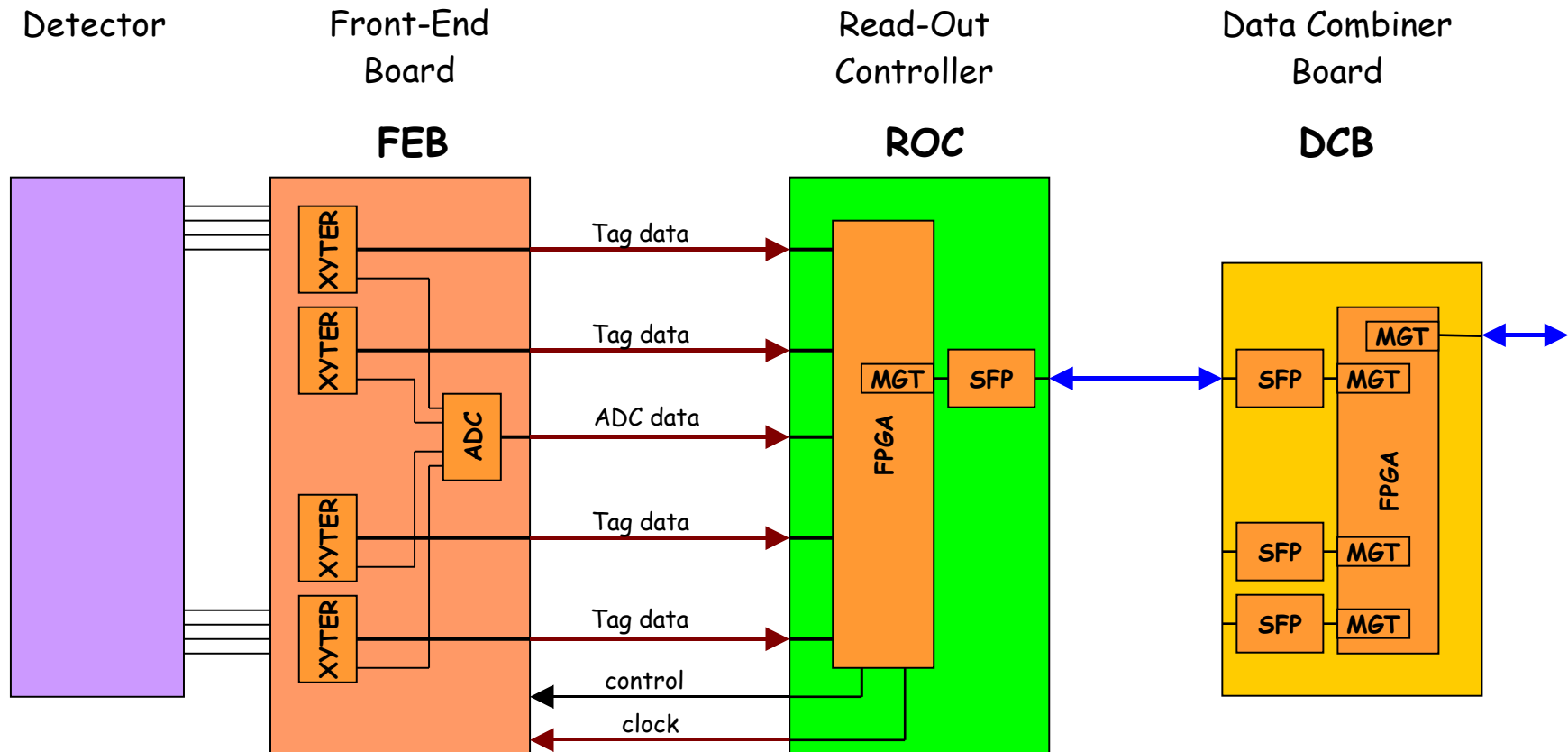


KIP Heidelberg

Norbert Abel

nXYTER meets SysCore

