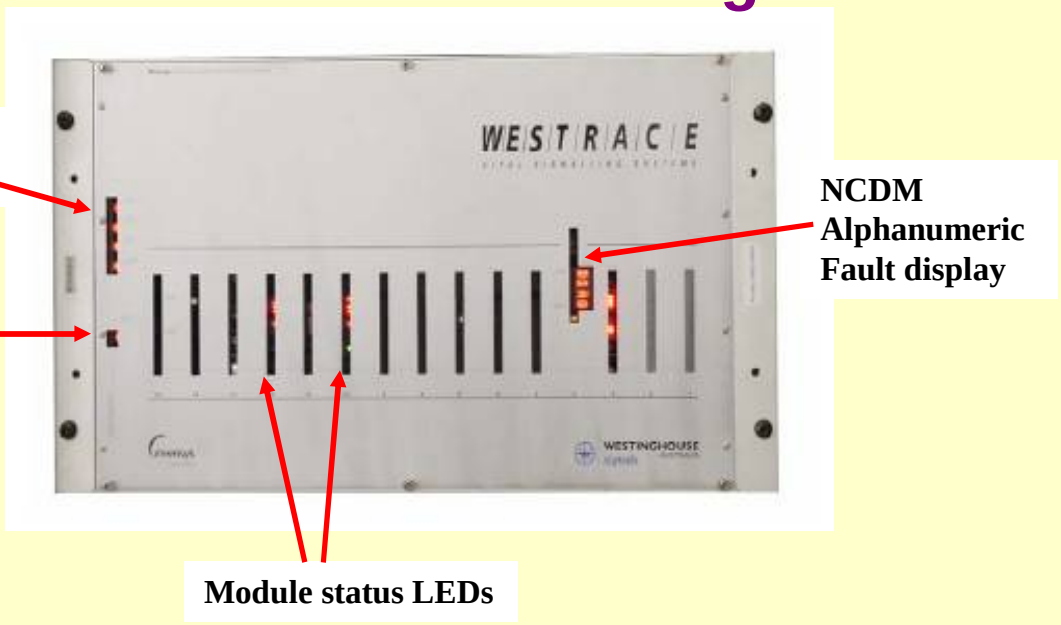
सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

