alpide_data

Version: 1.1

Sunday 8th November, 2020 20:42

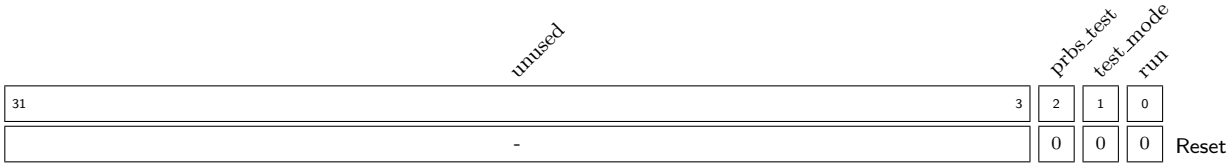
Control and status of ALPIDE data readout.

1 Register List

#	Name	Mode	Address	Type	Length	Reset
0	run_settings	RW	0x00000000	FIELDS	3	0x0
1	module_ids	RO	0x00000001	FIELDS	8	0x0
2	run_status	RO	0x00000002	FIELDS	9	0x0
3	reset_counters	PULSE	0x00000003	SL	1	0x0
4	num_prbs_error	RO	0x00000004	DEFAULT	32	0x0
5	num_decode_error_0	RO	0x00000005	DEFAULT	32	0x0
6	num_decode_error_1	RO	0x00000006	DEFAULT	32	0x0
7	num_protocol_error	RO	0x00000007	DEFAULT	32	0x0
8	num_frame_error	RO	0x00000008	DEFAULT	32	0x0
9	num_frames	RO	0x00000009	DEFAULT	32	0x0
10	num_empty_frames	RO	0x0000000A	DEFAULT	32	0x0
11	num_busy	RO	0x0000000B	DEFAULT	32	0x0
12	num_busy_violation	RO	0x0000000C	DEFAULT	32	0x0
13	num_flushed_incomplete	RO	0x0000000D	DEFAULT	32	0x0
14	num_strobe_extended	RO	0x0000000E	DEFAULT	32	0x0
15	num_busy_transition	RO	0x0000000F	DEFAULT	32	0x0
16	num_data_overrun	RO	0x00000010	DEFAULT	32	0x0
17	num_fatal_condition	RO	0x00000011	DEFAULT	32	0x0
18	num_buffer_overflow	RO	0x00000012	DEFAULT	32	0x0
19	num_frames_dropped	RO	0x00000013	DEFAULT	32	0x0
20	num_fake_frames	RO	0x00000014	DEFAULT	32	0x0

2 Registers

Register 2.1: RUN_SETTINGS - RW (0x00000000)
Run settings register.

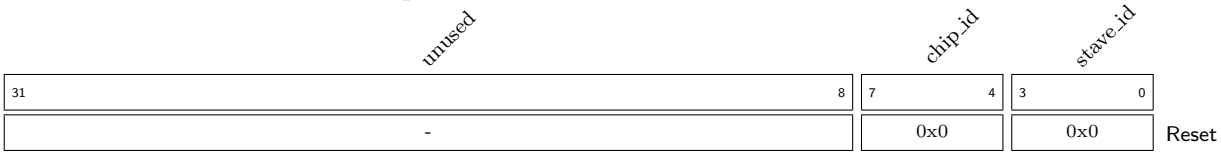


run De-asserts DPA channel reset. Enables 8B10B decoder after 100 clock cycles.

test_mode Enable test mode functionality. Disables the data flow blocks of the module. To be asserted together with the run bit before a PRBS test.

prbs_test Enable PRBS-7 test mode functionality - counting number of PRBS-7 errors. test_mode bit must be asserted PRIOR to asserting this bit to avoid counting wrong.