Concept - FEB - ROC - ABB



Detector

Front-End Board

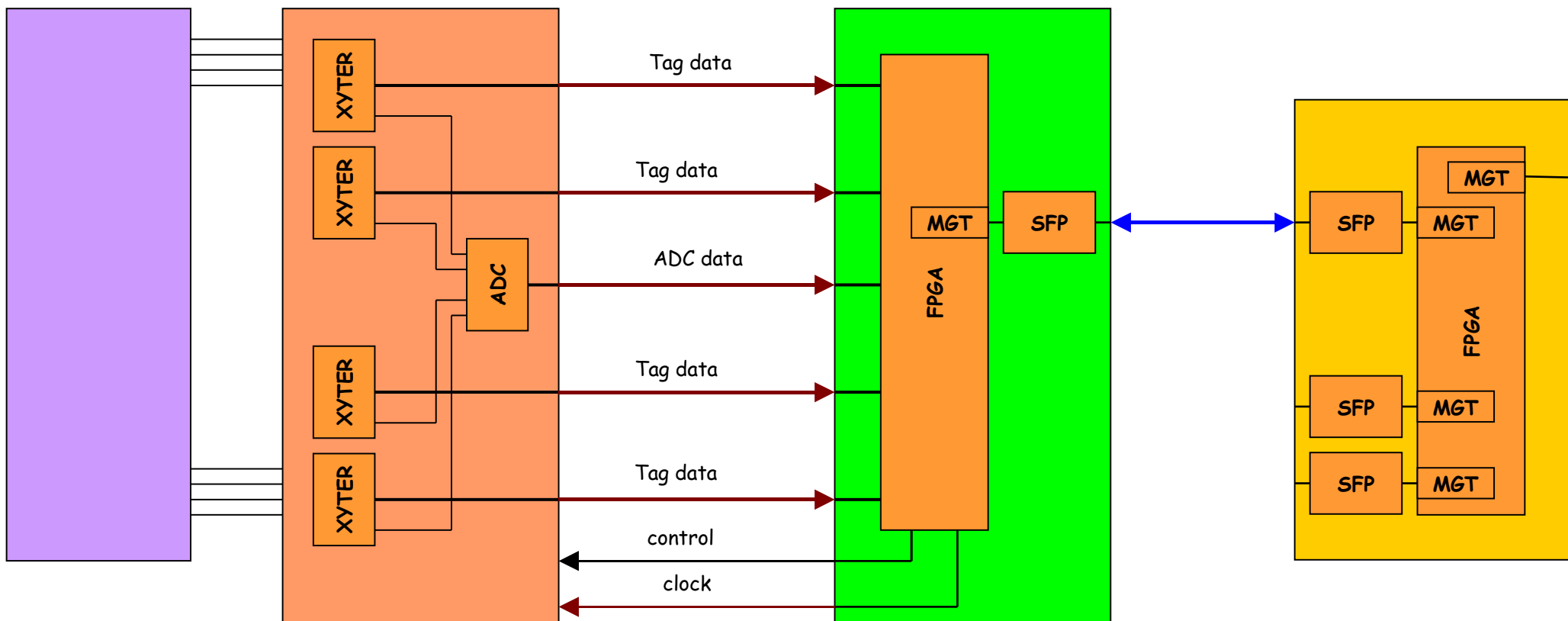
Read-Out Controller

