WA-MA-3

CI-Log System Installation and Operations Manual

Issue: F   Date: 07-Jun-2011

This document is based on experience gained to date with installations of the CI-Log engine monitor and logger system.   The CI-Log system is a non-certificated engine monitoring system.   Control and safe operation of engines is the responsibility of the installer and operator of non-certificated aircraft and they must consider all system and operational issues. No claim is made regarding the airworthiness or otherwise of installations based on suggestions contained herein.   Wilksch Airmotive Ltd offers these suggestions without prejudice and cannot be held liable for non-certificated products.

In future these suggestions may be modified in the light of further experience.

Any relevant experiences and observations can be reported directly to WAM.

Application:

Issues B and above of this document apply to installation of the CI-Log system with WAM engines using piezo-resistive type sensors for oil and fuel pressure.   These sensors have a removable three-pin connector. Previous engines and CI-Log systems used sensors with two threaded posts for connections.

Operation of the CI-Log system is covered in a separate document.

This document may be subject to change without notice.

Introduction

The CI-Log system is designed to work with WAM CI engines (e.g. WAM-100, WAM-120, and WAM-160) and provides a display of engine parameters and logging to memory.

The system consists of an Interface Unit (IU) which is mounted close to the engine and a Cockpit Module (CM) that provides the display and data download functions. These two units communicate via a serial link.

System Components

The CI-Log system as shipped consists of the following items:

Part No.	Description	Qty.
001765	CI-Log Cockpit Module Assy	1
	M4 x 15 screws, slotted pan head, black finish	4
	11 way plug	1
001647	Multi Media Data Card, formatted by WAM	1
	CI - Log Interface Unit Assembly	1
	17 way plug and back-shell	1
	Hose for manifold pressure connection	2m

Note: MMC cards must be pre-formatted by WAM.

Installation

Power Supply

You will need to provide both CI-Log modules (CM & IU) with electrical power at between 7 and 30 volts from the aircraft main bus via a 1-2 amp circuit breaker. They do not require a switch and can power-up when aircraft master power is turned on. You will also need to provide them with a good ground.

Interface unit (IU)

The IU should be mounted on the aircraft structure near the engine in a location that avoids unnecessary vibration and temperature.   The IU temperature should not be allowed to exceed 75°C during operation or a hot soak (after shutdown).   The IU temperature is a logged parameter and can be checked after data download. Mounting on the engine side of the firewall is normally an acceptable position.

WAM engines are supplied with a wiring loom that includes all of the connections to the on-engine transducers. The loom has numbered sleeves that correspond to the pin numbers on the IU. The IU end of the loom may be reduced in length to suit the installation; taking care not to lose the numbered sleeves. Spare heatshrink, and a backshell for the IU plug, are provided to complete a neat installation. The connecting of the loom to the engine is discussed in the Installation Guidelines Manual WA-MA-1.

| IU Pin No	Function	Wire Colour Using Wilksch Loom	Comments
1	Power In	Not supplied	+7 to +30 volts
2	Ground	Black	3 wires. Unit case is also grounded
3	5V out	Pink	2 wires
4	Serial IN	Not supplied	To CM pin 6
5	Serial OUT	Not supplied	To CM pin 5
6	Engine Speed	Grey	
7	Glow on	Green	
8	not used	Yellow	Wire no longer used. Leave unconnected
9	Low Coolant	Blue	Volts-low = warning. See Note 2
10	Starter Engaged	Red	
11	not used		
12	Oil Temperature	Violet	
13	Coolant Temp	Pink	
14	Air Chest Temp	Yellow/Green	
15	Temp common return	Black	3 wires
16	Fuel pressure	White	
17	Oil pressure	Violet	

NOTE   1) There will be three wires left over on the loom. Nos. 31,32 and 33. These are for airframe items and their connection is described in the Installation Guidelines Manual WA-MA-1.