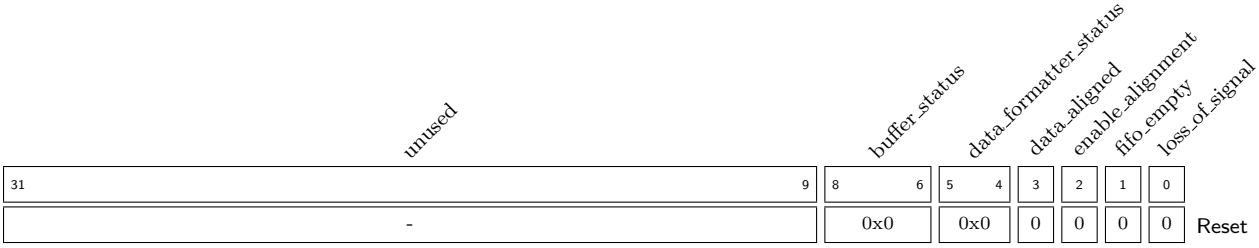
Register 2.2: MODULE_IDS - RO (0x00000001)
The chip and stave ID associated with the module.



stave_id Stave ID - used for tagging pRU data words.

chip_id Chip ID - used for tagging pRU data words.

Register 2.3: RUN_STATUS - RO (0x00000002)
Run status register.



loss_of_signal DPA logic lost signal.

fifo_empty CDC FIFO is empty.

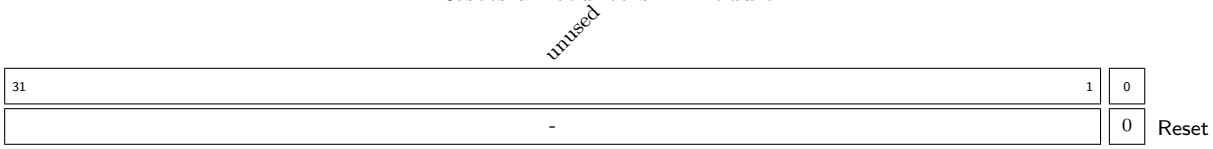
enable_alignment Data processing is started.

data_aligned Data is aligned and 8B10B decoding started.

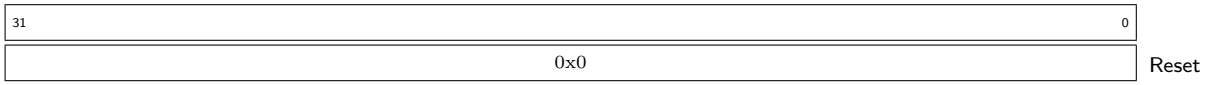
data_formatter_status 0 = idle, 1 = processing frame, 2 = waiting for free space (buffer full).

buffer_status 0 = empty, 1 = almost empty, 2 = prog empty, 3 = some data, 4 = prog full, 5 = full.

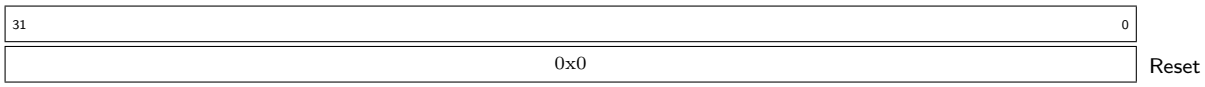
Register 2.4: RESET_COUNTERS - PULSE FOR 1 CYCLES (0x00000003)
Resets all counters in module.



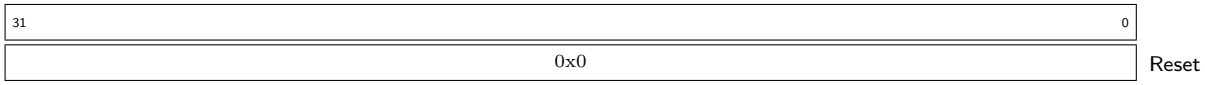
Register 2.5: NUM_PRBS_ERROR - RO (0x00000004)
Number of PRBS-7 errors in PRBS test mode.



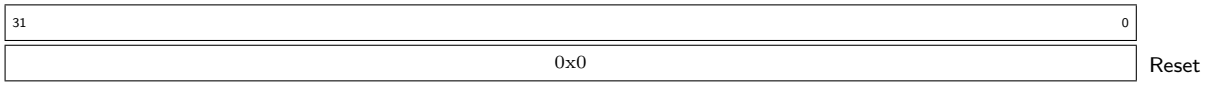
Register 2.6: NUM_DECODE_ERROR_0 - RO (0x00000005)
Number of 8B10B decode errors observed - bits 31:0.



