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IRISET

गाड़ी डिटेक्शन प्रयोगशाला

TRAIN DETECTION LABORATORY

प्रयोग सं : टी डी एल – 14

EXPERIMENT NO: TDL – 14

नाम

Name : _____

अनुक्रमांक

Roll No : _____

पाठ्यक्रम

Course : _____

दिनांक

Date : _____

प्राप्तांक

Marks Awarded : _____

अनुदेशक के आदक्षर

Instructor Initial : _____

Single Section Digital Axle Counter (GG TRONICS – G 36)

(RDSO / SPN / 177 / 2012 – Ver. 3)

INTRODUCTION:

G-36 Digital axle counter field unit / counting device is the track side electronic assembly that energize the axle detectors for 'Detecting the Passing of Wheels', 'Determining the Direction of Movement' and 'Keeping the Counting of Wheels'. It transmits the 'count' and 'health' information to the other end unit at regular intervals. Based on the information detected, track side unit determines 'status' of track section at each end of axle counter section (Start Fed & End Fed) whether 'clear' or 'occupied'.

This axle counter make is available in three configurations

- 2DP 1S
- 3DP 1S
- 3DP 2S

Configuration installed in TD Lab is 2DP 1S

EQUIPMENTS:

Indoor Equipments:

1. Reset Box
2. VPR, PPR relays
3. Filter unit for surge protection
4. Power supply

Outdoor Equipments:

1. Trackside Evaluator
2. Web mounted axle detectors. (TX/RX coils)
3. VR, PR relays
4. LCD UNIT (Track side Display unit).
5. Line Verification Box (LV) - for station track sections only.

WORKING PRINCIPLE

- a) This system consists of a **Start Fed Unit (SF)**, an **End Fed Unit (EF)** housed in location boxes adjacent to the track with associated web mounted axle detectors (TX/RX coils)
- b) The axle detectors TX1 coil & TX2 coil are fed with 21 KHz & 25 KHz respectively at SF end. Then at EF end also, TX3 coil & TX4 coil are fed with 21 KHz & 25 KHz respectively.
- c) TX coils are connected outside of the rail and RX coils are connected inside of the rail.
- d) The system is based on phase reversal technology, wherein the TX & RX signals will be 'OUT' of PHASE' under 'No wheel' condition & will be 'IN PHASE' during 'Presence of a Wheel'.
- e) The system senses wheels above 550 mm dia, by which only train wheels are detected & trolley wheels are ignored. Motor trolley wheels are not counted & also will not lead to error condition.
- f) 'Start Fed Unit (SF)' and 'End Fed Unit (EF)' will communicate at 1200 bps through FSK Modem over ½ quad cables for exchange of information on the 'Status' & 'Wheel Counts' continuously. Based on the information detected, track side unit determines 'status' of track section at each end of axle counter section (Start Fed & End Fed) whether 'clear' or 'occupied'.
- g) VR & PR relays are provided in the relay box along with the unit in the location box at each end. VR relay status (pick up - section clear /drop-section occupied) is available at 'both ends' of the system.
- h) When VR is in energized condition system will give 'CLEAR' indication and when VR is in de-energized condition system will give 'OCCUPIED' indication
- i) Each unit will be connected with the station-reset box with ½ quad cables for providing the same information on the reset box through FSK communication. Another signal cable is run between the system & the reset box for transmitting reset commands & getting back responses from the system.

SYSTEM DESCRIPTION:

- With the help of this axle counter make we can monitor track section max up to 25 km
- The block section, track sections in station section can be monitored by this system.
- The system is designed to work with different rail profiles (90 pound, 52 Kg, 60 Kg rails) & is suitable for axle detection for train speed from 0 to 250 Km/h
- The system can work in RE/Non RE areas satisfactorily.
- The system can work between -10°C to +70°C.
- 24 VDC supply from battery charger suitable for 'Digital Axle Counter' which is backed up by 80AH/120 AH capacity batteries is fed to the system through 2-core aluminum cable of 25 Sq mm.

EQUIPMENT DESCRIPTION

- Equipment consists of evaluator unit at each end ('SF' and 'EF').
- One LCD unit and one relay box (VR, PR) are also provided with these units at each end.
- Evaluator unit at each end 'SF' and 'EF' consists different boards as shown below

SSDAC (G 36)	
SF END	EF END
Phase Detector Board – 1 (21 KHz)	Phase Detector Board – 1 (21 KHz)
Phase Detector Board – 2 (25 KHz)	Phase Detector Board – 2 (25 KHz)
Central Processing Unit – 1 (at address 001)	Central Processing Unit – 1 (at address 003)
Central Processing Unit – 2 (at address 002)	Central Processing Unit – 2 (at address 004)
Event Logger Board (SM CPU).	Event Logger Board (SM CPU).
Modem Board - (COM-2 at SF)	Modem Board -(COM-1 at EF)
Relay Driver Board - (Relay drive-2)	Relay Driver Board - (Relay drive-1)
DC-DC Converter Board.	DC-DC Converter Board.

