INSTRUCTION and OPERATIONS MANUAL

For

Track Signal Sniffer

MODEL NUMBER 17050-00

CAUTION

All operators are expected to read and become thoroughly familiar with the entire contents of this manual before attempting to operate the Track Signal Sniffer.

DOCUMENT NO. 17050-99 Rev. A

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1. GENERAL DESCRIPTION

The Track Signal Sniffer measures AC signals applied to a section of track and displays the code rate, duty cycle, and RMS current for a given carrier frequency. The Track Signal Sniffer has the ability to read single carrier frequencies, Cab Signal 4 and Cab Signal 9 signals, as well as track audio frequencies up to 10 KHz.

The Track Signal Sniffer is based on a DSP, and uses digital filters to select the desired frequency. The Track Signal Sniffer then calculates the code rate, duty cycle, and RMS current.

2. EQUIPMENT DESCRIPTION

2.1 Track Signal Sniffer

2.1.1 Controls

The Track Signal Sniffer has five software configurable buttons (F1 – F5). The buttons function is displayed on the screen above the button, and is lighted if the button is active.

2.1.2 Display

The Track Signal Sniffer's display consists of a 40 character by 2 lines. Transflective Back Lit LCD. The LCD displays the measurements, the selection menus, and the button functions.

2.1.3 Input

The Track Signal Sniffer's input is connected to either the supplied current probe or the optional Track Shunt. The output from either is scaled to 10mV/A, and is connected to the unit though shielded banana jack. The maximum input is 100 mV.

2.1.4 Battery Indication

Battery status is indicated by the LED located next to the DC Input jack. There is 3 states green means the battery is charged, amber means the battery is getting low, and red means the battery is about to die.

2.2 Battery Charger/Power Adapter

2.2.1 120 VAC Charger

The Track Signal Sniffer is supplied with a 120 VAC Charger/Power Supply

2.2.2 12 VDC Charger

The Track Signal Sniffer can be charged from 12 VDC car adaptor.

2.3 Current Pickup Device

2.3.1 Flexible Inductive Current Probe

AEMC Current Probe, UTE Part Number 16837-00

2.3.2 Hard Shunt Current Probe

UTE Shunt Current Probe, UTE Part Number 17102-00

3. SETUP AND OPERATION

3.1 Basic Setup

1) Turn on Track Signal Sniffer
2) Connect current Probe (or Shunt) to Unit
3) Turn on the Current Probe by placing the slide switch in the 10mV/A position.
   CAUTION! The switch must be in the 10mV/A position for the Track Signal Sniffer to work correctly!
4) Install loop or shunt to rail
5) Select mode and frequency of interest to make measurements

3.2 Basic Mode (Cab Signal 4)

3.2.1 Selecting Different Frequency

1) Press *F1* to enter the Carrier Frequency 1 Menu
2) Press *F4* to enter the Frequency Selection Menu
3) Use *F1* and *F5* to scroll though the Frequency List
4) Use *F2* though *F4* to select the frequency
5) Press *F5* to return to the Main Screen

3.2.2 Editing a Frequency

1) Press *F1* to enter the Carrier Frequency 1 Menu
2) Press *F2* to enter the Frequency Edit Menu
3) Use *F1* to *F4* to increase the frequency digit, the digit will scroll from 0 through 9, then repeat.
4) Press *F5* once the desired frequency has been entered
5) Press *F5* to return to the Main Screen

3.2.3 Selecting Code Rate Display

1) Press *F3* to change the units being displayed
   a. PPM (Default)
   b. MPH (Must have a speed list)
   c. Hz

3.3 Cab Signal 9 Mode

Entering Cab Signal 9 Mode

1) Press *F2* to enter the Carrier Frequency 2 Menu
2) Press *F4* to enter the Frequency Selection Menu
3) Use *F1* and *F5* to scroll though the Frequency List
4) Use *F2* though *F4* to select the frequency
5) Press *F5* to return to the Main Screen

3.3.1 Editing a Frequency

1) Press *F2* to enter the Carrier Frequency 2 Menu
2) Press *F2* to enter the Frequency Edit Menu
6) Use *F1* to *F4* to increase the frequency digit, the digit will scroll from 0 through 9, then repeat.
3) Press *F5* once the desired frequency has been entered
4) Press *F5* to return to the Main Screen

3.3.2 Selecting Current Display

Press *F5* to change the displayed current from frequency 1 to frequency 2. Code Rate and Duty Cycle are based on Frequency 1.

3.4 Display Nomenclature

3.4.1 Carrier Frequencies

(100) Indicates that the frequency is set to 100Hz, but no carrier frequency is detected.
100   Indicates that the detected frequency is 100 Hz
>100< Indicates that the detected frequency is 100 Hz and is selected for Amps display (in CS9 Mode)

3.4.2 Rate (Code Rate)

30PPM   30 Pulses Per Minute code rate
15MPH   15 Miles Per Hour (must have speeds list)
0.5 Hz   Means 0.5 Hz code rate

4. TRACK SIGNAL SNIFFER HOST SOFTWARE

The TSS Host software is used to manage and customize the Track Signal Sniffer. The system utilizes a text file to customize the unit. The standard or default carrier frequency can be established, a list of all of the carrier/track frequencies of interest can be created and stored, and the default cab signal mode (4 aspect or 9 aspect) can be established. This information can then be downloaded to the unit. The frequency list is then available to scroll through and select the desired track frequency to be measured.

