

**TECHNICAL MANUAL**

**System Name** : TB\_DVOR

**Document No.** : T-PED-ATP-A2046-  
REV00

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**TECHNICAL MANUAL  
OF  
2010 DVOR TEST BENCH**

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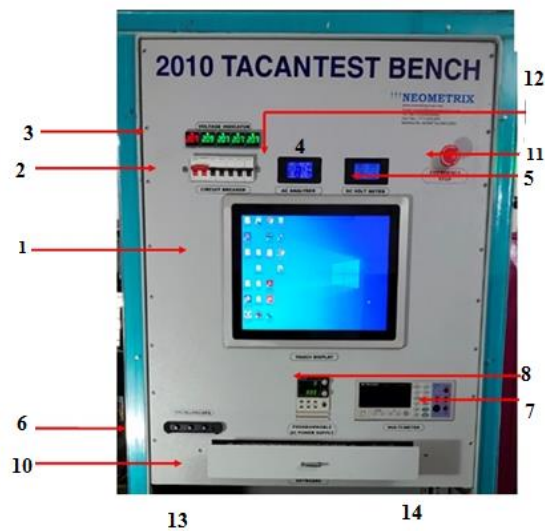
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### LIST OF DVOR COMPONENTS:

1. TOUCH DISPLAY
2. CIRCUIT BREAKER
3. VOLTAGE INDICATOR
4. AC ANALYSER
5. DC VOLT METER
6. OSCILLOSCOPE
7. MULTI-METER
8. PROGRAMMABLE DC SUPPLY
9. CENTRAL PROCESSING UNIT (CPU)
10. KEYBOARD
11. EMERGENCY STOP
12. EMERGENCY ALAM WITH INDICATE
13. UNINTERRUPTIBLE POWER SUPPLY (UPS)
14. PRINTER



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### **1. INTRODUCTION:**

This is user/operator manual of DVOR TEST BENCH. This manual has complete description of the system for operation point of view.

This manual brief about the testing of DVOR MODULES and their interconnections.

The Modules (Unit Under Test/UUT) can be broadly classified into following

- a) Intelligent Module
- b) Slave/Component Module

#### a) List of Intelligent Modules

- i. Transponder
- ii. System interface
- iii. Antenna Interface
- iv. Distribution Unit
- v. Keyer Interface
- vi. Transfer Unit
- vii. Local Status Indicator
- viii. Monitor
- ix. Receiver

#### **b) LIST OF SLAVE/COMPONENT MODULE**

- i. Mains Power Supply
- ii. Modem
- iii. Fan Unit
- iv. Directional Coupler
- v. Pulse Filter
- vi. Detector
- vii. RF Splitter Assy
- viii. Hybrid/Isolator
- ix. Combiner
- x. Circuit Breakers
- xi. HPA Backplane
- xii. TXP/MON Backplane
- xiii. Remote Status Panel

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### **2010 DVOR TESTBENCH HAS FOLLOWING FEATURES**

- Capable to test both intelligent and slave modules of DVOR
- Computerized data acquisition system
- Generation of test report and printing
- Frequency range is 960MHz to 1250MHz
- Power range 8dB max.
- Power backup with inbuilt of 20 minutes to perform uninterruptable testing
- Weatherproof Industrial enclosure of IP65 protection cabinet.
- Industrial compact PC with windows 10 support
- Industrial grade touch monitor for hassle free operation.
- Additional integrated keyboard with mouse for ease of operations and testing.
- Programmable DC power supply of voltage range : 0-30VDC and Power : 700watt
- Industrial grade panel mounted Digital multimeter for cross validation of input and output signals.
- Oscilloscope with integrated output in PC for signal measurement.
- Open able backdoor for ease of maintenance activity
- All wiring and cables is having proper ferruling and cable marking for identification
- Looms and connectors used are MIL grade
- User friendly software GUI is designed for ease of testing
- Software is designed on open ended backend architecture to have flexibility for future modifications.
- Emergency switch provided for any alarming situation, it will shut down the main power supply.
- Tower light is provided for audio visual alarm
- AC analyzer is provided for quality inspection of incoming power supply to the system.
- DC voltmeter (DC power meter) is provided for voltage and current read out.

