



THERE IS MORE TO YARD POINTS CONTROL  
**THERE IS ACTOM**



ACTOM Signalling  
Yard Control System

TRANSPORT  
A division of ACTOM (Pty) Ltd

ACTOM



**2** LEVEL 2  
LOCAL CONTROL  
AREA VDU  
CONTROL

EQUIPMENT  
CONTROL  
ENCLOSURE **3**

**1** LEVEL 1  
CENTRALISED  
YARD MASTER  
CONTROL AND  
OVERVIEW

**4** LEVEL 3  
LOCALISED PUSH  
BUTTON CONTROL  
- TURNOUT  
INDICATOR

**6** AXLE COUNTER  
VACANCY  
DETECTOR

**5** YARD AUTOMATION  
POINTS MACHINE

**6**

**ACTOM**  
Signalling Yard  
Control System.





The YPCS is used to mechanise the operation of shunting yards. In the past the points were operated by using hand tumblers connected to the set.

The shunter would walk from points set to points set to operate them into the correct position for the train to traverse the required route. This method is prone to errors and leads to costly train derailments. By mechanising the yard, these errors are prevented.

The system allows the shunter to operate any points set electrically to set a route for a train to traverse.

The position of the blades of each set is detected to give the shunter and train driver a visual indication of the direction of travel for which the points set is laying.

In the event of the point blades not being closed completely, a fault indication is given to shunter and train driver, showing them not to proceed with the train movement.

The system allows three levels of control, namely:

- Central Yard Master Mode
- Local Control Panel Mode
- Pushbutton Mode.

The Yard Master Display allows an overview of all the LCP areas constituting the yard, to be displayed at a central point. This is typically the Yard Master Office who is in control of the yard operation.

The system allows the shunter to set the position of multiple points sets simultaneously making up a route, reducing the amount of walking to be done by the shunter. This procedure is executed on the Local Control Point (LCP). The LCP operates a control area consisting of a group of points, interconnected by track.

## 1. Central Yard Master



The Yard central control function provides the following functionality:

- Yard Control Central server
- Local yard VDU workstation to control entire area, from either the Yard Master office or from remote CTC.

### Yard Control Central Server

This functionality includes a SQL database server, logging all yard control events.

Inclusive is the ACTOM Elephant Data Logger, allowing recording of all signalling controls and indications as well as visual playback within the yard.

This network provides a TCP/IP network with a unique IP address within each Yard, isolated from the business network. Fiber is routed from the central office to the various Local Control Panels (LCP) and equipment enclosures.

When Yard Master mode is disabled, it delegates the authority to the LCP for direct control of the points set.

## 2. Local Control Panel (LCP)



The Local Control Panel allows the yard personnel to operate the point's

sets under its control to the correct position to allow a train to travel to its destination.

The LCP provides maintenance information about the Track Vacancy System. This information is

- A wheel detector loose on or fallen off the rail
- A sensor of the wheel detector not functioning correctly
- Detection of point's machine.

When LCP mode is disabled, it delegates the authority to the points controller for direct control of the points set at the points indicator associated with it - Pushbutton Mode.

## 3. Equipment Control



An Equipment Controller can contain up to a maximum of three objects, the communication interface equipment and 24V DC power supplies.

Each object operates a single set of points, with its associated LED points indicator and track vacancy detection equipment.

A single object consists of the following major components:

- Programmable Logic Controller (SIL3 PLC)
- Wheel detector communication interface
- Track Vacancy module
- Relay Interface
- Variable speed drive
- Points relay contactor.

This PLC is a SIL3 level conforming to the IEC61508 standard. The program installed on the PLC provides the interlocking functionality required by the Points Object.

It performs the following functions:

- Obtains the Track Vacancy Status from The Track Vacancy System
- Obtains the Points blade position from the point's machine
- Obtains the status of the pushbuttons on the Points Indicator.
- Obtains the status of the crank handle in the point's machine
- Communicates with the LCP to transmit indication to and receive commands from the LCP
- Using the obtained information, the PLC can call the points set into the required position.

It will not operate the points set when the:

- Track is occupied
- The crank handle is removed from the ICC.

When the point set is in the process of operating and:

- The track is occupied; the set will complete its stroke
- The crank handle is removed; the set will complete its stroke.

## 4. Track Vacancy Detector

The track vacancy detector system provides track occupancy information to the point's controller. By counting the axles entering and leaving the track section and evaluating the counts, the unit will set the section occupied or unoccupied.

The Evaluator Module is connected to the:

- Wheel Counter Modules
- The Track Vacancy Reset input
- The Track Vacancy Output.

The Evaluator Module receives count information from the Wheel



Counter Modules. The information contains the number of axles having passed the Wheel Counter Module at a given time using this information continuously to determine whether the section is occupied or free.

The Evaluator Module contains a supervision processor that detects that the main evaluator processor is running. If the main processor fails the Vsafe supply is switched off.

## 5. Points Indicator

The Points indicator provides:

- The position of the point's set
- Control the point's set operation using the control push buttons fitted on the side.



The push buttons and indication located under the hood on the outside of the Points indicator, allows the yard personnel to:

- Operate the point's set
- Reset the Track Vacancy Detector
- Display the status of the point's set.

The Points Operation Push Button controls the point's movement to the opposite direction. By operating the Points Push Button again the points will throw back to the previous state and the indicator will change accordingly to the position of the points.

The Track vacancy reset button requires the following procedure.

- Verify that the track area is free of any vehicles
- Perform the first phase of the reset, using the LCP
- Perform the second phase of the reset, using the Push Button Control Point.

## 6. Point's Machine

Type ACYD Points Machine is designed for the electrical control and operation of yard type turnouts.



The ACTOM Yard machines main features are:

- Standard motor voltage 220/380v AC
- Adjustable retentive force of switch to stock in set end position
- Vital electrical proving of switchblades in end position
- Fully trailable
- Installation on either the left or right hand sides of the track without modification
- Captive crank handle
- Internal end of stroke detection
- Manual operation facility, in the case of emergency operation
- Minimum points opening of 100mm
- Maximum points opening of 140mm
- Operational reliability and operational availability
- Maintenance Free i.e. on condition inspection cycles.

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