

# Readout

## Online DAQ Code Tutorial

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```
stern - Private Shell
File Edit View Profiles Help
Connect Disconnect Terminal SecureFTP Settings Copy Paste Find Help
ibonline@stern:~/ibgroup/COLTRIMS/Production/Readout$ ls
C1290EventSegment.cpp  CCAENEventSegment.o  CV1290Trigger.cpp  CV560Scaler.o  Skeleton.h
C1290EventSegment.h   CCAENV560.cpp        CV1290Trigger.h   Makefile       Skeleton.o
C1290EventSegment.o   CCAENV560.h         CV1290Trigger.o   rdstart
CCAENEventSegment.cpp CCAENV560.o         CV560Scaler.cpp   Readout
CCAENEventSegment.h   CCAENV560Registers.h CV560Scaler.h     Skeleton.cpp
ibonline@stern:~/ibgroup/COLTRIMS/Production/Readout$
```

C1290EventSegment.cpp – V1290N TDC

Makefile – Linux file for compiling

CCAENEventSegment.cpp – V785N ADC

rdstart – Script for starting Readout

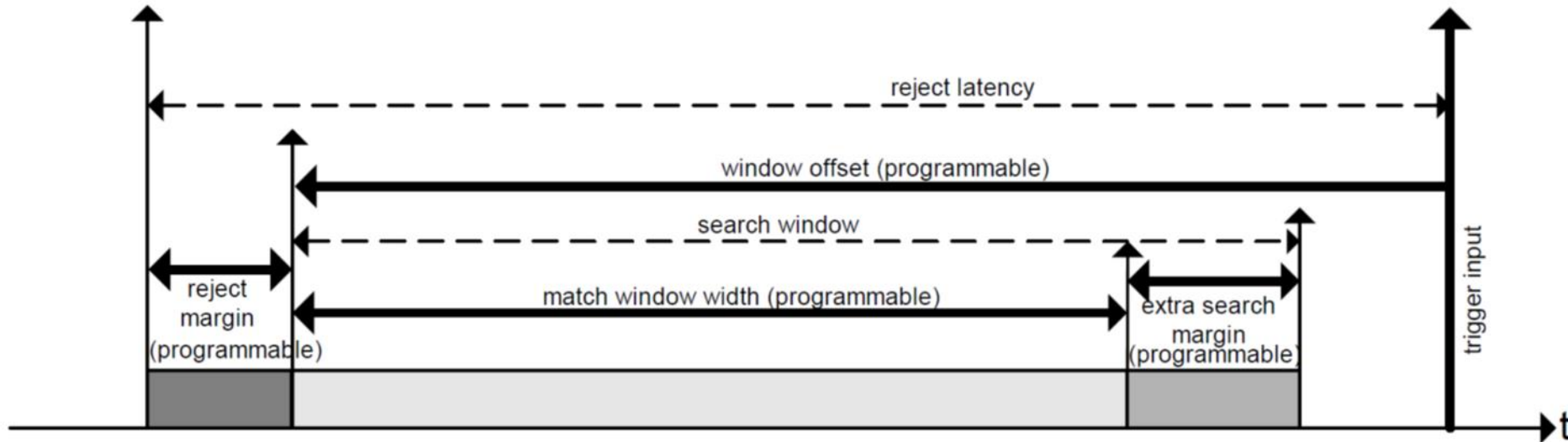
CV560Scaler.cp – V560N Scaler

Skeleton.cpp – Base file to define modules

```
C1290EventSegment.cpp - KWrite
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void
C1290EventSegment::initialize()
{
    pModule->TriggerMatchMode();
    pModule->SetWindowWidth(1200); // 400 X 25 = 10 microsec
    pModule->SetWindowOffset(-1200); // offset same as width
    pModule->SetExtraSearchMargin(8);
    pModule->SetRejectMargin(1);
    pModule->SetEdgeDetectMode(CCAENV1x90::EdgeMode_Leading);
    pModule->DisableTDCencapsulation();
    pModule->SetMaxHitsPerEvent(CCAENV1x90::HITS_UNLIMITED);
    pModule->EnableTriggerTimeSubtraction();
}

Line: 41 Col: 18 LINE INS C++ C1290EventSegment.cpp
```



```
CCAENEventSegment.cpp - KWrite
File Edit View Bookmarks Tools Settings Help
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CCAENEventSegment::initialize()
{
    m_pCard->reset();
    m_pCard->setThreshold(-1,7);
}