Phase Detector Board (Board 1 & 2):

The Phase Detector Board -1 (PD -1) generates 21 KHz carrier signals, which is transmitted to 1st TX coil. The Phase Detector Board-2 (PD -2) generates 25 KHz carrier signals, which is transmitted to 2nd TX coil. The respective Rx coils receive these signals. When the train wheel passes over the axle detectors, the RX signal gets phase modulated. (Out of phase with reference signal) The PD Board receives the modulated signal and demodulates it, after demodulation it will generate valid pulse, this valid pulse is transmitted to both 'Central Processing Units'-CPU1&2.

Settings in PD boards for different voltages: In the PD boards' adjustment facility is provided for Rx signal, supervisory signal & phase adjustment of Rx with respect to TX. All the adjustments have to be carried out under no wheel condition & the voltages are to be as indicated in table. Adjustments have to be carried out on each of the 21 KHz & 25 KHz PD boards individually.

Module	Monitoring point	Expected values	
		Without wheel	With wheel
PHASE DETECTOR (PD1 and PD2)	RX-SIG and GND (Rx Adj)	900 mV to 1.2 V AC	< 350 mV AC
	SUP-OUT and GND	4 V to 5 V DC	3 V to 3.9 V DC
	WHEEL- M-OUT and GND	4.5 V to 5 V DC	3 mV to 5 mV DC
	WHEEL- S-OUT and GND	4.5 V to 5 V DC	3 mV to 5 mV DC
	RX-PH-SIG and GND (PH Adj)	10 V to 12 V DC	0.1 or 0.2 V(min)
	SUP-ADJ and GND (SUP Adj)	4 V to 5 V DC	3 V to 3.9 V DC
	Wheel influencing both detectors	-	< 2 V in both PD boards

Central Processing Unit (CPU-1 & CPU-2)

The Central Processing Unit is the heart of the system. These boards implement the wheel detection, train direction checking and wheel counting functions. In addition it receives the remote wheel count and computes the status of the section for clear or occupied. It also checks various supervisory signal levels like supervisory of Tx/Rx coils, presence of various boards, communication link failure etc. These boards communicate with each other for wheel count. This board is having a block of seven segment indicators for command display. Co-existence of multiple units without interference is achieved by having 255 unique addresses through software. Configuration setting and address setting is done in this CPU board, it is explained on further pages.

Module	Monitoring point	Expected values
CPU 1	EN1B O/P and GND (for SF, CF, 3DP1S units)	11.5 V to 12.5 V DC
	EN1A O/P and GND (for EF, CF)	11.5 V to 12.5 V DC
CPU 2	EN2B O/P and GND (for SF, CF, 3DP1S units)	11.5 V to 12.5 V DC
	EN2A O/P and GND (for EF, CF)	11.5 V to 12.5 V DC

Modem Board

The Salient features of the Modem Board include: -

- 'Start Fed Unit (SF)' and 'End Fed Unit (EF)' will communicate at 1200bps through FSK Modem over ½ quad cables
- Originator (COM-2 at SF) and Answerer (COM-1 at EF)
- V.23 type
- Full duplex
- No need of external-internal setting at site as per SF and EF end

Relay Driver Board

- The Relay Driver Board (RD-2 at SF and RD-1 at EF) provides the 24 VDC output required for driving Vital Relay VR and Preparatory Relay PR.
- The RD Board receives the command from CPU1 & CPU2 boards and drives the vital relay, when section is clear and Healthy.
- If a train occupies the section, the vital relay is dropped. The vital relay status is read back by the system as per the driving output.

Module	Monitoring point	Expected values
RELAY DRIVE 1(FOR EF,CF)	VITAL RLY A O/P (+) VITAL RLY A O/P (-)	>20V DC
RELAY DRIVE 1(FOR EF,CF)	VITAL RLY A O/P (+) VITAL RLY A O/P (-)	>20V DC

DC/DC Converter Board.