WESTRACE VLM6

Electronic Interlocking



CAMTECH/S/PROJ/2015-16/PAM-W_EI/1.0
September 2015

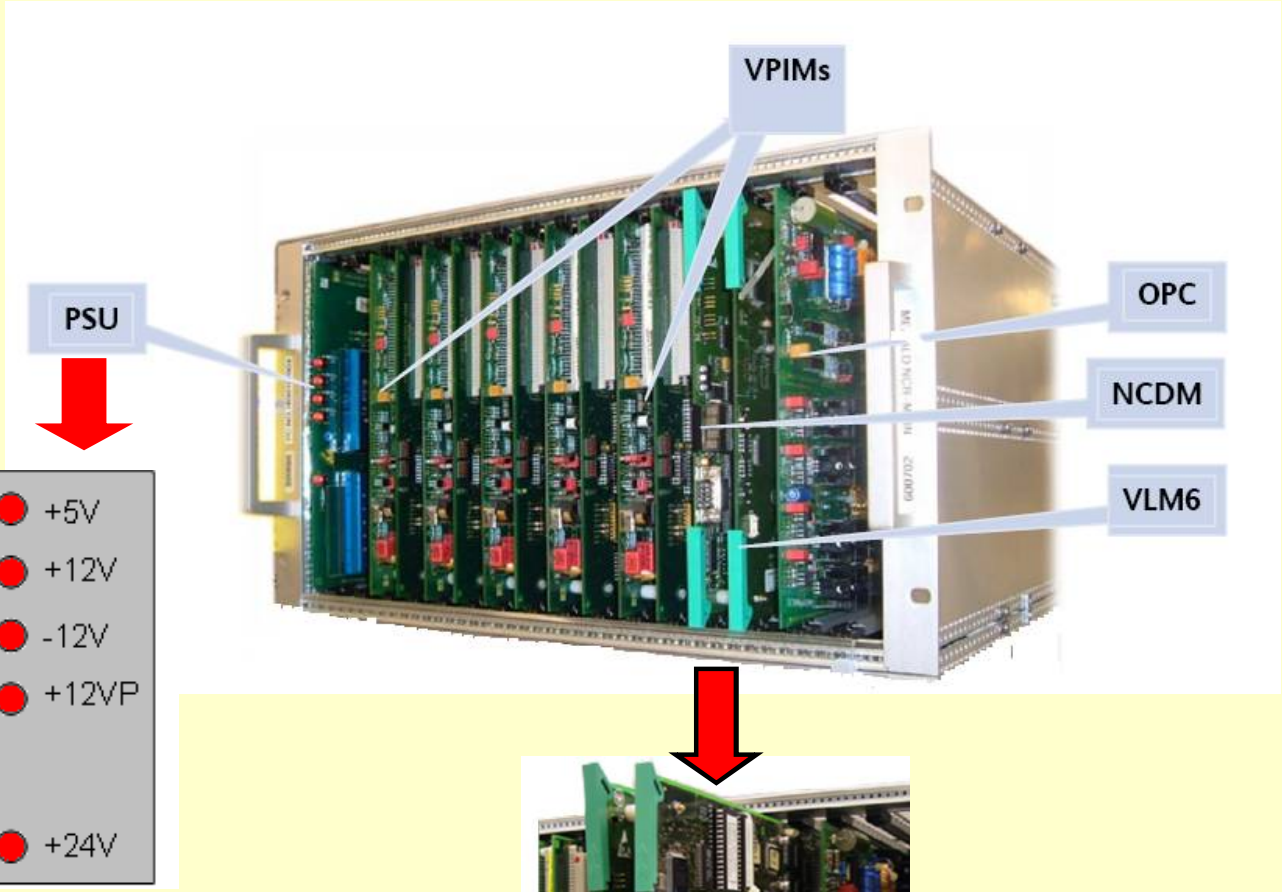
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Introduction

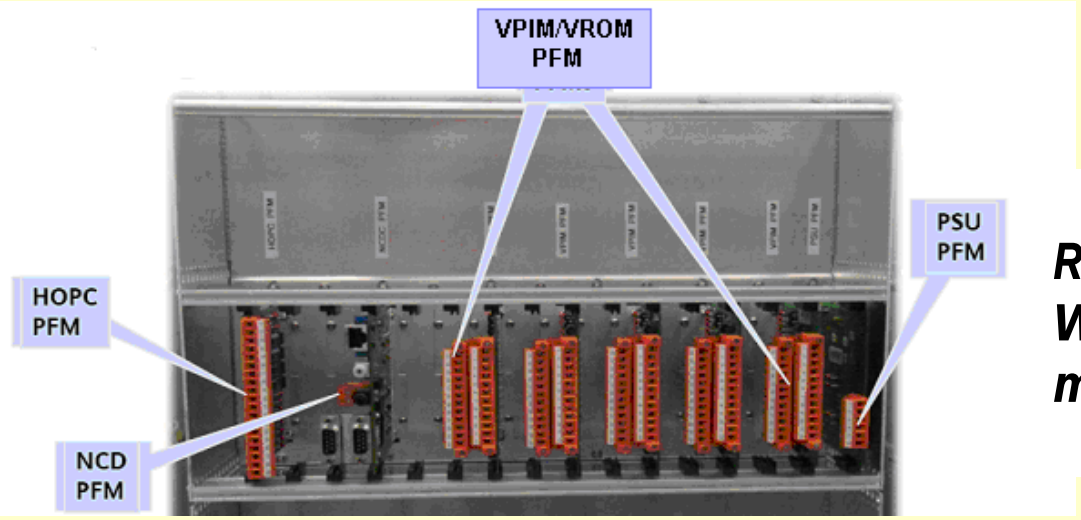
The **WES**tinghouse **T**rain **R**adio **A**dvanced **C**ontrol **E**quipment. (WESTRACE) VLM6 is a Vital Railway Signalling System which comprises following modules:

