

# ACDC DAQ Programmers Manual

Jonathan Eisch, Miles Lucas, Eric Oberla and Others

## Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Commands</b>	<b>2</b>
2.1	Template . . . . .	3
2.1.1	Bit Fields . . . . .	3
2.1.2	Source . . . . .	3
2.1.3	Destination . . . . .	3
2.2	Sync Usb . . . . .	5
2.2.1	Bit Fields . . . . .	5
2.2.2	Source . . . . .	5
2.2.3	Destination . . . . .	5

## 1 Introduction

This document is intended to document the commands sent to the ACC and ACDC cards.

It includes source listings of the source and destinations for each command as they were when this documentation was written. New implementations may have been written since, but that is outside the scope of this document.

## 2 Commands

2.1	Template	3
2.1.1	Bit Fields	3
2.1.2	Source	3
2.1.3	Destination	3
2.2	Sync Usb	5
2.2.1	Bit Fields	5
2.2.2	Source	5
2.2.3	Destination	5

## 2.1 Template

### 2.1.1 Bit Fields

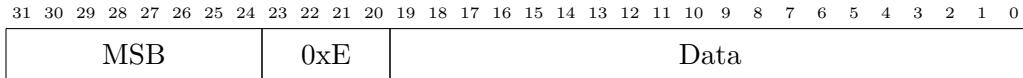


Figure 1: Command 0xE bit fields

Bit Range	Name	Description
31-24	MSB	This is really the most significant byte
23-20	<b>0xE</b>	Command marker
19-0	Data	All of the data.

### 2.1.2 Source

#### acdc-daq:src/DAQinstruction.cpp

```
void SuMo::software_trigger_slaveDevice( unsigned int
    ↪ SOFT_TRIG_MASK, bool set_bin, unsigned int bin )
{
    usb2.createHandles();
    const unsigned int hi_cmd = 0x000E0000;
    unsigned int send_word = hi_cmd | SOFT_TRIG_MASK | set_bin <<
        ↪ 4 | bin << 5;
    usb2.sendData(send_word);
    usb2.freeHandles();
}
```

### 2.1.3 Destination

#### ACDC-Firmware:SRC/dff\_async\_RST.vhd

```
library IEEE;
use IEEE.STD_LOGIC_1164.all;
use IEEE.numeric_std.all;
```

```
entity dff_async_rst is
  port( d, clk, reset: in std_logic;
        q: out std_logic);
end dff_async_rst;
architecture behav of dff_async_rst is
begin
  process(clk,reset)
  begin
    if (reset='1') then
      q <= '0';
    elsif rising_edge(clk) then
      q <= d;
    end if;
  end process;
end behav;
```

## 2.2 Sync Usb

This command does something regarding to syncing the usb

### 2.2.1 Bit Fields

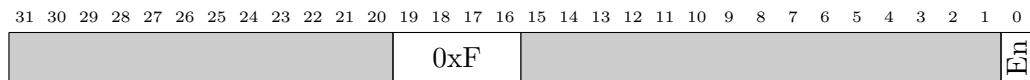


Figure 2: Command 0xF bit fields

Bit Range	Name	Description
19-16	<b>0xF</b>	Command marker
0 0	En	Boolean to enable or disable usb sync

### 2.2.2 Source

#### acdc-daq:src/DAQinstruction.cpp

```
void SuMo::sync_usb( bool SYNC ) {
    createUSBHandles();
    if(SYNC != false) { //enable USB_SYNC
        usb.sendData((unsigned int)0x000F0001);
        if(mode == USB2x) usb2.sendData((unsigned int)0x000F0001
            ↪ );
    } else { //disable USB_SYNC
        usb.sendData((unsigned int)0x000F0000);
        if(mode == USB2x) usb2.sendData((unsigned int)0x000F0000
            ↪ );
    }
    closeUSBHandles();
}
```

### 2.2.3 Destination