 Kg/M³) Approx.

Specification :
Industrial grade, For monitoring level of powder,
granules and food grains
Switch compartment : Al, Polycarbonate, IP 40
Max. operating temp 80 °C
Special models for High
Temp application
Output : 1 C/O relay contact,
Contact Rating : 10 Amps. Resistive
at 230 V AC
Diaphragm Material : SS
Rubber diaphragm also
available

Special Note :
Industrial grade suitable for particle size up to 30 mm
(should also contains fines) (without sharp edges)
Sensitivity : 300-500 gm

Radar Level Transmitter



Application Area :
For monitoring level of solids and powder by non
contact way
Hopper/ Bunker level sensor
2 Wire / 4 wires Level Transmitter.

Specification :
Range : Up to 70 Meters
Housing : Al / ABS Plastic
Enclosure of
Electronics : IP 65 / NEMA 4.
Output : 4 - 20 mA with
Communication
Port / HART Protocol
Power Supply : 18 to 35V DC.
Process Connection : 1.5" BSP with slip on 4"
MS Flange, 15 mm thick.
Available in guided type
with probe or horn type
with horn

Portable type ESP Hopper Condition Monitoring System



Application Area :

ESP Hopper
Economizer ash hopper
Cone Pump
Buffer Hopper

For Detection of :

Ash Level In ESP Hopper by non contact way.

Percent ash quantity inside the hopper.

Rat hole formation.

Ash deposition on walls of ESP Hopper.

ESP Hopper Condition Monitoring Duty.

Single system can be used for monitoring condition of multiple hoppers.

Same product can be used for Continues monitoring of single hopper.

Analogue 4-20 mA O/P with respect to ash quantity in hopper

Relay contacts for tripping, High and low level

Specification :

Consist of :
1. Coal Ash Sensor
2. Portable Power Supply
Supply : 85 to 230 V AC from portable power supply

Naturally Occurring Gamma Ray Detection Technology

No need of external Gamma Ray Source or approval
Fully safe.

Mounting : From outside the hopper, no need of cutting walls or making holes to the hopper.

To be located near the top level RF switch of the hopper

Operating Temp : Up to 85 °C ,
Weight : Approx 4.5 Kgs
With portable heavy duty power supply having back Up 8 Hours for continuous reading
Power Supply I/P : 230 V AC ,
Weight : Approx 8 Kgs

OUR OTHER PRODUCTS

Safety Pull Rope Switch Single Side Operation



Application Area

Bulk Material Handling Conveyors
Emergency Stop Switch with Rope Break Detection
Safety Pull Rope Switch
Switch with extra safety feature
Contact operation
1. Cable is pulled
2. Cable is broken or slack.
Span : 80 Mtrs

Safety Pull Rope Switch Both Side Operation



Application Area

Bulk Material Handling Conveyors
Emergency Stop Switch with Rope Break Detection
Safety Pull Rope Switch
Switch with extra safety feature
Contact operation
1. Cable is pulled
2. Cable is broken or slack.
Span : 160 Mtrs

Accessories for Safety Pull Rope Switch



Application Area

Required to keep rope always in tight condition

Crane Anti Coalition Safety Switch



Application Area :

Protect two cranes moving on same plane against coalition

Digital Zero Speed Safety Switch



Application Area :

Digital Display Zero speed switch For conveyors and crushers bucket elevators and rotating equipment

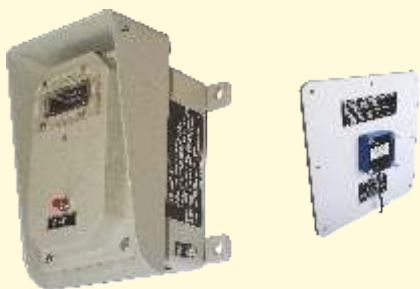
Compact Zero Speed Switch



Application Area :

Bucket Elevators
BMH conveyors
Chemical processing
Conveyor systems
Food processing
Mining Equipment
OEM applications
Paper Manufacturing
Power Plants
Recycling Equipment

