



Excellence in Compliance Testing

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## **Certification Exhibit**

**FCC ID: 2ACQD-COMMOD01  
IC: 12381A-COMMOD01**

**FCC Rule Part: 15.247  
IC Radio Standards Specification: RSS-210**

**ACS Project: 14-2071**

**Manufacturer: Infrax Systems, Inc.  
Model: COMMODO1**

## **User Manual**



# OEM USERS MANUAL

Infrax Systems Inc.

FCC ID: 2ACQD-COMMOD01  
IC: 12381A-COMMOD01

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## Contents

Operating Requirements and Conditions .....	1
FCC ID.....	1
FCC Warning.....	2
Mobile Device RF Exposure Statement.....	2
Caution Statement for Modifications .....	2
FCC Part 15 Statement.....	2
Class B Devices .....	2
Operating Frequency Range .....	3
Approved Antenna Types .....	3
.....	3
.....	3
Industry Canada Specific Statements.....	3
Industry Canada Statements.....	4
Detachable Antenna.....	5
Types d'antennes approuvées.....	5
RF Exposure.....	5
Installing the COMMOD on the HIB .....	5
Operating Instructions.....	7
Host Labeling Requirements.....	8
Installing the HIB into a meter.....	9
COMMOD Pics With and Without Shield .....	13

## Operating Requirements and Conditions

The design of HIB/COMMOD complies with U.S. Federal Communications Commission (FCC) guidelines respecting safety levels of radio frequency (RF) exposure for radio devices. This Device shall not be operated within 20cm of a human body.

## FCC ID

This product FCCID: 2ACQD-COMMOD01

Note: In the case where the Host / Module combination has been re-certified the FCCID shall appear in the product manual as follows: 2ACQD-COMMOD01

### FCC Warning

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS. (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION

### Mobile Device RF Exposure Statement

The COMMOD complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter

### Caution Statement for Modifications

CAUTION: Any changes or modifications not expressly approved by Infrac Systems Inc. could void the user's authority to operate the equipment.

### FCC Part 15 Statement

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

### Class B Devices

“NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/TV technician for help.”

**Modifications:** Any modifications made to this device that are not approved by Sun Microsystems, Inc. may void the authority granted to the user by the FCC to operate this equipment.

## Operating Frequency Range

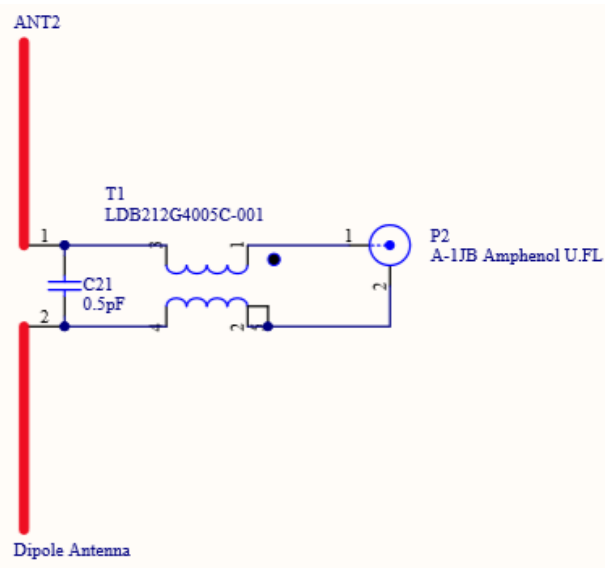
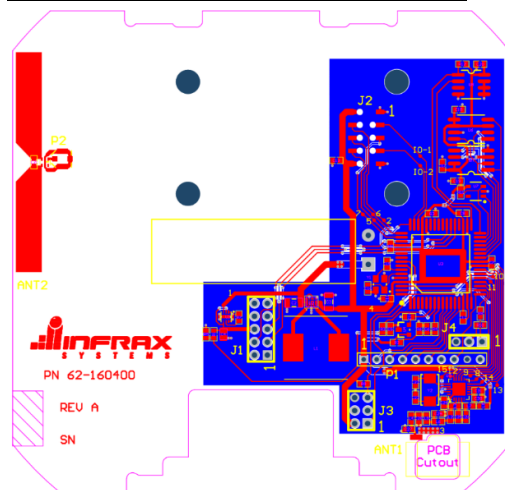
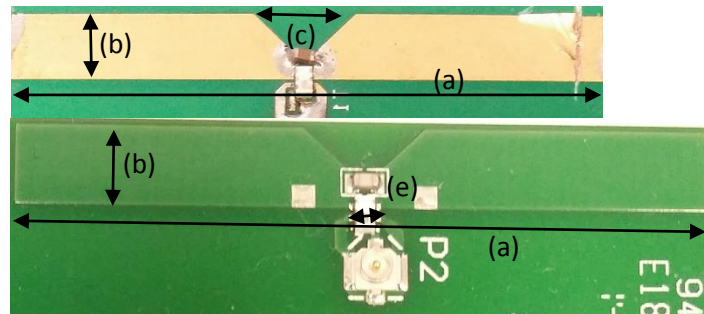
The Operating Frequency Range will be 2405MHz – 2475MHz

