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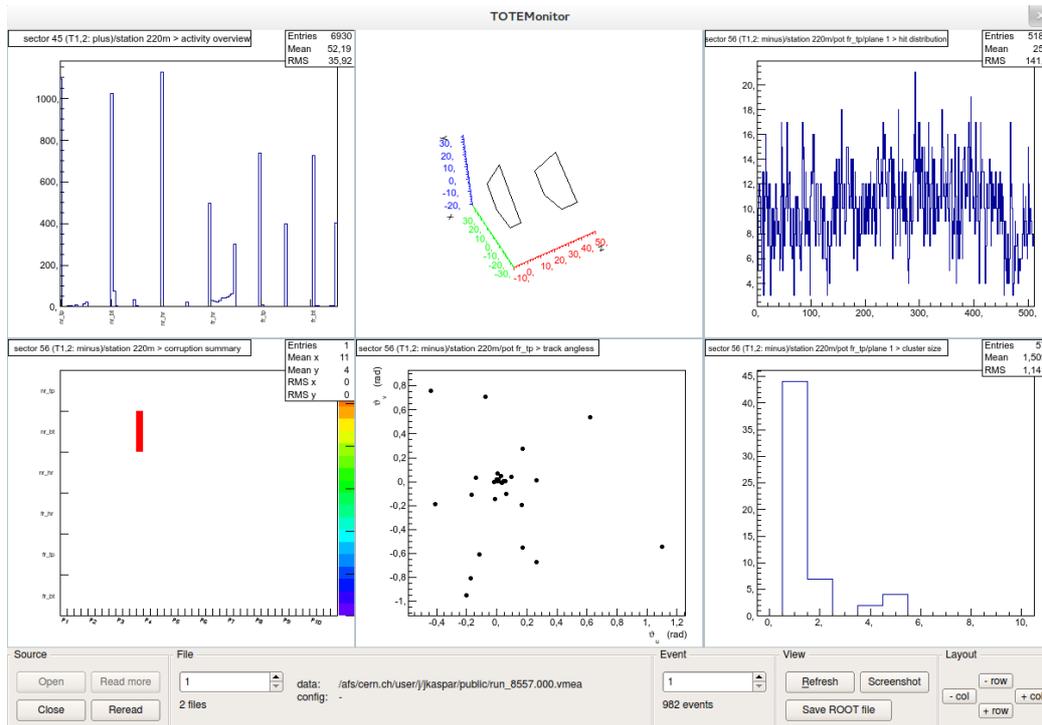
# Totem Monitor: User manual

This manual describes version 4.5.

## Using the GUI

The GUI consists of three windows: **main window**, **open dialog** and **canvas layout dialog**. When the Monitor is launched, an empty main window appears. In order to open and analyze a data file, click on **Open** button and invoke the open dialog. The detailed usage of all three windows is described in the following sections.

## Main window



The main window consists of the **control panel** in the bottom of the window and the **canvas** area with custom plots. The canvas is formed by a grid of **pads**, each pad shows one plot. To change number of rows and columns in the canvas grid, use buttons in the **layout** section of the control panel. To **change plot** displayed by a pad, double click (or alternatively click while holding ctrl key) on the desired pad. The canvas layout dialog opens and you can select the desired plot. For more details consult the dedicated sections.

## Multiple files

In main window you can switch between files. For per-event-plots event is identified by pair **event number + file number**. Cumulative plots use data from all data files.

## Open dialog

Open a source (on lxplus0184.cern.ch)

<< previous values    next values >>

Hardware setup file

Data source information

Type

	Data file	Config file	
1	/afs/cern.ch/user/m/mzmuda/inputs/data1.vmea	/afs/cern.ch/user/m/mzmuda/public/dat_from_v	<input type="button" value="Browse Data"/>
2	/afs/cern.ch/user/m/mzmuda/inputs/data2.vmea	/afs/cern.ch/user/m/mzmuda/public/dat_from_v	<input type="button" value="Browse Config"/>
3	/afs/cern.ch/user/m/mzmuda/inputs/data3.vmea	/afs/cern.ch/user/m/mzmuda/public/dat_from_v	<input type="button" value="Add row"/>
			<input type="button" value="Remove row"/>
			<input type="button" value="Up"/>
			<input type="button" value="Down"/>

Cycles per configuration     Events per cycle

Setup Container

Source directory

Reset

TTP test

Perform a TTP test and write protocol

Load settings for test

Protocol file

**Hardware setup file** describes the hardware setup of the run, e.g. which VFATs were present, mappings of VFATs to detectors, etc. For more details, see section of hardware setup file.

