MANUAL

enGage® IV

DIGITAL INSTRUMENTATION

Read Instructions Carefully!

INDEX

1.0 Technical Specifications

1.1 Electrical ⚠

Power Requirements

Auto-ranging - 12V to 80V DC ± 25% (9V to 100V DC).

Operating Current

Total system current entering the V+ pin is a function of system voltage, LED alert/warning icons, backlight, LCD heater and sender loads. The table below illustrates the typical and maximum operating current for a panel with a V+ voltage of 12V with the sender inputs left as open circuit. The LCD heater circuitry is PWM based and typically consumes an average of 310mA when active. The backlight circuit typically consumes 30mA. For higher V+ voltages the operating current is reduced accordingly.

enGage®IV Operating Current (mA)

	Without Backlight		With Backlight		With LCD Heater on	
V+	Typ.	Max	Typ.	Max	Typ.	Max
12.0	30	40	60	70	370	380

Operating currents for V+ of 24, 36, 48, 60, 72 and 80 VDC are lower than this listing.

1.2 Mechanical

Size and Weight

Item	Enclosed Unit (T)	PCB & LCD Module Only (P)
Bezel H x W	120 x 180 mm	N / A
Case H x W	91.8 mm x 137.8 mm	82.6 mm x 128.5 mm
Depth	53.5 mm	38.8 mm
Weight	400 g max	200 g max

Display

Dot Matrix LCD (128 x 240 pixels), 40.9mm x 81.6mm Viewing Area, Backlit.

Hour Meter Range & Resolution

Hour Meter: 99,999.9 Total Hours, 0.1 hours resolution.
Maintenance Monitor: 999 Total Hours (countdown), 1 hour resolution.

Panel Cutout

92 (+0.8/–0.0) mm x 138 (+1.0/–0.0) mm

1.3 Environmental

Operating Temperature Range:	–40°C to +70°C
Storage Temperature Range:	–50°C to +90°C as per SAE J1455, section 4.1.1.5.
Thermal Cycling (Applicable To Enclosed Units Only):	As per SAE J1455 section 4.1.3.1. to +80°C
Thermal Shock (Applicable To Enclosed Units Only):	As per SAE J1455 section 4.1.3.2. to +80°C
Humidity (Applicable To Enclosed Units Only):	95% RH (non-condensing) at +38°C as per SAE J1455, section 4.2.3.
Shock (Applicable To Enclosed Units Only):	SAE J 1378 March 83. Amplitude 44–55g, half sine, 9–13 ms duration.
Vibration (Applicable To Enclosed Units Only):	SAE J 1378 March 83. Double amplitude of 1.53 mm with frequency sweep from 10-80-10 Hz (20 g max.) at intervals of 1 minute.
IP Ratings (Applicable To Enclosed Units Only):	Face sealed to IP65. Rear sealed to IP40.

2.0 Installation

2.1 Terminal Assignments—Main connector (J1) ⚠

Pin#	Function
1	Battery V+
2	Common
3	Sender1 input (R, V, I)
4	Sender2 input (R, V, I)
5	Sender3 input (R, V, I, Frequency*)
6	Sender4 input (R, V, I, Frequency**)
7	Switched Input 1
8	Switched Input 2
9	Switched Input 3
10	Switched Input 4
11	Switched Input 5
12	Switched Input 6
13	Keyswitch Input
14	MOSFET output 1***
15	MOSFET output 2***
16	MOSFET output 3***
17	Range Select V+ (BDI see table in Section 3.0)
18	Sender5 (Frequency**)
19	LCD Heater V+
20	Dimming Control

* Speedometer, Odometer.
** Tachometer.
*** Supplying inductive loads with out suppression diodes in place will damage FET drivers.

Note: Sender 1, 2, 3 and 4 inputs are limited to 60V max. Voltages beyond that, will damage the instrument. ⚠

2.1 Terminal Assignments—Communications Connector (J2) ⚠

Pin#	Function
1	CAN H
2	CAN L
3	GND
4	n/c
5	CAN Terminator 1
6	CAN Terminator 2
7	n/c
8	n/c
9	SCI Rx
10	GND
11	SCI Tx
12	+7V Out (<10mA – unregulated)

2.2 Mounting

Enclosed unit snaps into panel cutout using molded-in fingers. An optional mounting bracket (Curtis P/N 17644307) can be used for additionsal support. Module units are attached via screw holes in the four corners of the PCB.