1. Vital Logic Module (VLM)
2. Network Communication Diagnostic Module (NCDM)
3. Vital Parallel Input Module (VPIM)
4. Vital Relay Output Module (VROM)
5. Power Supply Unit (PSU) module
6. Blanker Card (BLANKER)
7. Protection and Filter Modules (PFM) (at the rear of each module)



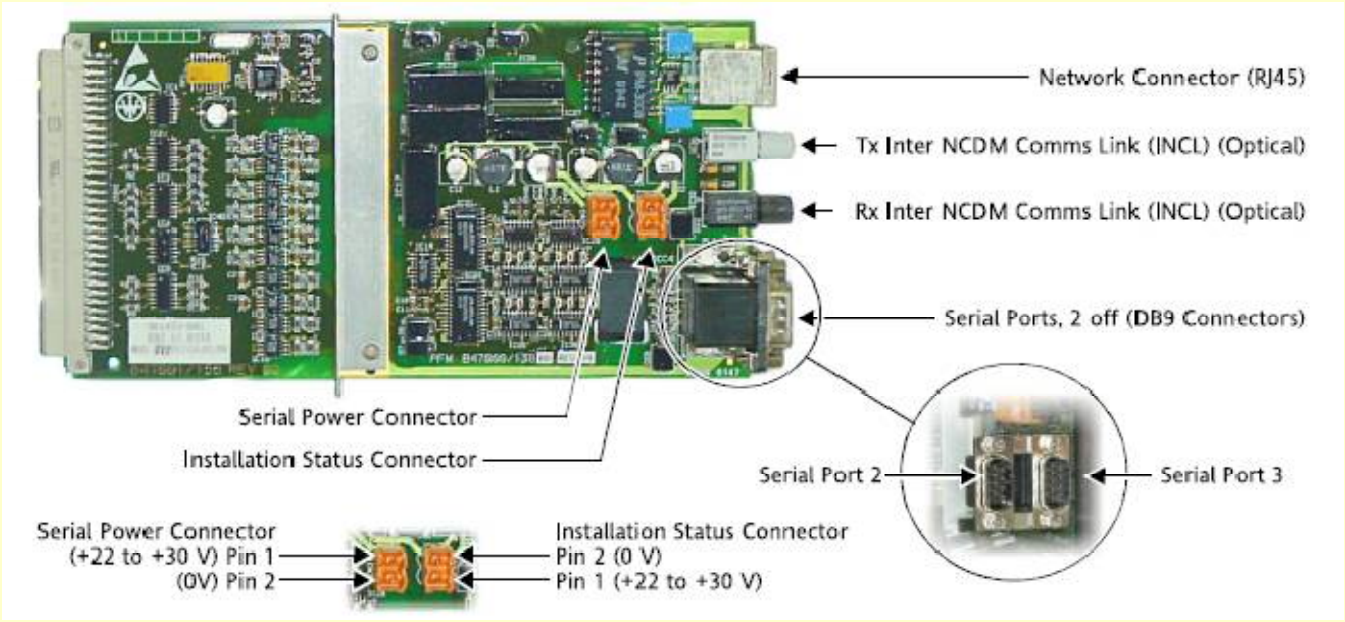


Front view of WESTRACE modules with cover open



Rear view of WESTRACE modules

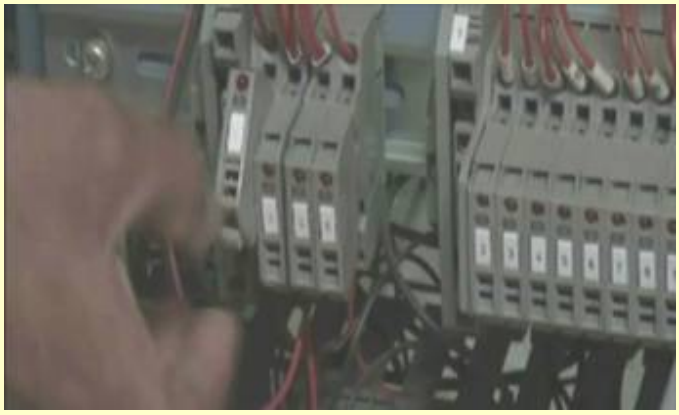
Ports at the rear of NCD PFM



- Serial 2 (External) DB9 – to connect Diagnostic or Control system e.g. Data Logger.
- Serial 3 (External)DB9 - Diagnostic or Control system e.g. Panel Processor.
- INCL (External) Tx & Rx Optical - Inter NCDM Communication Link , A fibre optic connection used in a Hot Standby system to transfer data between the main and standby NCDMs.
- Network/Ethernet RJ45 (External) - Diagnostic, Control system or vital communications e.g. VDU or MoviolaW .

System Powering Up and Down

A Housing may be powered down by the removal of the pivoted B24 fuse or negative terminal link provided at the bottom of housing rack.



For a multi-housing WESTRACE installation with separate fuse for each Housing, follow these steps:

Powering Down

Switch the top housing OFF *first* as the processor (VLM) is available in the first housing only

The other housings can be switched off in any order.

Wait at least 40 seconds before powering up

Powering Up

Switch the top housing ON *last* i.e. connect the housing 1 fuse *last.*

The other housings can be switched on in any order.

After connecting all the fuses wait for the WESTRACE to reboot.

Fault codes and version numbers are displayed on NCDM card.

Watchdog LEDs (Green) will start flashing on VPIM and VROM.