Channel	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Frequency	2405 MHz	2410 MHz	2415 MHz	2420 MHz	2425 MHz	2430 MHz	2435 MHz	2440 MHz	2445 MHz	2450 MHz	2455 MHz	2460 MHz	2465 MHz	2470 MHz	2475 MHz

## Approved Antenna Types

The COMMOD is only approved to be used with the 2.5db antenna that is printed on the host interface board (ANT2). The antenna connects via U.FL cable via P2. The Antenna has an Impedance of 50.0 Ohm, it is 43mm long by 5.10mm wide by 0.11mm thick. Attached to the Antenna is a TRANSFORMER BALUN 2.45GHZ made by Murata Electronics. The Antenna is tuned for 2405MHz to 2475MHz with a center channel at 2440MHz. To verify the antenna a printed dipole antenna was built and measured. First the input impedance of the antenna was measured with a network analyzer. This measurement was performed inside the laboratory. The antenna was kept away from metallic objects as far as possible. Of course the ground plane on the PCB and also the connecting cable will always be close to the antenna. The antenna has been mechanically tuned to a resonance at 2440MHz. This was done by simply shortening the radials until the resonance occurred at 2440MHz.

	Antenna
Substrate material	PCB – FR-4
Substrate thickness	1.55 mm
Antenna thickness	0.11 mm
Width (a)	43 mm
Ground distance (b)	5.1 mm
Tuning style	Outer end shortening
Impedance	50.0 Ohm
Separation(c)	7mm
Separation(e)	1.10mm



Industry Canada Specific Statements

Industry Canada Representative- Celltech

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Kelowna B.C. V1X7R8  
(250)765-7650

Radio apparatus shall comply with the requirements to include required notices or statements to the user of equipment with each unit of equipment model offered for sale. The required notices are specified in the RSS documents (including RSS-Gen) applicable to the equipment model.

#### Industry Canada Statements

Radio apparatus shall comply with the requirements to include required notices or statements to the user of equipment with each unit of equipment model offered for sale.

The required notices are specified in the RSS documents (including RSS-Gen) applicable to the equipment model. These notices are required to be shown in a conspicuous location in the user manual for the equipment, or to be displayed on the equipment model. If more than one notice is required, the equipment model(s) to which each notice pertains should be identified.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This radio apparatus contains digital circuitry which can function separately from the operation of a transmitter or an associated transmitter, complies with ICES-003.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

### Detachable Antenna (Antenne Amovible)

*This radio transmitter FCC ID: 2ACQD-COMMOD01, IC: 12381A-COMMOD01 has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.*

*Cet émetteur radio FCC ID: 2ACQD-COMMOD01, IC: 12381A-COMMOD01 a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous avec le gain maximal admissible et l'impédance d'antenne requise pour chaque type d'antenne indiqué. Types d'antennes ne figurant pas dans cette liste, ayant un gain supérieur au gain maximum indiqué pour le type ne ont, sont strictement interdits pour une utilisation avec cet appareil.*

### Types d'antennes approuvées

See above for English version of approved Antenna Types.