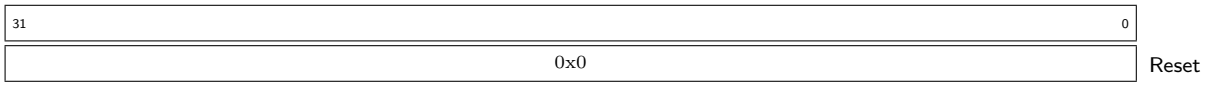
Register 2.7: NUM_DECODE_ERROR_1 - RO (0x00000006)
Number of 8B10B decode errors observed - bits 63:32.



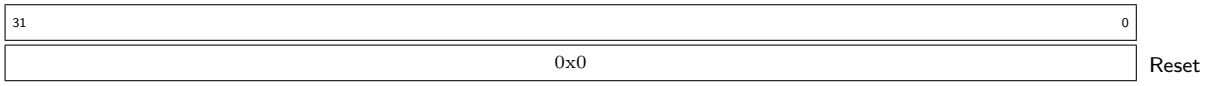
Register 2.8: NUM_PROTOCOL_ERROR - RO (0x00000007)
Number of protocol errors observed. Protocol errors are all decode errors observed during processing of an frame, but also all other protocol errors e.g. a double busy on assertion.



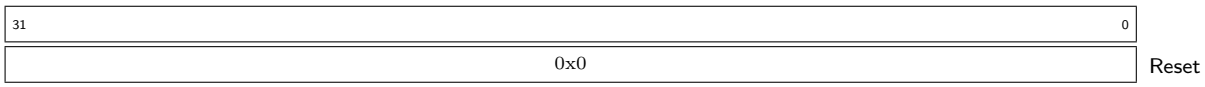
Register 2.9: NUM_FRAME_ERROR - RO (0x00000008)
Number of frames with errors observed. These errors are fatal, i.e. they cause the processing of the frame to be aborted and an immidiate generation of the pRU trailer word.



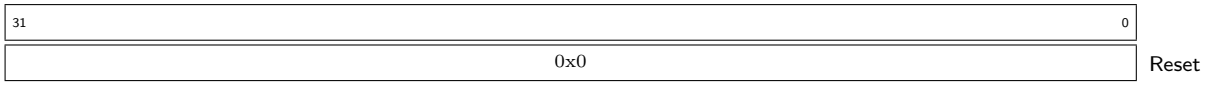
Register 2.10: NUM_FRAMES - RO (0x00000009)
Number of ALPIDE frames registered. Is incremented when the protocol checker is asserting that processing of a complete frame is done. However, this may include frames with fatal errors.



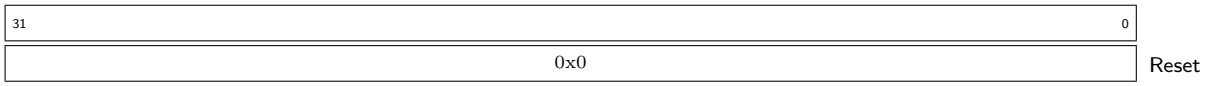
Register 2.11: NUM_EMPTY_FRAMES - RO (0x0000000A)
Number of empty ALPIDE frames registered.



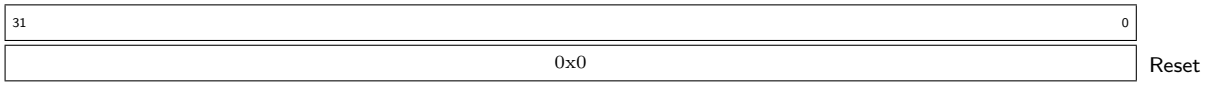
Register 2.12: NUM_BUSY - RO (0x0000000B)
Number of busys observed.



