CP1000 Installation Manual

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Introduction

This manual provides general installation information for LOFA's CP1000. This manual's target audience is professional installers for Engine Distributors and OEMs of engine-driven machines. The engine manufacturer specific application information should be followed for any detailed or specific requirements. LOFA sales and technical support are available to discuss specialized requirements or custom applications.

Mechanical Mounting

The CP1000 control panel is adaptable to a wide variety of applications. The included engine harness connector facilitates quick installation. The following is list of installation guidelines:

1. Panel mount shall be
    a. Easily accessible by operator
    b. Away from moving equipment
    c. Stable during equipment operation and transportation
2. Vibration isolation mounts shall
    a. be properly installed,
    b. have normal movement, and
    c. panel must not hit adjacent structure during operation

WARNING!
Correct any problem before proceeding to the next step! Continued testing may damage the panel, harness or engine!

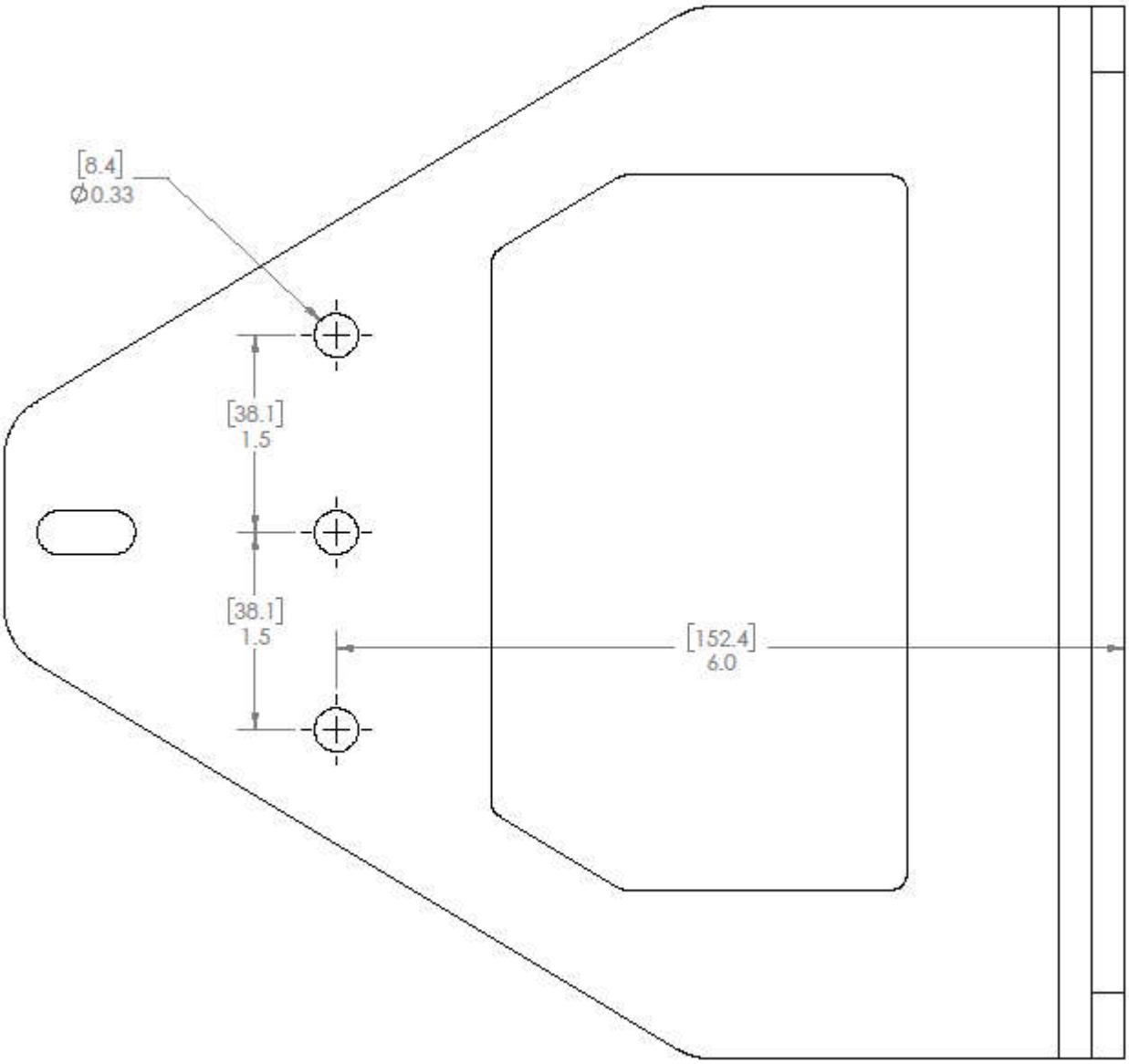
1. Turning key switch on initiates self-test, Check all connections and battery polarity on failure
2. Test to verify over current protection, Identify and correct wiring fault on failure
3. Verify fuel run/stop solenoid or ECM energizes
4. Fuel solenoid should be powered for 10 to 30 seconds when key turned on
    a. ECM should send CANbus data as soon as self-test completes
    b. Verify engine cranks when key is turned to start Check all connections on failure
5. If engine does not start, Check fuel/bleed fuel lines
6. Verify gauges and indicators with engine running
    a. See user manual for details
7. Test safety shutdowns
    a. See user manual for details
8. Run engine for extended time to identify temperature or connection problems