Now the WESTRACE is ready for functioning

☞Caution

Incorrectly powering up or down may cause the display of system fault codes or prevent system restart.

Weekly Maintenance

Measuring voltages schedule [Performed by Signal Maintainer]

Nominal Voltage Ranges 24 V DC & 50 V DC

Sr No	Date	24 VDC WESTRACE Supply		50 V DC OPCR, VROM & VPIM Supply		Remarks	Signature

Measurement of voltages at following busbars of WESTRACE is to be done:

1. 24 V DC Busbar (Specified range 22 V to 25.8 V)
2. 50 V DC Busbar (Specified range 48 V to 52 V)

- Measure the input voltage (24 VDC) from DC-DC Converter at PSU PFM at terminal nos. 1 (+) & 4 (-).
- Measure the input voltage (50 V DC) from DC-DC Converter at OPC PFM at terminal nos. 1 (+) & 2 (-).

Fuses checking schedule [Performed by Signal Maintainer]

Fuses of PSU, VROM/VPIM, Network Switch/Modem on WESTRACE Racks and Power Supply fuses and Scanner card fuses on Panel Processor (S2) Rack should be checked and their status recorded in the prescribed proforma.

Monthly Maintenance

Earth Resistance Measurement [Performed by Signal Engineer]

Earth Resistance measurement should be recorded. The value should be less than 1 Ohm.

Database Backup schedule [Performed by Signal Engineer]

MoviolaW Database Backup should be taken every 45 days only. (All data to be saved in a separate folder called Backup folder) MoviolaW is used to access various types of reports by clicking tool bar buttons at the top of track diagram.

EI System Failure Register [Performed by Signal Engineer]

Failure in System, Interlocking Downtime, Details of the failure**,** Equipment or Component failed along with corrective action taken should be recorded with date and time.