- The input voltage of 24 VDC
- The corresponding input monitoring point.
- Outputs +5 VDC , +18 VDC, +12 VDC, -12 VDC, +24 VDC
- The same GND monitoring point to measure these voltages.
- An adjustment facility has been provided for +5 VDC , +18 VDC

Module	Item	Nominal Voltage	Required Voltage
DC-DC Converter	Input Voltage	24V DC	22V to 26V dc
	Output Voltage	+5V DC and GND	4.75 to 5.25 V DC
		+12V DC and GND	11.75 to 12.25 V DC
		-12V DC and GND	11.75 to 12.25 V DC
		+24V DC and GND	11.75 to 12.25 V DC
		+18V DC and GND	17.5 TO 18.25 V DC

- Foolproof working is ensured in hardware with polarization for avoiding mix up of positioning of boards.
- LED's are provided on individual boards for indication of different stages of the working of the system. Seven segment displays are provided on CPU module for bold display of status & error codes.
- LCD display modules of the unit & reset box provide plain English messages of status & error codes making the system highly user friendly during installation, commissioning & maintenance.
- The changes in status & wheel counts are stored in both the SF & EF units & are continuously displayed in LCD modules.
- Whenever the system enters into error mode due to internal or external reasons, the system has to be reset.
- For resetting the system under different conditions, interactive & intelligent reset box is provided in the station. Reset unit is also provided with LCD to display error codes.
- The system accepts co-operative reset with piloting of a train or direct reset with/without line verification depending upon the field conditions. If one field unit is reset & the second one is not reset within 5 minutes the reset initiation automatically gets cancelled.

Independent Resetting procedure when SSDAC is used in Block sections:

- 1) a) Insert SM's key, turn right and keep pressed.
 b) Press Reset Button.
 c) Release SM's key and Reset Button.
 d) Turn left, remove SM's key and keep in safe custody.
- 2) With the above operation from step 1(a) & (b) the 48 VDC (36 to 52 VDC) from reset box is extended and connected to the SSDAC through the drop contacts of PPR and VPR relays in Relay room. This 48 VDC actuates the reset circuit in modem card of SSDAC unit and generates reset command to the CPU-1 and CPU-2 boards.
- 3) The SSDAC units become reset and counts become zero and self test is carried out in both the units. The SSDAC units attain the preparatory reset state. The preparatory reset LED indication glows on the reset box in SM's room.
- 4) The counter reading also increments by 1 count through the Preparatory Reset command after a gap of 5 sec approx .The counter reading should be recorded.
- 5) One pilot train is to be passed in the section to make the system normal. The vital relay picks up at both units after piloting the train.
- All these events up to 12,000 are stored in Event Logger module of the system. The data therein can be downloaded through RS232 communication port available on the module.
- The distance between the unit & the detectors (TX/RX coils) is with 15 m.
- **Surge protection:**
 - a) External Surge Protection Devices on input, output and power supply lines. It is Indicative type, plug able and easy to install on a DIN rail.
 - b) Surge Voltage Protection device Part No is G36-LTDU00.
 - c) The surge protectors are rated for 24 VDC main supplies and 48 VDC for reset box. The wiring diagram takes for the proper routing of the cables through the surge protectors. The metallic frame of the surge protector should be connected to the main earth rigidly achieved proper earth protection
 - d) Class B & C types surge protection must be provided on 230 VAC mains line
- **Earthing:**
 - a) Check that metal sheaths of the outdoor cable are connected to earth at both ends.
 - b) Screen of axle detector cable should be earthed.
 - c) Separate Earth of quad/PIJF telecom cable shall be less than one ohm (1Ω).
 - d) Earthing of SSDAC units, relay box and reset box should be provided firmly through copper strips or other standard copper cable. (Value $< 1 \Omega$)

LED Indications of the 2DP1S Configuration of Start Fed

Module	LED	Power On Mode	Preparatory Mode	Clear Mode	Occupied Mode
PHASE DETECTOR PD 1 & PD 2	TX	ON	ON	ON	ON
	SUP-OK	ON	ON	ON	ON
	SUP-FAIL	OFF	OFF	OFF	OFF
	WHEEL-M	OFF	OFF	OFF	OFF
	WHEEL-S	OFF	OFF	OFF	OFF
COM 2	TX2	Flashing	Flashing	Flashing	Flashing
	RX2	Flashing	Flashing	Flashing	Flashing
	CD2	Flashing	Flashing	Flashing	Flashing
	CS2	Flashing	Flashing	Flashing	Flashing
	RS2	Flashing	Flashing	Flashing	Flashing
DAC CPU 1	TXIA	Flashing	OFF	OFF	OFF
	RLYV1-FB	OFF	OFF	OFF	OFF
	RX1A	Flashing	OFF	OFF	OFF
	RLYV2-FB	OFF	OFF	ON	ON
	TX1B	OFF	Flashing	Flashing	Flashing
	RX1B	OFF	Flashing	Flashing	Flashing
	EN1A	OFF	OFF	OFF	OFF
	EN1B	OFF	OFF	ON	OFF
DAC CPU 2	STATUS CODE	-b and -r	-p	CL	OC
	TX2A	Flashing	OFF	OFF	OFF
	RLYV1-FB	OFF	OFF	OFF	OFF
	RX2A	Flashing	OFF	OFF	OFF
	RLYV2-FB	OFF	OFF	ON	ON
	TX2B	OFF	Flashing	Flashing	Flashing
	RX2B	OFF	Flashing	Flashing	Flashing
	EN2A	OFF	OFF	OFF	OFF
RELAY DRIVE 2	EN2B	OFF	OFF	ON	OFF
	STATUS CODE	-b and -r	-p	CL	OC
	PREP/SBY	OFF	ON	OFF	ON
SM CPU	VITAL-RLYA	OFF	OFF	ON	OFF
	TX	Flashing	Flashing	Flashing	Flashing
	RX	OFF	OFF	OFF	OFF
	CD	OFF	OFF	OFF	OFF
	CS	Flashing	Flashing	Flashing	Flashing
DC-DC CONVERTER	RS	Flashing	Flashing	Flashing	Flashing
	ON	ON	ON	ON	ON
	REVERSE	OFF	OFF	OFF	OFF
	NORMAL	ON	ON	ON	ON
	UNDER VOLTAGE	OFF	OFF	OFF	OFF
	OVER VOLTAGE	OFF	OFF	OFF	OFF
	POWER SHUTDOWN	OFF	OFF	OFF	OFF
	+5 VDC	ON	ON	ON	ON
	+18 VDC	ON	ON	ON	ON
	+12 VDC	ON	ON	ON	ON
	-12 VDC	ON	ON	ON	ON
	+5 VDC OVERLOAD	OFF	OFF	OFF	OFF

