SAMTEL

AUTOMATED TEST EQUIPMENTS (ATE)

SYSTEM LEVEL TEST BENCH

The System level Test Bench is used to evaluate the performance of the Multifunction Display (MFD) by performing a suite of tests as defined in the Acceptance Test Procedure (ATP) of the MFD. During the performance of the ATP, every stimulus to the MFD is generated and every output of the MFD is monitored under defined environmental conditions against the required performance parameters both during development and production process of MFD.

The STB is made up of the following sub-systems:

- **Functional Test Set:** This is housed in a 19" Rack and contains the power supplies, Input generation and Output monitoring circuits, video and communication monitoring circuits, video pattern generator, electrical test, measurement equipments and also includes Industrial PC with Application Software. The Industrial PC along with a TFT LCD Monitor acts as the user interface to the operator by prompting him to perform the required tests on MFD, feed the measured values from the instruments as well as the test results. The PC system also generates the date and time stamped Acceptance Test Report (ATR) with all entries filled in and prints the ATR on the printer.

- **Optical Test Bench:** The optical bench consists of an optical table, MFD holding, manipulating fixtures, optical parameter measurement equipment.

- **Interconnecting Cable Assemblies:** This cable assembly consists of the cable for connecting main power to the STB and the cable for connecting the MFD to the STB.

BROAD CATEGORY OF TESTS PERFORMED

- Preliminary Checks
- Visual Inspection
- Mechanical Dimensions and Weight
- Grounding and Bonding Resistance
- Insulation Resistance
- DP Communication Test
- Power Measurement
- RS 422 Tests
- Bezel Operation
- Discrete Input Tests
- Video Tests
- Optical Tests
- Performance Checks

TYPICAL SPECIFICATIONS

Functional Test Bench

STB Feature	Specifications
AC power Supply	3 Phase, 105VAC-125VAC, 350Hz-420Hz, 1 KVA
DC power Supply	0-32VDC/0-10A
Bezel Power Supply	Variable in 6 steps of 0, 1, 2, 3, 4 & 5V AC, 400Hz @100mA
Discrete Outputs	A total of 20 inputs through toggle switches. (3 switches generate 28V at Logic ON and 0V at Logic OFF; rest 17 switches generate 0V at logic ON and are OPEN at OFF logic.)
Discrete Inputs	5 Nos. of LEDs to indicate ON or Off State.
RS422 Communication	2 channel Differential, baud rate of 9600 bps
Video Interface	• Two channel of Differential video signal • STANAG 3350 Class B standard • Aspect Ratio: 1:1, 4:3
Industrial PC	Pentium 4 with latest configuration, and TFT LCD Monitor.
Measurement System	• 2 Channel 60 MHz Digital Storage Oscilloscope • 4⅘ digit Digital multimeter with display count of 50,000 • 4½ Digit Micro-ohm meter with resolution of 0.01mOhm in the range of 0-20 mOhm

Optical Test Bench

STB Feature	Specifications
Optical Table	**Type:** 5 axis Manual Table **Fixtures:** To hold both the 5"x5" and 6" x 6" MFD on the optical bench **Linear Movement:** Manual Adjustment along axes x, y and z. This movement is available for the Luminance Meter and Spectro-radiometer. • **X-axis movement:** 300mm, Accuracy ± 0.1mm • **Y-axis movement:** Adjustment 1000 ± 300mm, Accuracy ± 0.1mm • **Z-axis movement:** 275mm, Accuracy ± 0.1mm **Rotational Movement:** Manually adjustable Pan and Tilt motion for the MFD. • **Pan movement:** + 75°, Accuracy 0.5° • **Tilt movement:** + 75°, Accuracy 0.5° **Lighting Adjustment:** Dark Room conditions by curtains (10 Lux max.) **Mandatory Mechanical Adjustments:** • Origin matching between meter and MFD • Perpendicular alignment between meter and MFD screen **Optical Table blackened:** to avoid multiple reflection
Luminance Meter	**Measuring Range:** 0.01 – 999,900 cd/m^2 **Angle of View:** 9° **Acceptance Angle:** 1/3° **Minimum Measuring Area:** 4.8 mm Dia.
Spectroradiometer	**Wavelength Range:** 380-780 nm **Minimum measuring Area:** 350 (standard lens), 35nm (macro lens) **Acceptance Angle:** 1° **Luminance Range:** 0.003-5000cd/m2 **Chromaticity:** Capability of measuring
High Power Light Source	**TYPE of lamp head:** Par **Power:** 1200 W **Illuminance at a distance of 5 m:** 91,208 Lux
Cold light source	**Lamp Type:** Halogen Reflector Lamp type EFR **Illumination Flux:** 600 lumens

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