Data Combiner Board

FEB

ROC

DCB



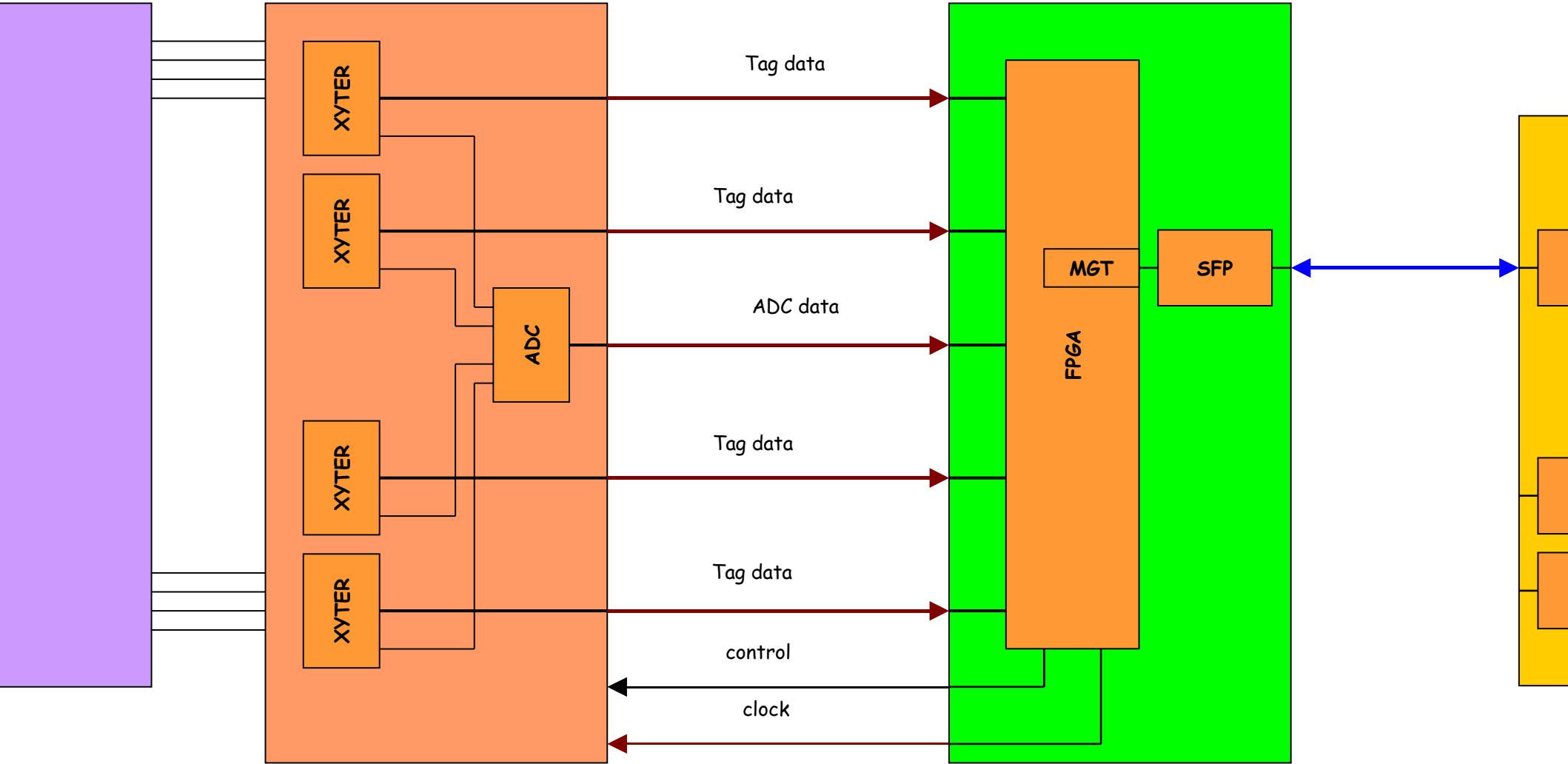
Detector

Front-End Board

