

Accessing 15Hz Waveforms

Changes for FTPMAN

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In order to provide access to 15Hz waveforms, a data stream scheme can be used via RETDAT using a special application to interpret the replies. In order to operate the digitizer in auto-trigger mode, so that it can digitize each 15Hz waveform, FTPMAN must capture the waveform directly from the hardware buffer, when the specified clock event occurs. The current support for the Swift digitizers operates by using the services of the SWFT local application, in which each snapshot request must be placed into a command queue that SWFT acts upon serially. This mode and the auto-trigger mode are incompatible. So SWFT cannot be used, and FTPMAN has to be changed to capture SWFT waveforms that are measured at 15Hz.

The FTPMAN logic would like to operate in both ways. If it detects that the Swift digitizer is operating in auto-trigger mode, or if there is no data stream queue available, it can monitor the clock events itself; otherwise, it can expect SWFT to handle it. When in SWFT mode, it needs to check for the occurrence of the expected clock event itself; otherwise, it should monitor the current status data structure in the data stream queue header that functions as a command queue.

An auto-trigger snapshot request can pay attention to the specified clock event, but it should include in its status reply with the currently-selected delay and digitize rate. Those parameters must be changed globally.

RETDAT changes

It is desirable to support byte offset access to a waveform array. If the supplied offset value is zero, and if the number of bytes requested is two, the usual Reading field from the ADATA table is accessed. But if the supplied offset is nonzero, or the number of bytes requested is more than two, but a multiple of 2 bytes, then the data accessed is a portion of the waveform buffer, assuming that one exists. In order to determine whether a waveform exists for a given channel number, the CINFO table is searched for a match on the given channel number of a suitable type. Three types of digitizers can be supported by this method: the Swift, the Quick, and the Quicker digitizers. The KHz digitizer will not get this kind of support, at least initially.

Devices needed to support BLM waveforms

The Swift digitizer hardware is operated at 12.5KHz to deliver 35 ms of each waveform in 475 points. Each waveform will be an Acnet device. For each set of 8 Swift digitizer channels, a rate channel and a delay channel are used. Access to sampled elements of the waveform array is done via the same signal channels that are used with FTPMAN requests for the waveforms. At this time, there is no need for populating the ADATA table entry for the waveform channels. One could copy the first waveform value into the ADATA entry reading field. There are devices needed to represent the dose accumulations. Since there may be 10–16 of these per waveform, they are defined as array devices. What will determine the ranges used for dose accumulations? They could be fixed in the local application that supports them; it would probably be desirable to have the same ranges specified throughout the Booster.