LED Indications of the 2DP1S Configuration of End Fed

Module	LED	Power On Mode	Preparatory Mode	Clear Mode	Occupied Mode
PHASE DETECTOR PD 1 & PD 2	TX	ON	ON	ON	ON
	SUP-OK	ON	ON	ON	ON
	SUP-FAIL	OFF	OFF	OFF	OFF
	WHEEL-M	OFF	OFF	OFF	OFF
	WHEEL-S	OFF	OFF	OFF	OFF
COM 1	TX1	Flashing	Flashing	Flashing	Flashing
	RX1	Flashing	Flashing	Flashing	Flashing
	CD1	Flashing	Flashing	Flashing	Flashing
	CS1	Flashing	Flashing	Flashing	Flashing
	RS1	Flashing	Flashing	Flashing	Flashing
DAC CPU 1	TX1A	Flashing	Flashing	Flashing	Flashing
	RLYV1-FB	OFF	OFF	ON	ON
	RX1A	Flashing	Flashing	Flashing	Flashing
	RLYV2-FB	OFF	OFF	OFF	OFF
	TX1B	OFF	OFF	OFF	OFF
	RX1B	OFF	OFF	OFF	OFF
	EN1A	OFF	OFF	ON	OFF
	EN1B	OFF	OFF	OFF	OFF
DAC CPU 2	STATUS CODE	-b and -r	-p	CL	OC
	TX2A	Flashing	Flashing	Flashing	Flashing
	RLYV1-FB	OFF	OFF	ON	ON
	RX2A	Flashing	Flashing	Flashing	Flashing
	RLYV2-FB	OFF	OFF	OFF	OFF
	TX2B	OFF	OFF	OFF	OFF
	RX2B	OFF	OFF	OFF	OFF
	EN2A	OFF	OFF	ON	OFF
RELAY DRIVE 1	EN2B	OFF	OFF	OFF	OFF
	STATUS CODE	-b and -r	-p	CL	OC
	PREP/SBY	OFF	ON	OFF	OFF
SM CPU	VITAL-RLYA	OFF	OFF	ON	OFF
	TX	Flashing	Flashing	Flashing	Flashing
	RX	OFF	OFF	OFF	OFF
	CD	OFF	OFF	OFF	OFF
	CS	Flashing	Flashing	Flashing	Flashing
DC-DC CONVERTER	RS	Flashing	Flashing	Flashing	Flashing
	ON	ON	ON	ON	ON
	REVERSE	OFF	OFF	OFF	OFF
	NORMAL	ON	ON	ON	ON
	UNDER VOLTAGE	OFF	OFF	OFF	OFF
	OVER VOLTAGE	OFF	OFF	OFF	OFF
	POWER SHUTDOWN	OFF	OFF	OFF	OFF
	+5 VDC	ON	ON	ON	ON
	+18 VDC	ON	ON	ON	ON
	+12 VDC	ON	ON	ON	ON
	-12 VDC	ON	ON	ON	ON
	+5 VDC OVERLOAD	OFF	OFF	OFF	OFF

SF END COUPLERS

SL No	MS coupler (MS-3)		Description of Signal	MS coupler (MS-1) on Relay Box	
	Pin	Cable		Pin	Cable
1.	A	RED	+5V DC	A	RED
2.	C	RED	VR-B+ (+24V DC)	C	RED
3.	F	BLACK	VR-B- (-24V DC)	E	BLACK
4.	G	BLUE	RLYUV2-FB (-5V DC)	G	BLACK

