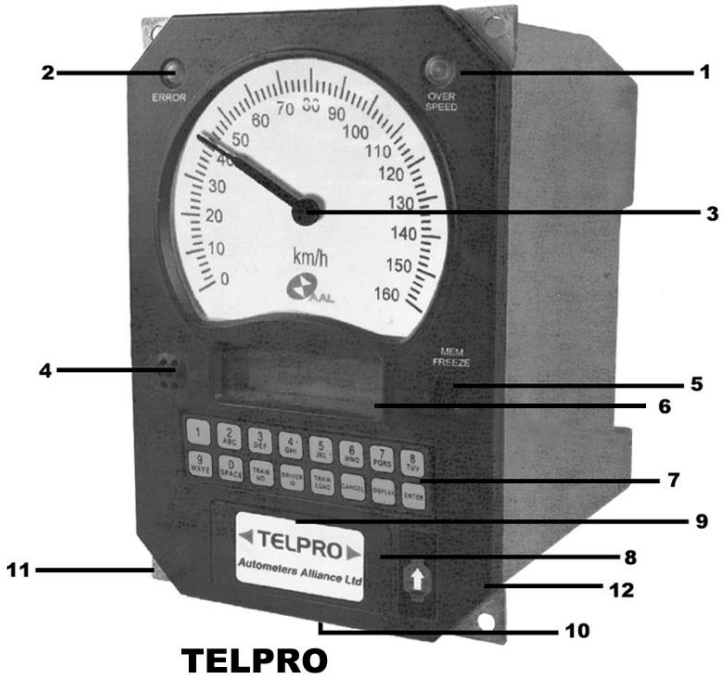
## SPEEDOMETERS

**AUTOMETERS ALLIANCE LTD**
**TELPRO-DL**

**Display functions :**

- Analog speed indication
- 16 x 2 Alphanumeric LCD display.
- Audio and visual over speed alarm status indication.
- Display of time, Odometer reading, date, train No, Driver ID Train load, wheel diameter, maximum speed alarm, loco No, digital speed, memory free (in percentage), distance traveled by present driver (DT by PD),error messages , memory freeze indication (MF) and stepper motor indication(SE).

Detailed view of the front panel of **TELPRO** is shown in the figure:




**TELPRO**

**PARTS :**

| SL No | Display units and controls | Functions |
|---|---|---|
| 1. | Over speed indication LED | Indicates speed crossing the set over speed limit |
| 2. | Error indicator LED | Indicates memory full, external memory absent and fault in TELPRO system. |
| 3 | Analog speed display assembly | Displays speed in KMPH |
| 4 | Buzzer | Produces audio alarm with over speed indication |
| 5 | Memory freeze switch(In side glass cover) | To stop recording in short - term memory in case of accident/emergency. |
| 6 | LCD Display | Displays time, date, speed, distance and other parameters |
| 7 | Key Board | To set various parameters by pressing keys, also to display these parameters |
| 8 | Memory card connector | For compact flash memory card connection. |
| 9 | 9 Pin D- type male connector | Used for RS 232 communication and speed pointer setting. |
| 10 | Push-to-on switch | Used for configuration and parameter setting. |
| 11 | Door assembly | To prevent unauthorized access to the system. |
| 12 | Lock assembly | To prevent unauthorized access to the system |

**Display Functions available:**

- Speed on analog display (Pointer)
- Error indicator LED for displaying error along with the digital display
- Over speed indicator LED.
- LCD display is used to display the following parameters: -
    1. Time
    2. Odometer reading
    3. Date
    4. Train No

5. Driver ID
6. Train Load
7. Wheel diameter
8. Max. Speed alarm
9. Loco No
10. Digital speed
11. Memory free (In %)
12. Distance traveled by present driver (DT by PD)
13. Error messages
14. Memory freeze indication (MF)
15. Stepper motor error indication (SE)
16. Display also provides assistance in configuration of the system through the keypad.