2) A low coolant warning system that is compatible with the CI-Log system is available from Wilksch Airmotive WAM PN 001777. Details of this are provided in the Installation Guidelines Manual WA-MA-1 or contact sales dept.
If no coolant warning is to be connected to the CI-Log system you will need to fit a jumper wire between pins 1 and 9 to turn off the warning display on the CM and **do not** connect the blue wire.
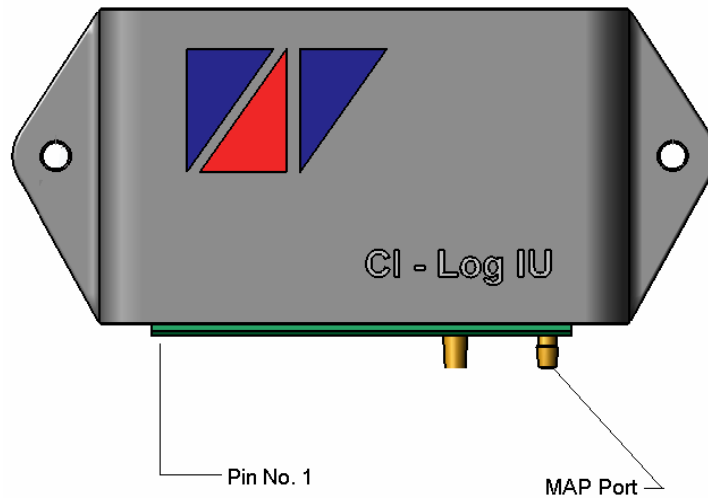
Ensure during installation and operation that the brass filter located on the CI-Log IU is kept clean and clear at all times. Especially beware of spilling fluids onto it, or painting it. It is therefore recommended to mount the IU as shown above to avoid ingress.

Fit hose here for Manifold pressure to IU MAP Port
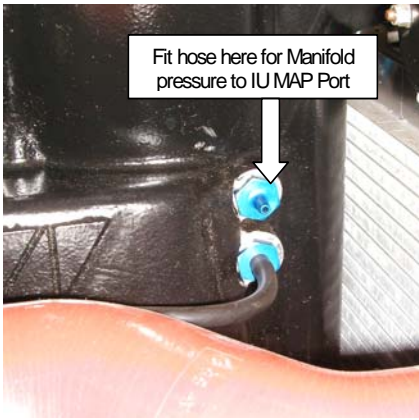
A length of small-bore rubber hose is supplied with the logger kit. Connect between the pressure tapping point on the air chest and the MAP Port on the IU and trim to length. The hose has been provided at a suitable length to cater for most installations. If a longer hose is required then please contact the sales team with your requirements. Secure hose ends with a cable tie.

Cockpit module (CM)

The CM can be mounted flush from behind the instrument panel using the M4 screws provided. A drawing is appended to this document giving the panel cutout dimensions. In some installations it can be mounted on front of a panel or other suitable structure using M3 screws (not provided) passing all the way through the four mounting holes. The multi-pin plug at the back of the CM can be repositioned 90 degrees to allow for these different installation options (this option if desired must be specified on ordering).

The CM temperature should not be allowed to exceed 55°C during operation or storage. The CM temperature is a logged parameter and can be checked after data download.

The CM only requires power, ground and serial connections to the IU. This wiring is not provided due to the unknown distance and routing between IU and CM. 22swg or thicker wiring of good quality is recommended for this purpose.

Pin	Function	Comments
1	Power in	+7 to +30 volts
2	Ground	Unit case is also grounded
3	5V out	Limited to 500mAmp
4	External Warning	Switches to ground
5	Serial-A IN	To IU pin No. 5
6	Serial-A OUT	To IU pin No. 4
7-11	not used	

Pin No. 1

MM Card
Present for data
down-load only
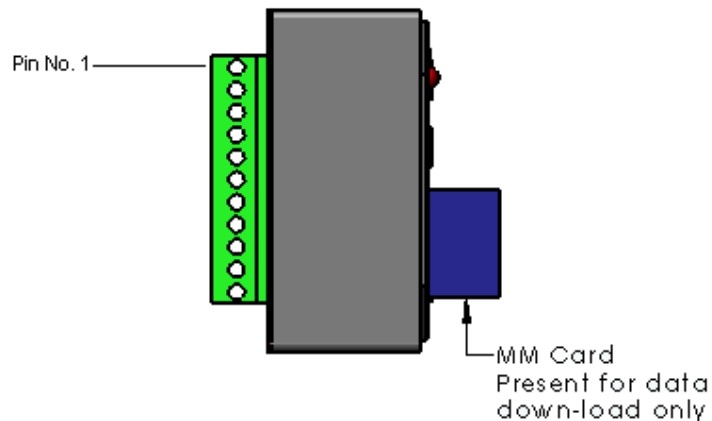
The External warning pin can be used to switch on a warning light in addition to the LED included in the CM (it duplicates the function). This pin is switched to ground when a

warning occurs. Any lamp LED or warning device can be used provided it draws less than 0.5amp.