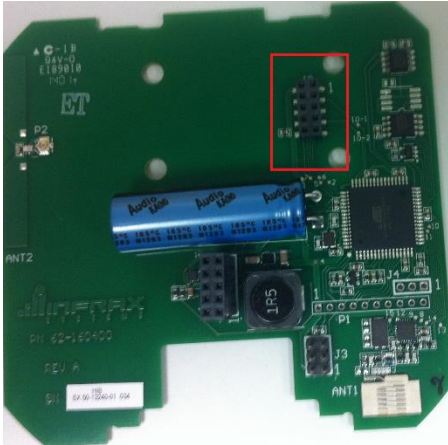
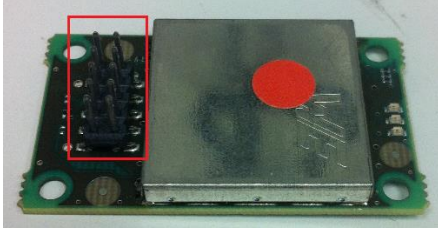
Le COMMOD ne est approuvé pour être utilisé avec l'antenne de 2.5dB qui est imprimé sur la carte d'interface hôte ( ANT2 ) . L'antenne se connecte via un câble U.FL via P2 . L'antenne a une impédance de 50,0 Ohm , il est 43mm de long par 0,11 mm de large par 5.10mm d'épaisseur. Fixé à l'antenne est une 2.45GHz TRANSFORMER BALUN faite par Murata Electronics . L'antenne est accordé pour 2405MHz à 2475MHz avec un canal central à 2440MHz . Pour vérifier l'antenne d'une antenne dipôle imprimée a été construit et mesurée. Tout d'abord l'impédance d'entrée de l'antenne est mesurée avec un analyseur de réseau. Cette mesure a été effectuée à l'intérieur du laboratoire. L'antenne a été tenu à l'écart des objets métalliques autant que possible . Bien sûr, le plan de masse sur le circuit imprimé ainsi que le câble de raccordement est toujours proche de l'antenne . L'antenne a été réglé mécaniquement à une résonance à 2440MHz . Cela a été fait en raccourcissant simplement les radiales jusqu'à ce que la résonance est produite à 2440MHz .

### RF Exposure

The radiated output power of the COMMOD radio is below the FCC radio frequency exposure limits under part 15. This device is intended to be installed inside a host device. This radio will never exceed one watt transmitting power.

### Installing the COMMOD on the HIB

- 1) Make sure proper grounding procedures are followed
- 2) The COMMOD has a 10 pin Male header and the HIB has a 10 pin Female header.



- 3) Insert the COMMOD header into the HIB header
- 4) Ensure that all pins are aligned and the COMMOD is sitting flush



- 5) Attach all four screws on top of COMMOD





6) Attach U.FL cable to COMMOD and then to HIB



### Operating Instructions

- 1) The HIB/COMMOD can be set and accessed through the 3 pin debug port using an USB/RS232 cable. Pin 1 = DIAG TXD, Pin 2 = DIAG RXD, Pin 3 = GND.