Hot Standby – System Changeover Schedule
[Performed by Signal Engineer – once in a month]

- Clear the signal after setting a route and observe indications on panel.
- Switch off WESTRACE A (Online system) by removing fuse.
- System should immediately changeover to WESTRACE B (Standby system).
- Green Watchdog LEDs on VLM and NCDM cards of standby System B should start flashing showing System B functioning properly.
- The changeover should not disturb the signal and route on the panel.

Reading Fault Codes

Read the fault code displayed by Fault Diagnostic LEDs on the front of a module comprising two bytes (binary digits – a combination of 0s & 1s). Blank LED is read as '0' and lit LED (RED) is read as '1'. Remember, the lower four LEDs represent the first (left) character and the upper four the second character in the Hexadecimal error code.

Fig. below is displaying 1111 1000 (reading bottom to top) which when converted into hexadecimal represents F8. On referring to VLM6 Error code list in First Line Maintenance Manual F8 means ***Time Stamp Error*** and action to be taken is ***Replace VLM6.***

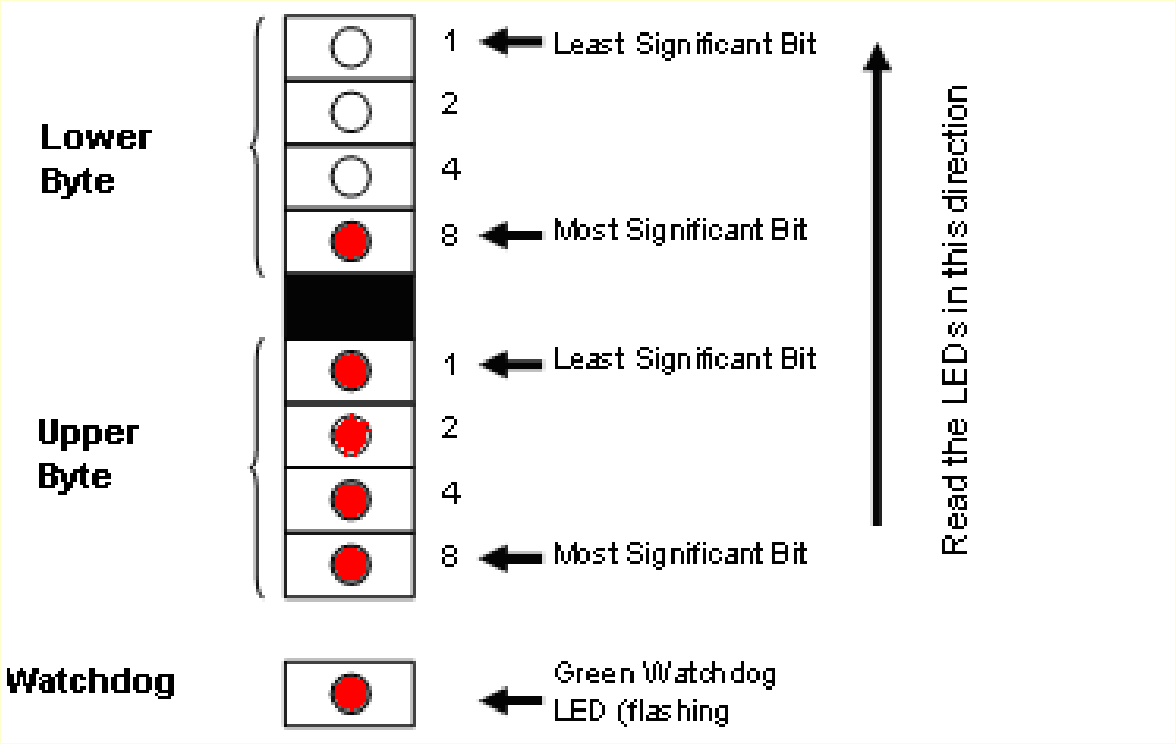
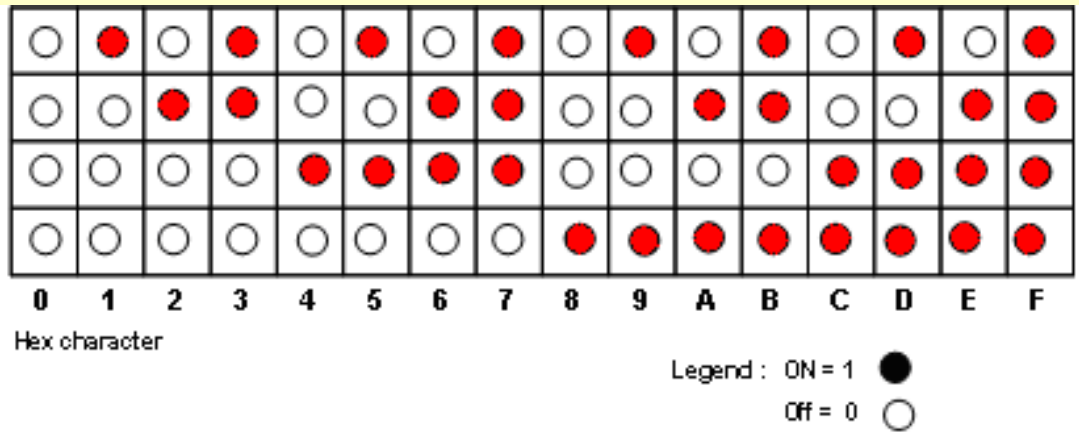