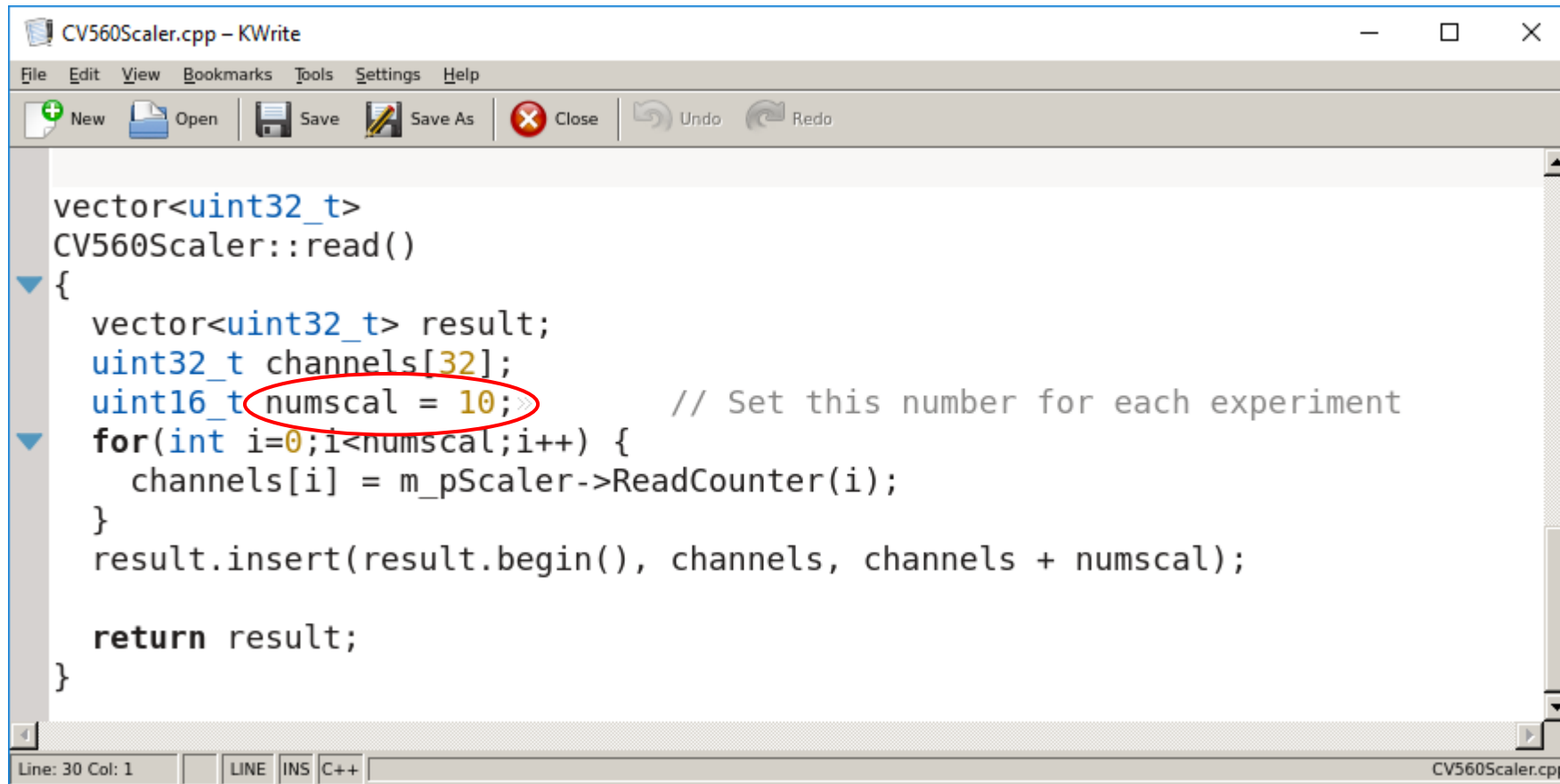
void
CCAENEventSegment::clear()
{
    m_pCard->clearData();
}

size_t
CCAENEventSegment::read(void* pBuffer, size_t maxwords)
{
    // Maximum number of words is 18*2 for V785N: 16 channels, 1 header, 1 traile
    if (maxwords < 18*2) {
        throw
            std::string(
                "CCAENEventSegment - insufficient buffer space for worst case event");
    }
    for(int i=0; i < 100; i++) {
        if(haveEvent()) break;
    }
    int n = (m_pCard->readEvent(pBuffer))/sizeof(uint16_t);
    return n;
}