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### 1. TOUCH DISPLAY:



The **touch screen** enables the user to interact directly with what is displayed, rather than using a mouse, touchpad, or other such devices (other than a stylus, which is optional for most modern **touch screens**).

Touch Monitors have a modern sleek look with its flat edge to edge glass IP65 water- and dust proof front panels. This device has capacitive 10-finger multi touch (40-finger for 86" device), glass front reaching MosH 7, the glass surface is anti-glare treated (chemical etching) and a wide variety of connectors. This display includes the following ports:

External Connectors	
Video	1x HDMI
	1x DVI-D
	1x VGA
Audio	1x PC-Audio
Touch Connector	1x USB
Connectors	1x 12V DC-In (screwable)

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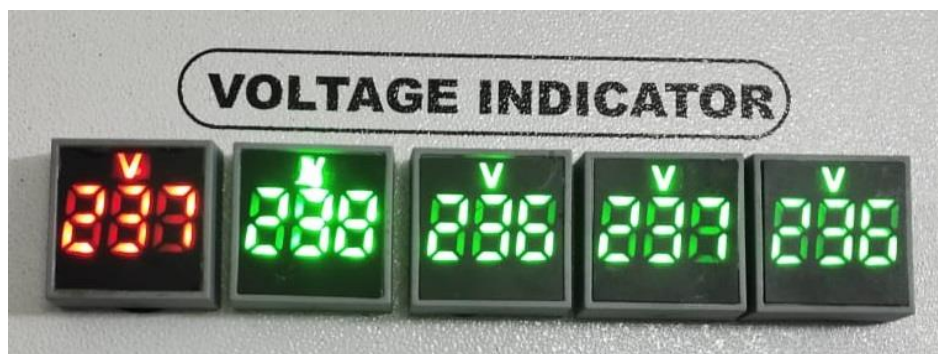
### 2. CIRCUIT BREAKER:



A circuit breaker can make or break a circuit either manually or automatically under all conditions viz., no-load, full-load and short-circuit conditions. This characteristic of the circuit breaker has made it very useful equipment for switching and protection of various parts of the power system.

Circuit breaker can make or break a circuit either manually or automatically 16A.

### 3. INPUT VOLTAGE INDICATOR:



Voltage indicators are small installation devices for measuring both alternating and direct voltages. Voltage indicators continuously show the current voltage. Voltage indicators are used to check batteries or mains voltage.



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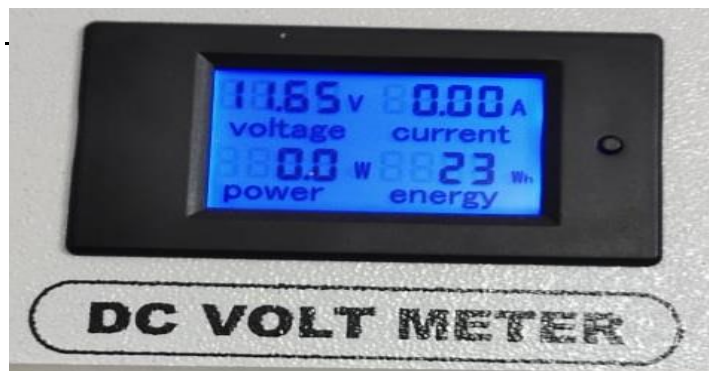
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### 4. AC ANALYSER:



Power analyzers can be used to measure the flow of energy in alternating current (AC) systems – with distinct considerations for measuring AC circuits. Once the power analyzer has determined each of these values, calculating power is a matter of simple mathematics. A power analyzer must also detect the voltage and current of the system.

### 5. DC VOLT METER:



**DC voltmeter** is a measuring instrument, which is used to measure the **DC** voltage across any two points of electric circuit. The series resistance, which is used in **DC voltmeter** is also called series multiplier resistance or simply, multiplier.