Fig. below shows the patterns of a group of four vertical LEDs representing a particular Hex character.



Recommended spares

Vital Logic Module (VLM) , Network Communication Diagnostic Module (NCDM) , Vital Parallel Input Module (VPIM) . Vital Relay Output Module (VROM) , Power Supply Unit (PSU) module , Blanker Card, Protection and Filter Modules (PFM) & OPCR . The quantity of spares depends upon the size of the station viz. 2 lines, 4 lines etc.

Do's & Don'ts

Do's

- ✓ Keep the EI room free from dust and moisture.
- ✓ Ensure all terminations are fully tight.
- ✓ Place the faulty modules removed from the system with an identity tag into a conductive shielding bag.
- ✓ Check the WESTRACE system fuses at regular interval.
- ✓ Take backup of MoviolaW- maintenance terminal user data log file once in every 45 days.
- ✓ Use card extractor for removing of WESTRACE modules.
- ✓ Use vacuum cleaner for the EXTERNALLY accumulated dust/dirt
- ✓ Powering Down – Switch OFF the top housing *first.*
- ✓ Powering Up – Switch ON the top housing *last.* Give a delay of 40 seconds between powering down and powering up again.

Don'ts

- X Remove modules, OPCR relays, Fuses, Links, PFMs and I/O module connectors when the System is ON or Optic fibre cable connector when optical modem is ON
- X Force modules into the slots during insertion.
- X Change version switch settings of VLM6 and NCDM modules.
- X Change jumper settings in UHVBC and S2 Scanner card.
- X Touch the module components & repair module on your own.
- X Switch OFF MoviolaW, Alter WESTRACE, MoviolaW and WESTCAD PC settings without Authorization.
- X Delete/Modify Application Logic program without Authorization.
- X Use blower for cleaning the dust & vacuum cleaner INSIDE the housing. Use any kind of solvents, detergents or abrasive cleaners on the Housings or internal components..
- X Installation of Unauthorized software in WESTCAD/MoviolaW PC.

DISCLAIMER :The information given in this pamphlet does not supersede any existing provisions laid down in Signal Engg. Manual, Rly. Board and RDSO publications. This document is not statutory and instructions given in it are for the purpose of guidance only. If at any point contradiction is observed, then S.E.M., Rly. Board/RDSO guidelines or Zonal Rly. instructions may be followed.