

Level Detector

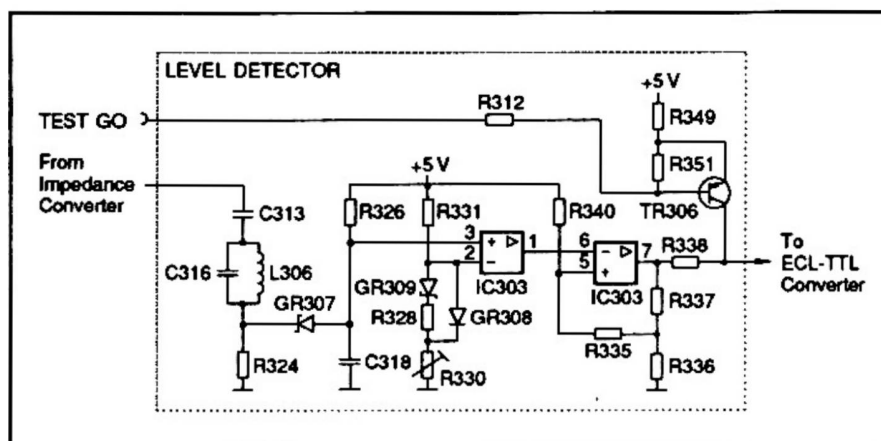


Figure 45. Level detector.

This circuit detects the lowest signal level which is acceptable for counting.

As a result of a sufficiently high input signal from the impedance converter, capacitor C318 is discharged via diode GR307, to a voltage level below the threshold level from potential divider R331/R328+R330. Pin 3 on IC303 becomes more negative than pin 2 and the output of the amplifier, pin 1, becomes low. This amplifier stage amplifies the level by about 10 times.

The second amplifier stage, IC303, works as a Schmitt trigger. The output of this amplifier, pin 7, becomes high if the level on pin 6 sinks below the level on pin 5. Transistor TS303 in the ECL-TTL converter starts conducting.

R330 is used to set the threshold level for IC303, pin 2.

The temperature drift of the detector diode GR307 is compensated by the diodes GR308 and GR309.

For test purpose it is possible to force TS303 to conduct by connecting TEST GO (BU303 pin 5) to ground.

• MTCXO Oscillator (option)

The PM 9607 MTCXO Oscillator cannot be repaired at a local work shop. It has to be sent to the factory for repair. Therefore only the principle is described here.

A crystal oscillator generates a frequency of 10 MHz, and a temperature oscillator generates a frequency proportional to the crystal temperature.

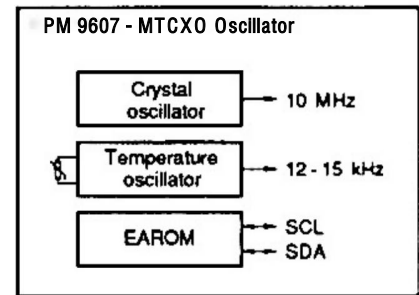


Figure 46. MTCXO oscillator.

The frequency deviations of the crystal oscillator for different temperatures are stored in an EEPROM type memory.

The frequency of the temperature oscillator and the corresponding value from the EEPROM is read by the Micro-Controller. This information is used to compensate the measuring result to a correct value with respect to the ambient temperature.

• GPIB Interface (option)

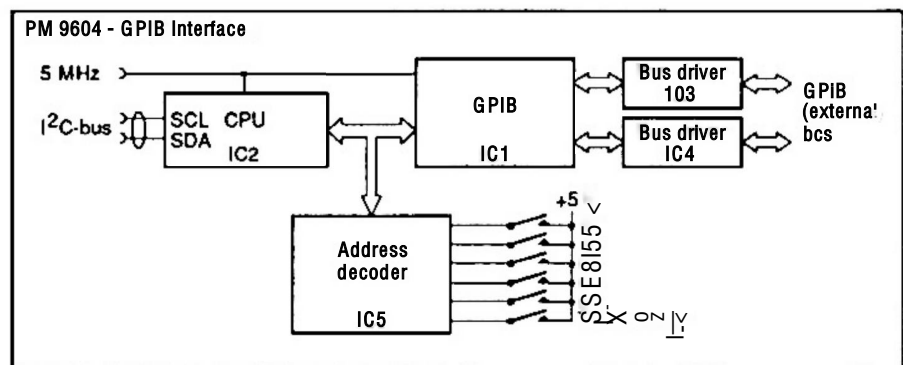


Figure 47. GPIB interface.

