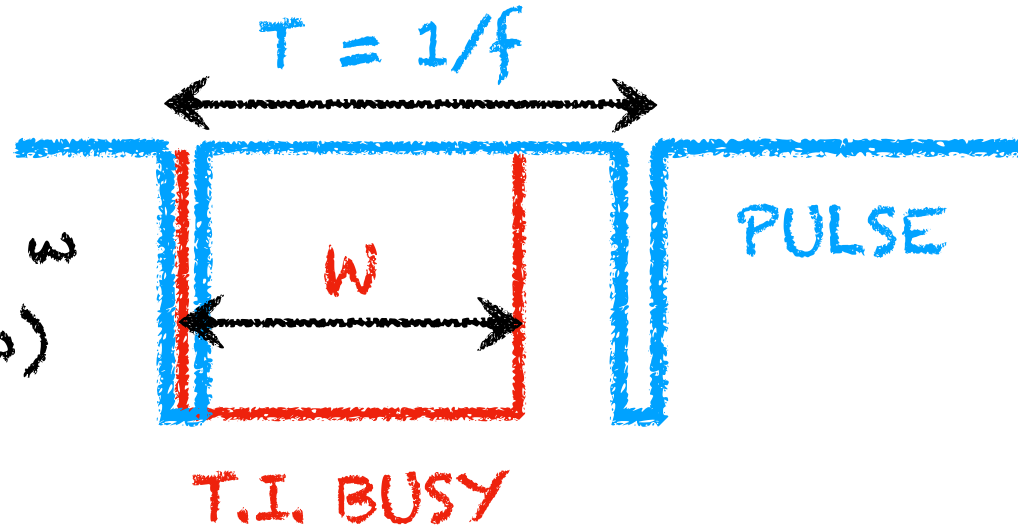


# Dead-Time Studies

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Eric Pooser  
11/21/2017

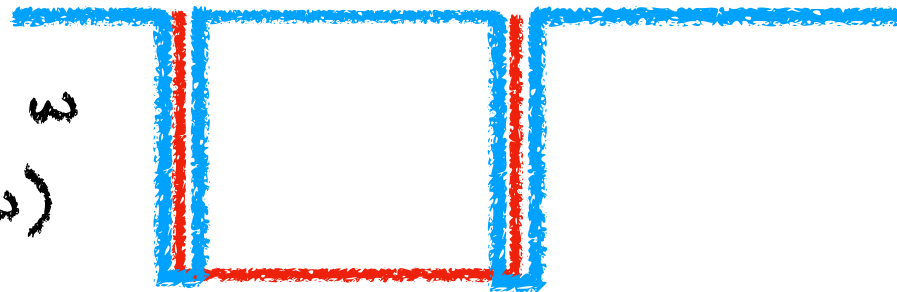
# Basic Concepts

Case 1:  $T > w$   
(or  $f < 1/w$ )



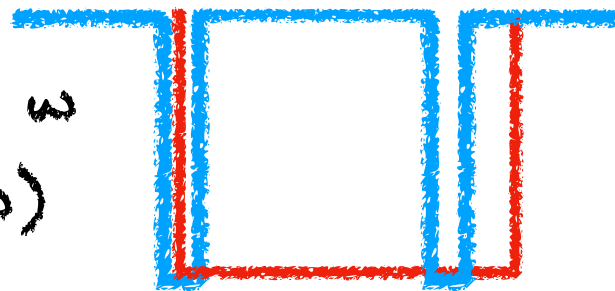
Case 1:  $T > w$  (or  $f < 1/w$ ):  
Live Time = 100% (only EDTM)

Case 2:  $T = w$   
(or  $f = 1/w$ )



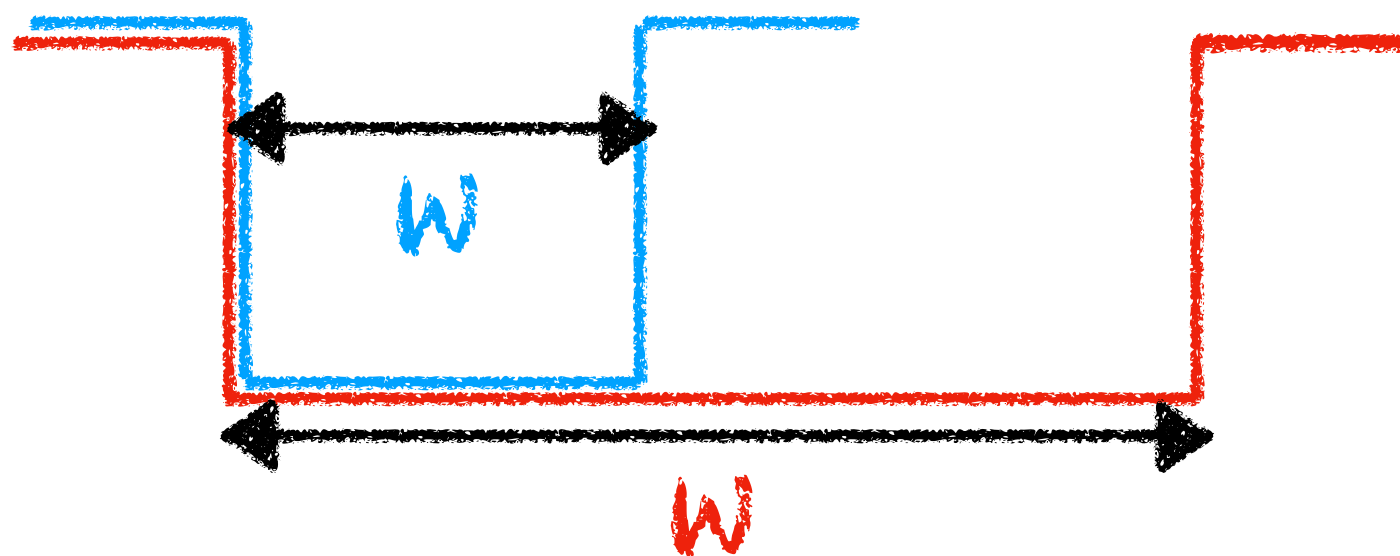
Case 2:  $T = w$  (or  $f = 1/w$ ):  
Live Time  $\sim 50\%$