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### 6. OSCILLOSCOPE:



The Multicomp Pro PC USB Oscilloscope is an Oscilloscope. Oscilloscopes are used to analyse signals. They have various application e.g. Signal analysis, peak detection, rise time, max.min, Values of signal. They are found in most laboratories. Normally, in the lab they are not PC based like this one but has screen to analyse different signals. There are various parameters to look while selecting an oscilloscope.

An oscilloscope is a laboratory instrument commonly used to display and analyze the waveform of electronic signals. In effect, the device draws a graph of the instantaneous signal voltage as a function of time. A typical oscilloscope can display alternating current (AC) or pulsating direct current (DC) waveforms having a frequency as low as approximately 1 hertz (Hz) or as high as several megahertz (MHz)

#### FEATURES:

- 8 bit vertical resolution (A/D) (2 channels simultaneously)
- 5mV/div~5V/div vertical sensitivity
- Edge, pulse, video, slope and alternate trigger types
- Auto, normal and single trigger modes
- Sample, peak detect and average acquisition modes
- USB 2.0 communication interface
- Synchronized input/output, pass/fail and external trigger input signal types
- 5.0V/1A power supply

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- Dimension is 6.69" (170mm) x 4.7" (120mm) x .7" (18mm)

### 7. MULTI-METER:



a multimeter is a measuring instrument that can measure multiple electrical properties. A typical multimeter can measure voltage, resistance, and current, in which case it is also known as a volt-ohm-milliammeter (vom).

- Digital multimeter measures current, voltage, resistance, and frequency
- True RMS (root mean square) meter provides accurate readings when measuring linear or nonlinear loads where the current or voltage has an undistorted or distorted waveform
- Dual LCD shows two readings at once
- Audible continuity sensor confirms a circuit conducts electricity, and diode test detects proper functioning of a circuit's diodes
- Meets International Electrotechnical Commission (IEC) safety standard 61010 and is certified for Category I installations up to 1,000V and Category II installations up to 300V

### 8. PROGRAMMABLE DC POWER SUPPLY:



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A programmable power supply (PPS) is one that allows remote control of its operation through an analog input or digital interface. Controlled properties may include voltage, current, and in the case of AC output power supplies, frequency.

- Switching power supply unit provides a constant source of DC voltage and current for powering and testing electronic devices
- LCD shows voltage and current reading simultaneously and is readable in low light
- Up to two PSUs can be connected in series for more voltage, and up to three PSUs can be connected in parallel for more current
- Constant current/constant voltage priority feature helps prevent damage to the device under test due to current spikes
- Adjustable slew rate controls the rise and fall time of the output voltage or current to help prevent damage to the device under test

### 9. CENTRAL PROCESSING UNIT (CPU):



A central processing unit (CPU), also called a central processor, main processor or just processor, is the electronic circuitry that executes instructions comprising a computer program. The CPU performs basic arithmetic, logic, controlling, and input/output (I/O) operations specified by the instructions in the program. This contrasts with external components such as main memory and I/O circuitry, and specialized processors such as graphics processing units. Principal components of a CPU include the arithmetic logic unit (ALU) that performs arithmetic and logic operations, processor registers that supply operands to the ALU and store the results of ALU operations, and a control unit that orchestrates the fetching (from memory) and execution of instructions by directing the coordinated operations of the ALU, registers and other components.

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### 10. KEYBOARD:



The **technology of computer keyboards** includes many elements. Among the more important of these is the switch technology that they use. Computer alphanumeric keyboards typically have 80 to 110 durable switches, generally one for each key. Virtual keyboards on touch screens have no physical switches and provide audio and haptic feedback instead. Some newer keyboard models use hybrids of various technologies to achieve greater cost savings or better ergonomics. The modern keyboard also includes a control processor and indicator lights to provide feedback to the user (and to the central processor) about what state the keyboard is in.

