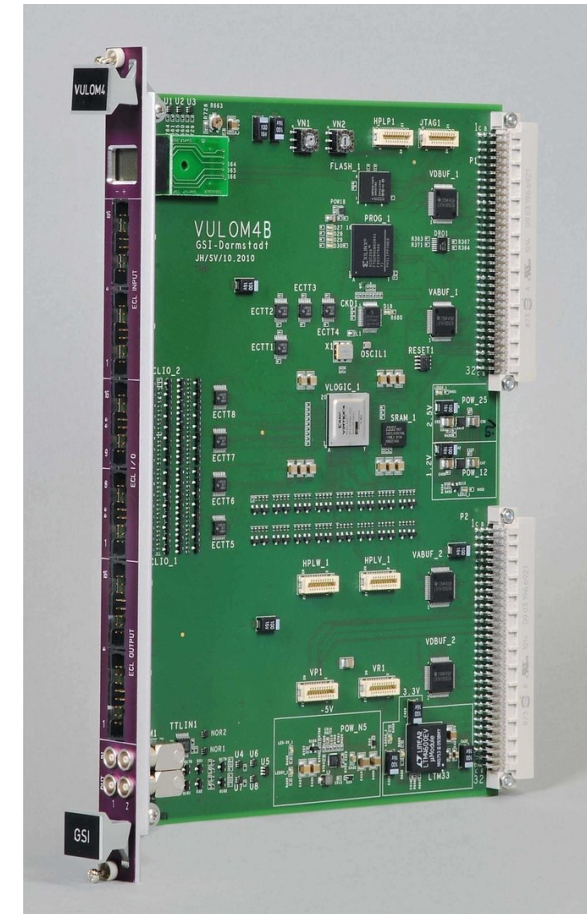
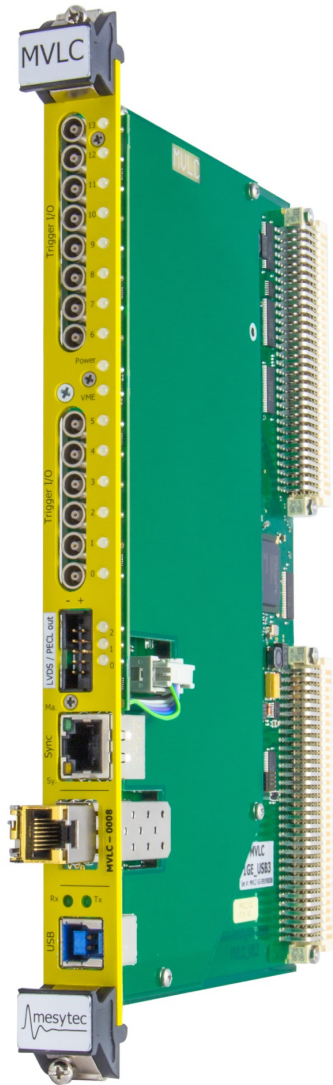


MVLC calling TRLO II

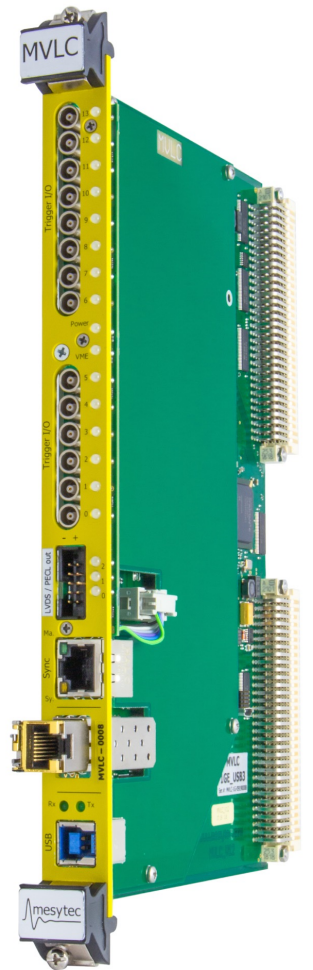
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MVLC

- + VME controller,
- + Internal sequencer for readout (vmescript),
 - Event readout decoupled from CPU (PC/RIO),
 - Unbeatable readout speed – minimal event overhead.
- We need asynchronous access:
“slow control”/monitoring