Case 3:  $T < w$   
(or  $f > 1/w$ )



Case 3:  $T < w$  (or  $f > 1/w$ ):  
Live Time  $< 50\%$

# HMS Trigger Interface Busy



TI BUSY with NO scaler reads  
 $W = 270 \text{ us}$  (3.703 kHz)

TI BUSY with scaler reads  
 $W = 816 \text{ us}$  (1.225 kHz)

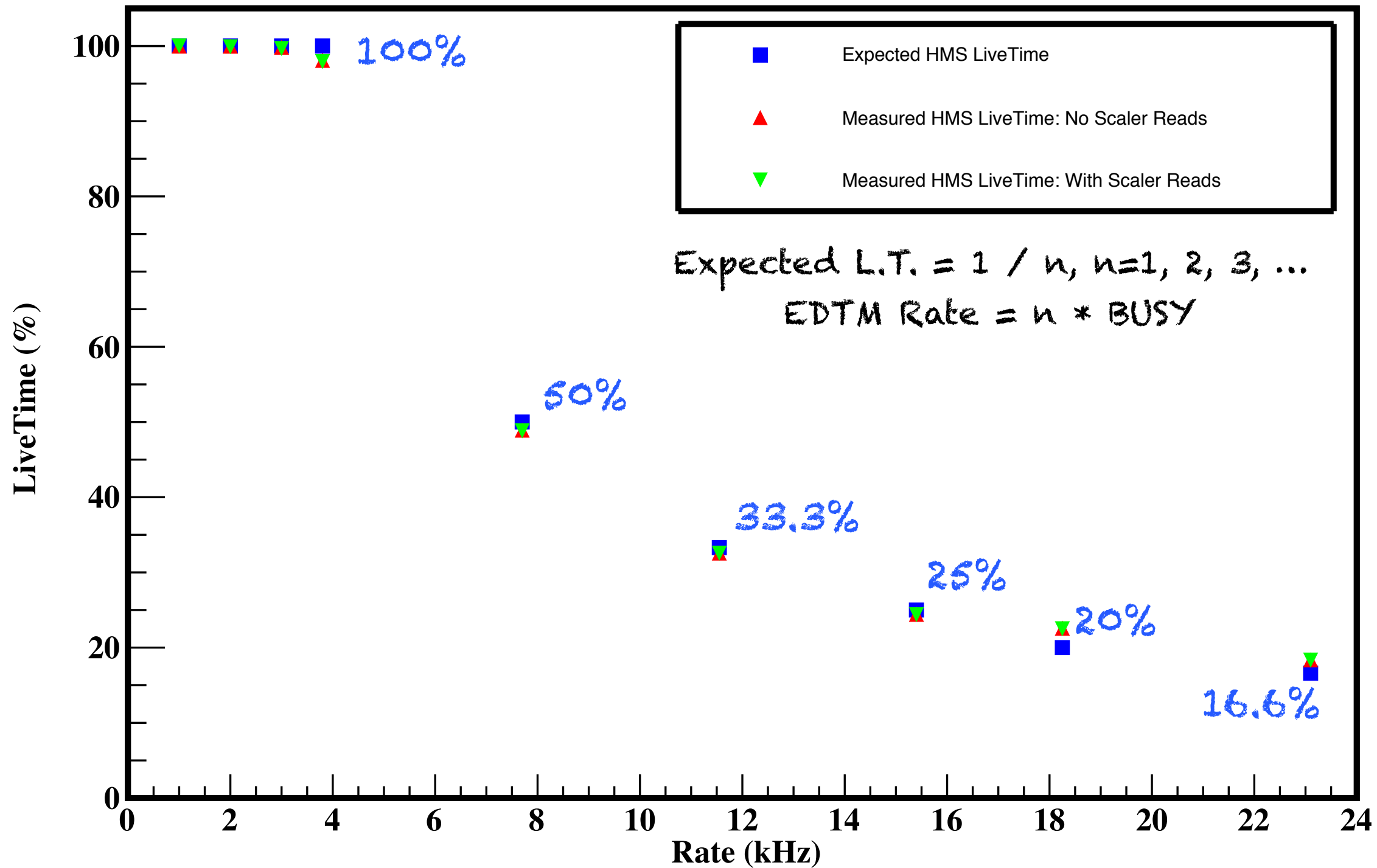
What are scaler reads?