**Keyboard and its functions**:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 2 ABC | 3 DEF | 4 GHI | 5 JKL | 6 MNO | 7 PQRS | 8 TUV |
| 9 WXYZ | 0 SPACE | TRAIN NO. | DRIVER ID | TRAIN LOAD | CANCEL | DIS PLAY | ENTER |

No Of Keys : 16
Colour : Black and Yellow

Pictorial view of key board and its inscriptions as used TELPRO is shown above.
Descriptions of each key provided on the keyboard are as follows;

Key "**0** to **9**" and **A** to **Z** — They are used to enter alphanumeric values while setting parameters. Some keys are provided with other functions also. These functions are given below;

Key "**0**" — Back light illumination setting is done through this key

Key "**1**" — Date is displayed as this key is pressed

Key "**9**" — Dial illumination setting is done through this key

Key "**Train No**" — Used to set the train No

Key "**Driver ID**" — Used to set the Driver ID

Key "**Train Load**" Used to set the train load in tons. Also used while setting is done in parameter mode or configuration mode.

Key "**Cancel**" Used when a wrong value that has been entered is to be cancelled.

Key "**Display**" Displays the set parameter value and used in setting display parameter in configuration mode.

Key "**Enter**" Save the changes that are made in various parameters.

**Memory freeze switch**

Memory freeze switch is present inside the front panel of master behind the glass window. As this switch is pressed ON after breaking the glass further recording in the short-term memory is halted.

| **Facilities** | **Medha** | | | | | **Auto meter** | | | **Laxven** |
|---|---|---|---|---|---|---|---|---|---|
| | MRT 912 | MRT 912M | MRT 912 C | MRT 918VI | MRT 918VII | RT9 | SP 90S | TELPRO | LAXVEN 2000 |
| Graph roll availability | Yes | Yes | No | No | No | Yes | No | No | No |
| Memory capacity | No | 6 Hrs | 60 Days | 60 Days | 90 Days | No | 30 Min. | 60 Days | 60 Days |
| Memory freezer switch | No | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| Driver/train ID entry Facility | No | No | Yes | Yes | Yes | No | No | Yes | Yes |
| Digital speed display | No | No | Yes | Yes | Yes | No | Yes | Yes | Yes |

