LUPO Scaler Firmware
Rev. 1.3

2020 Jul. 1

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1 General

1.1 Function

1.2 Output register

1.3 Scaler

This firmware has 16ch LVDS scaler inputs.

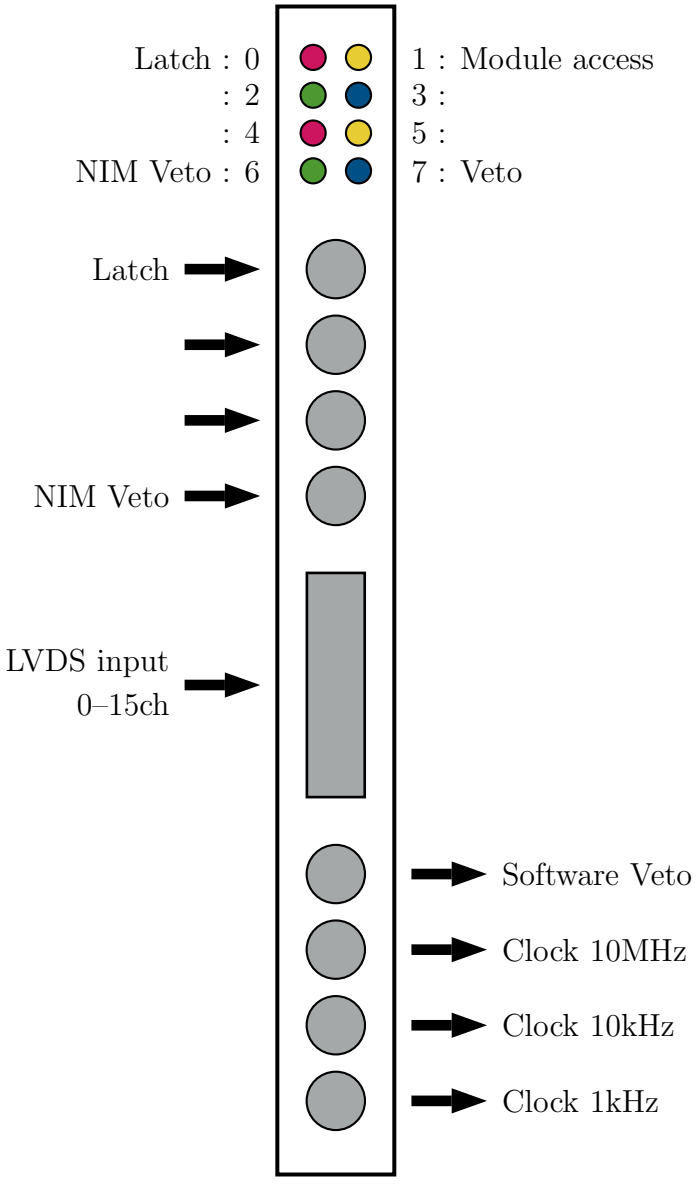
1.4 Clock

Internally 10MHz, 10kHz and 1kHz clocks are provided. These can be read via commands. Also these clocks are output from NIN Output 1–3 ch.

1.5 Latching scaler for 10kHz clock

There is an additional register to hold 10kHz clock value. If NIM Input 0ch is issued, the register keeps 10kHz clock value according to the rising edge of the signal. When next input comes, the value is updated. This register is useful to know the spill-change timing at HIMAC.

1.6 Connector


Latch : 0
: 2
: 4
NIM Veto : 6
1 : Module access
3 :
5 :
7 : Veto
Latch
NIM Veto
LVDS input
0–15ch
Software Veto
Clock 10MHz
Clock 10kHz
Clock 1kHz

2 Interface

2.1 Register Map

Command list.(Tab.2.1)B

2.1.1 Scaler Sequential

F(6)A(0) / Base+%60 D32R

Read scaler data sequentially (20 scaler values in total). LVDS 0–15 → Clock 1k → Clock 10k → Clock 1M → Clock 10k Latch

2.1.2 Software Veto

F(0)A(0) / Base+%00 D16W

When write '1', all scalers do not count signals.

2.1.3 Clear Register

F(9)A(0) / Base+%90 D16R

Clear all scaler values. Also, the sequential pointer is reset.

2.1.4 Reset sequential pointer

F(9)A(1) / Base+%92 D16R

Reset the pointer of for sequential readout.

2.1.5 Version

F(7)A(0) / Base+%70 D16W

Returns version code of this module. Following is VME Scaler Rev 1.2:

Table 2.1: Register map

CAMAC (R/W)	VME	Register	Data	VME R/W
F(0)A(0)	Base + %00	Clock 10MHz	D32	read
F(0)A(2)	Base + %04	Clock 10kHz	D32	read
F(0)A(4)	Base + %08	Clock 1kHz	D32	read
F(1)A(0)	Base + %10	Clock 10kHz Latch	D32	read
F(2)A(0)	Base + %20	Scaler LVDS 0	D32	read
F(2)A(2)	Base + %24	Scaler LVDS 1	D32	read
F(2)A(4)	Base + %28	Scaler LVDS 2	D32	read
F(2)A(6)	Base + %2C	Scaler LVDS 3	D32	read
F(3)A(0)	Base + %30	Scaler LVDS 4	D32	read
F(3)A(2)	Base + %34	Scaler LVDS 5	D32	read
F(3)A(4)	Base + %38	Scaler LVDS 6	D32	read
F(3)A(6)	Base + %3C	Scaler LVDS 7	D32	read
F(4)A(0)	Base + %40	Scaler LVDS 8	D32	read
F(4)A(2)	Base + %44	Scaler LVDS 9	D32	read
F(4)A(4)	Base + %48	Scaler LVDS 10	D32	read
F(4)A(6)	Base + %4C	Scaler LVDS 11	D32	read
F(5)A(0)	Base + %50	Scaler LVDS 12	D32	read
F(5)A(2)	Base + %54	Scaler LVDS 13	D32	read
F(5)A(4)	Base + %58	Scaler LVDS 14	D32	read
F(5)A(6)	Base + %5C	Scaler LVDS 15	D32	read
F(6)A(0)	Base + %60	Scaler Sequential	D32	read
F(0)A(0)	Base + %00	Software Veto	D16	write
F(7)A(0)	Base + %70	Version	D16	read
F(9)A(0)	Base + %90	Clear	D16	read
F(9)A(2)	Base + %94	Reset sequential pointer	D16	read

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CAMAC/VME				Module ID				Rev **X**.X				Rev X.**X**			
2				A				1				3			

3 Appendix

3.1 Version Information

1.3 Add sequential readout for MPV

1.2 Bug fix for LVDS ch3,7,11,15 data

1.1 First version