The DAQ can be configured for scalers to be read out at intervals of time/event counts during a run

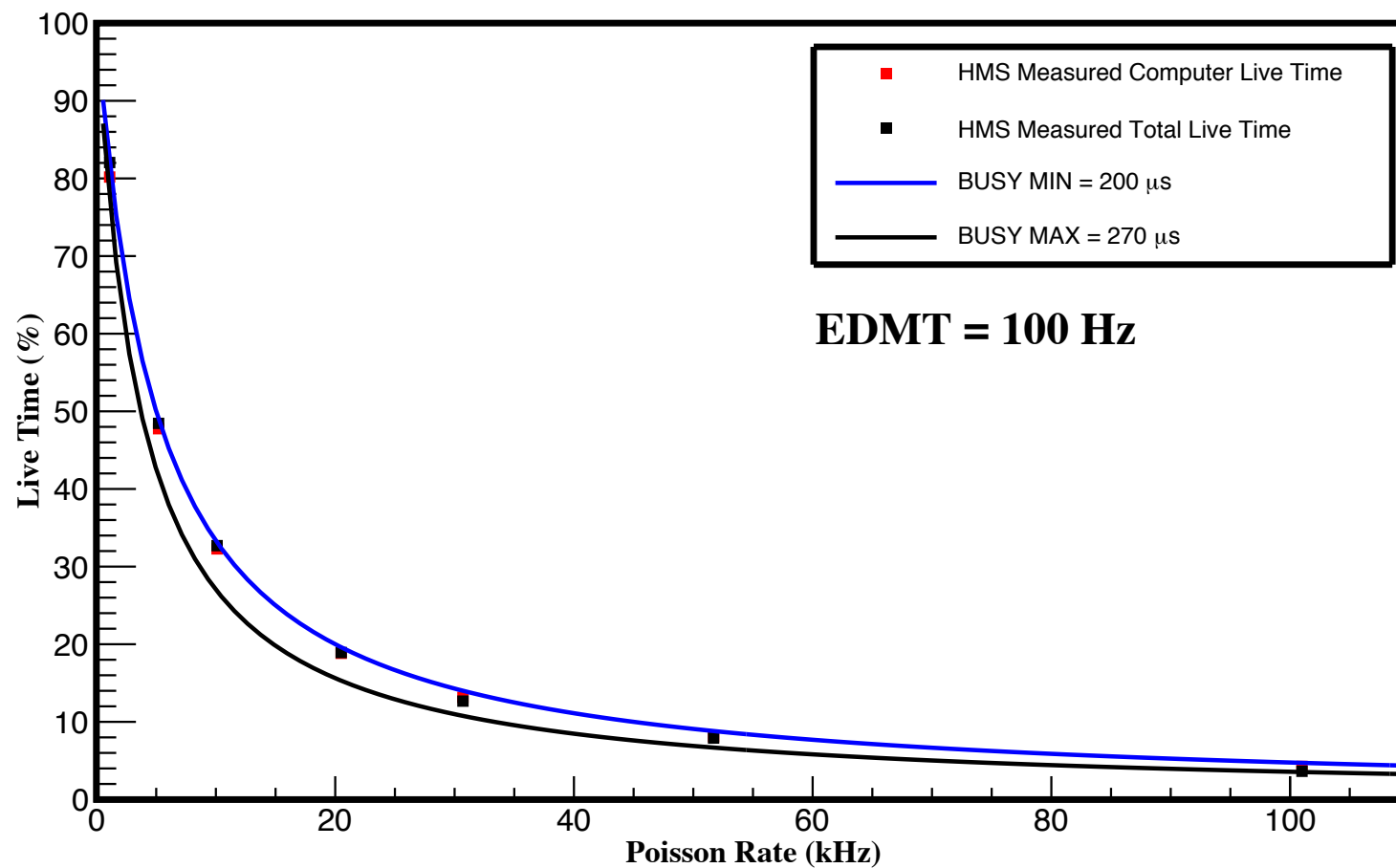
Example: scaler counts = 1000 events, t-scaler = 2 sec. ,  
every 1000 events or a 2-sec period, the SCALERS will produce  
an inhibit signal (RED)

# Total Live Time Using **ONLY** EDTM Pulse

## HMS Live Time Measurements



### HMS Live Time Measurements (NO Scaler Reads)



### HMS Live Time Measurements (with Scaler Reads)