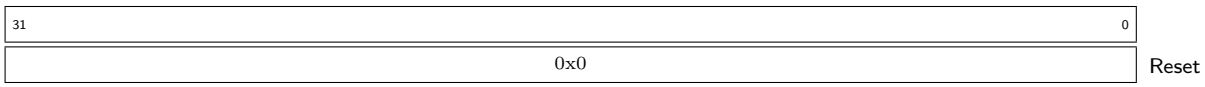
Register 2.13: NUM_BUSY_VIOLATION - RO (0x0000000C)
Number of busy violation events indicated by the ALPIDE chip.



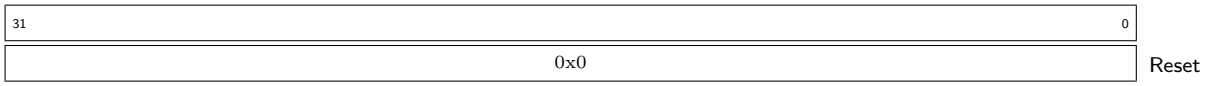
Register 2.14: NUM_FLUSHED_INCOMPLETE - RO (0x0000000D)
Number of flushed incomplete events indicated by the ALPIDE chip.



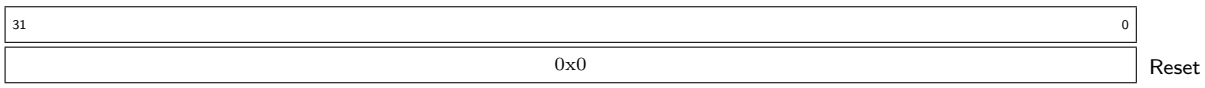
Register 2.15: NUM_STROBE_EXTENDED - RO (0x0000000E)
Number of strobe extended framing windows indicated by the ALPIDE chip.



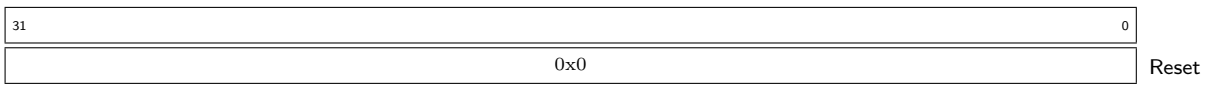
Register 2.16: NUM_BUSY_TRANSITION - RO (0x0000000F)
Number of busy transitions indicated by the ALPIDE chip.



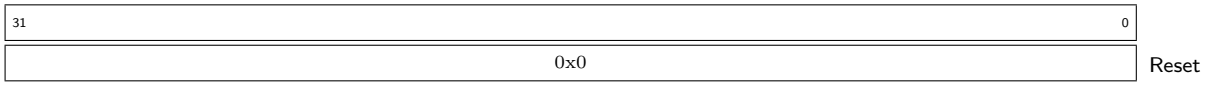
Register 2.17: NUM_DATA_OVERRUN - RO (0x00000010)
Number of data overruns indicated by the ALPIDE chip.



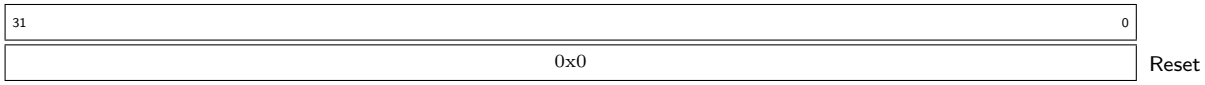
Register 2.18: NUM_FATAL_CONDITION - RO (0x00000011)
Number of fatal conditions indicated by the ALPIDE chip.



Register 2.19: NUM_BUFFER_OVERFLOW - RO (0x00000012)
Number of buffer overflows observed.



Register 2.20: NUM_FRAMES_DROPPED - RO (0x00000013)
Number of full frames dropped because over buffer overflow.



Register 2.21: NUM_FAKE_FRAMES - RO (0x00000014)
Number of ALPIDE frames rejected because of mistmatch of chip ID. Will only be counted if global_regs/check_id register is set.