AN-11 CNT-90 and Agilent 53131A compatibility

pendulum

Introduction

The new CNT-90 Timer/Counter/Analyzer from Pendulum Instruments is designed for high-speed and high-resolution measurements over GPIB or USB. It has a "native SCPI" bus mode with a command set which optimizes every aspect of the instrument performance.

The CNT-90 also has a "compatibility mode", which is intended to make life easy for the current user of the 53131A/132A, when he needs to upgrade or duplicate his current GPIB test system, while maintaining as much as possible of the SW control program. In the Compatibility mode, the CNT-90 emulates the behaviour and responses of a 53131A/132A.

Note: If 53131A/132A commands are sent to a CNT-90 working in native mode, you must not expect correct response messages.

Since the CNT-90 and the 53131A/132A are not 100% identical units, the compatibility does not reach 100%either. One obvious difference is the response to the Identity Query (*IDN?), where the 53131A answers "HP 53131A" and the CNT-90 answers "Pendulum CNT-90". Other examples are commands that address hardware only found in the 53131A/132A, like the RS232 port.

For the majority of SW programs, very few program changes are needed. All measurement and setting commands are understood, and the response formats are the same. Status registers and SRQ handling are the same.
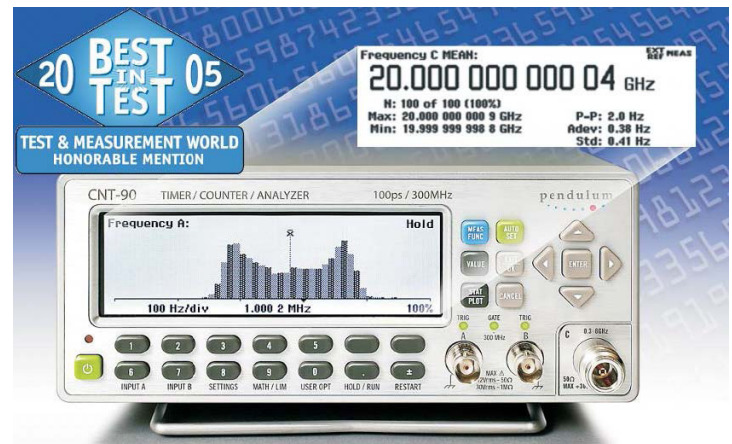
This application note describes the few incompatibility issues, which the user should be aware of in order to make a seamless drop-in CNT-90 replacement with a minimum of trouble.

Responses to Identification queries

1. Response to *IDN? is "pendulum CNT-90" instead of e.g. "Agilent 53131A".

2. Response to *OPT? depends on the actual option installed.

Termination

CNT-90 follows the SCPI standard, which demands that commands to the instrument be terminated with EOI. HP/Agilent also accepts NL (without EOI). If the CNT-90 receives a command string without an accompanying EOI, then it will wait indefinitely.

Missing functions

The CNT-90 incorporates all input settings and all measuring functions from the Agilent/HP counters with one exception. The CNT-90 does not have a Totalize function, so commands beginning with :FUNC:TOT will result in an error message.

Missing hardware

HP/Agilent units have a RS232-port for "talker only" purposes, e.g. for printing measurement results on a serial printer. The CNT-90 does not have the RS232 port, so the commands in the table below will result in error messages (see table).

Internal calibration and diagnostics

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

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"

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