SL No	MS coupler (MS-8)		Description of Signal	MS coupler (MS-2) on Relay Box	
	Pin	Cable		Pin	Cable
1.	A	RED	+5V DC	A	RED
2.	C	RED	PREP2+ (+24V DC)	C	RED
3.	F	BLACK	PREP2 - (-24V DC)	E	BLACK
4.	G	BLUE	PREP2-FB (-5V DC)	G	BLACK

SLNo.	MS coupler (MS-9)		Description of Signal	MS coupler (MS-2) on Train Simulator Box	
	Pin	Cable		Pin	Cable
1.	A	RED	WHEEL-M1	A	2 Core Coil wire - Red
2.	B	BLACK	WHEEL-S1	B	2 Core Coil wire - Black
3.	C	GREEN	WHEEL-SUP1	C	2 Core Coil wire - Red
4.	D	RED	WHEEL-M2	D	2 Core Coil wire - Black
5.	E	BLACK	WHEEL-S2	E	2 Core Coil wire - Red
6.	F	GREEN	WHEEL-SUP2	F	2 Core Coil wire - Black
7.	G	BLACK	DIG- GND	G	2 Core Coil wire - Green

SL No	MS coupler (MS-11),		Description of Signal	Cable to be used
	Pin	Cable		
1	A	RED	B-MODEM-INOUT+	½ Quad 0.9 mm
2	B	BLACK	B-MODEM-INOUT-	
3	C	NC	NC	No Connection

SL No	MS coupler (MS-13),		Description of Signal	Cable to be used
	Pin	Cable		
1.	A	RED	RESET2+	1.5mm Signaling cable or 1/2 Quad 0.9mm(refer note)
2.	B	BLACK	RESET2 -	
3	C	NC	NC	No Connection

SLNo	MS coupler (MS-14),		Power Supply	Connection from battery / IPS
	Pin	Cable		
1.	A	RED	+24V DC	2 Core cable Coil Wire
2.	B	BLACK	-24V DC	
3.	C	NC	No Connection	

SLNo	MS coupler (MS-4)		Description of Signal	Wiring Details Of TX2 Coil Axle Detector	
	Pin	Cable			
1	A	RED	TX2a	Blue 25 KHz	23 / 0.2mm, 2 core shielded PVC cable with blue sheath 15m connected to the MS coupler MS-4 of the system
2	B	BLACK	TX2b	White 25 KHz	23 / 0.2mm, 2 core shielded PVC cable with blue sheath 15m connected to the MS coupler MS-4 of the system
3	C	NC	NC	NC	No Connection

SLNo	MS coupler (MS-10),		LCD Display	MS coupler (MS-1) on LCD,	
	Pin	Cable		Pin	Cable
1.	A	3 Core Coil wire - Red	LCD1-RS	A	3 Core Coil wire - Red
2.	B	3 Core Coil wire - Black	LCD1-DET	B	3 Core Coil wire - Black
3	C	3 Core Coil wire - Yellow- Green	LCD1-D-E	C	3 Core Coil wire - Yellow- Green
4	D	3 Core Coil wire - Red	LCD1-STR	D	3 Core Coil wire - Red
5	E	3 Core Coil wire - Black	LCD1-D	E	3 Core Coil wire - Black
6	F	3 Core Coil wire - Yellow- Green	LCD1-CLK	F	3 Core Coil wire - Yellow- Green
7	G	3 Core Coil wire - Red	LCD2-RS	G	3 Core Coil wire - Red
8	H	3 Core Coil wire - Black	LCD2-DET	H	3 Core Coil wire - Black
9	J	3 Core Coil wire - Yellow- Green	LCD2-D-E	J	3 Core Coil wire - Yellow- Green
10	K	3 Core Coil wire - Red	LCD2-STR	K	3 Core Coil wire - Red
11	L	3 Core Coil wire - Black	LCD2-D	L	3 Core Coil wire - Black
12	M	3 Core Coil wire - Yellow- Green	LCD2-CLK	M	3 Core Coil wire - Yellow- Green
13	N	2 Core Coil wire - Red	SVDC	N	2 Core Coil wire - Red
14	P	2 Core Coil wire - Black	DIG- GND	P	2 Core Coil wire - Black

SL No	MS coupler (MS-15)		Description of Signal	Cable to be used
	Pin	Cable		
1.	A	RED	SM-MODEM-INOUT+	½ Quad 0.9 mm up to station
2.	B	BLACK	SM-MODEM-INOUT-	
3.	C	RED	RTC-BAT	2 Core coil cable
4.	D	BLACK	DIG- GND	
5	E	NC	NC	No Connection

