

NAME

ortec – Ortec 974/994/995/996/997 Counters and Timers

DESCRIPTION

spec supports the Ortec 974, 994, 995, 996 and 997 counter and counter-timer NIM modules over both GPIB and RS-232C interfaces. When running the configuration editor, select from the following descriptions on the device configuration screen to specify which Ortec modules you are using and how you are using them:

Ortec 974/994 Counter/Timer (GPIB)
Ortec 974/994 Counter/Timer (Serial)
Ortec 974/994/995/996/997 Counter (GPIB)
Ortec 974/994/995/996/997 Counter (Serial)
Ortec 994/996 Counter and Blind Timer (GPIB)
Ortec 994/996 Counter and Blind Timer (Serial)

Only one module can be selected as a counter/timer. The 974 module can be assigned a maximum of four channels. The 994 should be assigned two channels normally and three channels when used as a blind timer. The 996 should be assigned one channel normally and two channels when used as a blind timer. The 995 has two channels and the 997 has one.

On the scaler configuration screen, choose OR9XX as the controller for all channels associated with an Ortec module. The unit numbers selected for each channel correspond to the order the Ortec modules appear on the device configuration screen. When using the 994 as a blind timer, you must select channel number 2 for the timebase. When using the 996 as a blind timer, you must select channel number 1 for the timebase.

Using the 974

The 974 is a four-channel counter/timer having a minimum 0.1 second time base. You should connect the monitor counts through a tee to the EXT IN connector on the back of module and to the COUNTER INPUT 2 connector on the front of the module. Use the COUNTER INPUT 3 and 4 connectors for one or two detector input channels. Also, make sure that the internal dip switch S-1 has position 6 set to one-cycle (ON/closed).

Using the 994 As a Normal Timer

The 994 is a two-channel counter/timer with a minimum 0.01 second time base. In order to obtain accurate elapsed time readings, one counter channel is used to count time and the other is used to count monitor counts. An additional counter, such as the 995 or 997 is normally used to accumulate detector counts and is gated by the 994. The monitor count source should be connected to both the IN A and IN B front panel connectors of the 994 using a tee. The internal jumpers W3 and W4 (located underneath the interface board) must both be set to the TIME position (the rightmost two pins on W3, the leftmost two pins on W4). Jumper W1 must be set to the NORMAL position (the two rightmost pins). Also, make sure the internal dip switch on the interface card has position 6 set to one-cycle (ON), position 7 set to COUNTER/TIMER (OFF) and position 8 set to NORMAL (ON). Finally, make sure the front panel DWELL switch is turned all the way off.

Using the 994 or 996 as a Blind Timer

In the blind timer mode, the 994 has the monitor counts connected to IN A and detector counts connected to IN B. The 996 has only one input to be use for detector counts. The internal jumpers W3 and W4 (for the 994) must be set to the COUNTS position (the leftmost two pins on W3, the rightmost two pins on W4). Jumper W1 must be set to the NORMAL position (the two rightmost pins). Also, make sure the internal dip switch S-1 has position 6 set to one-cycle (ON), position 7 set to COUNTER/TIMER (OFF) and position 8 set to NORMAL (ON). Finally, make sure the front panel DWELL switch on the 994 is turned all the way off.

When operated as a blind timer, `spec` cannot read back the elapsed time from the module. Instead, when counting to monitor counts, when counting in powder mode, when reading the counters during updated counting and when counting is aborted with a ^C, the elapsed count time is estimated from the software clock.

Gating

An external enable signal from certain motor controllers may be fed into the rear-panel gate BNC input on the 974 or the front panel enable BNC input on the 994 for precise counter gating in powder-mode scans.

If using a second Ortec module as a counter, you must connect the INTERVAL BNC connector (rear panel on 974, front panel on 994) to the master GATE on the 974 rear panel or to the ENABLE or individual GATE inputs on the 994, 995, 996 or 997 modules.

Setting Operational Parameters

The `counter_par()` function can be used to set various parameters associated with the Ortec module code in `spec`. The first argument to `counter_par()` is a channel number, although all the commands affect all channels of the associated module, or all of the Ortec modules, if appropriate.

`counter_par(counter, "alarm", mode)` – If `mode` is zero, turns off the ALARM mode of operation of the timer, and turns on a polled mode. If `mode` is one, ALARM mode is turned on. The default operation used to be for ALARM mode to be turned on. However, recent versions of the Ortec firmware changed the meaning of ALARM mode such that it is no longer usable with `spec`, at least over the GPIB interface. Thus, ALARM mode is disabled when the GPIB interface is used, except for blind-timer mode with the 994 and 996, where it is required.

`counter_par(counter, "alarm")` – Returns one if ALARM mode is on. Otherwise returns zero.

`counter_par(counter, "display", channel)` – Sets the counter channel that will be displayed on the associated module. For the 974 modules, valid values for `channel` are 1 to 4. For the the 994 and 995 modules, valid values for `channel` are 0 and 1.

`counter_par(counter, "display")` – Returns the channel number currently being displayed.

`counter_par(counter, "local", mode)` – If `mode` is nonzero, will force the associated module to go into local mode to allow front panel operation. In addition, the module will be placed in local mode after each count interval. If `mode` is zero, the module will be set to remote mode at the start of the next count interval, and will not be set back to local mode after counting. When `SPEC` starts up, not switching to local mode is the default behavior to minimize overhead.

`counter_par(counter, "local")` – Returns zero if the associated module is to be kept in remote mode. Otherwise, returns one.