Pin 3 provides 5V as a convenience to power external PDA based instruments if required. 0.5 amp Max

Commissioning and Operation

On power-up

The red LED will light. There will then be a short delay before the introduction screen will briefly show:

- the CM software version number Vx.x
- Connected to IU Number yy
- IU Run Number   zz

If yy and zz are "none", then the CM is not receiving serial data from the IU and the serial link wiring and IU power wiring should be checked. In this case the engine parameter screen will show blank "bars" and "dials".
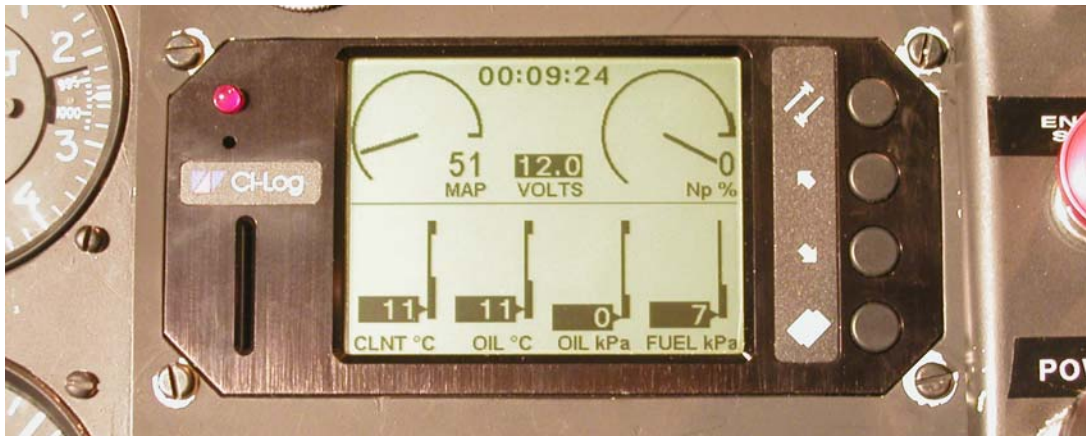
 After the CM jumps to the Engine Display screen, it should show all six analogue/digital parameters (4 bars and 2 dials) and voltage in digits as well as any warning flags e.g. Low Volts. Latest Version also has a stopwatch at the top of the screen. (See Above)

- MAP should read approximately 50 at ambient sea level pressure. Apply pressure (< 1.0 bar) via the small rubber hose and check that the MAP scale responds.

Check that the temperature indications are giving sensible readings in relation to the outside air temperature of the day. Remove each of the three temperature transducer connectors in turn (AMP mini-timer connectors on blue transducer plugs) and check that the CLNT and OIL temperature readings respond.   A disconnected transducer should result in a reading of 200°C. Note that the Air Chest temperature is recorded by the CM but not displayed. Note also that a short circuited or open circuited sensor is assumed by the system to have failed and appropriate action is taken

Temperature Transducer Locations:

T channel	Position on engine
CLNT	Engine block, starter motor side, horizontal probe
OIL	Engine block, turbocharger side
Air Chest	Engine block/air chest, starter motor side, vertical probe

Pictures of the location of these sensors are available from the Loom Installation Appendix to the WA-MA-1 Installation Guidelines Manual.

- Check that low coolant warning appears when low coolant warning device is activated. If using the Low Coolant Warning kit WAM P/N 001777, then the system will activate by disconnecting the plug from the coolant bottle. There is a delay of about 30 secs before the warning will activate, to prevent nuisance warnings during aircraft manoeuvres etc.

LED Warning light.

The LED warning light will come on steady during initial power up and should then extinguish. However if any warning is triggered this light will flash to alert your attention to the screen. Any indication that is exceeding its limits will be highlighted by a bold background. The flashing LED warning can be cancelled by pressing any button.

Keys and their function

TAB key – This is used to bring up and move the cursor between entry fields on the Administration Page.

UP and **DOWN** arrow keys – are used in the engine display page to turn on/increase/decrease/turn off the backlighting for night use. In the Administrations Page they increase or decrease the value of the field highlighted by the cursor.

PAGE key – This is used to toggle between the Engine Display and Administration Page. Also used as the "Accept" key during data download.

Backlighting function

When in the Engine Display or Administration screen, press the up arrow key to turn on/ increase and down arrow to decrease/ turn off the backlighting.