- 2) Once the USB cable is attached open a terminal program and use the settings below
  - a. Baud Rate = 9600
  - b. Data Bits = 8
  - c. Parity = None
  - d. Stop Bits = 1
  - e. Flow Control = None
- 3) Once the terminal software is running press esc to access the main menu
- 4) Within the main menu you can change all the operating parameters for the HIB and COMMOD
  - a. ESC pressed - entering command mode
  - b. > MODE {?.|#|LIST} - Show/change communications mode
  - c. REBOOT - Not implemented
  - d. RESTART - Restart communications with currently selected parms
  - e. EXIT - Exit command mode - discard any changes
  - f. UPDATE - write parms to EEPROM
  - g. <ESC> - Enter command mode
  - h. HELP - Show this list
  - i. MONITOR {MASTER|SLAVE|DEBUG} {ON|OFF|?.} - Show/change output to utility port
  - j. DIRECT {MASTER|SLAVE|OFF} - Connect utility port to selected port
  - k. ECHO {ON|OFF|?.} - Show/change utility port echo (duplex)
  - l. SEND {MASTER|SLAVE|LIST} # - Send selected constant data to master/slave port
  - m. MRTS {#,.?.} - Set number of meter readings to send at start - 128+ = continuous
  - n. COMMOD {ON|OFF|?.} - Show/change COMMOD handler
  - o. READ {ON|OFF|?.} - Show/change meter read command test handler
  - p. RSSI {ON|OFF|?.} - Show/change radio read rssi handler
  - q. RICK {ON|OFF|?.} - Show/change radio ignore interrupt check
  - r. SMRT {ON|OFF|?.} - Show/change show meter reading text
  - s. CRBT {ON|OFF|?.} - Show/change reboot commod after MRTSs
  - t. '?' displays current setting. '.' displays operating setting.
  - u. Current settings take effect after a RESTART command

## Host Labeling Requirements

As per Itron's Instructions these are tier labeling instructions.

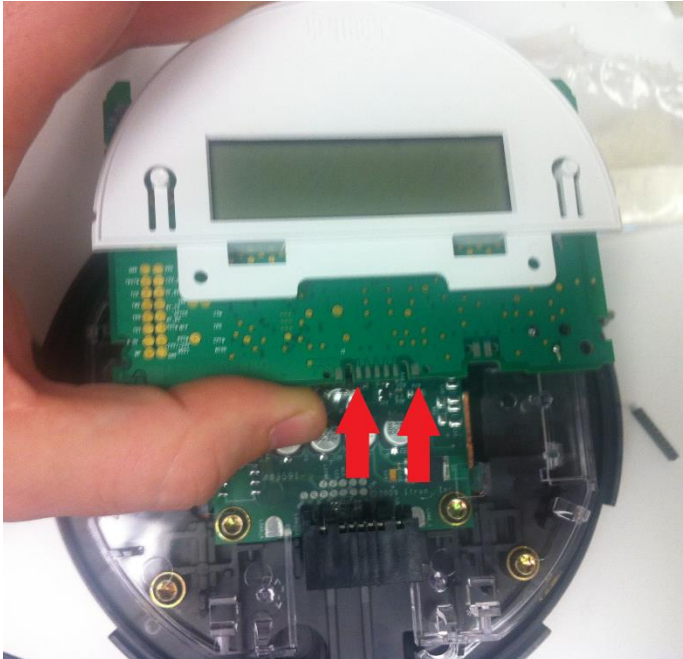
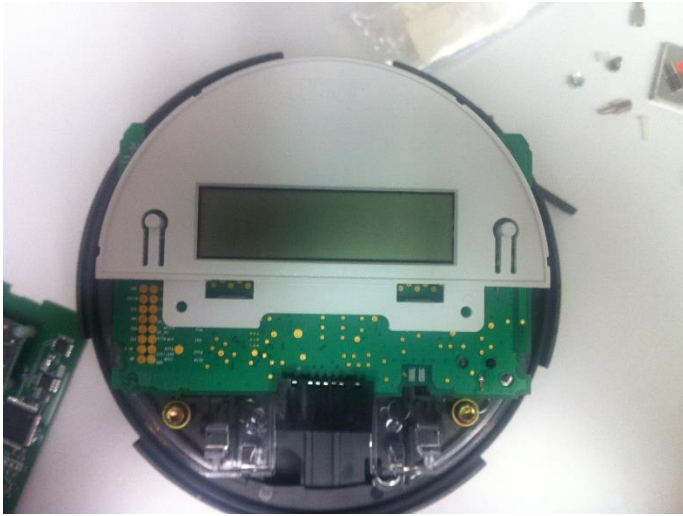
*"A label specifying the FCC and/ or IC ids of the OEM Module will need to be placed on the meter so as to be visible in the field. A specifications of the information printed on the label needs to be sent to Itron with the constraint that all the information must fit on a label that is 2 inches wide by 0.75 inches tall. This size restriction is required due to space constraints, since the label will be placed above the LCD on the plastic housing. During the manufacturing process Itron will print the label with the correct information and will place it on the plastic housing."*