Missing Bucket Detector for Bucket Elevator



Application Area :
Digital Display ZSS
For conveyors and crushers bucket elevators and rotating equipment

Belt Misalignment Detector for Bucket Elevator



Application Area :
Used on bucket elevator to detect belt sway
Prevent damage by early detection of sway

Belt Rupture Detector IR Type



Application Area :
Long Conveyor Belt Protection

Jet Pulse Sequencer Timer



Application Area :
Bag Filter
Jet Pulse Filter
ESP filter

Lubrication Event Timer



Application Area :
Lubrication timer for machines
Street light controlling
Garden light controlling

Proximity Switch



Application Area :
Position Sensor
Rotation Sensor
Speed Sensor

Enclosures and Junction Boxes.



Application Area :
Junction Boxes
Local Control Station
Push Button Station
Pendant Control Station

Limit Switches



Application Area :
End Travel, Position Limit Switch

Cement Bag Counter



Application Area :
Production Counter
Jumbo Display Process Indicator
Batch Counter

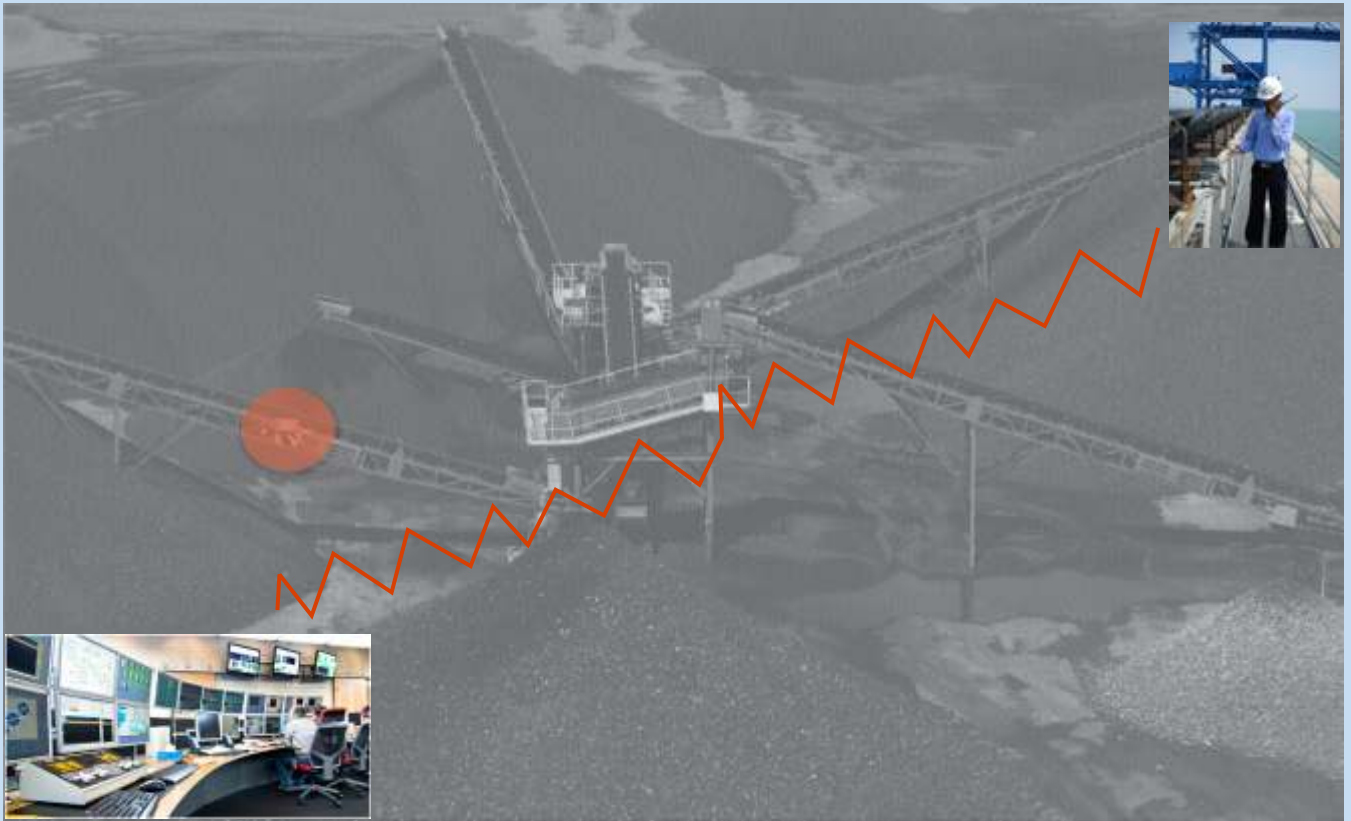
Smart Sensors And Automations

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FAST & ACCURATE FAULT DETECTION CONVEYOR MONITORING SYSTEMS



CONVEYOR MRI TRIP INDICATOR



ADDRESSABLE SAFETY SWITCH TECHNOLOGY

SALIENT FEATURES:

- Easy and instant location of operated safety switch
- Saves precious down time in locating the operated switch
- Displays exact location of operated switch
- Multiple operated switch displayed by way of scrolling
- Specially developed for conveyor safety and maintenance monitoring in material handling industries.
- Concept of TRIP INDICATOR with PC interface facility is developed first time in India (even in world).
- Superior in terms of its essential features, user comfort, installation, and due to various versions available
- Can be easily adapted in running plants as no special cable is required
- Saves cable cost for upcoming plants
- Multiple type switches (Pull Cord Switch, Belt Sway switch, ZSS) can be wired in single loop and still you get separate contact O/P

CONVENTIONAL OPERATION OF SAFETY SWITCHES