SL No	MS coupler (MS-5)		Description of Signal	Wiring Details Of TX1 Coil Axle Detector	
	Pin	Cable			
1	A	RED	TX1a	Blue 21 KHz	23 / 0.2mm, 2 core shielded PVC cable with gray sheath 15m connected to the MS coupler MS-5 of the system
2	B	BLACK	TX1b	White 21 KHz	23 / 0.2mm, 2 core shielded PVC cable with gray sheath 15m connected to the MS coupler MS-5 of the system
3	C	NC	NC	NC	No Connection

SL No	MS coupler (MS-16)		Description Of Signal	Wiring Details Of RX2 Coil Axle Detector	
	Pin	Cable			
1	A	RED	RX2b	Blue 25 KHz	23 / 0.2mm, 2 core shielded PVC cable with blue sheath 15m connected to the MS coupler MS-16 of the system
2	B	BLACK	RX2a	White 25 KHz	23 / 0.2mm, 2 core shielded PVC cable with blue sheath 15m connected to the MS coupler MS-16 of the system
3	C	NC	NC	NC	No Connection
4	C	NC	NC	NC	No Connection
5	C	NC	NC	NC	No Connection

SL No	MS coupler (MS-17)		Description Of Signal	Wiring Details Of RX1 Coil Axle Detector	
	Pin	Cable			
1	A	RED	RX1b	Blue 21 KHz	23 / 0.2mm, 2 core shielded PVC cable with Blue sheath 15m connected to the MS coupler MS-17 of the system
2	B	BLACK	RX1a	White 21 KHz	23 / 0.2mm, 2 core shielded PVC cable with Blue sheath 15m connected to the MS coupler MS-17 of the system
3	C	NC	NC	NC	No Connection
4	C	NC	NC	NC	No Connection
5	C	NC	NC	NC	No Connection

**SF END UNIT
COUPLER NUMBERS**
MS-3, MS-4, MS-5
MS-8, MS-9, MS-10
MS-11, MS-13
MS-14, MS-15, MS-16, MS-17

EF END COUPLERS

Sl. No	MS coupler (MS-2)		Description of Signal	MS coupler (MS-1) on Relay Box	
	Pin	Cable		Pin	Cable
1.	A	RED	+5V DC	A	RED
2.	C	RED	VR-A+ (+24V DC)	C	RED
3.	F	BLACK	VR-A- (-24V DC)	E	BLACK
4.	G	BLUE	RLYUV1-FB (-5V DC)	G	BLACK

Sl.No	MS coupler (MS-6)		Description of Signal	Cable to be used
	Pin	Cable		
1	A	RED	A-MODEM-INOUT+	½ Quad 0.9 mm
2	B	BLACK	A-MODEM-INOUT-	
3	C	NC	NC	No Connection

Sl. No	MS coupler (MS-7)		Description of Signal	MS coupler (MS-2) on Relay Box	
	Pin	Cable		Pin	Cable
1.	A	RED	+5V DC	A	RED
2.	C	RED	PREP1+ (+24V DC)	C	RED
3.	F	BLACK	PREP1- (-24V DC)	E	BLACK
4.	G	BLUE	PREP1-FB (-5V DC)	G	BLACK

Sl.No	MS coupler (MS-9)		Description of Signal	MS coupler (MS-2) on Train Simulator Box	
	Pin	Cable		Pin	Cable
1.	A	RED	WHEEL-M1	A	2 Core Coil wire - Red
2.	B	BLACK	WHEEL-S1	B	2 Core Coil wire - Black
3.	C	GREEN	WHEEL-SUP1	C	2 Core Coil wire - Red
4.	D	RED	WHEEL-M2	D	2 Core Coil wire - Black
5.	E	BLACK	WHEEL-S2	E	2 Core Coil wire - Red
6.	F	GREEN	WHEEL-SUP2	F	2 Core Coil wire - Black
7.	G	BLACK	DIG- GND	G	2 Core Coil wire - Green

Sl. No	MS coupler (MS-12)		Description of Signal	Cable to be used
	Pin	Cable		
1.	A	RED	RESET1+	1.5mm Signaling cable or 1/2 Quad 0.9mm (refer note)
2.	B	BLACK	RESET1-	
3.	C	NC	NC	No Connection

Sl.No	MS coupler (MS-14)		Power Supply	Connection from battery / IPS
	Pin	Cable		
1.	A	RED	+24V DC	2 Core cable Coil Wire
2.	B	BLACK	-24V DC	
3.	C	NC	No Connection	

Sl.No	MS coupler (MS-4)		Description of Signal	Wiring Details Of TX2 Coil Axle Detector	
	Pin	Cable			
1	A	RED	TX2a	Blue 25 KHz	23 / 0.2mm, 2 core shielded PVC cable with blue sheath 15m connected to the MS coupler MS-4 of the system
2	B	BLACK	TX2b	White 25 KHz	23 / 0.2mm, 2 core shielded PVC cable with blue sheath 15m connected to the MS coupler MS-4 of the system
3	C	NC	NC	NC	No Connection