Read-Out Controller

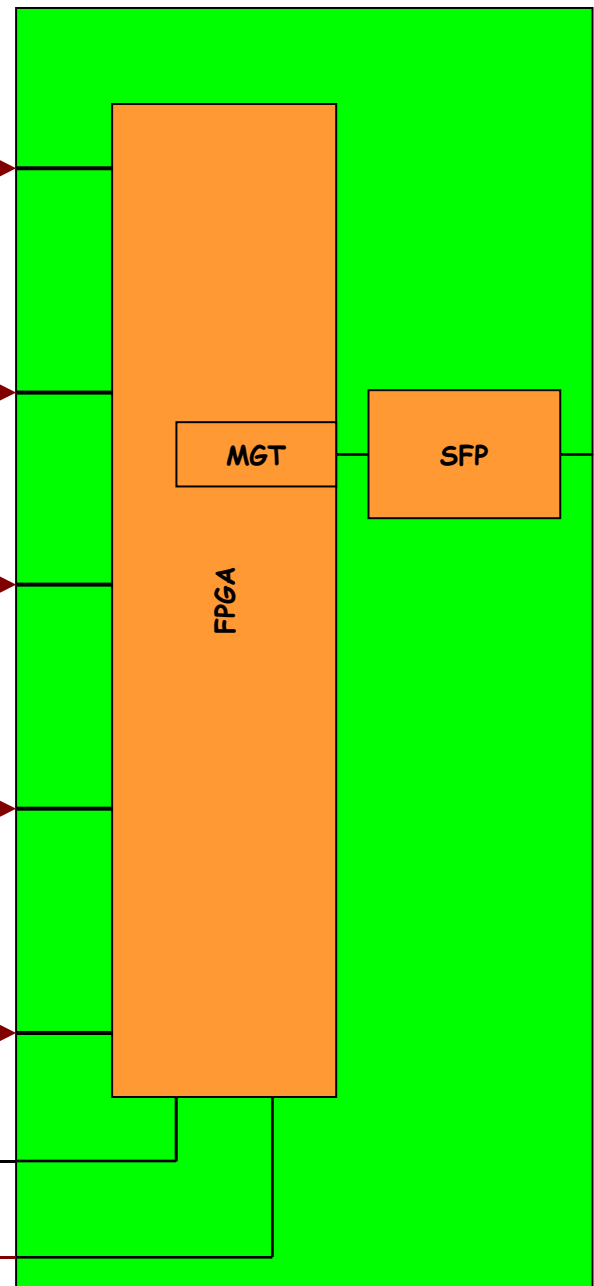
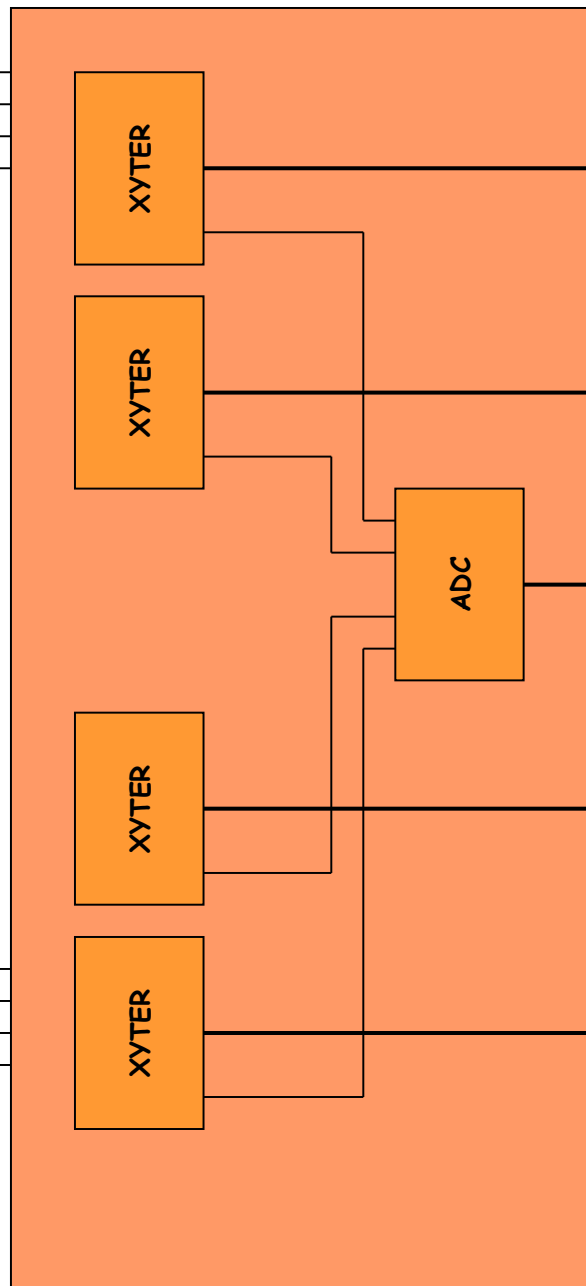
FEB