Conventionally safety switches are installed at 30 Meter distance on a conveyor. If any of the installed safety switches is actuated, there was not any provision for the exact identification of location and status of safety switch in control room. Operator has to rush at field for detection of safety switch to check and locate the actuated switch or any cable fault. In this process there were losses in production, time, money and sometimes life also.

SMART ADDRESSABLE WAY OF WIRING SAFETY SWITCHES

To make ordinary safety switch addressable, Protocontrol offer Trip Indicator system is to be used. Trip Indicator Unit consists of :

- Display Unit (Trip Indicator or Master unit) located in control room
- Communication Cards: To be mounted in each safety switch

When any safety switch gets operated, conveyor will trip INSTANTLY and signal sent to the Trip Indicator from where TRIP relay o/p is generated. The operated switch number is displayed and communicated to PC/ PLC as per requirement.

TRIP INDICATOR UNIT MODELS:

Trip Indicator system is offered in different models as below

- Trip Indicator : TRA (Popular and economical model)
- Trip Indicator : TRS (Sophisticated model with added features)

TRA MODEL:

These models are auto addressable type and requires termination module at the end of loop for proper functioning. Auto addressing helps to place any communication card in any safety switch without individual addressing. TRA model is more popular due to its small size, low cost with extra essential features. Refer loop diagram shown in this catalogue for TRA. All safety switches NC contacts are connected in series with communication card mounted in each safety switch and to be connected as shown in diagram.

One common trip indicator unit for multiple loops/ groups/ conveyors etc are also possible Without hampering any safety of major functionality since Individual loop operation is independent

Special essential features:

Following are the various possible essential features of Model TRA

- **HMI/ Keypad** facility makes the system fully smart.
- **Auto detection of type of safety switch:** This unique feature offered by Protocontrol. With this facility Pull cord Belt sway can be wired in single loop and you get separate contact O/P for Pull Cord Switch and Belt Sway Switch. This can save cable cost drastically.
- **Auto/Manual reset :** Key pad selectable function.
- **CABLE FAULT** with exact location : Fault location for

cable short or cable open both

(available only with Protocontrol).