# AUTO METERS Rt-9-98

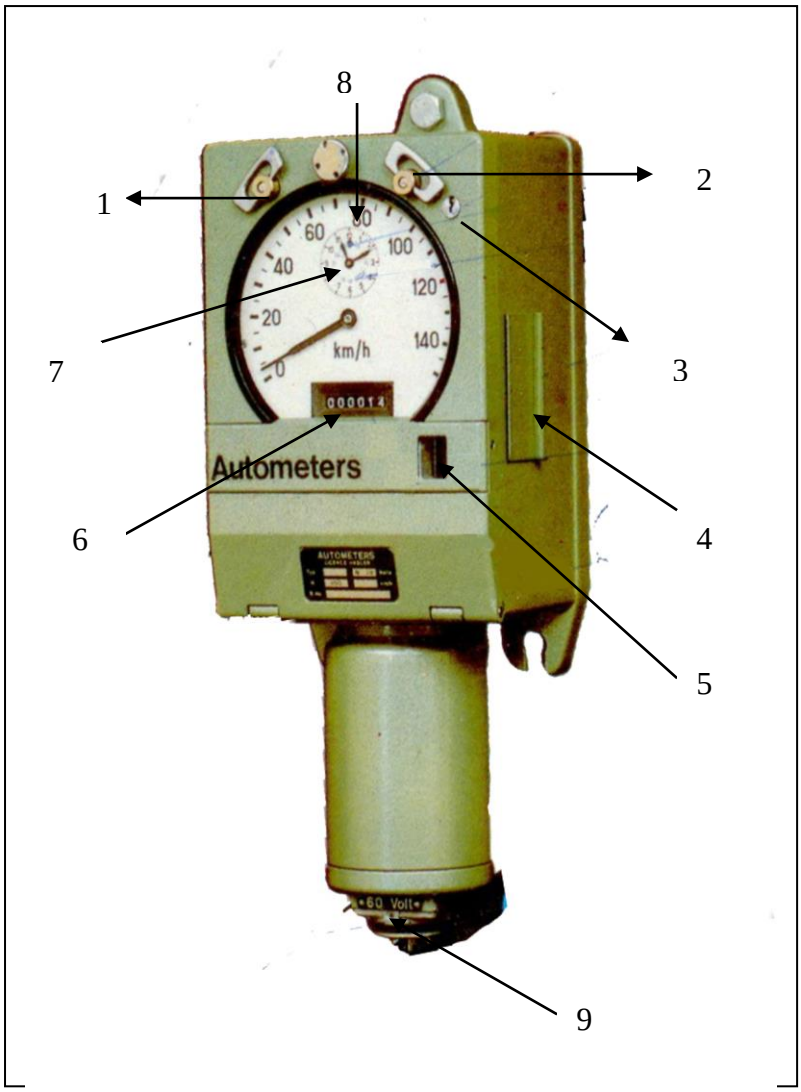



**Chart R**

1. Clock winding key
2. Time setting key
3. Lock
4. Chart Inspection Door
5. Glass window
6. ODO Meter
7. Clock Dial
8. AM-PM Indicating Dot
9. Plug connection

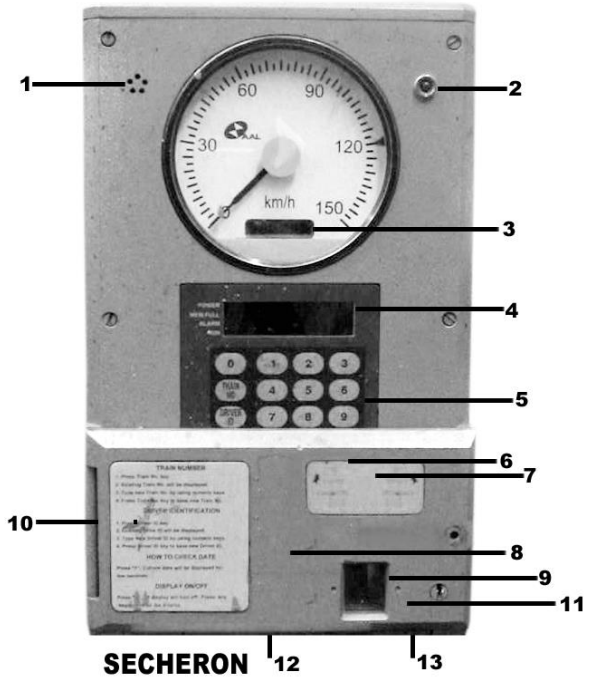
Instructions :

1. Wind the clock every morning at 9 hrs.
2. Time adjustment only after winding the clock.
3. From 00:00 Hrs to 12:00 Hrs White Dot and 12:00 Hrs to 00:00 Hrs Blue Dot
4. In window if Red lines are noticed, chart is ending.

## AUTOMETERS SECHERON

### SP – 90S

Indicator with static memory, SP-90S has the following features:




**PARTS :**

1. Over speed alarm
2. Over speed LED
3. Six Digit Odometer
4. Display
5. Key Board
6. Loco No. Thumbwheel switch
7. Max. Speed thumbwheel switch

8. Wheel wear thumbwheel switch
9. Memory freeze switch
10. Short term memory module
11. Power on Switch
12. 10-pin connector
13. 14-Pin connector

(a) **Speed indication**

Needle for analog speed indication is driven by highly reliable stepper motor

(b) **Odometer**

Six digit Odometer indicates the total distance covered by the loco in k.m.

