

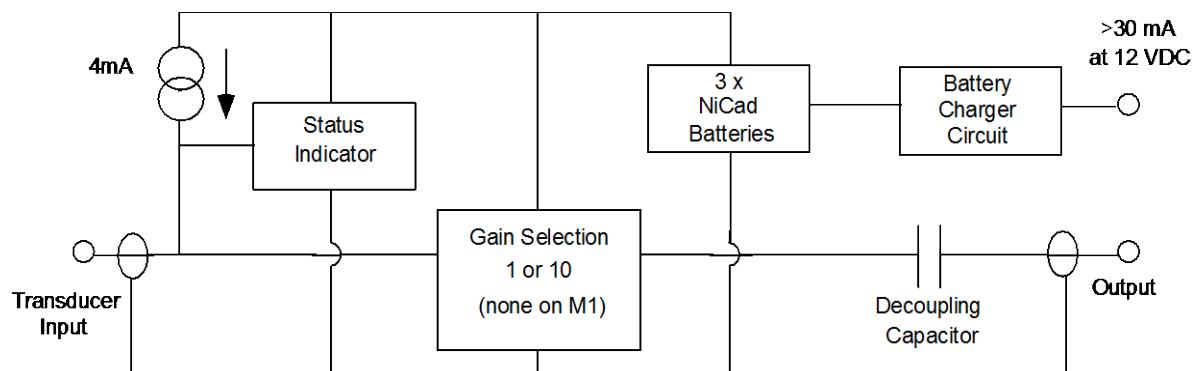
## INSTRUCTION MANUAL

### For Model 4416B, 4416BM1 & 28980A BVM Kit IM4416B, Revision C

This Instruction Manual describes the basic operation of Model 4416B / 4416BM1 Battery Powered Signal Conditioner and its use in other ENDEVCO measurement kits, such as Model 28980A Basic Vibration Measurement Kit.

#### Description

The ENDEVCO Model 4416B Battery Powered Signal Conditioner is a small, portable, low noise power supply/amplifier for use with integrated electronic piezoelectric (ISOTRON®) transducers or piezoelectric transducer (charge output) with Remote Charge Converter (RCC). It supplies ~4 mA of constant current power to the transducer (or RCC) in a two-wire system. The 4416B is powered by rechargeable batteries and can be operated during the recharging cycle. The input signal can be amplified by a X1 or X10 gain stage (4416BM1 has no gain stage). This unit contains a Status LED indicator to notify the operator to recharge the batteries or input open/short fault conditions. Note: Model 4416BM1 is the same as the 4416B with the exception that the 4416BM1 does not have a gain switch.



**Model 4416B Block Diagram**

#### Operation

##### Transducer Connection:

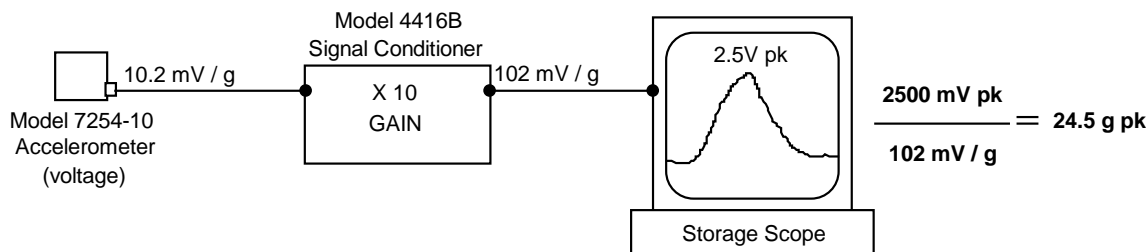
The unit is turned on by attaching a transducer or RCC to the input BNC connector. The EJ21 adapter allows 10-32 cable connector to be attached to the BNC input. The Status LED will indicate green when the transducer is properly connected and the batteries are charged. If the input is shorted, the Status LED will turn red. The Status LED will turn off when the transducer is removed, the input cable is open or the batteries are low.

##### Output Connections:

the signal at the output is the mV / Engineering Units (EU) input level times the gain selected, X1 or X10. For acceleration measurements, EUs are in g's. The output is AC coupled and is flat ( $\pm 5\%$ ) from 1 Hz to 20kHz. The output can be connected to a DMM, O'scope, Signal analyzer, Data Recorder or PC based analog to digital converter board.

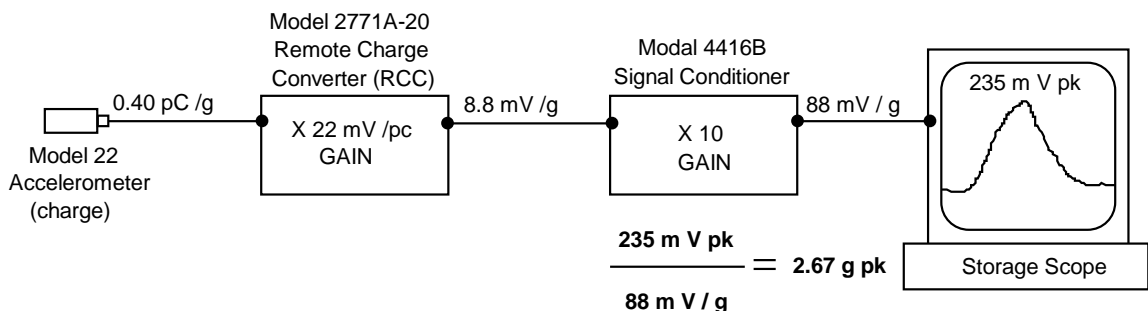
## Application Examples:

1. A Model 7254-10 ISOTRON accelerometer has 10.2 mV/g output sensitivity. Gain on the 4416B is set at X10. System output is now 102 mV/g. If 2.5V pk is recorded on a digital storage scope, the acceleration level in this measurement is 24.5 g's pk.



### Example with ISOTRON Accelerometer

2. A Model 22 piezoelectric accelerometer (charge output) has 0.40 pC/g output sensitivity and it is used with a Model 2771A-20 Remote Charge Converter (RCC) that has a fixed gain of 22 mV/pC. Output at the RCC is 8.8 mV/g. Gain on the 4416B is set at X10, therefore the system output is now 88 mV/pC. If 235 mV pk is recorded, the acceleration level in this measurement is 2.67 g's pk.



### Example with Piezoelectric Accelerometer and RCC

#### Recharging

The 4416B can be operated with or without the charger attached. When the charger is properly connected and plugged in, the yellow charge LED will turn on. The 4416B will be fully recharged in 2-3 hours. To achieve the best possible signal to noise ratio, fully charge the 4416B and disconnect the charger for the lowest noise operation.

A DMM can be used to verify the charge level of the batteries, by connecting a DMM to the input BNC and measuring the DC voltage. If the voltage is greater than 28V, the 4416B is fully charged. If the voltage is 24V - 28V, the 4416B is ready for operation. If the voltage is less than 24V, recharge the 4416B to >28V for the longest continuous operation. A fully charged 4416B can operate continuously for about 8 hours.

#### Repair

The only field serviceable parts are the Ni Cad rechargeable batteries. To replace batteries, remove the four rubber feet and four screws. Separate the top and bottom covers. Remove and replace the batteries with new 9V 110mAh Ni Cad batteries and re-assemble. Charge the batteries before use.