4.1 Connecting to Track Signal Sniffer
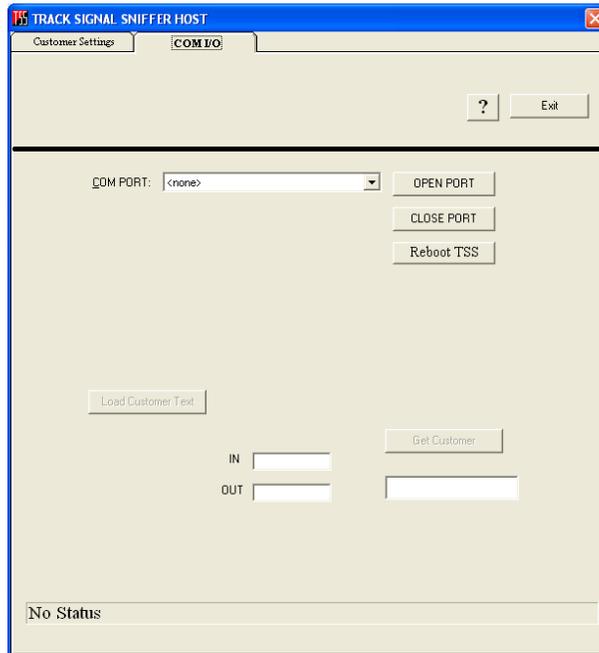
4.1.1 Physical Connection

To establish communications with the unit, connect a standard 9 pin serial cable between your computer and the serial port on the front panel of the unit. Select the communications port you wish to use to connect to the Track Signal Sniffer, then click "OPEN PORT".

To download the customer text file from the unit to your computer, click the "Get Customer" button, then save the file. To upload a customer text file to the unit from the pc, click the "Load Customer Text" button, then select the file you wish to load to the unit.

4.2 Customer Settings

The customer settings page provides a means to customize the Track Signal Sniffer. To open a customer text file, click on the "Read Cust. File" button and select the customer text file you wish to view or edit. The boxes labeled Basic Frequency and CS9 Frequency determine the default frequencies to be measured by the unit. Typically a 100 Hz carrier frequency is used for 4 aspect cab signaling. The CS9 entry determines the 2nd carrier frequency utilized for nine aspect cab signaling, typically 250 Hz. Note that if a value is entered for CS9 frequency is entered, the default mode of operation becomes 9 aspect cab signal. If no value is entered, the default is 4 aspect cab signal.

4.2.1 Basic Frequency

Set this for the frequency that will be used by default by the system, this is also referred to as CS4 frequency.

4.2.2 CS9 Frequency

An entry in the CS9 mode will cause 9 aspect cab signaling to become the default mode. If CS9 mode is not used this should be left blank.

4.2.3 Frequency List

This is a list of frequencies that the user can select from the screen on the Track Signal Sniffer.

4.2.4 Display Frequency Window

This is a value used to limit the bandwidth of frequency detection. For example, if the value entered in this window is 25Hz, when measuring a 100Hz signal, only frequencies between 75Hz and 125Hz will be displayed. Any frequencies outside of this window are considered out of range and will not be displayed.

4.2.5 Code Rate/Speed Conversion

Enabling the Rate/Speed conversion allows the Track Signal Sniffer to convert code rates to speed equivalents for display on the window. Values may be entered for both 4 aspect and 9 aspect cab signals.

4.2.6 Rate Window %

The value entered in the rate window determines the percentage of tolerance from a selected code rate that can be displayed. For example, for a 180 code rate, if the rate window percentage is 10%, if the measured code rate is less than 162 or greater than 192, no code rate will be displayed.

4.2.7 CS4 Rate List

This table allows defining equivalent speeds for given code rates. Used for 4 aspect cab signals.

4.2.8 CS9 Rate List

This table allows defining equivalent speeds for given code rates. Used for 9 aspect cab signals, in conjunction with the CS4 table.

5. SPECIFICATIONS

5.1 Physical

Width 13.375 "
Depth 11.75"
Height 6"
Weight   20 lbs

5.2 Electrical

5.2.1 Power System

5.2.1.1   Power Adapter

Input Voltage   120 VAC 60Hz
Input Current   1 Amp
Output Voltage   12 to 15 VDC
Output Current   ~1.5 Amps

5.2.1.2   Track Signal Sniffer

Power Input Voltage   12 to 15 VDC
Power Input Current   ~1.5 Amps

5.2.2 Inputs

5.2.2.1   Voltage Range

0 to 100 mV AC RMS

5.2.2.2   Frequency Range

40 to 9999 Hz

5.3 Environmental

5.3.1 Storage Temperature

Storage Temperature Range: -20°C to 70°C

5.3.2 Operating Temperature

Operating Temperature Range: -20°C to 60°C