

# Single Section Digital Axle Counter

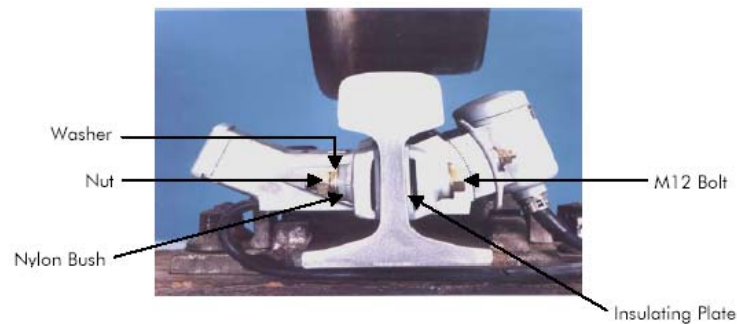
## 1. Introduction

This pamphlet contains brief installation guidelines and procedure for recording various parameters during routine maintenance of Alcatel AzLS and CEL DACF 710A/710P Single Section Digital Axle Counter (SSDAC) systems.

## 2. Alcatel AzLS

### 2.1 Installation of outdoor Track devices Sk30H

- Installation between two sleepers.
- Web without embossing.
- Minimum distance 1 m from insulated joint.
- Minimum distance 2 m from neighbouring rail contact.
- Tx heads mounted on Al casting with two M8 bolts, bowed pressure plates, washers and self locking nuts. The teeth and grooves must be lined-up carefully. Torque applied 25 Nm.



*Fig 1: Mounting of TX & RX coils*

- Brackets, protecting tube and cable to be installed as per guideline.

## Rail mounting holes

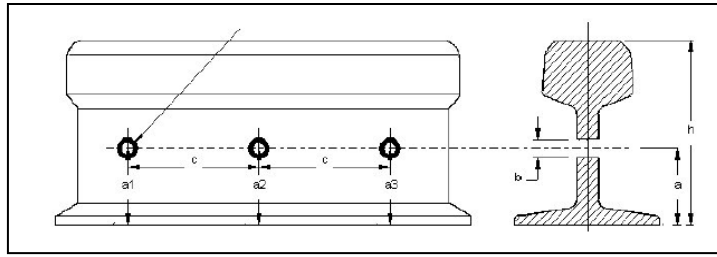


Fig. 2: Drilling of holes for mounting of TX & RX coils  
 $h = \text{height of the rail}$      $b = 13 \text{ mm} \pm 0.2 \text{ mm}$ ,  
 $c = 148 \text{ mm} \pm 0.2 \text{ mm}$

Rail Profile	90 lbs	52 Kg.	60 Kg.
Rail Height (mm.)	170 mm	172 mm	172 mm
a (mm.)	56 mm	63 mm	68 mm

- Track devices (Tx & Rx coils) are fixed on 3 holes drilled on rail web.
- Install Trackside Electronic unit within around 4 meters of the rail contact.
- Clean the area, mark and punch the three holes on rail web.
- Run a pilot drill of 6 mm diameter if required
- Drill the three 13 mm holes accurately.
- Clean the burrs on the drilled holes.
- Fix the Tx heads on the outside and Rx heads on the inside of the rail.
- Mount the protecting tube on the brackets with integral cable as per specified bends and clamping.
- Install the deflector plates (2 Nos. per dual rail contacts) to protect the rail contacts from hanging metal objects from passing train.

## 2.2 Installation of Trackside Electronic Unit

- Install Trackside Electronic Unit (EJB) in Mushroom cover or in location box as far as practicable from the rails.
- Integral cable is available in sizes of 5.5 Mtr., 8 Mtr, & 12 Mtr. Integral cable should not be shortened.

