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Find the *Ametek / VTI Instruments / VXI Technology VM3608A* at our website: *Click HERE*

MTS3000

Medical Electronics Subsystem

VXI Technology™

- Generate Cardiac Pulses
- Monitor low-level Signals
- Pacemakers
- Ultrasound Equipment
- Medical Beds
- Patient Monitoring Systems



Overview

Medical Electronic devices typically monitor micro-volt level signals. Due to stringent FDA requirements, the testing of these devices need to be very repeatable. The leading manufacturers of medical devices use VXI Technology's line of high-density instruments (VMIP™ family) and switching systems (SMIP//™ family). These products have been designed with the medical electronics community in mind. Several instruments and switching systems can be combined in a very small footprint to resolve a magnitude of applications.

The MTS3000 base system consists of:

CT400

13-Slot VXIbus mainframe (alternatively, a small CT100B 6-slot chassis can be used)

Slot 0 Interface

This allows the VXIbus cardcage to be controlled from a host computer, via GPIB (HPIB), PCI, Firewire, Ethernet or other connectivity method

Card 1

VM2608 – 16-bit 8-channel digitizer
VM3608A – 16-bit 8-channel DAC/low frequency AWG
VM3640 – 50MS/s AWG

Card 2

VM2710A – 6.5 digit system DMM
VM1548C – 48-channel open-collector I/O
VM7004 – programmable resistor (load simulation)

Card 3

VM1602 – counter-timer/event recorder
VM6068/9 – telemetry interface
VM7000 – prototyping module for signal conditioning

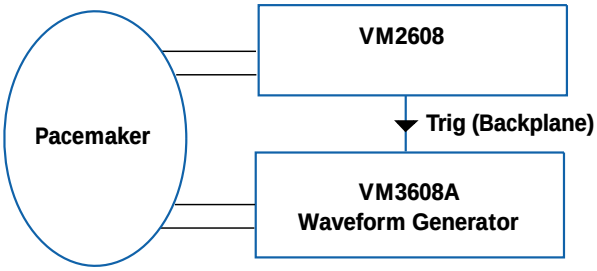
Card 4

SMP2001A - power switch
SMP3001 - scanner/multiplexer
SMP4001 - shielded matrix
SMP6001 - coaxial switch

All appropriate switch modules are shielded and all instruments are optimized for micro-volt signals. Our modular approach to instruments and switches also allows products to be easily configured.

Application - Testing Pacemakers

The application is to digitize the output pacing pulse from the pacemaker, triggering at a set point. A waveform generator then simulates the output from the heart delayed at a programmed interval from the pacing pulse trigger.



The VM2608 is an 8-channel digitizer that has large memory and a programmable differential input amplifier with ranges from ±0.1V to ±40V (16 bits of resolution). Extensive triggering capability is available.

The pacemaker pulse is fed into the VM2608 (after any desired signal conditioning). The input range is set accordingly. The trigger is set to trigger at a known point on the waveform (positive or negative slope and threshold).

This trigger is also routed to the TTL backplane trigger line to trigger the VM3608A waveform generator.

The VM3608A is an arbitrary waveform generator, with each channel running at 100ks/s. It also has extensive triggering capability as well as waveform segmenting, linking, etc. It is set up to trigger from the TTL backplane trigger line generated by the VM2608. Memory segments are loaded for the delays and the cardiac waveforms. Once a trigger is received, the VM3608A generates the delay segment and then automatically advances to the cardiac pulse. On the next trigger, different delay segments and/or pulses can automatically be generated.

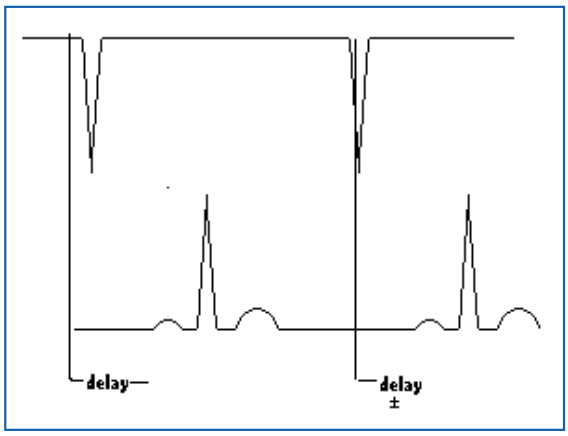
The salient features of the VM2608 and VM3608A that lend themselves to medical electronic testing are:

VM2608

16-bit resolution (3.05mv)
100ks/s per channel
Input channel triggering w/programmable thresholds and slopes
Ability to drive VXIbus TTL trigger lines for synchronization
Large memory
±0.02% accuracies

VM3608A

True 16-bit 100ks/s converters
±10V or ±20V o/p range, ±0.15% accuracy
Waveform linking, segmenting, looping, advancing, etc.
Up to 1 MWord memory
Extensive triggering
FIFO mode for large FDA approved waveforms



The VM2608 and VM3608A together use only 2/3 of a VXIbus card slot. One of the following instruments could be used to complete the VXIbus card:

1. VM7004 — 4-channel Programmable Resistor Card for simulating loads
2. VM1602 — 1ms differential event recorder/time stamp for capturing serial or parallel patterns (counter/timer).
3. VM2710A — 6.5 digit DMM, DCV, ACV, current and resistance.

A software driver is also available with the demo that simulates the application

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