Notes on using and accessing the Shield Plex

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1 Introduction

This document is intended to serve as a quick reference to accessing the shield plex information in the database and relating the individual shield modules with their electonics readout channels. At the time of writing of this document, the Plex tables for the current configuration of the shield are incomplete and inaccurate. It is assumed the user of this document has access to the central or a local distribution of the MINOS MySQL database and access to the maps and tables contained in

`http://home.fnal.gov/~asousa/shield/shield.html`

2 Getting Started

The first step is to logon to your account on a machine running the MINOS MySQL database (*e.g.* minos-offline at soudan) :

```
prompt> ssh account@minos-offline.minos-soudan.org
```

Source your setup_minossoft script which will configure properly your environment variables:

```
prompt > source setup_minossoft_soudan
```

Start a mysql session:

```
prompt > mysql --user=reader -p
```

You will be asked for a password. If you do not know the password, look inside the setup_minossoft script for the word next to ENV_TSQL_PSWD and try again. If all goes well. you should see something like:

```
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 7147 to server version:  3.23.43
Type 'help;' or '\h' for help.  Type '\c' to clear the buffer.
mysql>
```

3 Looking at some Database Tables

Inside your mysql session, you will be interested in the offline tables. These are selected by doing:

```
mysql> use offline;
```

Suppose you wish to obtain the MUX Plane number for one of the physical modules composing the shield, for instance, the Top2_05 module in section 1. Looking at the Plex map for section 1, one finds the module number to be **548**. We can look at this particular module by doing (note that tab completion works in MySQL):

```
mysql> SELECT * from PLEXVETOSHIELDMUXTOMDL where MDLPLN = 548;
```

From the output one finds that MUXPLN=523. We can find out more about the readout of this MUX plane through the command:

```
mysql> SELECT * from PLEXPIXELSPOTTOSTRIPEND where PLANE = 523;
```

In the first column the sequence number has the fromat 20000XXXX, where "XXXX" is the number of the readout mux box. Summarizing the relevant information from the output we just obtained:

- ★ Mux Box number: 5001 and 5004 (South and North ends of the modules respectively)
- ★ RackBay: 1 and 5
- ★ Position: East, Top.
- ★ Position in the Rack: 9 (Mux box positioned on top of the rack, 8 would mean the very bottom of the rack)
- ★ PMT Tube: 0

We can access information on the electronics using yet another table. Let us focus, for example, on Mux Box 5004 and Pixel 5 in Tube 0 and look at the output of :

`mysql> SELECT * from PLEXPIXELTORAWCHANNEL where SEQNO=200005004 and PIXEL=5 and TUBE=0;`

This corresponds to the electonics channel:

- ★ Crate: 4
- ★ VARC: 2
- ★ VMM: 5
- ★ VAADC: 1
- ★ VAChip: 0
- ★ VAChannel: 9

4 Useful Example. Determining the position of shield light leaks

Looking at the difference between singles rates taken with lights on and lights off, it is possible to find light leaks in the detector and in the shield.

Supposing some shield readout electonics channel presents a light leak, one can narrow down the physical position of the light leak using the plex information.

Assume the light leak was found at crate 0, varc 2, vmm 5, vaadc 1, vachip 0, vachan 5. The database information for this channel is obtained via:

`mysql> SELECT * from PLEXPIXELTORAWCHANNEL where CRATE=0 and VARC=2 and VMM=5 and VAADCSEL=1 and VACHIP=0 and VACHAN=5;`

The ouput tells us the channel is readout by pixel 1 in tube 0 of mux box 5001. Next step:

`mysql> SELECT * from PLEXPIXELSPOTTOSTRIPEND where SEQNO=200005001 and TUBE=0 and PIXEL=1;`

The mux plane is thus found to be 517. Now we do:

`mysql> SELECT * from PLEXVETOSHIELDMUXTOMDL where MUXPLN=517;`

where the MDLPLN column shows the phyical planes to be 533 through 537. Using the Plex map together with the overview map found in the webpage, the light leak can be traced to be on one of the Section 1 Top_01 modules (Section 1 Top portion bottom layer). In this case, all 5 of the modules would have to be tested for light leaks.

5 Useful References

For some guidance in using SQL commands, see:

`http://www.mysql.com/doc/en/Data_Manipulation.html`

Some general knowledge on MySQL can be found at:

`http://minos.phy.bnl.gov/fom/cache/141.html`

To better understand the Plexus, look at:

`http://www-numi.fnal.gov/fnal_minos/computing/srt_public_context/doc/UserManual/node6.html`