2.3 Main Connector

20-pin AMP Mini Universal Mate-N-Lok. (Mating connector: AMP part number 770585-1).

2.4 Communications Connector

12-pin AMP Mini Universal Mate-N-Lok. (Mating connector: AMP part number 770581-1).

2.5 User Interface

Curtis enGage® IV series instruments include 3 front panel buttons for navigating through a menu system and programming the following specific functions:

- Time Of Day Clock
- Battery Discharge Indicator
- Maintenance Intervals
- Settable Hour Meters
- Units - Metric / English Conversion

2.6 Configuring Your Panel

In order to configure an enGage® IV panel, main power must be applied (12–80VDC) to V+ and V– and the keyswitch must be active. Following a power up sequence, the OEM logo (if applicable) will be displayed. Once the start-up process is complete, the specified default (normal) instrumentation screen will appear.

2.6.1 enGage® IV Menu System

The menu system is activated by pressing and holding the select ▷ button for 3 seconds and then releasing when main menu appears.

2.6.2 Choosing Items Within Menu System

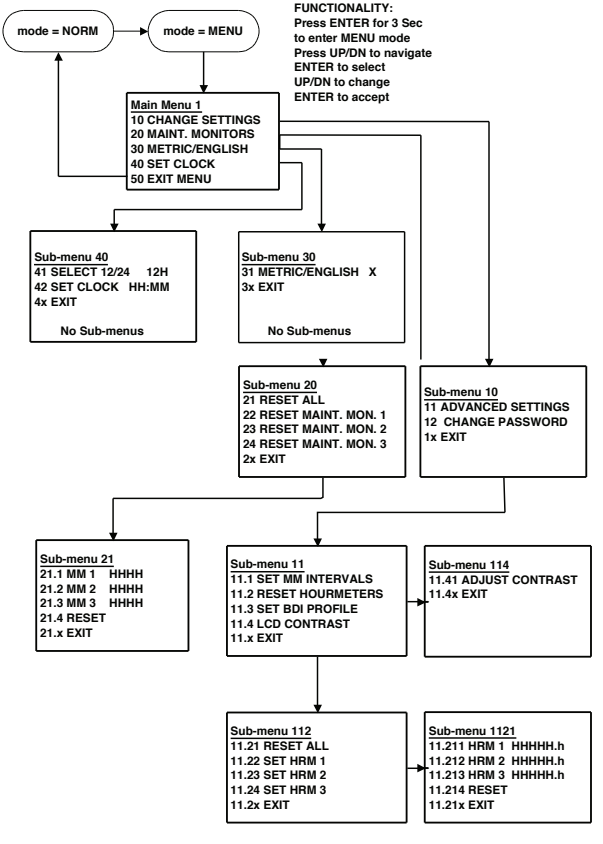
Items are selected within each menu utilizing the up / down arrows △▽ on right side of panel. Once the desired item is chosen / outlined, press the select button once and release. You will then see a new set of choices for the previously selected item.

Depending on your configuration, some of the menu entries may not be available.

2.6.3 enGage®IV Menu System Navigation

The diagram below illustrates the navigation through the menu system.

enGage®IV Menu System



NOTES: 1. ALL MENUS EXIT TO THEIR PARENT MENU
2. KEYSWITCH OFF/ON EXITS THE MENU

2.6.4 Changing Parameters Within Menu System

2.6.4.1 Maintenance Monitor

Starting from the main menu, choose **"Maint Monitors"** then **"Reset All."**

Return to the main menu by utilizing the up / down arrows on panel and select **"Exit."**

2.6.4.2 Metric / English

Starting from the main menu, choose **"Metric / English"** then **"Metric / English"** again. Once the left button is pressed to select this choice, a box will appear around the E / M portion of the item. Utilizing the up / down arrows on the right side of panel, enter E or M. Once the desired choice is made, press the select button on the left side of the panel to accept the selection.