AluFlex™ Panels

AluFlex panel enclosures are constructed from extruded aluminum and powder-coated for durability. The faceplate is aluminum or powder-coated galvanized steel and the backplate is powder-coated galvanized steel. The enclosure is splash proof and includes condensation drain holes in the bottom. AluFlex panel isolation mounts are preinstalled to a heavy-duty mounting bracket with mounting holes to accommodate various installations. Isolator mounts should not be twisted when installed. Doing so will lead to premature failure.

Mounting Templates

The following two (2) pages have the one-to-one hole template for the CP1000 mounting bracket.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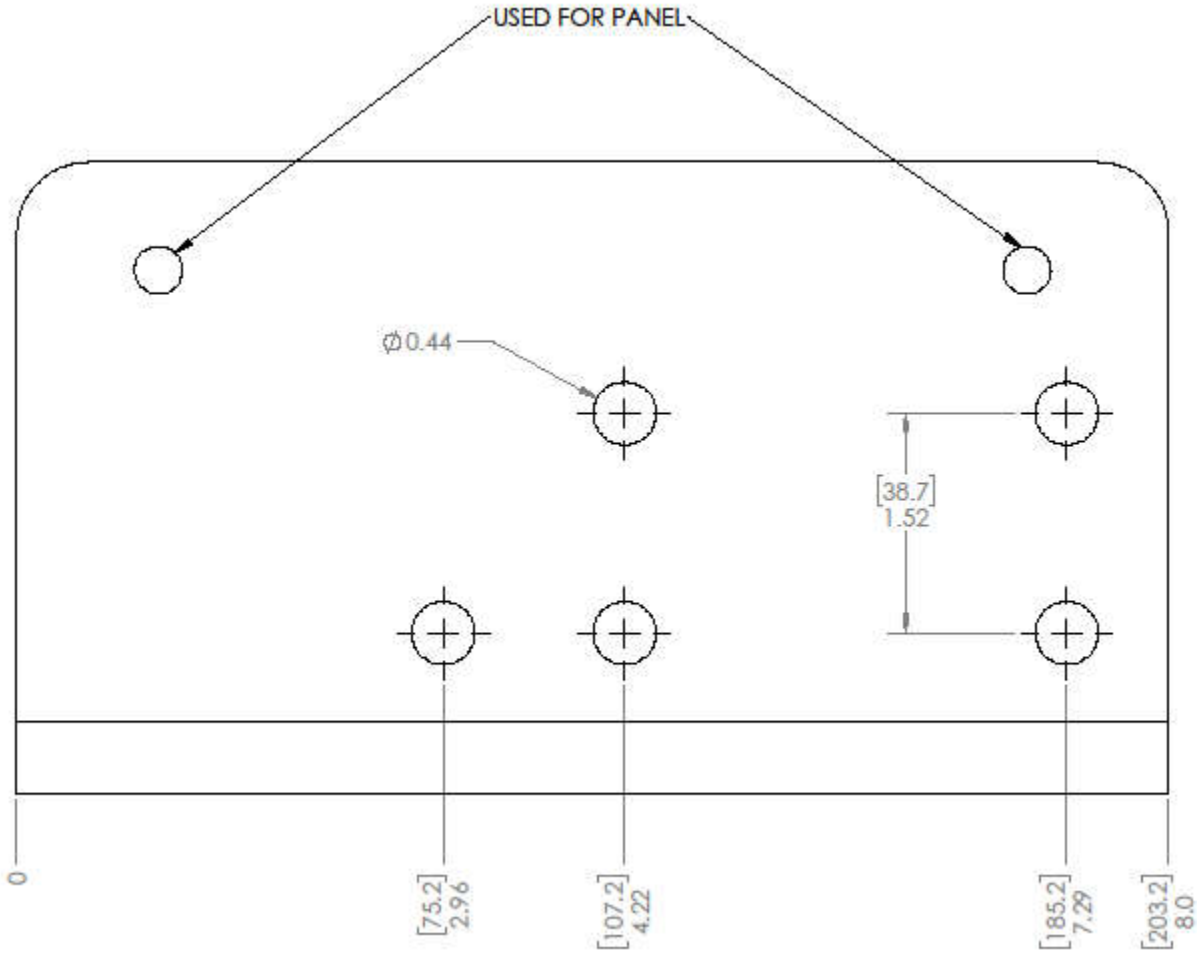
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Connector Pinouts

There are two connectors on the CP1000.