ROC



FEB

ROC



Tag data

Tag data

ADC data

Tag data

Tag data

control

clock

MGT

SFP

FPGA

XYTER

XYTER

ADC

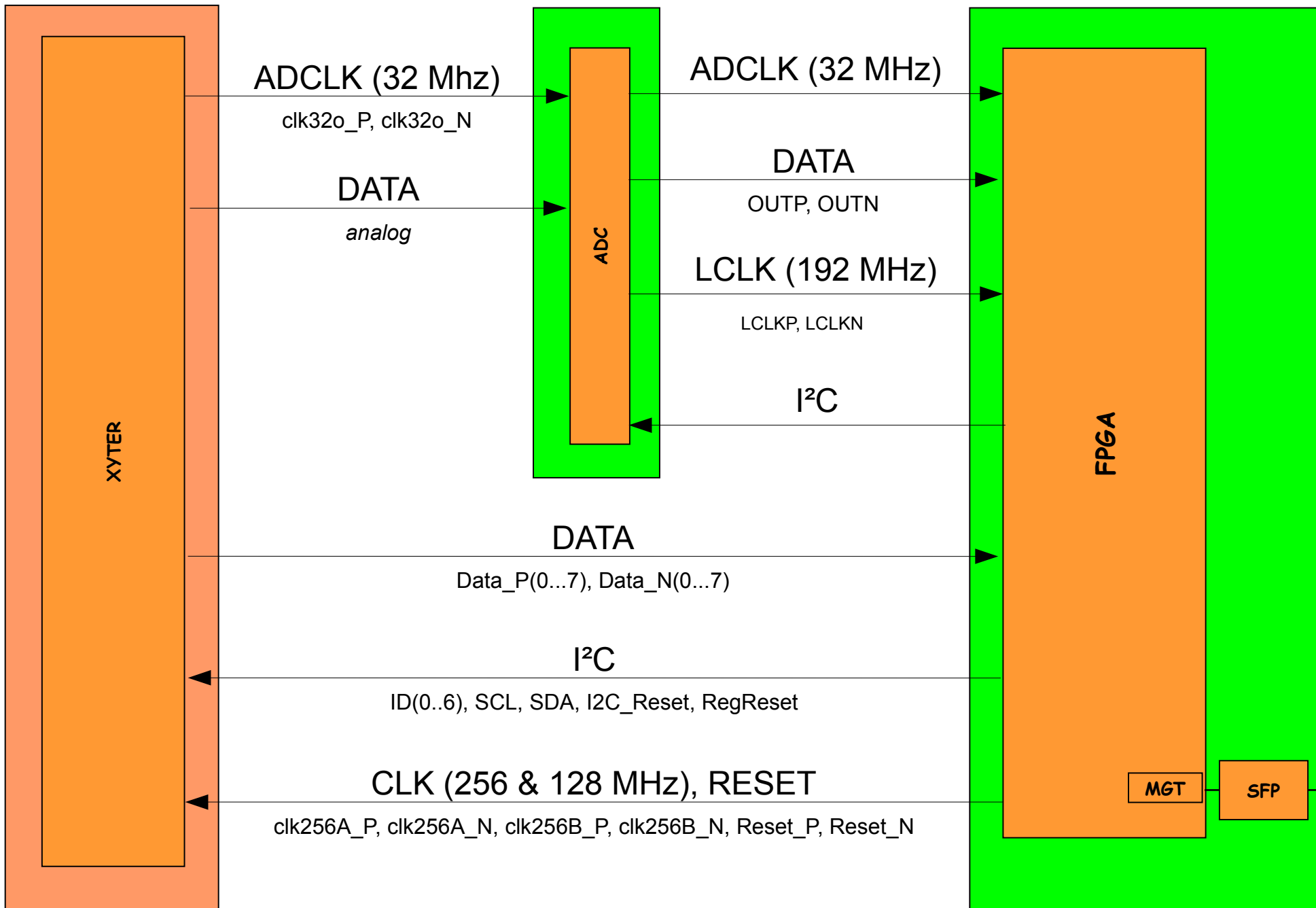
XYTER

XYTER

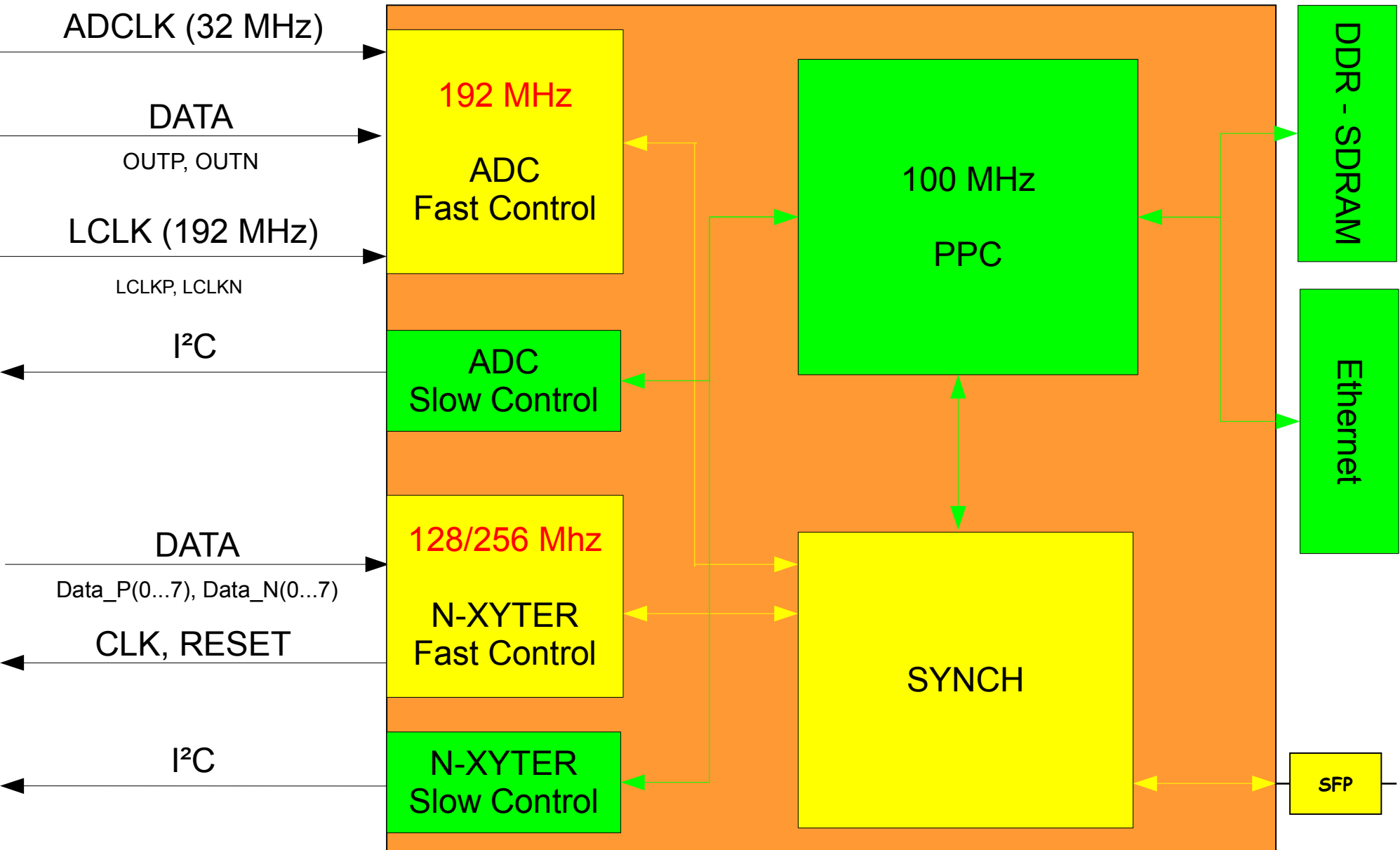
Hd-Board

ADC Eval Board

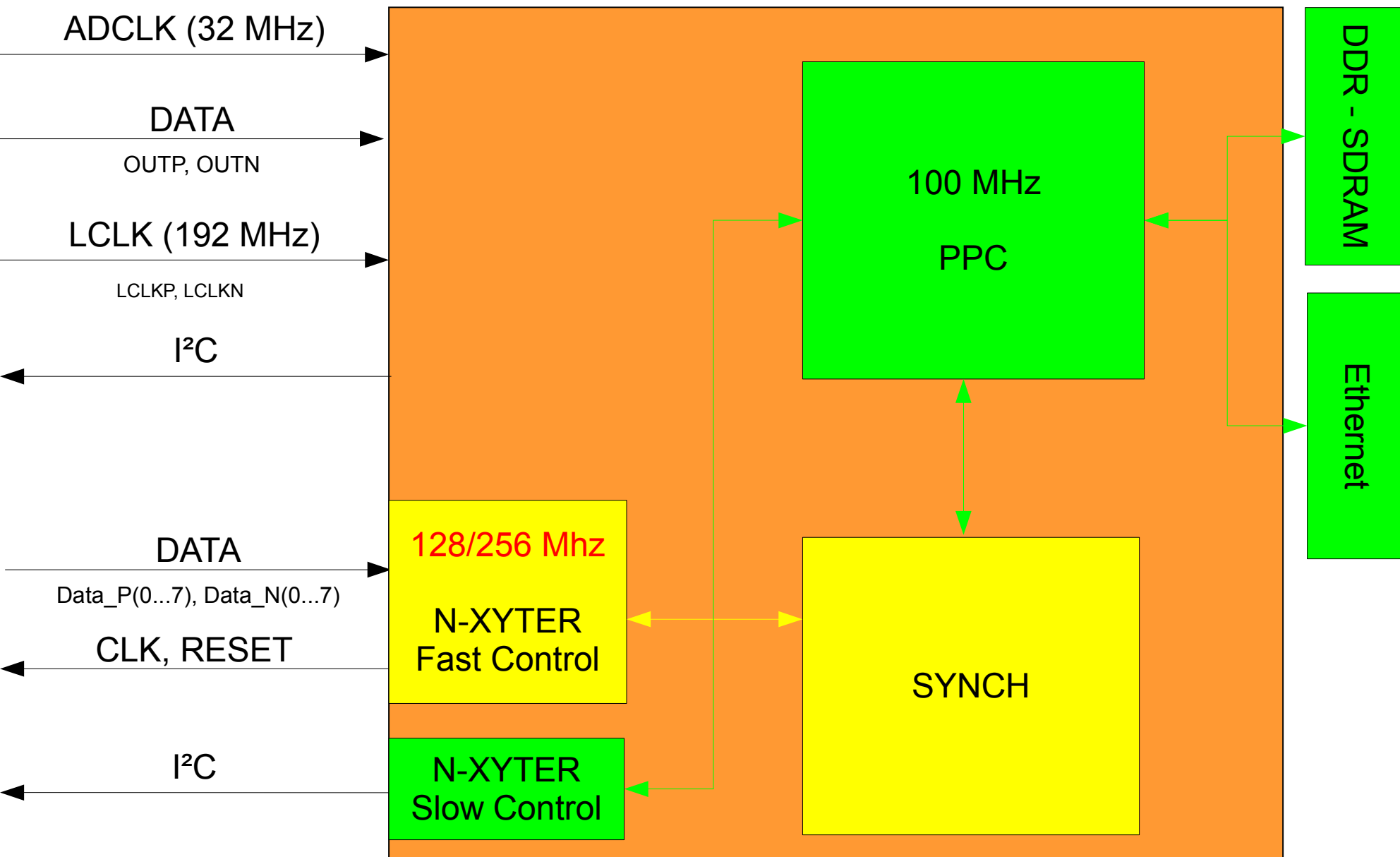
SysCore Prototype



Syscore Details



Already done



Slow Control - Linux (1)

```
loaded at:      04000000 040FC1E0
relocated to:   00400000 004FC1E0
board data at: 004F9138 004F9150
relocated to:   00405304 0040531C
zimage at:      004058C9 004F8157
avail ram:      004FD000 10000000
```

```
Linux/PPC load: root=/dev/mtdblock0 rootfstype=romfs rw ip=on
```

```
Uncompressing Linux...done.