Return to the main menu by utilizing the up / down arrows on panel and select **"Exit."**

2.6.4.3 Set Clock

Starting from the main menu, choose **"Set Clock"** then **"Set Clock"** again. Once the left button is pressed to select this choice, a set of "up arrows" will appear under the hour digits on left portion of the item. Utilizing the up / down arrows on the right side of panel, enter the desired time in hours. Then press left button on front panel to accept the data. The "up arrows" will then move to the minutes portion of the time. Utilizing the up / down arrows on the right side of panel, enter the desired time in minutes. Once the desired choice is made, press the select button on the left side of the panel to accept the data.

Return to the main menu by utilizing the up / down arrows on panel and selecting **"Exit."**

2.6.4.4 Advanced Settings

2.6.4.4.1 Reset Hour Meter

Starting from the main menu, choose **"Advanced Settings"** then, choose **"Set Hour Meters."** From the next menu listing choose **"Reset All."** Return to the main menu by utilizing the up / down arrows on panel and select "**Exit**".

2.6.4.4.2 Set LCD Contrast

Starting from the main menu, choose "**Advanced Settings**" then, choose "**LCD Contrast**". Choose "**Adjust Contrast**" and press Enter to select (star appears). Press Up/Down to change the contrast, press Enter to accept.

2.6.4.5 Exiting Menu Mode

This can be accomplished by selecting the **"Exit"** menu choice.

3.0 Operation

Buttons are utilized for menu navigation as described earlier.

3.1 Auto-range (BDI)

Curtis enGage® IV has an operating voltage range for V+ from 12 to 80 VDC +/–25%. The source to which pin J1–17 is connected will configure the instrument for the correct Battery Discharge Indicator system voltage. Refer to table below for J1–17 connection depending on voltage range desired.

Pin J1-17 Connection Guide ⚠

System Voltage	J1-17Connection
12	No Connection
24	V+
36	V-
48	No Connection
60	V+
72	V-
80	No Connection

When configured to display other instruments (not BDI), terminal J1–17 is unused. Note that for all analog sender inputs (J1–3, J1–4, J1–5, J1–6), the sender range is factory configured.

3.2 TRIP Odometer reset:

When available – To reset the Trip Odometer, press the Down button while the instruments display.

3.3 Backlight adjustment:

To control the backlight brightness, connect a 50K Ohm potentiometer to ground at J1–20.

4.0 Trouble-shooting

General

Problem	Possible Cause
No Display	V+ (keyswitch) voltage not present at J1–13. Battery voltage too low. Battery terminals not connected.
Display Too Dark/Light	LCD Contrast not adjusted. See section 2.6.4.4.2.

BDI Function

Problem	Possible Cause
No Display	Terminals Not Connected. Improper Voltage – Check Pin J1–17
Stays At FULL	Instrument voltage range selected does not match battery voltage. Range Select V+ connected to wrong terminal.
Will Not Reset	Instrument voltage does not match battery voltage. Battery not fully charged. Battery may be defective.
Resets Without Charging Battery	Not connected directly to battery terminals.

Trouble-shooting continued

Empty Too Soon	Range Select V+ connected to wrong terminal. Instrument voltage does not match battery voltage. Terminals not connected directly to battery.

Sender Function

Problem	**Possible Cause**
No Display	Terminals not connected. Improper voltage.
Stays At Maximum/Minimum	Sender or Sender Connection Problems. Sender connected to wrong terminal. Incorrect sender used.

Maintenance Function

Problem	**Possible Cause**
Will Not Reset	Procedure as described in Section 2.6 not being followed.

5.0 Maintenance

The enGage® IV 3210 series is not serviceable.

CAUTION ⚠

The protection provided by enGage®IV may be impaired if the device is used in a manner not specified by Curtis Instruments, Inc.

6.0 Safety

- This instrument was manufactured and tested according to the applicable technical standards. It complies with all the safety regulations as shipped from the factory.
- Installation and startup must be performed by skilled personnel.
- Failure to install and operate the unit in accordance with these instructions may result in damage or injury.
- If safe operation of the instrument can no longer be ensured, stop and secure it against accidental operation.
- If instrument failure or malfunction may cause personal injury or material damage, use additional safety measures such as limit switches, guards, etc.
- Read Operating Instructions carefully before startup.
- Note the safety instructions marked with this warning symbol in this manual.

7.0 Warranty

Two year limited warranty from time of delivery.

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