### 11. EMERGENCY STOP:



An E-stop switch, otherwise known as an emergency stop switch, is a form of fail-safe control. When utilized, an E-stop switch halts the operation of associated equipment and shuts off all potential hazards outside of the equipment's main power enclosure.

E-stops are typically integrated into the circuitry of a machine or electrical system so that if they are used, the circuit becomes disconnected and cuts off electrical power to the machine. This makes it physically impossible for the machine to be used until the switch is reset and the system undergoes restart procedures.

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### 12. EMERGENCY ALAM WITH INDICATE:



Alarm management refers to the effective design, implementation, operation, and maintenance of industrial manufacturing/process plant alarms. Alarm management is necessary in a process plant environment controlled by an operator using a control system, such as a DCS, or a Programmable Logic Controller (PLC). Alarms are triggered when the process value deviates from normal operating conditions.

### 13. Uninterruptible power supply (UPS):



An uninterruptible power supply or uninterruptible power source (UPS) is an electrical apparatus that provides emergency power to a load when the input power source or mains power fails. A UPS differs from an auxiliary or emergency power system or standby generator in that it will provide near-instantaneous protection from input power interruptions, by supplying energy stored in batteries, super capacitors. The on-battery run-time of most uninterruptible power sources is relatively short (only a few minutes) but sufficient to start a standby power source or properly shut down the protected equipment. It is a type of continual power system.

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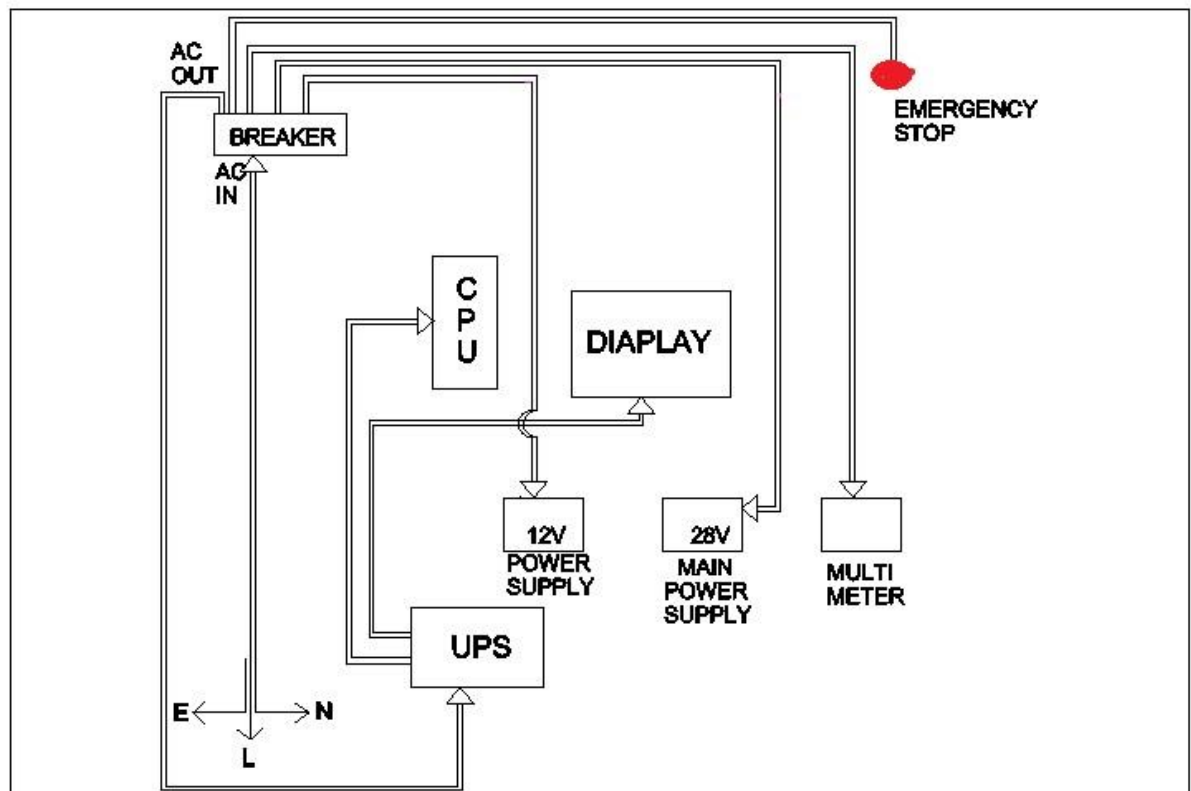
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### 14. PRINTER:



