

PM6690 Frequency Counter/Timer/Analyzer

in 53131A & 53132A Bus Compatibility Mode

Application Note

Introduction

The Fluke PM6690 Frequency Counter/Timer/Analyzer is designed for high-speed, high-resolution measurements and can be used either as a stand-alone instrument or as part of a test-system, using GPIB or USB interfacing.

When used with the GPIB interface, the PM6690 has two different modes of operation:

- a native SCPI bus mode with a command set, which is optimized towards the specific capabilities of the PM6690 itself.
- a compatible mode, intended to simplify operation for users who already have a 53131A or 53132A timer/counter designed into their test system.

In the compatible mode, the PM6690 emulates the behavior and the responses of a 53131A or 53132A. Such ‘drop-in’ replacement mode is most beneficial for users who need to upgrade or duplicate their current GPIB test system, while maintaining the control program with minimal changes.

This application note provides further details on the compatible mode, and offers helpful tips when installing the PM6690 into a test system, which is already built around the 53131A or 53132A.



Known differences

Basically, the PM6690 and the 53131A/132A are different units with different bus responses. One obvious difference is in the response to the Identity Query “*IDN?”, to which the 53131A answers “HP 53131A” and the PM6690 answers “Fluke PM6690”. Other examples are in the commands that address hardware found only in the 53131A and 53132A, such as the RS232 interface.

Very few program changes are required for the majority of software programs. All measurement and setting commands are understood, and the response formats are the same. Status registers and SRQ handling are all the same.

Command Termination

The PM6690 follows the SCPI standard, which describes that commands sent to the instrument are to be terminated with an EOI (End-of-Identity). The HP/Agilent units also accept NL (ASCII character dec-10), without the EOI.

If the PM6690 receives a command string without an accompanying EOI, then it will wait indefinitely for it.

Responses to Identification queries

1. Response to “*IDN?” is “Fluke PM6690” instead of “Agilent 53131A” or “Agilent 53132A”.
2. Response to “*OPT?” is dependent on the options installed in the PM6690.

Missing functions

The PM6690 incorporates all input settings and all measuring functions also found in the Agilent/HP counters, with one exception: The PM6690 does not offer a Totalize function, so commands beginning with :FUNC:TOT will result in an error message.

Different hardware

The HP/Agilent units have an RS232 interface installed as “talker only”, supporting, for example, the printing of measurement results on a serial printer.

The PM6690 does not provide an RS232 port, but rather a USB interface for PC communication. As a result, the commands sent will result in the following error messages:

Command sent	Error message
:SYST:COMM:SER:CONT:DTR ON	-110,"Command header error"
:SYST:COMM:SER:CONT:DTR IBF	-110,"Command header error"
:SYST:COMM:SER:CONT:DTR LIM	-110,"Command header error"
:SYST:COMM:SER:TRAN:PAR EVEN	-110,"Command header error"
:SYST:COMM:SER:TRAN:PAR ODD	-110,"Command header error"
:SYST:COMM:SER:TRAN:PAR NONE	-110,"Command header error"
:BAUD 300 BAUD 19200	-113,"Undefined header"
:PACE XON	-113,"Undefined header"

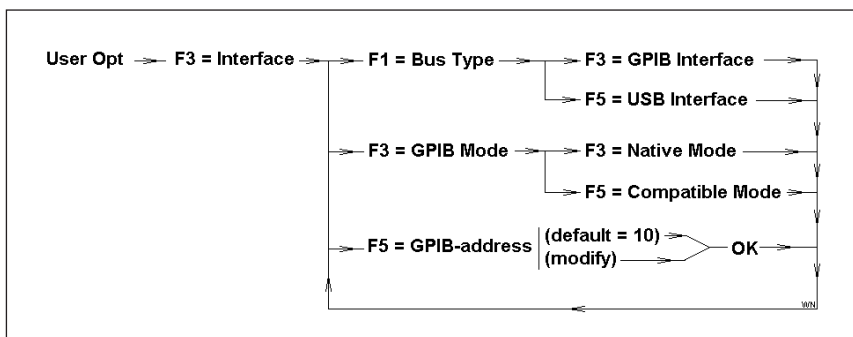
Internal calibration and diagnostics

Commands starting with ":CAL" and ":DIAG" are intended for calibration and diagnostics of internal parameters in the HP/Agilent hardware, and are therefore not supported by the PM6690.

Mode Selection Menu

As indicated before, the PM6690 has two distinctly different modes of operation for the GPIB/SCPI Remote Control system:

the instrument can be set up either in 'native mode' or in 'compatible mode'. If the PM6690 is set up to work in native mode and 53131/132A commands are still received, the response may be different and not suitable for an application program that was written for the 53131A/132A responses. The diagram below may be used for setting up the different interface modes of the PM6690, starting from key "O = User Opt."



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