The PM 9604 GPIB Interface controls the communication between the internal microcontroller and the external GPIB bus.

IC2 controls the GPIB converter IC1 and works as a slave processor to the microcontroller IC105.

Address decoder IC5 reads the address switch settings into IC2.

Two bus drivers, IC3 and IC4, read and write information on the external bus.

If information is to be sent from the internal to the external bus, the main controller IC105 orders processor IC2 to address affected registers in IC1. IC2 reads the I²C-bus and the information read is transferred to GPIB converter IC1 to be forwarded to the external bus via the I²C-bus.

If IC1 receives information from the external bus it sends an interrupt to IC2 (pin 12). IC2 reads the information and requests attention to IC105 which fetches the information.

• Battery Unit (option)

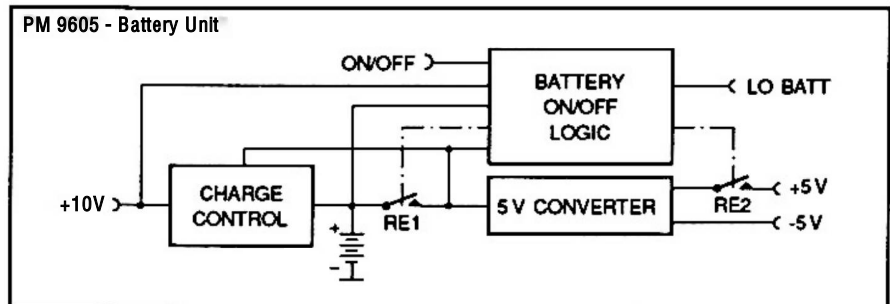


Figure 48. Battery unit.

The PM 9605 Battery Unit contains the following sub-functions (individually described below and on the next page):

CHARGE CONTROL limits the charging current and controls the charging voltage to a maximum of 6.9 V.

5 V CONVERTER generates and regulates the supply voltages for the counter.

BATTERY ON/OFF LOGIC turns off the output power to protect the battery when its voltage has dropped to a certain level.

Charge Control

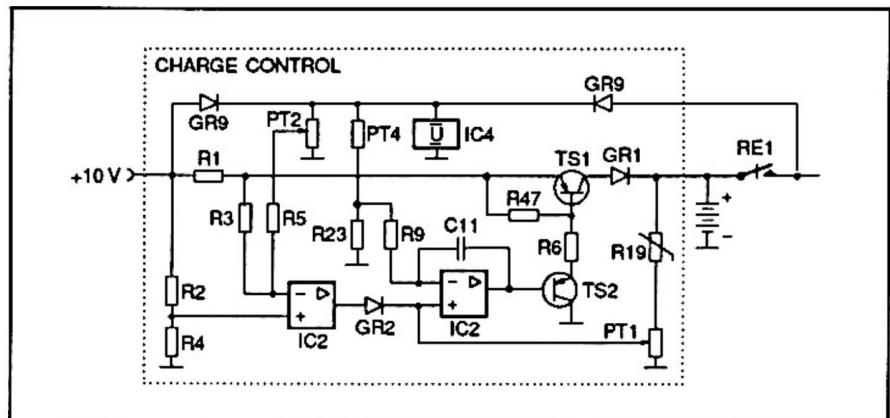


Figure 49. Charge control.

The charging current passes the Charge Control circuitry via R1, TS1, and GR1. This current causes a voltage drop across R1 which is sensed and used to regulate transistor TS1.

As a result of an increase in charging current, the voltage drop across R1 increases. This causes a higher potential difference between the sensing inputs to IC2 (via R2 and R3). The output level from this amplifier rises, as does the output level from the following amplifier as well. Transistor TS2 becomes less conducting. The base potential of TS1 rises and thus limits the charging current.

IC4 keeps a constant voltage to PT2 and PT4.

PT1 is used to set the maximum charging voltage.

PT2 is used to adjust the maximum charging current.

R19 is used for temperature compensation.