## Installing the HIB into a meter.

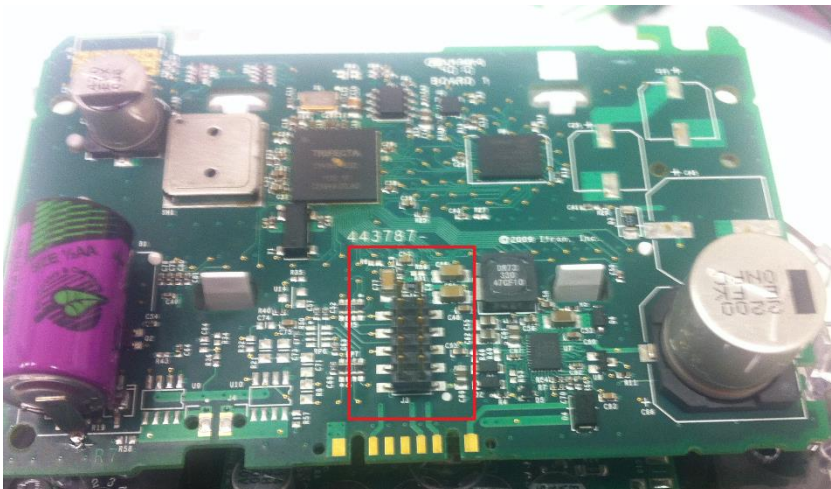
- 1) Remove Clear cover
- 2) Remove bottom gray cover and then the top gray cover using a small screw driver to push in the Small tabs

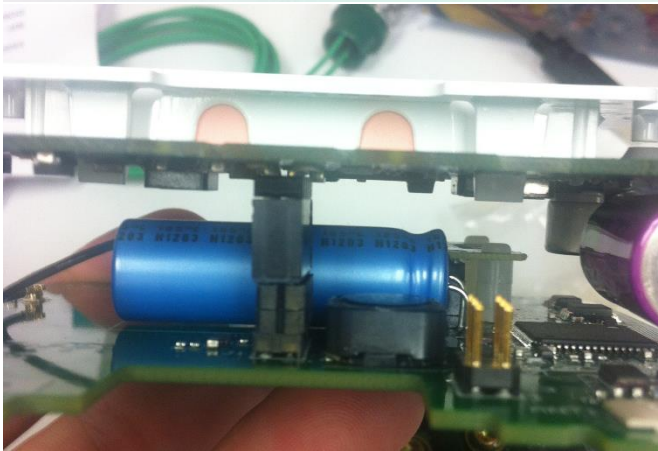
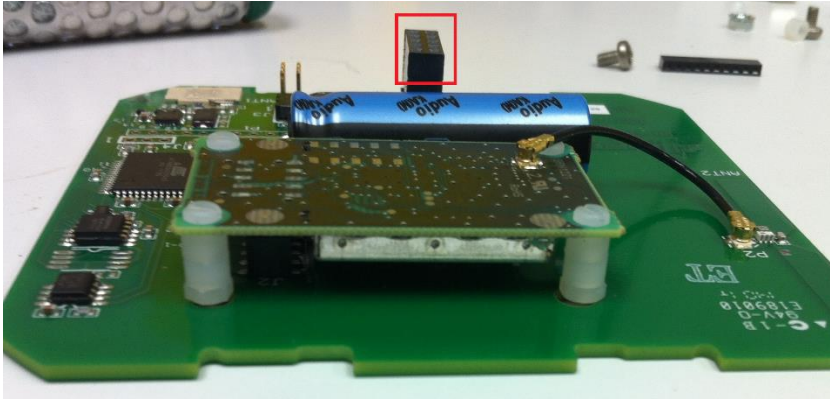


- 3) Pull Display board straight out.

