Event Status Bit

Local Application

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In a previous note, *Status Bit From Event*, a method was described to derive a status byte in the BBYTE digital data pool, using a CSTAT table entry to collect event bits into an analog channel reading, then a BADDR entry that points to the byte so assembled. The method involves five carefully orchestrated steps, which may make it difficult to do correctly the first time. This note describes a new local application called EVST that reduces the work of the above to an instance of an LA.

A key motivation for creating a status bit that reflects an event status, which means that the event occurred since the start of the local node's last 15 Hz cycle, is to creat a status for Bit 0x009F. This dedicated Bit number is used to indicate beam status for the current cycle, where 0 = beam. It has always been installed in Linac nodes and delivered from hardware. But for nodes that do not have this hardware digital input signal, the method described here can suffice to create it. The reason it is important to have this status indication in Bit 0x009F is that the automatic averaging provided normal RETDAT requests using slow periods such as 1 Hz relies on it to separate out the 15 Hz reading values that are preferentially summed to produce the average value returned in the reply. In the absence of any beam cycles during the request period, the simple average of all non-beam cycles is returned. Note that in the case that Bit 0x009F is always the stme state, whether 0 or 1, the simple average is returned.

Parameters

The Page E parameters that apply for this new EVST local application are as follows:

Parameter	*Example*	*Meaning*
ENABLE B	00B1	Usual Bit# to enable this LA
EVENT	0052	Clock event number in range 0x0000–0x00FF
STATUS B	809F	Target status Bit#, sign bit used for inverting state

Operation

The function HaveEvt() is called to determine whether the indicated event is true for this cycle. The target bit status in the appropriate byte of the BBYTE table is then set to reflect that event state, where setting the sign bit of the Status Bit number parameter indicates that the new status should be the inverse of the event state.

The example shows monitoring event 0x52 and setting the inverse of that state into Bit number 0x009F in the BBYTE table. Thus, when event 0x52 occurs, indicated by a true return from HaveEvt(), the status Bit will be set to 0; otherwise, it will be set to 1. Event 0x52 implies HEP beam in Linac, so it is a reasonable choice for deriving beam status.

Summary

This is a very simple example of a local application. As such, it may be useful as an example for writing other simple local applications. For the IRM, this LA produced a 600-byte executable that executes in about 25 μs, as shown on Page E. For the PowerPC, this same LA resulted in a 900-byte object file, for which the execution time is about 2 μs.