

## Detecting Measurement Events In The 2001

Instruments that complied with the IEEE-488.1 standard used a Serial Poll Byte to return important information about internal functions of the instrument. The 2001 on the other hand, which complies with the IEEE-488.2 standard, no longer uses a Serial Poll byte. It contains many status registers. These registers include a Standard Event, Operation Event, Arm Event, Sequence Event, Trigger Event, Measurement Event, and a Questionable Event register. There is also a Status Byte register which is used to summarize the status of a few of the previously mentioned event status registers. The status byte register of the 2001 should not be confused with the status byte register used on IEEE-488.1 compliant instruments.

The Measurement Event Status Register is a latched, 16-bit read-only register whose bits are set by the Measurement Event Condition register and Transition filter. Once a bit is set, it will remain set until the register is cleared by a specific operation.

The Measurement Event Status Register is composed of the following conditions:

Bit 11	Buffer Pretriggered	Weighted value = 2048
Bit 10	Buffer Overflow	Weighted value = 1024
Bit 9	Buffer Full	Weighted value = 512
Bit 8	Buffer Half Full	Weighted value = 256
Bit 7	Buffer Available	Weighted value = 128
Bit 6	Voltmeter Complete	Weighted value = 64
Bit 5	Reading Done	Weighted value = 32
Bit 4	High Limit 2	Weighted value = 16
Bit 3	Low Limit 2	Weighted value = 8
Bit 2	High Limit 1	Weighted value = 4
Bit 1	Low Limit 1	Weighted value = 2
Bit 0	Reading Overflow	Weighted value = 1

These bits generally will provide the most usable information that a user will need. As an example, suppose the 2001 is collecting data into the data buffer and you would like to know when the buffer is full. To permit the Measurement Event Status register to latch the Buffer Full bit, the Measurement Event Positive Transition Filter must be masked such that when the rising edge of the Buffer Full bit of the Measurement Event Condition register occurs, the Buffer Full bit in the Measurement Event Status register is latched. A complete figure of the Measurement Event Status registers is attached to help understand the process. The example code below illustrates this example ( code is written using the CEC format ):

```
'** Set Positive &NegativeTransition Filters here, send *CLS to clear
'** status model
cmd$ = ":Status:Measure:Ptransition 512; Ntransition 0"
Call Send(GPIBAddress, cmd$, status%)
cmd$ = "*CLS"
Call Send(GPIBAddress, cmd$, status%)
'
'***Code to start reading process is placed here
'
'**** Check for Buffer Full here
Do
```

```
cmd$ = ":Status:Measure:Event?"      'Query Measure Event Status
Call Send(GPIBAddress, cmd$, status%)
Call Enter(Event$, 10, 1%, GPIBAddress, status%)
Loop Until (Val(Event$) AND 512) = 512 'Loop until buffer full bit is set
'
```

This procedure can be applied to other events in the registers as well as the other status registers available in the 2001. See the 2001 IEEE-488 Reference section for a complete breakdown of the 2001 Status Model.

John Tucker 5/3/92