(c) **Display**

Time is displayed in hour: minute: second format. Also four red LEDs indicate:

a. Power: This LED continuous to glow when power to the system is turned on.
b. Memory Full: This LED kept for future use .
c. Alarm: This LED will glow when Loco speed crosses the over speed limit set by the over speed thumb wheel switches.
d. Run: This LED blinks to indicate that the system is functioning normally. **This does not have any link with loco is running or not.**

(d) **Key Board**

Driver ID and Train No. can be fed in the system with help of this key board. To enter Driver ID and Train No. follow the following instructions which are also printed on the system. Also time can be set using this key board. But this function is behind lock and key and can be performed by shed staff only. Instructions for setting the time are also given below.

**Caution:** Any data entry through key board should be done only when the loco is stationery. Any fiddling in the running condition will disturb the normal functioning of the system.

**TIME & DATE**

1. Press SET TIME key
2. System will ask for hour. Correct it & then press EXEC Key.
3. System will ask for minutes, correct it and press EXEC key.
4. Now system will ask for date in sequence dd/mm/yy.
5. Press EXEC key to save new date & time.

**TRAIN NUMBER**

1. Press Train No. key
2. Existing Train No. will be displayed.
3. Type new Train No. by using numeric keys.
4. Press Train No. key to save new Train No.

**DRIVER IDENTIFICATION**

1. Press Driver ID key
2. Existing Driver ID will be displayed.
3. Type new Driver ID by using numeric keys.
4. Press Driver ID key to save new Driver ID.

**HOW TO CHECK DATE**

Press "1", current date will be displayed for few seconds.

**DISPLAY ON/OFF**

Press "0", all display will turn off. Press any key to turn on the display.

(e) **Memory Freeze Switch**

This switch is covered by a glass window when the front door is closed. In case of any accident brake the glass and turn ON this switch. This will freeze the data in short term module and no further data will be recorded even if the Loco is moved. Thereafter data in the module can be extracted in the shed to know the exact conditions when the accident occurred.

# MICRO PROCESSOR BASED SPEED – TIME – DISTANCE – INDICATING AND RECORDING SYSTEM (LAXVEN)

## LOCO MOUNTED EQUIPMENTS

1. Pulse generator (Optical)
2. Junction box & cable assembly (J.B)
3. Microprocessor based speed recorder cum indicator unit (RCI)
4. Speed indicator (IND)

**PARAMETERS**

1. Date in DD:MM:YY format
2. Distance traveled by the locomotive in KM/Hr
3. Speed limit in KM/Hr
4. Wheel dia meter in mm
5. Memory fill in %
6. Train No.
7. Driver No.
8. Train load in tones
9. Locomotive No.
10. Dynamic brake status
11. Dynamic brake duration
12. Dynamic brake distance
13. Coasting status
14. Coasting duration
15. Coasting distance
16. Current distance by a present driver

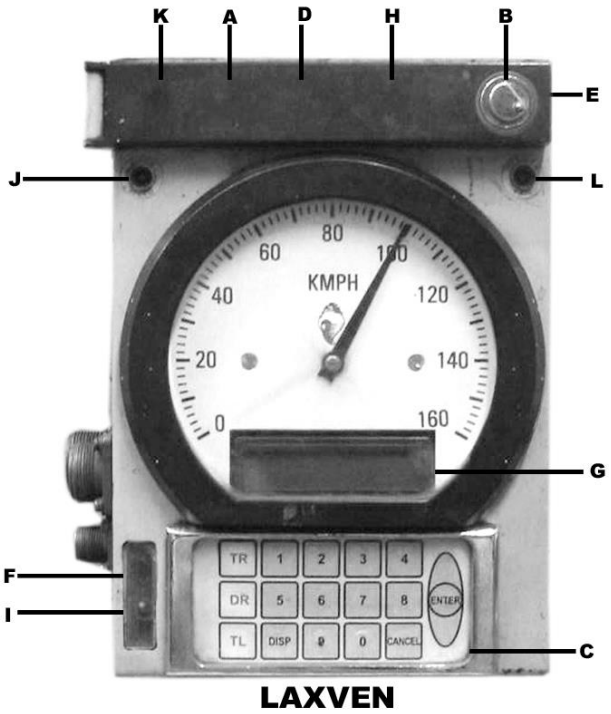
## DRIVER LEVEL PROGRAMMING:

Driver is supposed to operate the key pad only when the locomotive is in still/Half condition. As the driver is provided with the key, he can not open the lid of memory compartment, he is having direct access to key board to enter his identification, Train No. and train load in the following sequence.