## 2.3 Adjustment of Tx head with Dummy wheel & Tool kit

Dummy wheel is normally set to 40 mm and must be kept vertically at the centre of RX head. Following parameters are to be adjusted with the help tool kit:

### MESSAB1 (Rectified Rx voltage)

- Keep the Test Equipment Selector Switch to position 4
- Measure the rectified Rx voltage with & without dummy wheel.
- Turn Pot. R2 to positive max.
- Adjust Tx head to optimum position.
- Adjust using R2 such that received rectified voltages with & without dummy wheel have the same amplitude but the opposite polarity. (Tol.  $\leq 30$  mV).
- Repeat for MESSAB2 (Switch pos.7, Pot. R4).

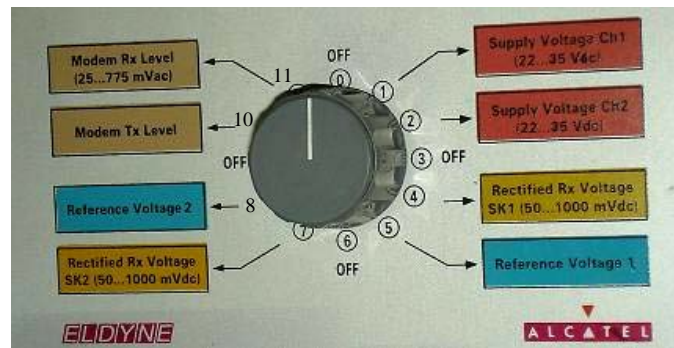


Fig 3: Selector switch of Test equipment.

### Reference voltage for SK1 (PEGUE1)

- Keep the Test Equipment Selector Switch to position 4.
- Measure the rectified Rx voltage.
- Adjust using Pot. R2 such that PEAGUE1=MESSAB1 (without dummy wheel).
- Tolerance  $\pm 2\%$ .
- Repeat for PEAGUE2 (Switch pos.8,Pot. R3,MESSAB1).

### 2.4 Recording of parameters

The various parameters are recorded as below:

Rail profile:90R/52Kg/60Kg

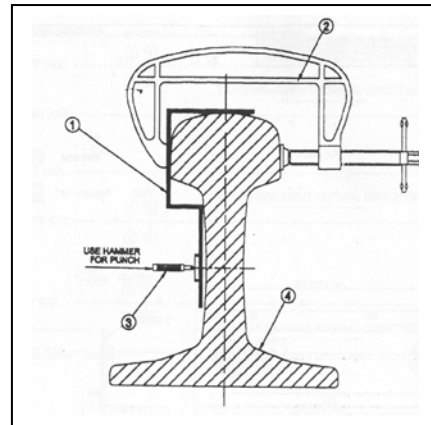
Parameter	Specified range	DP No..... (Mesured Value)	
Input power supply EJB terminals 2 & 18	21.5 V to 28.8 V DC		
Selector position in test unit	Parameter	Specified range	DP No... (Mesured Value)
1	Channel 1	22...35 VDC	
2	Channel 2	22...35 VDC	
4	(a) Rx1 voltage w/o dummy wheel MESSAB1	+80..+1000 mV DC	
	(b) Rx1 voltage with dummy wheel set on 40 mm	-80...-1000 mVDC	
5	Reference voltage PEGUE1	Adjust as per 4 (a) above	
7	(a) Rx2 voltage w/o dummy wheel MESSAB2	+80..+1000 mV DC	
	(b) With dummy wheel set on 40 mm	-80....-1000 mVDC	

8	Reference voltage PEGUE2	Adjust as per 7 (a) above	
Terminal SK1/S1 & SK1/S2	Transmitter frequency SK1	30.0...31.25 KHz	
	Transmitter voltage SK1	40...85 V AC	
Terminal SK2/S1 & SK2/S2	Transmitter frequency SK1	27.4...28.6 KHz	
	Transmitter voltage SK1	40...85 V AC	

### 3. CEL DACF 710A/710P

#### 3.1 Rail mounting holes

Three holes of 14 mm diameter are to be drilled at a distance of 0-170-340 mm on the rail web with the help of marking jig.