Sl.No	MS coupler (MS-10)		LCD Display	MS coupler (MS-1) on LCD	
	Pin	Cable		Pin	Cable
1.	A	3 Core Coil wire - Red	LCD1-RS	A	3 Core Coil wire - Red
2.	B	3 Core Coil wire - Black	LCD1-DET	B	3 Core Coil wire - Black
3	C	3 Core Coil wire - Yellow- Green	LCD1-D-E	C	3 Core Coil wire - Yellow- Green
4	D	3 Core Coil wire - Red	LCD1-STR	D	3 Core Coil wire - Red
5	E	3 Core Coil wire - Black	LCD1-D	E	3 Core Coil wire - Black
6	F	3 Core Coil wire - Yellow- Green	LCD1-CLK	F	3 Core Coil wire - Yellow- Green
7	G	3 Core Coil wire - Red	LCD2-RS	G	3 Core Coil wire - Red
8	H	3 Core Coil wire - Black	LCD2-DET	H	3 Core Coil wire - Black
9	J	3 Core Coil wire - Yellow- Green	LCD2-D-E	J	3 Core Coil wire - Yellow- Green
10	K	3 Core Coil wire - Red	LCD2-STR	K	3 Core Coil wire - Red
11	L	3 Core Coil wire - Black	LCD2-D	L	3 Core Coil wire - Black
12	M	3 Core Coil wire - Yellow- Green	LCD2-CLK	M	3 Core Coil wire - Yellow- Green
13	N	2 Core Coil wire - Red	5VDC	N	2 Core Coil wire - Red
14	P	2 Core Coil wire - Black	DIG- GND	P	2 Core Coil wire - Black

Sl. No	MS coupler (MS-15)		Description of Signal	Cable to be used
	Pin	Cable		
1.	A	RED	SM-MODEM-INOUT+	½ Quad 0.9 mm up to station
2.	B	BLACK	SM-MODEM-INOUT-	
3.	C	RED	RTC-BAT	2 Core coil cable
4.	D	BLACK	DIG- GND	
5	E	NC	NC	No Connection

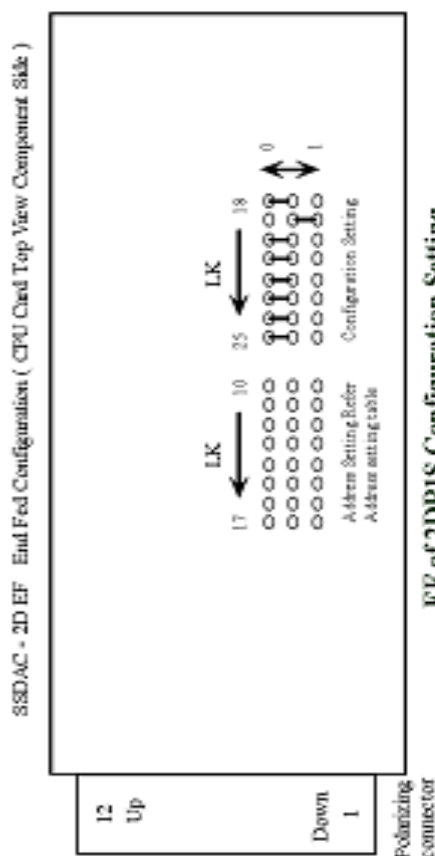
Sl. No	MS coupler (MS-5)		Description of Signal	Wiring Details Of TX1 Coil Axle Detector	
	Pin	Cable			
1	A	RED	TX1a	Blue 21 KHz	23 / 0.2mm, 2 core shielded PVC cable with gray sheath 15m connected to the MS coupler MS-5 of the system
2	B	BLACK	TX1b	White 21 KHz	23 / 0.2mm, 2 core shielded PVC cable with gray sheath 15m connected to the MS coupler MS-5 of the system
3	C	NC	NC	NC	No Connection

Sl. No	MS coupler (MS-16)		Description Of Signal	Wiring Details Of RX2 Coil Axle Detector	
	Pin	Cable			
1	A	RED	RX2b	Blue 25 KHz	23 / 0.2mm, 2 core shielded PVC cable with blue sheath 15m connected to the MS coupler MS-16 of the system
2	B	BLACK	RX2a	White 25 KHz	23 / 0.2mm, 2 core shielded PVC cable with blue sheath 15m connected to the MS coupler MS-16 of the system
3	C	NC	NC	NC	No Connection
4	C	NC	NC	NC	No Connection
5	C	NC	NC	NC	No Connection

