NAME

trlo_setup_readout_control, trlo_read_event, trlo_read_multi_event, trlo_readout_clear, trlo_readout_next_first_evcnt, trlo_read_trig_scalers – Read event-wise data from TRLO II.

SYNOPSIS

#include "trlo_functions.h"

void trlo_setup_readout_control(volatile trlo_register_map ****hardware*,**
struct trlo_readout_control ****ctrl*,**
uint32_t *multi_trig_event_header_id***,**
uint32_t *trig_scalers_header_id***,**
uint32_t *failure_corrupt_data***,**
uint32_t *failure_too_much_data***);**
uint32_t trlo_read_event(volatile trlo_register_map ****hardware*,**
struct trlo_readout_control ****ctrl*,**
uint32_t *expect_cnt_incr***,**
uint32_t *expect_trlo_trig_type***);**
uint32_t trlo_read_multi_event(volatile trlo_register_map ****hardware*,**
struct trlo_readout_control ****ctrl*,**
uint32_t *****outbuf*,**
uint32_t ****endbuf*,**
uint64_t *****timebuf*,**
int *write_header***);**
void trlo_readout_clear(volatile trlo_register_map ****hardware*);**

uint32_t
trlo_readout_next_first_evcnt(struct trlo_readout_control ****ctrl*);**

uint32_t trlo_read_trig_scalers(volatile trlo_register_map ****hardware*,**
struct trlo_readout_control ****ctrl*,**
uint32_t *****outbuf*,**
uint32_t ****endbuf*,**
int *use_as_next_ref***);**

Link with *−ltrlo_ctrl*.

DESCRIPTION

For all functions, *hardware* is a pointer to a TRLO II module, see **trlo_setup_map_hardware**() or **trlo_setup_check_version**().

trlo_setup_readout_control() initialises control and statistics structures *ctrl* for future event-wise readout, such that readout function can operate efficiently. Trigger-related setup must be done before this function is called:

- TPAT to trigger mappings have been set. This is needed as the readout verifies that each trigger has at least one associated TPAT. Note that this implies not to generate triggers based on TPATs by the pending trigger mechanism.
- Multi-event trigger number, if used.
- Logic matrix of triggers. This is needed as only scalers associated with used TPATs are read out. However, it does not matter ff a TPAT is enabled or not.

Header markers for multi-trigger and trigger scaler output data are also given to **trlo_setup_readout_control**(). The high 8 bits of *multi_trig_event_header_id* and *trig_scalers_header_id* will be used to mark the output data by **trlo_read_multi_event**() and **trlo_read_trig_scalers**(), respectively.

Error codes returned by the readout functions in case of corruption (as transferred from VME) or overflowing the provided output buffer are given in *failure_corrupt_data* and *failure_too_much_data*.

The **trlo_readout_clear**() function is used to sanitise the TRLO II state after a failed readout, by clearing the multi-event trigger buffer. Note that this does not perform a complete reinitialisation of the module, which has to be done by other means if desired.

trlo_readout_next_first_evcnt() retrieves the next TRLO event counter. This us useful for initialisation in multi-event readout schemes.

RETURN VALUE

On success, 0 is returned from the readout functions. On error, an error code (as specified to **trlo_setup_readout_control**() is returned).

trlo_readout_next_first_evcnt() returns the next TRLO event counter.

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SEE ALSO

trlo_setup_map_hardware(3), **trlo_setup_check_version**(3), **trlo_unmap_hardware**(3), **trlo_clear_config**(3), **trlo_read_config_file**(3), **trlolib**(7), **trloii**(7),