- **Analog output 4-20mA (Isolated)** available with selectable resolution.
- Analogue O/P with selectable resolution:
- Very special HEX analog O/P: Dual 4-20mA O/P with resolution of 1mA can be available up to 256 switches & with 0.5 mA resolution up to 1024 switches per trip indicator.
- **Split facility:** With the help of split facility user can get separate relay/analog output for belt sway switch and pull cord switch which are wired in common loop. This facility can also be useful for different cascaded conveyors wired in common loop.
- **Specific Switch Bypass (password protected) facility:** For safety switch which is faulty / operated if user do not want to attend particular safety switch immediately then with Sr. authority permission user can bypass particular safety switches from control room without actual visit to site.
- **Absent detection :** Unique but essential feature. In all auto addressable type units, if some switches are removed from loop due to auto addressing initial assigned positions change. Therefore user gets wrong information about status operated switch number for all safety switches. This is major drawback for existing auto addressable systems in market. This drawback is removed TRA model. User can teach the unit about these absent numbers in loop so that switch location number will remain same always.
- **ZSS (Zero speed switch) or other conveyor switches (like Chute block switch / tilt Switch) can be connected in same loop with pre auto assigned location number (saves cable cost)**
- **Higher conveyor length :** No limitations for length of conveyor or number of switches. Standard model can work up to 8-10 Km. length with 2.5 Sq. mm cable. For still higher length separate versions are available.
- **Unit with LCD display:** Models with alpha numeric display information like conveyor Name, correct fault location information etc are also available.
- For very small length conveyors extra economical models without key pad with only basic required features are also available.

Other special Models/ units :

Following additional units can be considered as readily available.

- TRA with Auto Detection of type of safety switch:** Type of safety switch will be automatically detected using special communication card.
- TRA with Phase looped communication:** In old plants existing conveyors are pre-wired /looped directly using phase voltage (230VAC or 110VAC) then changing loop voltage or mixing of 24 VDC communication signal is not possible due to use of multi core cables with phase voltage. Using or laying additional special cable just for using trip indication system may not be feasible. Special Modulation units are offered with which communication cards will be provided to work on 230VAc carrier signal and data is superimposed on this carrier with guaranteed performance Ask for more details whenever required.
- TRA with built in memory:** TRA unit with additional built in memory for fault logging like conveyor status, safety switch operation status required history for about last one month can be made available within this unit itself on per Hr/ per day basis.
- TRA unit for cascaded conveyors:** Safety switches of multiple conveyors are to be wired in common two core wire loop but you get separate outputs per conveyor for tripping. Max. up to 4 conveyors can be cascaded as per requirement. This feature is introduced to overcome drawbacks of existing auto addressable systems in market.

BASIC TRA MODELS: TRA4F

1. Mounting & Size : Front Panel Mounting With 48 (H) X 96 (W) size.
2. Max. Groups:
 - a) 4 input 4 output.
 - b) 4 input 8 outputs with external relay.



3. O/P : analog / digital / communication
Widely used in Belt watch panels being very small size.

TRA9W/9F

1. Mounting & Size : Back Panel Mounting / Front Panel mounting. With 96 (H) X 96 (W) size.
2. Groups: 4 input & 4 output
3. O / P : A n a l o g / digital / communication
Widely used for Individual unit mounted near to each conveyor separately.



TRA12W



1. Mounting & Size : Back Panel Mounting Approx size 120 (H) X 130 (W).
2. Max .Groups: 4 input & 8 o/p.
- 3 . O / P : a n a l o g & digital / communication Widely used when common unit to be used for more than one conveyors.

2. Trip Indicator Model: TRS (Sophisticated version).

TRS models are having dedicated INDIVIDUAL ADDRESSING feature which make It very special. Each safety switch communication card is individually addressable with addressing facility provided within indication unit itself. one time programming at site with features like Auto Reset, Roll Call, Bypass, Individual Addressing, Binary O/P etc. TRS Models are available in all sizes similar to TRA.

3. CC – 4W (System without Trip Indicator).

Most economical which requires no control unit but only 4 wire loop with only communication cards and best suitable for PLC controlled very small conveyors .PLC unit require RS 485 Modbus RTU master protocol. PROTOCONTROL also can offer master PLC as an option.