Example: **TRLO II**
trloctrl



Parsing vmescript

vmescript_lexer.l

```
170 "0" [xX] [0-9a-fA-F]+    {
171                             char *end;
172                             vmescript_yylval.u32 = strtoll(vmescript_yytext, &end, 0);
173                             if (*end != '\0' ) {
174                                 vmescript_yyerror("Invalid hex.");
175                             }
176                             return TK_HEX;
177                             }
```

mvme/templates/madc32/vme/reset.vmescript

```
1 # Reset the module
2 0x6008 1
3 wait 500ms
4
5 ## Get Module ids for log file
6 print "Hardware ID:"
7 read a32 d16 0x6008 # hardware ID
8 accu_mask_rotate 0x0000ffff 0
9 accu_test eq 0x5002 "MADC-32 hardware id check"
10
11 print "Firmware Revision:"
12 read a32 d16 0x600E # firmware revision
13
14 0x603a 0 # stop acq
15 0x603c 1 # FIFO reset
16 0x6034 1 # readout reset
```

vmescript_parser.y

```
254 mbltfifo:
255     TK_MBLTFIFO TK_ADDRESS_WIDTH addr_expr int_expr {
256         vmescript_command * c = vmescript_alloc_cmd(ct_mbltfifo);
257         c->_address_mode      = $2;
258         c->_address           = $3;
259         c->_value             = $4;
260         $$                    = c;
261     }
262
```

Wrapper

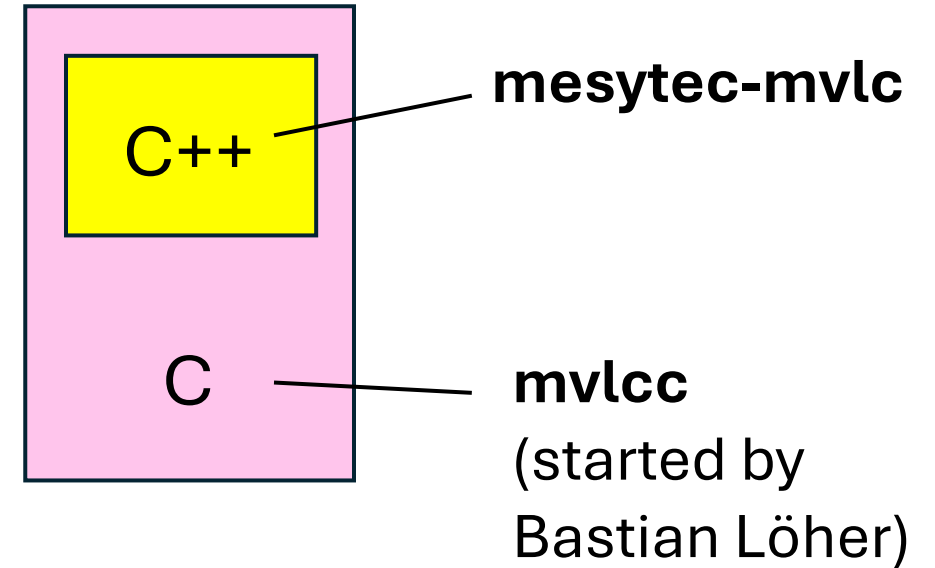
To call internal mesytec-mvlc functions from a C-code level (easier interface and compilation)

```
1 #include <mvlcc_wrap.h>
2 #include <stdio.h>
3
4 int main(){
5     mvlcc_t mvlc = mvlcc_make_mvlc_eth("192.168.1.103");
6     int ec;
7
8     if (ec = mvlcc_connect(mvlc))
9     {
10         fprintf(stderr, "Could not connect.\n");
11         return 1;
12     }
13
14     uint32_t vmeBase = 0x21000000u;
15     uint16_t regAddr = 0x6008u;
16     uint32_t readValue = 0u;
17
18     ec = mvlcc_single_vme_read(mvlc, vmeBase + regAddr, &readValue, 32, 16);
19
20     if (ec)
21     {
22         fprintf(stderr, "Could not read @ 0x%08x.\n", vmeBase + regAddr);
23         return 1;
24     }
25     printf("VME read: %08x\n", readValue);
26     mvlcc_disconnect(mvlc);
27
28     return 0;
29 }
30
31 }
```

Functions used by e.g. trloctrl

Output:

```
kawecka@bridge2:~/DAQ/mvlcc/example$ ./test
[2024-07-08 14:18:44.225] [mvlc_eth] [info] pipe=0, requested SO_RCVBUF of 10485760 bytes (10 MB), got 425984 bytes (
[2024-07-08 14:18:44.225] [mvlc_eth] [info] pipe=1, requested SO_RCVBUF of 10485760 bytes (10 MB), got 425984 bytes (
[2024-07-08 14:18:44.226] [mvlc] [info] Connected to MVLC (mvlc_eth: address=192.168.1.103, firmware=FW0037)
VME read: 00005007
[2024-07-08 14:18:44.744] [mvlc] [info] Disconnected from MVLC (mvlc_eth: address=192.168.1.103)
```