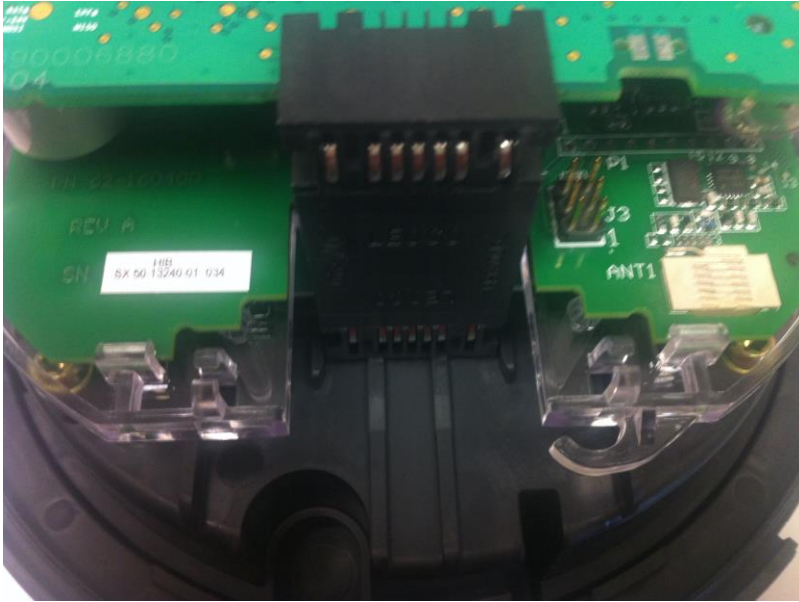


4) Attach the HIB to the display board on the 10 pin header.

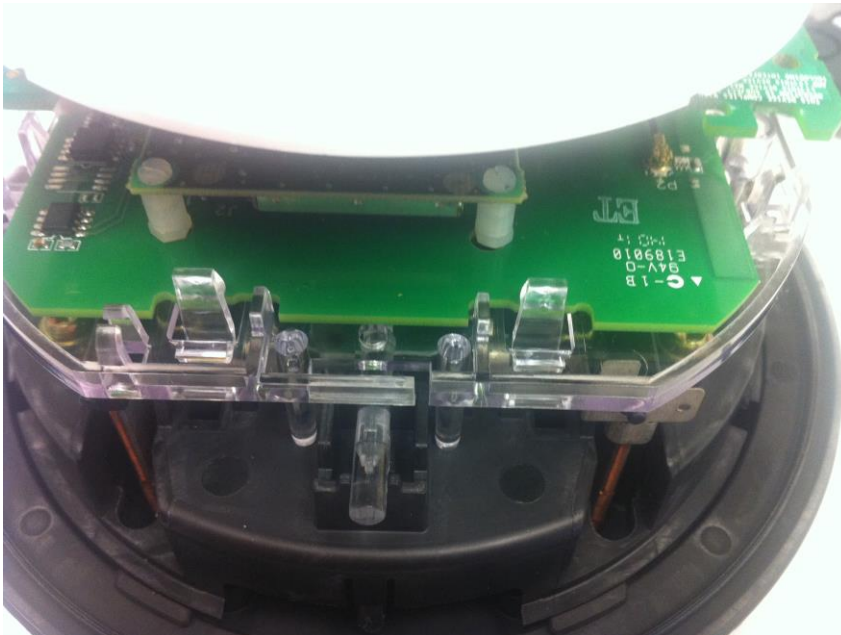




- 5) Slide bottom of HIB into mounting slots located in the meter case and attach the meter display board to its connector.



6) Then Clip the Top part of the HIB into the meter mount.



- 7) Secure Meter Display into the slide on connector
- 8) Attach the upper gray case to meter display then onto the meter case.
- 9) Next attach lower gray case.
- 10) Attach Clear plastic Cover.

COMMODO Pic With and Without Shield