4) Belt watch panel (BWP-TRA or BWP-TRS)

PROTOCONTROL offers total turn key package for Trip Indicating system. The system with Instrumentation grade control panel with proper electrical accessories/

instrumentation grade wiring as per international standards are provided. For turn key package engineering / procurement/ support can be provided on project to project basis. Belt watch panel is convenient system for large number of conveyors & also can be very efficient and economical option. Belt watch panel will take single phase, power supply (230 V,50 Hz). However individual Trip Indicator units will be provided internal 24 V DC power source. Trip indicators will be mounted on the front/back side inside panel. Required outputs will be made available in belt watch panel through proper termination/ wiring etc as per international standards. Panel fabrication can be of PROTOCONTROL make as well as it can be offered as per other approved makes. Enclosure protection grade can be provided as per the requirement.

TYPICAL CONVEYOR LOOP DIAGRAM (TRA MODEL).

- 1) TRA with individual loop connection. (PCS & BSS in separate loop)
2. Trip Indicator Model: TRS (Sophisticated version).

TRS models are having dedicated INDIVIDUAL ADDRESSING feature which make It very special. Each safety switch communication card is individually addressable with addressing facility provided within indication unit itself. one time programming at site with features like Auto Reset, Roll Call, Bypass, Individual Addressing, Binary O/P etc. TRS Models are available in all sizes similar to TRA.