```

```
Now booting the kernel
```

```
Linux version 2.4.30-pre1 (bob@debian) (gcc version 3.4.2) #12 Fri Aug 17 02:197
```

```
Xilinx Virtex-II Pro port (C) 2002 MontaVista Software, Inc. (source@mvista.com)
```

```
On node 0 totalpages: 65536
```

```
zone(0): 65536 pages.
```

```
zone(1): 0 pages.
```

```
zone(2): 0 pages.
```

```
Kernel command line: root=/dev/mtdblock0 rootfstype=romfs rw ip=on
```

```
Xilinx INTC #0 at 0x41200000 mapped to 0xFDFFF000
```

```
Calibrating delay loop... 99.73 BogoMIPS
```

```
Memory: 256804k available (996k kernel code, 1212k data, 44k init, 0k highmem)
```

```
Dentry cache hash table entries: 32768 (order: 6, 262144 bytes)
```

```
Inode cache hash table entries: 16384 (order: 5, 131072 bytes)
```

```
Mount cache hash table entries: 512 (order: 0, 4096 bytes)
```

```
Buffer cache hash table entries: 16384 (order: 4, 65536 bytes)
```

```
[...]
```

```
Freeing unused kernel memory: 44k init
```

```
Mounting proc:
```

```
Mounting var:
```

```
Populating /var:
```

```
Running local start scripts.
```

```
Setting hostname:
```

```
Setting up interface lo:
```

```
Mounting /etc/dhcpc:
```

```
mount: Mounting none on /etc/dhcpc failed: No such file or directory
```

```
Starting DHCP client:
```

```
Starting inetd:
```

```
Starting thttpd:
```