Stopwatch function

Available on the latest version of CI-Log is a stopwatch placed at the top of the screen. It starts counting as soon as the logger is turned on. You can reset it to zero by pressing the TAB key. You could use this for run time, brakes off/brakes or airborne time and is also useful for timing your 5min full power rating.

Administration Page:

Holding down the PAGE button should jump the display to the "Admin Page".
Hold down the PAGE button again to return to the Parameters page.

To set date and time

Hold down the page button until the admin page appears. Here the time and date can be set using the TAB and UP/DOWN buttons. Press the TAB key to bring up the cursor. Adjust the highlighted field using the UP and DOWN arrow keys. Press TAB to cycle to the next field. When complete press the TAB key until the cursor disappears.

On first engine cranking / run

Please ensure that the engine installation is complete and has been checked by a competent person before attempting to crank/start the engine for the first time. Always take suitable safety precautions. Check:

- Glow indication shows and extinguishes when key/ button is released
- Starter engaged indication shows and extinguishes when key/ button is released
- Oil pressure increases with engine speed
- Engine speed reads as expected, typically 5-10% during cranking and 30-40% at idle
- Fuel pressure reads a steady pressure of around 100kPa
- Coolant temp is increasing.
- Oil Temp is increasing.
- MAP and Np respond to power control setting.

How to download the data

From the engine display screen, press and hold the PAGE button to get onto the CI-Log Administrations Page. At the bottom of the screen is displayed the memory capacity and below that it says "External card not found"

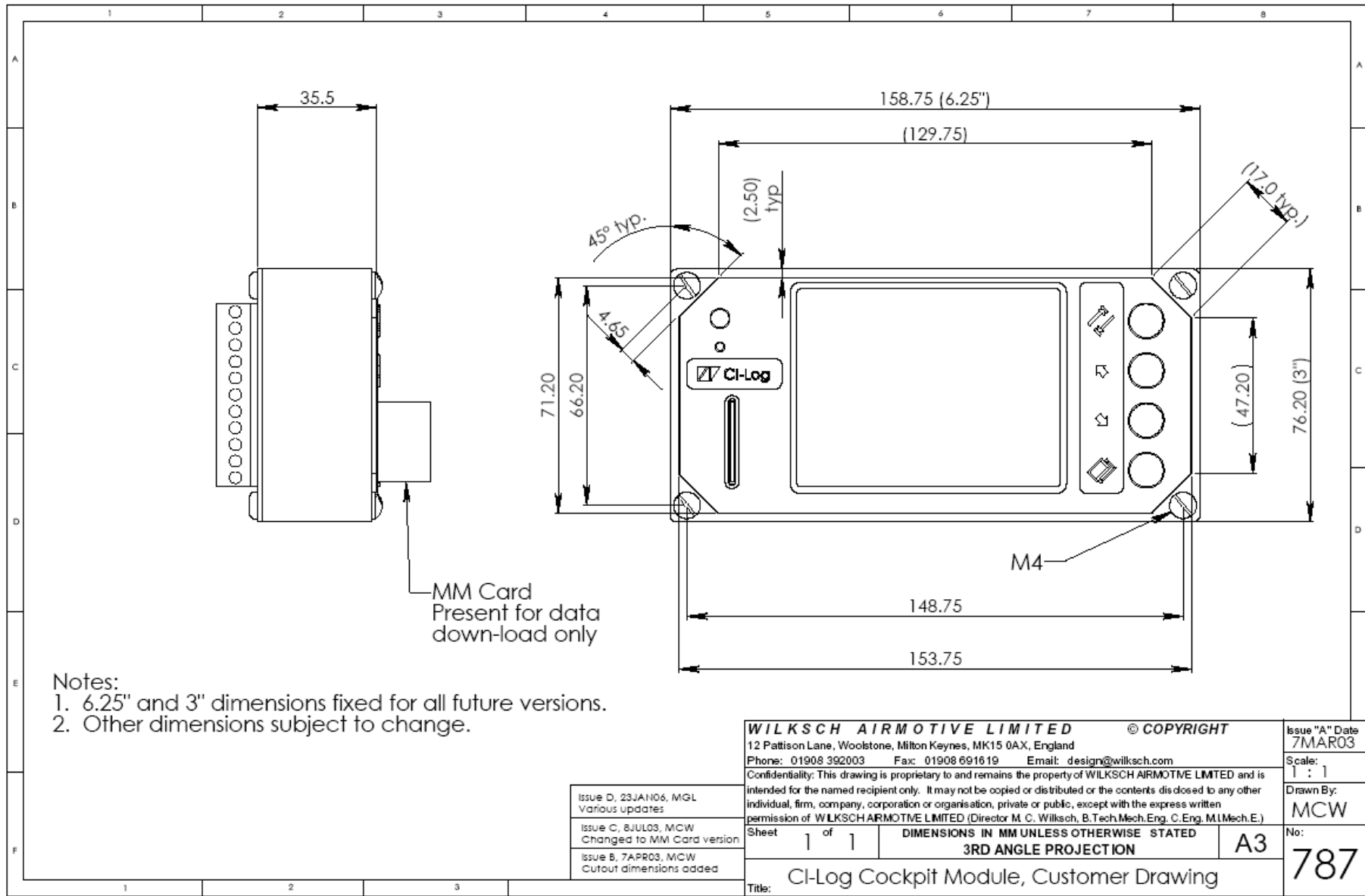Insert your MMC card with the adhesive label facing to the left and with the cut corner in to the CM slot.
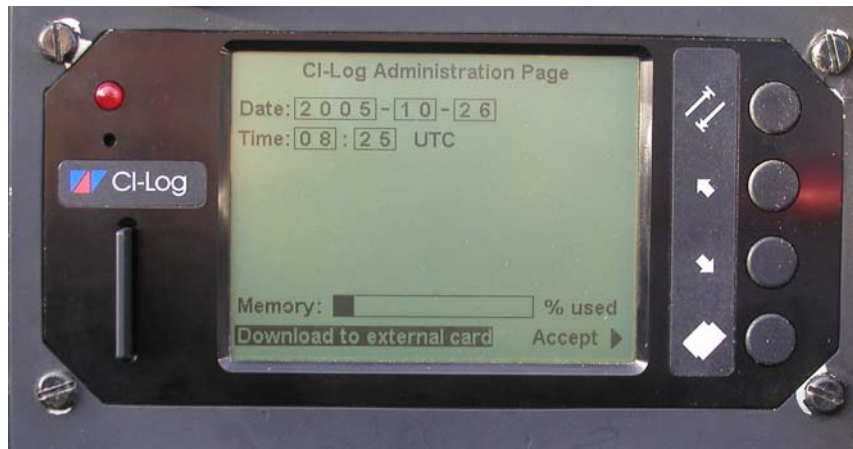
At the bottom of the screen it should now say "Download to external card". Use the TAB key to move the highlighted field through the date and time options till "Download to external card" is highlighted. Accept will then appear with a prompt arrow pointing to the PAGE button. If this doesn't happen, ensure that you are inserting the card correctly and that the MMC terminal strips are clean and undamaged. If this still doesn't work then contact WAM.