Each operation is given 8 Sec. time. If the driver opts to change the one of three parameters he has to operate the keys with in 8 Sec. from the last press. If he does not press with in the specified time old values will be retained.

1. Driver code can be entered by the driver
2. Train No. can be entered
3. Train load can be entered in Tonnes

During programming, the indicating unit shows a display of "PLEASE WAITPROCESSING" indicating that recorder cum indicator unit is in programming mode.




**PARTS :**

A. PROGRAMME SWITCH
B. LOCK
C. KEY PAD
D. PCMCIA CARD
E. PROTECTIVE COVER
F. MEMORY FREEZE SWITCH
G. DISPLAY
H. RS 232 PORT
I. MEMORY FREEZE LED
J. OVER SPEED LED
K. PROGRAMME ON LED
L. SYS/MEM FAIL LED

**MEMORY FREEZE**

A Memory freeze switch is provided on the front panel of the speed recording system. A breakable glass is provided on the switch, incase the fine memory is to be freezed , to access the written data and not to be over written, then the option is to brake the glass and MEMORY FREEZE switch should be put to ON condition. Once the switch is ON fine memory is freezed and system will not write or access the fine memory area till the memory freeze s2witch is put to OFF condition as long as the MEMORY IS FREEZED the fail indication appears on the display and a red LED indication will appear in the memory freeze compartment.

Only fine memory will be freezed during the memory freeze switch is in ON condition. Long term memory will however be written.

**MEMORY FULL**

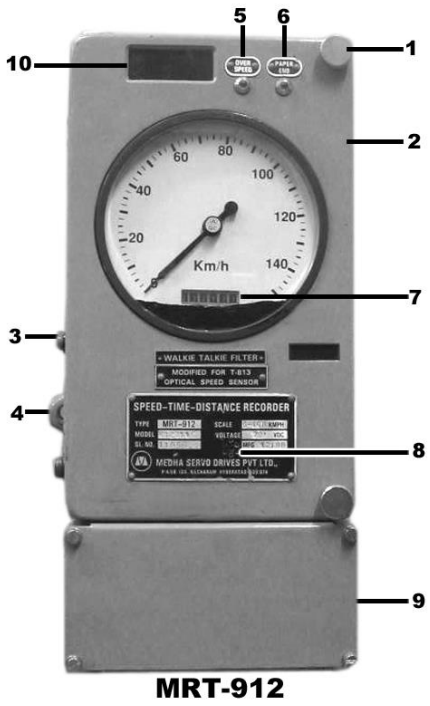
As per the specification if the data in the memory is more than 85 % of occupancy, then the systems should indicate the user as full memory and the caution the user to down load the data at the earliest to avoid the loosing the earlier data because of the looping format of the data structure.

During this time SYS/FAIL lights up and this is an indication to the user to verify the memory capacity on the display and the necessary action to be taken to down load the data.

In this case the SYS/FAIL does not mean the system is failed, but a warning signal to the user. Please do not mis- understand this point.