Rail Profile	Rail Height (mm.)	Distance of hole from top of rail
90 lbs		86 mm
52/60 Kg.	172 mm	88 mm

- 1- Marking Jig
- 2.-'C' clamp
- 3.-Center Punch
- 4.Rail

Fig 4: Marking Jig assembly

### 3.2 Measurement of Parameters

#### 3.2.1 24 V DC Supply (Battery)

S.No.	Input Range (DC Volts)	Actual measured value	
		Charger ON	Charger OFF
1.	19.2 V to 28.8 V		

#### 3.2.2 Oscillator Output (TX Coils)

S. No.	Parameter	Limit	TX Coil 1 (21KHz)	TX Coil 2 (23KHz)
1.	Osc. output	30 V to 40 V rms		
2.	Osc. Freq.	(i) 20.80 to 21.20 KHz. (ii) 22.80 to 23.20 KHz.		

#### 3.2.3 Receiver Coil Output

For Phase reversal type Axle counter

S. No.	Parameter	Limit mV rms	Measured value
1.	RX Coil 1 (21 KHz) O/P	275 to 600	
2.	RX Coil 2 (23 KHz) O/P	275 to 600	

For Amplitude modulation type Axle Counter

S. No.	Parameter	Signal Limit (mV rms)	Signal Measured value (mV rms)	Dip (15% of signal) (mV rms)
1.	RX Coil 1 (21 KHz) O/P			
2.	RX Coil 2 (23 KHz) O/P			

### 3.2.4 SCC Cards (Card 1 & 2)

S. No.	Card	Measured Output Voltage (DC Volts)					
		Without dummy wheel		With dummy wheel		With push trolley (4/8 spokes)	
		Limit	Value	Limit	Value	Limit	Value
1.	SCC1	2.0 to 2.5 V		< 0.7V		>1.7V	
2.	SCC2	2.0 to 2.5 V		< 0.7V		>1.7V	

Note: Dummy wheel setting = 44 mm for 90R, 52 Kg & 60 kg rails.

### 3.2.5 DC-DC Converter Card (Card 8)

S.No.	Parameter	Limit (DC Volts)	Measured output (DC Volts)
1.	5 V	4.75 to 5.25 V	
2.	12 V	11.50 to 12.50 V	
3.	24 V	23.50 to 24.50 V	
4.	15 V ISO	14.50 to 15.50V	

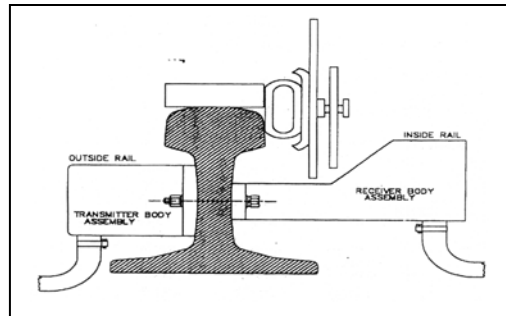


Fig.6: Dummy wheel setting for dip.

### 3.2.6 Modem Output (Card 6)

S. No.	Measuring Limit (mV rms)	Measured Output (mV rms)
1.	> 400 mV rms	

### 3.2.7 Relay Drive (Card 7)

To be measured across R1 & R2 of relay coil in vital relay box

S. No.	Parameter	Measuring Limit (DC volts)	Measured Output (DC volts)
1.	Unoccupied mode	> 20 V	
2.	Occupied mode	< 2 V	



सत्यमेव जयते

GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS  
(For Official Use)

## DIGITAL AXLE COUNTER ( Single Section)



CAMTECH/S/2008/SSDAC/1.0  
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Centre  
for  
Advanced  
Maintenance  
**TECH**nology



Maharajpur, Gwalior – 474 005

Contact Person: Director (S & T)  
☎: 0751-2470185, FAX: 0751-2470841  
e-mail: indian\_rail@dataone.in