3. CC 4W (System without Trip Indicator).

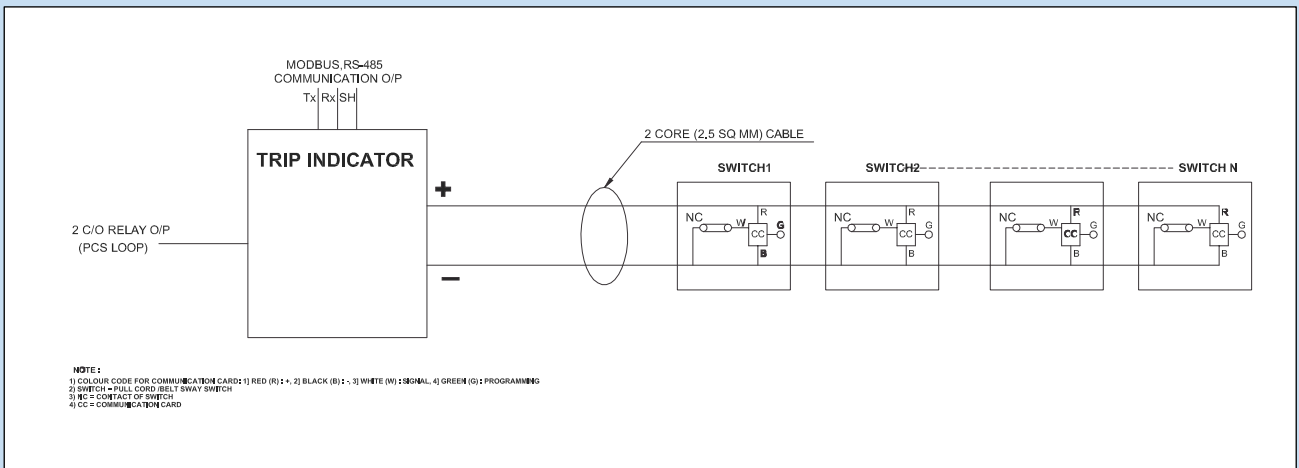
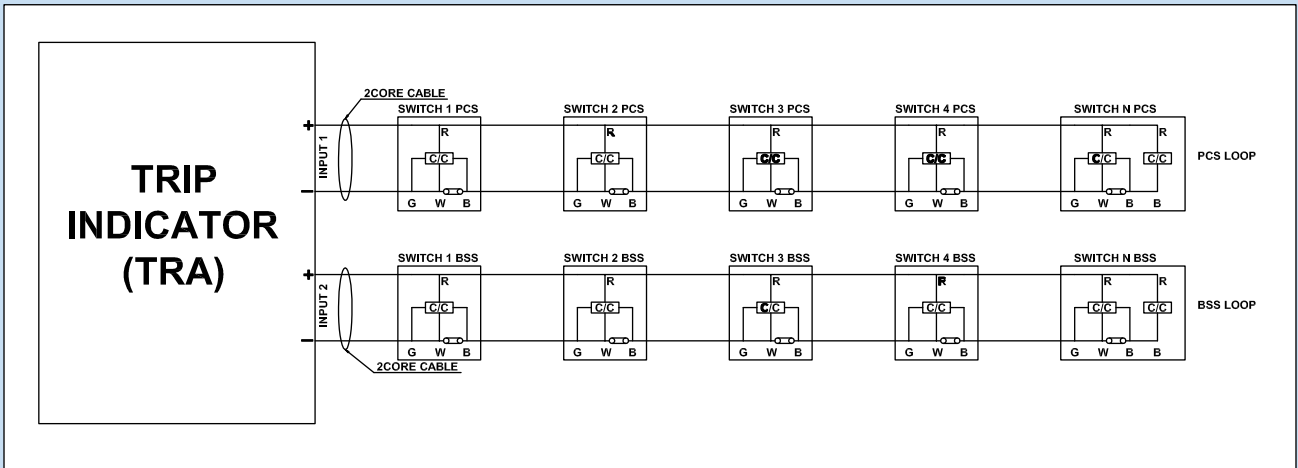
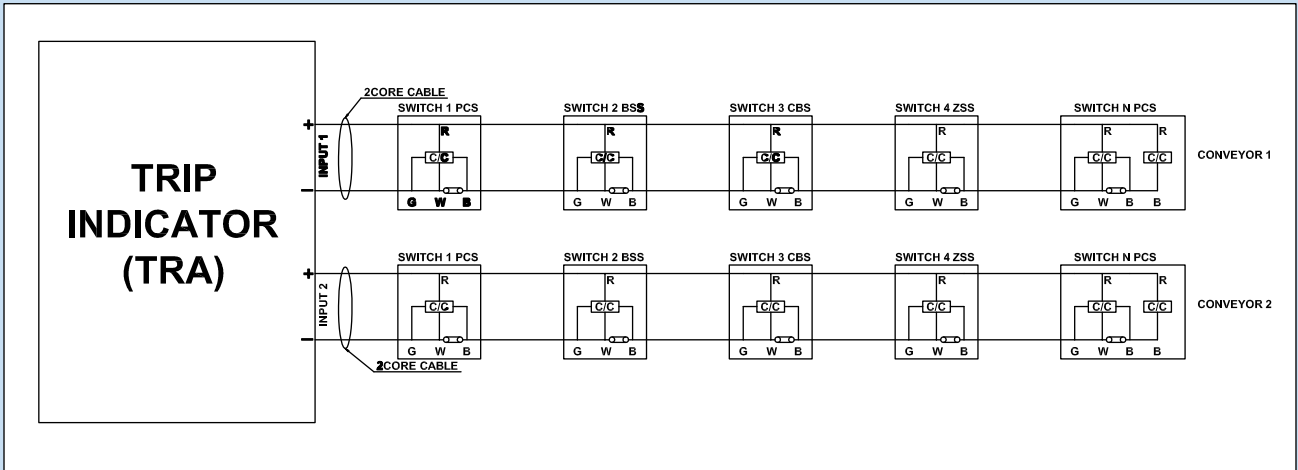
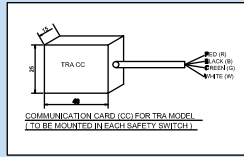
Most economical which requires no control unit but only 4 wire loop with only communication cards and best suitable for PLC controlled very small conveyors .PLC unit require RS 485 Modbus RTU master protocol. PROTOCONTROL also can offer master PLC as an option.