### Data source information group

**Type** specifies type of the run. Possible values are listed in the following table

Offline	for data taking (not for scans), possible to analyze single events
Online	not yet implemented
Generic scan	for threshold, pulse, latency and other scans
Latency scan, external trigger	for threshold, pulse, latency and other scans - in this mode configuration cycles are disabled - uses VFAT controller dumps to create mappings
TrimDAC scan	for TrimDAC scan and analysis
No data (DCU)	no data are processed, useful for showing DCU graphs, etc.

**Data file** is the file with raw data (usually .vmea format; .dat for binary format, .txt for ASCII format).

**Config file** (I2C configurations) (only for scans) is file with VFAT registers as they change during scan (VFAT controller dump).

**Cycles per configuration** and **events per cycles** (only for scans) are parameters for synchronization of data and I2C configurations. If you enter wrong value, Monitor is likely to issue a warning or an error in the end of processing.

User may use **Browse** buttons to select multiple files (for instance using ctrl+click). After selecting those files appear at the table. Another way of selecting files is manually typing their paths into new rows. For scans you need to pair configuration and data files. For that purpose use Up and Down buttons - they swap cells moving contents of currently selected cell.

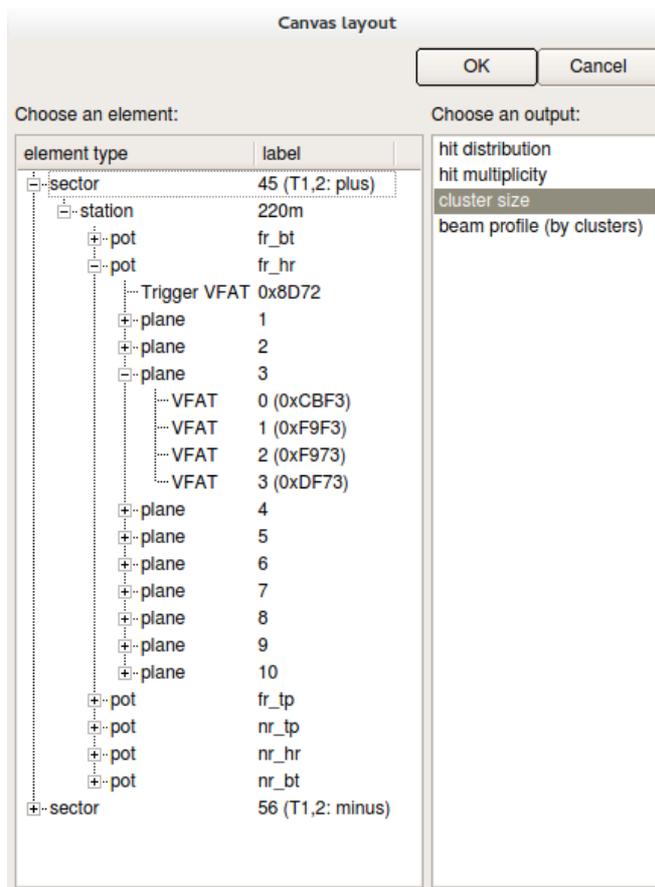
## Setup container group

**Source directory** is the directory with setup information other than I2C configuration. At the moment it is used only for DCU information. You need not fill this field in unless you want to use DCU information. The DCU information is cached by the Monitor run (it is not read again and again from files) and thus if you change a DCU file, you must check **Reset** box to reset the cache. Alternatively you can switch off and on the whole Monitor program.

## TTP test group

This group provides convenient controls to perform VFAT production tests with TTP. Choose a test from the list **load settings for test** and the program will automatically fill in all the important fields. You can manually set the name of **protocol file**.

## Canvas layout dialog



The left column displays the list (tree) of hardware elements (see the section on hardware configuration file). First, select the element you are interested in. Then, the right column shows list of plots available for the selected hardware element. Select the desired plot and click on OK button (or alternatively double click on your chosen plot).