In computing, a printer is a peripheral machine which makes a persistent representation of graphics or text, usually on paper. While most output is human-readable, bar code printers are an example of an expanded use for printers. The different types of printers include 3D printer, inkjet printer, laser printer, thermal printer, etc.

### DVOR MAIN WIRE DIAGRAM:



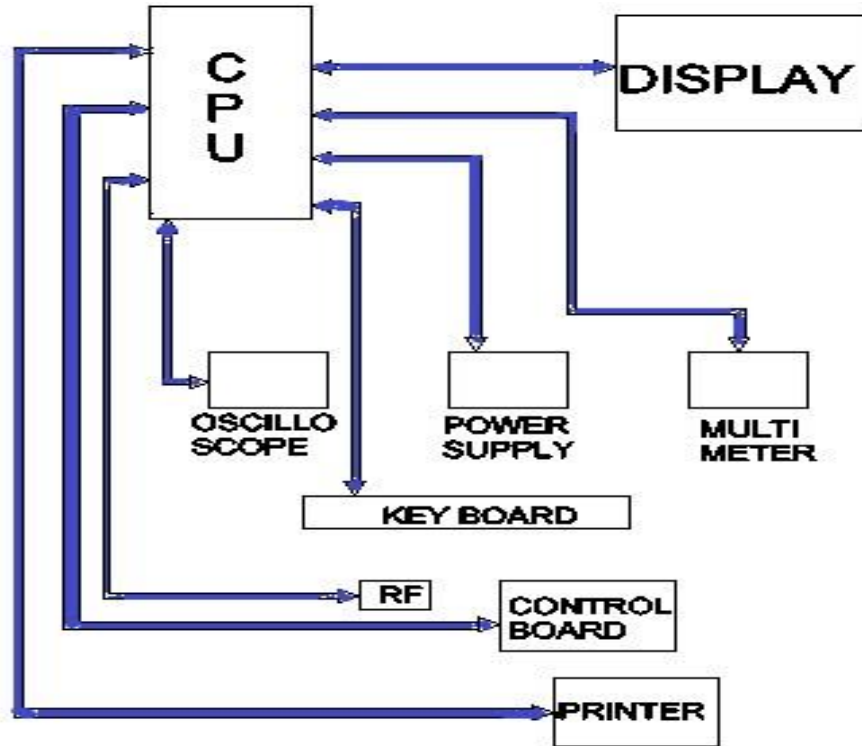
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DVOR UPS INTERFACE WIRE DIAGRAM:



LIST OF CABLES AND PART NUMBER:



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<b>Sl.NO</b>	<b>Item Description</b>	<b>Make</b>	<b>Part No</b>
1	PANEL	RETTAL	SE5834.6840
2	MULTIMETER	BK PRECISION	5491B
3	RF GENERATOR	SIGNAL HOUND	Mode VSG60A
4	REPORT GENRATION PRINTER	CANON	F166400
5	CPU I5 PROCESSOR, 8GB RAM, 512GB HD	MOOTEK	MOOTEKi5
6	TFT 15' TOUCH DISPLAY	AVZA TECH	AZ15M
7	INDUSTRIAL KEYBOARD &MOUSE	AVZA TECH	AZ45K
8	PANEL MOUNT AC VOLT,AMP METER	SELEC	MFM383A
9	POWER SUPPLY	MEAN WELL	12V
10	PROGRAMMABLE POWER SUPPLY	GW INSTEK	PSW 30-36
11	CONTROLLER BOARD	VERSATRON SOLUTIONS	VRS/CB/056