4) Belt watch panel (BWP-TRA or BWP-TRS)

PROTOCONTROL offers total turn key package for Trip Indicating system. The system with Instrumentation grade control panel with proper electrical accessories/ instrumentation grade wiring as per international standards are provided. For turn key package engineering / procurement/ support can be provided on project to project basis. Belt watch panel is convenient system for large number of conveyors & also can be very efficient and economical option.

Belt watch panel will take single phase, power supply (230 V,50 Hz). However individual Trip Indicator units will be provided internal 24 V DC power source. Trip indicators will be mounted on the front/back side inside panel. Required outputs will be made available in belt watch panel through proper termination/ wiring etc as per international standards.

Panel fabrication can be of PROTOCONTROL make as well as it can be offered as per other approved makes. Enclosure protection grade can be provided as per the requirement.



NOTE:

1) COLOUR CODE FOR COMMUNICATION CARD: 1) RED (R) 2) BLACK (B) 3) WHITE (W) 4) GREEN (G) 5) PROGRAMMING

2) SWITCH - PULL CORD BELT SWAY SWITCH

3) NC - CONTACT OF SWITCH

4) CC = COMMUNICATION CARD

ORDERING PROFORMA

A) CONTROL UNIT TRA TRA TRA TRA TRA TRA

B)SIZE AND MOUNTING

1	Back Panel Mounting /Small	9 W					
2	Front Panel Mounting 96 X 96	9 F					
3	Back Panel MoUnting / Large		12 W				
4	48(H) X 96(W) Front Panel Mounting			4 F	4 F		
5	DIN Rail(Plastic Enclosure)					R	

NOTE: Back Panel Mounting Enclosure Can be DIN Rail Mounted

C)SUPPLY VOLTAGE

1	24 V DC	24	24	24	24	24
2	90 - 270 V AC/DC	230	230	230	230	230

D)NO. OF INPUT GROUPS

1	O1	1G	1G	1G	1G	1G	1G
2	O2	2G	2G	2G	2G	2G	2G
3	O3	3G	3G	3G	3G	3G	3G
4	O4	4G	4G	4G	4G	4G	4G

Note: 1) TRA4F-230-3G/4G will not be available with analog output.

2) For TRA 4F, In 2G models , individual /HEX analog output is possible

E) TYPE OF ANALOG OUTPUTS(4-20mA)

1	Analogue output	A1/A2,	A1/A2	A1/A2/,A3/A4	A1/A2	A1/A2	A1/A2
2	Without Analogue Output	NA	NA	NA	NA	NA	NA
3	HEX Analog (Duel)	A2H	A2H	A2H	A2H	A2	HA2H

F) NO OF DIGITAL OUTPUTS

1	Digital (1C/O)	D4D4/D8	D4/D8	D2	D4	D2/D4
2	Open Collector (For BWP)	OC4/OC8	OC4/OC8	OC4/OC8	OC4/OC8	OC4/OC8
3	No Out Put (Only indication)	ND	ND	ND	ND	ND

G) COMMUNICATION OUTPUT

1	RS 485 MODBUS RTU (Slave)	C	C	C	C	C
2	NO Communication Output	C	NC	NC	NC	NC

NOTE: For other Protocols additional Convertors can be offered

H)DISPLAY

1	LED Display	1	1	1	1	1
2	LCD Display	2	2	2	2	2
3	NO Display					3

I)MAX.NO. OF SWITCHES PER GROUP

1	25	25	25	25	2510/25/50
2	50	50	50	50	50
3	75	75	75	75	75
4	100	100	100	100	100
5	Above 100 (Pl specify length of conveyor and total no. of safety switches per loop)				

NOTES:

1) For multiple group models , Group wise maximum stations will remain same

2) Communication Cards TRA- CC and Termination Models TRA-CC-TM are to be ordered separately. For Auto Assign / Auto Teach communication cards type will be TRA-AT-CC . For TRA-MU- CC communication card Type will be TRA-MU-CC-TM

3) For long conveyors (above 2-3 Kms.) single unit for single conveyor is preferred and recommended but not compulsor