## Hardware setup (XML) file

This file describes the hardware setup as a **tree**. For example one Roman Pot contains 10 planes (hybrids), each plane has 4 VFAT chips and each VFAT has 128 channels. The tree is written in XML language and everything must be put in between `<top> ... </top>` tags. Each object (RP plane, VFAT, etc) is represented by a **tag** and for each tag there is a certain list of histograms available in the Monitor. Any tag can take a list of attributes, each tag **must** take parameter `id` which corresponds to the ID of the object and is shown in the Monitor. The ID can be specified in decimal or in hexadecimal (with `0x` prefix). All available tags are summarized in the TotemRawData documentation.

### VFAT tags

object	tag	parameters
(data) VFAT	<code>vfat</code>	<code>mask_channels</code> , <code>verbose</code> , <code>iid</code> , <i>DAQ position parameters</i>
	<code>test_vfat</code>	as above plus <code>scurvefit</code>
Trigger VFAT	<code>trigger_vfat</code>	

The usage of *DAQ position parameters* is explained in TotemRawData documentation.

`mask_channels` E.g. value of "12,13,56" means to exclude channels 12, 13 and 56 from later analysis.

`verbose` parameter influences the level of warnings and errors printed. Value 0 means no output, value 255 full output. Use 0 unless you have some suspicion.

By `iid` parameter one specifies the internal ID (position) of the VFAT within detector. It is used only if the chip is connected to a GEM. The value ranges from 0 to 16 for GEM.

The parameter `scurvefit` sets the fit options for S-curve fitting. Its value is composed of two parts. No separator is needed, but I suggest a comma though. One part specifies fit range, possible values are `full` (for full range) or `10\%` (for range starting at 10% of maximum). Second part determines fit option. Possible values are `opt1`, `optw` and `optww`. If any part is omitted (or whole `scurvefit` parameter is not present), the defaults (`full`, `opt1`) are used. The defaults can be invoked also by `scurvefit="default"`.

### RP tags

object	tag	parameters
one arm	<code>arm</code>	
one station	<code>station</code>	
one silicon detector	<code>rp_plane</code>	<code>z</code> , <code>orientation</code>
a set of silicon detectors	<code>rp_detector_set</code>	<code>doCorrelations</code>

`z` gives the `z` (perpendicular to the Si detectors) position of the plane, in mm.

`orientation` gives the orientation of the strips. Possible values are `u` and `v`.

`doCorrelations` controls whether the correlation plots (among planes) are built. They occupy a large portion of memory. The possible values are 0 (not built) and 1 (built).

### T1 tags

### T2 tags

object	tag	parameters
--------	-----	------------

one Arm    `t2_arm`            `TrackReco, CluFileName, SaveClusters`

one Half    `t2_half`

one GEM    `t2_detector`    `z, arm, ht, pl, pls`

Note on the parameters (in the table the obligatory (for each tag) "id" parameter is not reminded):

`t2_detector` parameters: `z`, `arm`, `ht`, `pl`, `pls` are the z-position (in mm respecto to the IP), the arm, the half telescope side (0-1), the plane (0..4), and the plane side (0-1) of the GEM.

`t2_half` parameter: the half id parameter is also used for distinguish the side. 0 means near (to the LHC center), 1 means far.

`t2_arm` parameters: If `SaveClusters` is set to 1, a ROOT file called `CluFileName` with T2 clusterization results will be saved. When the `TrackReco` parameter is 0 the clustering and the track reconstruction is not implemented allowing a faster monitor processing. When `TrackReco=1` track reconstruction is implemented and the corresponding histogram saved. The possibility of perform cluster and hit reconstruction is automatically propagated to the children of the arm. `t2_arm id=0` means arm plus (sect 4-5) , 1 arm minus (sect 5-6).

## Monitor configuration file

The Monitor uses a configuration file `~/qt/totemonitorrc`. Most parameters are related to the GUI and thus will not be documented. The parameters of user's interest are

```
[general]
readMoreNumberOfEvents
outputFilePrefix
```

```
[TTP]
configFile
```

The `readMoreNumberOfEvents` gives the number of events to be read when the "read more" button is pressed (defaults to 100). The `outputFilePrefix` is a string prepended to the filename when "Save to ROOT file" button is clicked. It defaults to "output\_", that means that the files will be saved in the current working directory. If you want to save the output files to, for example `/tmp` directory, you may use prefix `/tmp/output_`.

The `TTP/configFile` gives path to the TTP configuration file.

-- JanKaspar - 19 Aug 2008

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This topic: TOTEM > CompMonitorUserManual

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