Line: 15 Col: 2 LINE INS C++ CCAENEventSegment.cpp
```

*Threshold for ADC. -1 means all inputs.  
7 in units of 16 channels=126.*

*Allow time for ADC to digitize after TDC trigger.*



```
CV560Scaler.cpp - KWrite
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vector<uint32_t>
CV560Scaler::read()
{
    vector<uint32_t> result;
    uint32_t channels[32];
    uint16_t numscal = 10; // Set this number for each experiment
    for(int i=0;i<numscal;i++) {
        channels[i] = m_pScaler->ReadCounter(i);
    }
    result.insert(result.begin(), channels, channels + numscal);

    return result;
}

Line: 30 Col: 1 LINE INS C++ CV560Scaler.cpp
```

```
#  
# This is a list of the objects that go into making the application  
# Make, in most cases will figure out how to build them:  
  
OBJECTS=Skeleton.o C1290EventSegment.o CV1290Trigger.o CCAENEventSegment.o CV560Scaler.o CCAENV560.o
```

Line: 29 Col: 1    LINE    INS    Makefile    Makefile

*Names of \*.cpp files included in Readout code.*

```
Skeleton.cpp - KWrite
File Edit View Bookmarks Tools Settings Help
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void
Skeleton::SetupReadout(CExperiment* pExperiment)
{
    CReadoutMain::SetupReadout(pExperiment);

    // Establish your trigger here by creating a trigger object
    // and establishing it.

    // Create and add your event segments here, by creating them and invoking CExperiment's
    // AddEventSegment
    pExperiment->EstablishTrigger(new CV1290Trigger(4, 0x4000000));      Trigger
    pExperiment->AddEventSegment(new C1290EventSegment(4, 0x4000000));  TDC
    pExperiment->AddEventSegment(new CCAENEventSegment(2, 0x2000000));  ADC
}

Line: 96 Col: 1  LINE INS C++ Skeleton.cpp
```

```
Skeleton.cpp - KWrite
File Edit View Bookmarks Tools Settings Help
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Skeleton::SetupScalers(CExperiment* pExperiment)
{
    CReadoutMain::SetupScalers(pExperiment);» // Establishes the default scaler trigger.

    // Sample: Set up a timed trigger at 2 second intervals.

    timespec t;
    t.tv_sec = 2; // Seconds between scaler reads.
    t.tv_nsec = 0;
    CTimedTrigger* pTrigger = new CTimedTrigger(t);
    pExperiment->setScalerTrigger(pTrigger);

    // Create and add your scaler modules here.
    pExperiment->AddScalerModule(new CV560Scaler(0x3000000, 0));
}

Line: 137 Col: 17  LINE INS C++ Skeleton.cpp
```

```
rdstart
File Edit View Bookmarks Tools Settings Help
New Open Save Save As Close Undo Redo
#!/bin/bash
. ~/.bashrc
killall -9 Readout
/usr/opt/daq/current/bin/ReadoutShell -host=localhost -path=/
common/argroup/Ringbuffer/COLTRIMS2/Readout/Pump_Probe/Readout
killall -9 Readout
Line 5, Column 19 INSERT Soft Tabs: 4 (8) UTF-8 Bash
```

Run Control

File Scalers

Host: localhost Readout Program: /common/argroup/Ringbuffer/COLTRIMS2/Readout/Pump\_Probe/Readout

Title: Set a new title

Run Controls:    Record

Run Number: 3170

Timed Run 0 : 0 : 0 : 0

Elapsed Active Time (d-hh:mm:ss): 0 00:00:00.00

Readout Output

```
Run Starting
Mon Feb 12 09:02:08 CST 2018 : Starting the Readout program.
Running /home/aronline/.readout/Readout with cwd /common/argroup/Ringbuffer/COLTRIMS2/Readout/Pump_Probe
%
```

No run file segments for run 3170 yet

aronline@ampere:~/argroup/Ringbuffer/COLTRIMS2/Readout\$  
./rdstart