Current status

MVLC talks to us.

```
trlo_ctrl --addr=0x04 --ramtest
```

```
kawecka@bridge2:~/DAQ/trloii/trloctrl$ fw_1409285e_trlo/bin_x86_64-linux-gnu_10/trlo_ctrl --addr=0x04 --ramtest
[2024-07-08 14:17:08.109] [mvlc_eth] [info] pipe=0, requested SO_RCVBUF of 10485760 bytes (10 MB), got 425984 bytes (0.40625)
[2024-07-08 14:17:08.109] [mvlc_eth] [info] pipe=1, requested SO_RCVBUF of 10485760 bytes (10 MB), got 425984 bytes (0.40625)
[2024-07-08 14:17:08.110] [mvlc] [info] Connected to MVLC (mvlc_eth: address=192.168.1.103, firmware=FW0037)
hwmap_mapvme.c:468: LOG: Virtual address for TRLO II @ VME 0x04000000 is 0x555acb831d3d0.
LOG: TRLO: MD5SUM: 0x1409285e (CT: 63bb1d44 = 2023-01-08 19:45:08 UTC)
Testing RAM block of 0x200 words @ offset 0x00012000.
0, 524.31 us sicy loop, 524.30 us sicy unrolled loop, 524.30 us sicy random
```

```
trlo_ctrl --addr=0x04 --mux-src-scalers
```

```
kawecka@bridge2:~/DAQ/trloii/trloctrl$ fw_1409285e_trlo/bin_x86_64-linux-gnu_10/trlo_ctrl --addr=0x04 --mux-src-scalers
[2024-07-08 13:15:10.513] [mvlc_eth] [info] pipe=0, requested SO_RCVBUF of 10485760 bytes (10 MB), got 425984 bytes (0.4062)
[2024-07-08 13:15:10.514] [mvlc_eth] [info] pipe=1, requested SO_RCVBUF of 10485760 bytes (10 MB), got 425984 bytes (0.4062)
[2024-07-08 13:15:10.515] [mvlc] [info] Connected to MVLC (mvlc_eth: address=192.168.1.103, firmware=FW0037)
hwmap_mapvme.c:468: LOG: Virtual address for TRLO II @ VME 0x04000000 is 0x5567a1abb3d0.
LOG: TRLO: MD5SUM: 0x1409285e (CT: 63bb1d44 = 2023-01-08 19:45:08 UTC)
1.000000 0 0 0
```

Name	Value	Diff	Name	Value	Diff	Name	Value	Diff
ECL_IN(1)	1		LEMO_IN(1)	5161		ALL_OR(1)	0	
ECL_IN(2)	1		LEMO_IN(2)	6663		ALL_OR(2)	0	
ECL_IN(3)	1		WIRED_ZERO	0		COINCIDENCE(1)	1	
ECL_IN(4)	1		WIRED_ONE	0		INPUT_COINC(1)	1	
ECL_IN(5)	1		PRNG_POISSON(1)	0		TCH_ALM_FULL(1)	1	
ECL_IN(6)	1		PULSER(1)	113354329		TCH_ALM_FULL(2)	1	
ECL_IN(7)	1		PULSER(2)	113354329		TCH_ALM_FULL(3)	1	
ECL_IN(8)	1		PULSER(3)	113354329		TCH_ALM_FULL(4)	1	
ECL_IN(9)	1		PULSER(4)	113354329		RIAL_TSTAMP_OUT	0	
ECL_IN(10)	1		LMU_OUT(1)	0		TSTAMP_ALM_FULL	1	
ECL_IN(11)	1		LMU_OUT(2)	0		L_TSTAMP_DESYNC	1	
ECL_IN(12)	1		LMU_OUT(3)	0		_SIGNALS_OUT(1)	0	
ECL_IN(13)	1		LMU_OUT(4)	0		_SIGNALS_OUT(2)	0	
ECL_IN(14)	1		LMU_OUT(5)	0		_SIGNALS_OUT(3)	0	
ECL_IN(15)	1		LMU_OUT(6)	0		HEIMTIME_OUT	1	
ECL_IN(16)	1		LMU_OUT(7)	0		ACCEPT_TRIG[0]	0	

not fast, but ok for monitoring

Future

- Please test and report any bugs!

<https://github.com/annakawecka/mvlcc>

https://gitlab.com/akawecka/vmescript_parser