Sl. No	MS coupler (MS-17)		Description Of Signal	Wiring Details Of RX1 Coil Axle Detector	
	Pin	Cable			
1	A	RED	RX1b	Blue 21 KHz	23 / 0.2mm, 2 core shielded PVC cable with Blue sheath 15m connected to the MS coupler MS-17 of the system
2	B	BLACK	RX1a	White 21 KHz	23 / 0.2mm, 2 core shielded PVC cable with Blue sheath 15m connected to the MS coupler MS-17 of the system
3	C	NC	NC	NC	No Connection
4	C	NC	NC	NC	No Connection
5	C	NC	NC	NC	No Connection

EF END UNIT
COUPLER NUMBERS
MS-2, MS-4, MS-5
MS-6, MS-7, MS-9, MS-10
MS-12,
MS-14, MS-15, MS-16, MS-17

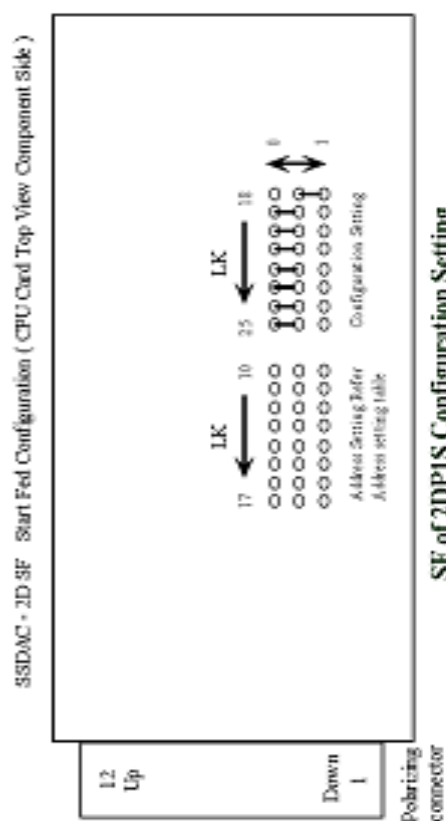
SSDAC-2DP1S (Configuration Setting and address settings)



EF of 2DP1S Configuration Setting Jumper Settings for Configuration EF of 2DP1S

Juniper Settings for SSDAC - 2DP1S EF END Fed configuration									
LK25	LK24	LK23	LK22	LK21	LK20	LK19	LK18		
0	0	0	0	0	0	1	0		

CPU addressing for EF of 2DP1S Configuration

[illegible]

SF of 2DP1S Configuration Setting
Jumper Settings for Configuration SF of 2DP1S

Jumper Settings for SSDAC – 2DP1S SF Start Fed configuration						
LK25	LK24	LK23	LK22	LK21	LK20	LK18
0	0	0	0	0	0	1

CPU addressing for SF of 2DP1S Configuration

Jumper Settings								Address Assigned
LK10	LK11	LK12	LK13	LK14	LK15	LK16	LK17	
LSB							MSB	
1	0	0	0	0	0	0	0	1
0	1	0	0	0	0	0	0	2
▼	▼	▼	▼	▼	▼	▼	▼	▼
0	0	1	1	1	1	1	1	252

MAINTENANCE LOG SHEET FOR SSDAC – G36

BLOCK SECTION: **STATION:** **SF / EF**

Sr.no	DATE	BATTERY	AC Volts				Phase Detector 1				Phase Detector 2				With push trolley on Axle detector (4 spokes)	DC – DC Converters (DC Volts)				Sign	
			TX1 Vrms/ freq	TX2 Vrms/ freq	RX1 Vrms/ freq	RX2 Vrms/ freq	RX Sig & GND AC volts	SUP level & GND DC volts	RX PH – SIG & GND socket DC Volts		RX Sig & GND AC volts	SUP level & GND DC volts	RX PH – SIG & GND socket DC Volts			RX PH – SIG & GND socket	5 V	+12 V	+18 V		24 V
									Normal	Dummy Wheel			Normal	Dummy Wheel							
		FTB 1&2	FTB 52&53	FTB 56&57	FTB 54&55	FTB 58&59															
		22-30 V DC	40-70 V 20.802 to 21.302 KHz	40-70V 24.750 to 25.250 KHz	300 mV to 1.2 V	300 mV to 1.2 V															

EXERCISE:

- 1) Draw layout of G.G.Trronics axle counter installation as on board

- 2) Due to communication failure which error code will display on LCD unit?
- 3) Which links are used for Configuration setting of SF end unit and EF end unit and in which board?
- 4) Give the details of dimensions of holes for installation of detectors (information is available in E content site <http://10.195.2.19>)
- a) _____ Holes to web
 - b) Dia of hole _____ mm ,
 - c) Distance between centre of adjacent holes _____ mm,
 - d) Height of hole
 - I. _____ 90 pound rail ,
 - II. _____ 52 kg rail,
 - III. _____ 60 kg rail
- 5) Write details of MS-1 coupler of relay box

Date

Signature of the Trainee