# MEDHA METERS

## MRT 912




MRT-912

Chart Recorder with Indicator Memory Back up

**Parts**

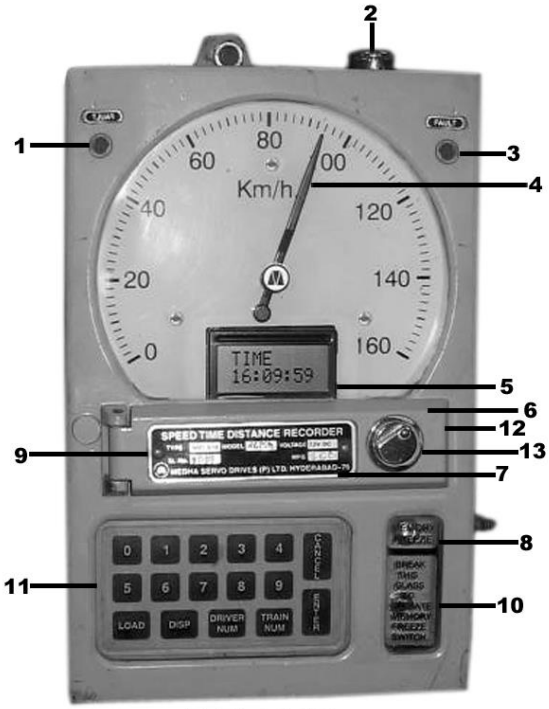
1. Knurled screw
2. Door Lock
3. Light Knob
4. Chart Viewing window
5. Over Speed Indicator
6. Paper End Indicator
7. ODO Meter
8. Buzzer
9. Memory Card Box

Instructions

1. **During over speeding a preset-able 'Over Speed Audio Visual indication provided to alert the driver,**
2. 'PAPER END' indication glows when graph when graph roll is exhausted.
3. Memory capacity 6 Hrs.

# SPEED TIME DISTANCE RECORDER CUM INDICATOR

## MRT – 918




**MRT-918**

**PARTS:**

1. MEMORY INDICATION
2. TOP COVER LOCK
3. FAULT INDICATION
4. SM POINTER
5. 16CH ALFA NUMERIC DISPLAY
6. PS 232 SERIAL PORT
7. SELECT PARAMETERS SWITCH
8. MEMORY FREEZE INDICATION
9. MEMORY CARD
10. MEMORY FREEZE SWITCH
11. KEY BOARD
12. MEM CARD BOARD
13. MEM CARD BOARD LOCK

**The fault LEDs:**

Two fault LEDs are provided, one for the Memory fault (Green colour) and the other for the system fault (Red colour).

Memory Fault LED (Green colour) :

The Memory LED will blink at a low frequency (approximately 0.5 Hz) once the Memory is 85% full. After 100% Memory is full the LED will be continuously ON.

The LED will blink continuously at a high frequency (approximately 3 Hz) whenever the Memory card is faulty.

System Fault LED (Red colour) :

Whenever the Analog Indication fails and this LED will glow and the Speed (Digital) will be displayed in the LCD display. System failure.

**SETTING OF PARAMETERS:**

To set these parameters the Door shall be closed and speed shall be zero.

It is possible for the Driver to set the following parameters only.

- Loco Load
- Dial Illumination (10 to 90%)
- Driver No.
- Train No.

TO SET THE LOAD :

- Press the LOAD key on the keyboard.
- Existing Load value is shown on the Display with first digit blinking.
- Enter the new value with the numeric keys 0-9.
- After setting the desired value press ENTER key to accept the new value.

TO SET DIAL ILLUMINATION:

- Using the DISP key to view the parameters, select Dial illumination.
- Existing number is shown on the Display with first digit blinking.
- Enter the new value with the Numeric keys 0-9.
- After setting the desired value press ENTER key to accept the new value.

TO SET DRIVER NUMBER :

- press the DRIVER NUM key on the keyboard.
- Existing number is shown on the Display with first digit blinking.
- Enter the new value with the Numeric keys 0-9.
- After setting the desired value press ENTER key to accept the new value.

TO SET TRAIN NUMBER :

- press the TRAIN NUM key on the key board .
- existing number is shown on the display with first digit blinking
- enter the new value with the numeric keys 0-9.
- After setting the desired value press ENTER key to accept the new value.

MEMORY FREEZE OPERATION :

Memory Freeze facility is provided to allow the loco to be moved after an accident, without overwriting of the data on the latest data stored. There will not be any further recording of the data in the short memory.

The Memory Freeze Switch and the Indication are provided inside a sealed glass cover on the Recorder Cum Indicator unit.

The glass has to be broken to operate the switch. Once the switch is operated the LED will be on.

There will not be any more recording in the short memory as long as the Memory Freeze switch is on.