Press the PAGE button. It will then display "Copying…" at the bottom of the page. Dependent upon how much memory has been used, it may take some time for all the data to transfer. The memory used bar will reduce as the data is copied. The display will change to say "DOWNLOAD Complete" when finished, you may then remove the MMC. Hold PAGE to return to the engine screen.

This data should then be sent to WAM for evaluation. You can post the card to us or, using a normal card reader the file can then be e-mailed or transferred onto a disk. It requires a special decoding programme, which will be available to customers in due course.

NOTE – When you insert the data card for download it will overwrite any data that is on that card. Therefore please ensure that any data on the card has already been copied to Wilksch to avoid losing information and engine warranty issues. If you experience problems with the data download then please contact Wilksch before proceeding.

35.5

158.75 (6.25")

(129.75)

(2.50) typ.

45° typ.

(17.0 typ.)

4.65

CI-Log

71.20

66.20

(47.20)

76.20 [3"]

M4

148.75

153.75

MM Card
Present for data
down-load only

Notes:
1. 6.25" and 3" dimensions fixed for all future versions.
2. Other dimensions subject to change.

Issue "A" Date
7MAR03

Scale:
1 : 1

Drawn By:
MCW

Issue D, 23JAN06, MGL
Various updates

Issue C, 8JUL03, MCW
Changed to MM Card version

Issue B, 7APR03, MCW
Cutout dimensions added

| Sheet | | | DIMENSIONS IN MM UNLESS OTHERWISE STATED | | |
| 1 | of | 1 | 3RD ANGLE PROJECTION | A3 | No:
787 |

Title: CI-Log Cockpit Module, Customer Drawing