D21 to Engine pinout

This connector contains the typical connections required for electrically or mechanically governed engines. The following is the pinout:

Pin	Signal	Comment	Pin	Signal	Comment
A	Pre-Heat	1A @ System Voltage	M	Aux IN 2	Active Low
B	B+		N	Temp SW	Active Low, Normally Open
C	Sender return		P	Oil PSI sender	System Voltage 0—750 Ω
D	Starter	10A @ System Voltage	R	---	--
E	GND		S	Pulse2 Tach	System Voltage
F	CAN Shield		T	Oil PSI SW	Active Low, Normally Closed
G	ECU/Solenoid	10A @ System Voltage	U	CAN Low	
H	Temp Sender	System Voltage 0—750 Ω	V	CAN High	
J	Ignition	1A @ System Voltage	W	Aux IN 1	Active low
K	Pulse Tach	System Voltage	X	Fuel Level Sender	System Voltage 0—750 Ω
L	---	---	---	---	---

D31 IO pinout

This connector contains the CP1000's expanded IO. The following is the pinout:

Pin	Signal	Comment	Pin	Signal	Comment
1	Switched In 1	Active Low	17	Switched Out 5	1A @ System Voltage
2	Switched In 2	Active Low	18	Transducer Power 1	1A @ System Voltage
3	Switched In 3	Active Low	19	Transducer Power 2	1A @ System Voltage
4	Switched In 4	Active Low	20	**Pulse In 1**	
5	Switched In 5	Active Low	21	**Pulse Gnd**	
6	Switched In 6	Active Low	22	**Pulse In 2**	
7	Isolated Power In 1a	20A	23	E-Stop Input	Normally Grounded
8	Isolated Power In 1b		24	**4-20mA In**	
9	Isolated Power Out 1a	20A	25	**4-20mA In**	
10	Isolated Power Out 1b		26	**4-20mA In**	
11	Isolated Power Out 2	10A	27	**4-20mA In**	
12	Isolated Power In 2	10A	28	**4-20mA In**	
13	MODBus (+)		29	**4-20mA In**	
14	MODBus (-)		30	**Float 1**	Active Low
15	Switched Out 3	1A @ System Voltage	31	**Float 2**	Active Low
16	Switched Out 4	1A @ System Voltage			

Typical Wiring

The following describes the typical engine interface wiring.

Power and Ground

The panel's Power and Ground must connect directly to the battery posts and must not share its power and ground wiring with any other devices, especially any high current loads. The Power line should have over-current protection in the form of current limiting devices, fuses, circuit breakers or fusible links protect harness wiring in the event of fault conditions.

ECU Power Out

The CP1000 can directly power the engine ECU

Starter Power Out

The Starter Power Out is intended to power the starter relay, which is required. When power is removed from the relay coil, the collapsing magnetic field generates a negative voltage surge. Negative voltage surges can damage components. The CP1000 has protection against these negative surges. However, it is still required to have a protection/suppression diode as close to the relay as possible. LOFA recommends the use of relays that have this protection/suppression diode built-in. The protection/suppression diode must have sufficient voltage ratings to survive and sufficiently suppress these negative voltage surges. LOFA recommends a 1N4001 diode. LOFA sales a spike suppressing diode kit (630-4007-77).

Resistive Senders

The Resistive Sender connections send System Voltage out to the sender to obtain the current value. It is required that the Sender Return connection be connected to a ground point (engine chassis as an example) as close to the sender as possible in order to get an accurate measurement. If more than one sender is used, each sender should have a sender return connected to a ground point near that particular sender. All sender returns should then be connected together near the panel and the combined returns connected to the panel's sender return input.

CANBus Termination

CANBus requires two 120 Ω termination resistors each at the extreme ends of the wiring harness. Typically, the engine ECU provides the termination resistor on its end (see engine documentation to verify). The CP1000 has a termination resistor that can be turned off and on as needed. The CP1000's default configuration has this termination resistor turned on.