OTHER SPECIAL OPTIONS OF TRA (TO BE SPECIFIED ALONG WITH TRA i.e. TRA-SPL FOR SPLIT FUNCTION)

1	TRA with Modulating Unit	MU	MU	MU	MU	MU
2	TRA with Built In Memory	BIM	BIM	BIM	BIM	BIM
3	Auto Assign (Auto Teach)	AT AT	AT	AT	AT	
4	With short circuit location detection	SCD	SCD	SCD	SCD	SCD
5	Split facility in common loop	SPL	SPL	SPL	SPL	SPL

SPECIAL NOTES: 1)TRS models will be available in same size , Supply , Input ,Output Etc.

Similar to TRA model however with standard TRS features

2)Special options as above are not available in TRS models

3) TRS Model is not available in plastic DIN Rail mounting enclosure

4) For TRA-MU model , Modulation unit is to be ordered separately.

OTHER NOTES FOR TRS:

1) TRS 14 model (Back panel mounting type) is available in size : 150(W)x 200 (H) x

2) Binary output is available only in TRS model as other option

3) TRS 14 is an old model and will be absolute in future.

4) TRS Model will be used with communication card TRS-CC

5) TRS -CC Communication cards to be ordered separately

TYPICAL ORRDERING CODE: TRA-SCD-SPL-4F-24

Ask for this feature	Protocontrol TRA	Why this feature is provided
Is it with Key Pad?	<input checked="" type="checkbox"/>	Makes this system fully Smart & addressable
Can you wire BS and PC in single loop but you get separate relay contact and Indication at Indicator?	<input checked="" type="checkbox"/>	Reduce cabling cost nearly to half. Indicator recognize Type of safety switch & informs operated safety switch is PC/ BS or ZSS even in single loop.
Does allocated switch number remains same even after removing few switches from loop?	<input checked="" type="checkbox"/>	Even if any switch is removed for maintenance the allotted number for other should not change
Is it auto addressable Type?	<input checked="" type="checkbox"/>	Makes commissioning simple
Can you bypass particular switch from Indicator, keeping balance loop in circuit (with password Entry for extra safety)?	<input checked="" type="checkbox"/>	Increased safety as Pull Cord Loop always in circuit
Can your Indicator Detect SHORT / OPEN in loop WITH LOCATION? i.e. cable open between 8 & 9 or cable short between 44- 45?	<input checked="" type="checkbox"/>	Indication of Cable Open and Cable Short fault with Location. Unique feature introduced first time in India.
Is your Indicator is having output (4- 20mA) with SELECTABLE RESOLUTION?	<input checked="" type="checkbox"/>	Better resolution in 4-20 mA loop
Can 4-20 mA O/P be made suitable when number of switches in loop are more?	<input checked="" type="checkbox"/>	HEX analog type output : 4-20 mA can be available with 1 mA resolution up to 256 safety switches. and with 0.5 mA resolution up to 1024 safety switches
Can your Indicator provide separate analog output even in common loop?	<input checked="" type="checkbox"/>	We give separate analogue O/P in common loop as per operated switch number.
Is O/P can be Interfaced to PC ?	<input checked="" type="checkbox"/>	Protocontrol offers RS 485 O/P with MODBUS. Other options like Profibus/ ethernet etc will be available using additional converters
Is your addressable type Indication System is really Smart ?	<input checked="" type="checkbox"/>	Key pad enabled Trip Indication is Smart

Protocontrol developed TRA series to overcome drawbacks faced by ordinary Pull Cord Indication Systems. Trip Indicator TRA provides all features required by end user and makes this indicator really Smart. Trip Indicator series TRA is cost effective as well as technologically updated solution for your conveyor indication system.

PLEASE CALL OUR EXPERT FOR DETAILED DISCUSSION, OR INFORM DETAILS ASKED ON PAGE 11 SO AS TO OFFER YOU SOLUTION.

SMARTsaa Instruments (I) Pvt. Ltd.

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