Slow Control - Linux (2)

```
powerpc-auto login: root
```

```
Password:
```

```
# ls
```

```
bin    dev    etc    home  lib    mnt    proc  sbin  tmp    usr    var
```

```
# mount
```

```
/dev/mtdblock0 on / type romfs (ro)
```

```
/proc on /proc type proc (rw)
```

```
none on /var type ramfs (rw)
```

```
# ps
```

PID	PORT	STAT	SIZE	SHARED	%CPU	COMMAND
1		S	0K	0K	0.3	/sbin/init
2		S	0K	0K	0.0	keventd
3		S	0K	0K	0.0	ksoftirqd_CPU0
4		S	0K	0K	0.0	kswapd
5		S	0K	0K	0.0	bdflush
6		S	0K	0K	0.0	kupdated
7		S	0K	0K	0.0	mtdblockd
33		S	0K	0K	0.0	/bin/inetd
37		S	0K	0K	0.0	thttpd -c *.cgi
38	S0	S	0K	0K	0.0	-sh
39		S	0K	0K	0.0	/bin/inetd
42	S0	R	0K	0K	0.0	ps

```
#
```

Slow Control - SysCore Shell

SysCore>

Slow Control - SysCore Shell

```
SysCore> help
```

```
Available commands:
```

```
reset      NX RESET  
init       NX INIT  
ls         List Registers  
ll         List Registers  
set        Set Register  
pulse      TestPulseOff  
data       NX Data Out  
testpulse  Start test pulse and show data
```

```
SysCore>
```

Slow Control - SysCore Shell

```
SysCore> ls
```

```
Register 0: 0  
Register 1: 0  
Register 2: 0  
Register 3: 0  
Register 4: 0  
Register 5: 0  
Register 6: 0  
Register 7: 0  
Register 8: 0  
Register 9: 0  
Register 10: 0  
Register 11: 0  
Register 12: 0  
Register 13: 0  
Register 14: 0  
Register 15: 0
```

```
[...]
```

```
Register 32: 1E  
Register 33: C  
Register 34: 4  
Register 35: 0  
Register 36: 0  
Register 37: 0  
Register 38: 0  
Register 39: 0  
Register 40: 0  
Register 41: 0  
Register 42: 0  
Register 43: 0  
Register 44: 0  
Register 45: 0  
FIFO full: 0  
FIFO empty: 1
```

```
SysCore>
```

Slow Control - SysCore Shell

```
SysCore> ls 32
```

```
Register 32: 1E
```

```
SysCore> set 32 0x1F
```

```
Register 32: 1F
```

```
SysCore> data
```

```
FIFO is empty.
```

```
SysCore>
```

Slow Control - SysCore Shell

```
SysCore> testpulse
```

```
Data: AA310001  --  DV: 1, TS: 1655 (010101001100 01), ID: 0 (0), PileUp: 0, OverF : 0, Parity: 1
Data: AA310100  --  DV: 1, TS: 1655 (010101001100 01), ID: 1 (1), PileUp: 0, OverF : 0, Parity: 0
Data: AA310301  --  DV: 1, TS: 1655 (010101001100 01), ID: 2 (3), PileUp: 0, OverF : 0, Parity: 1
Data: AA310200  --  DV: 1, TS: 1655 (010101001100 01), ID: 3 (2), PileUp: 0, OverF : 0, Parity: 0

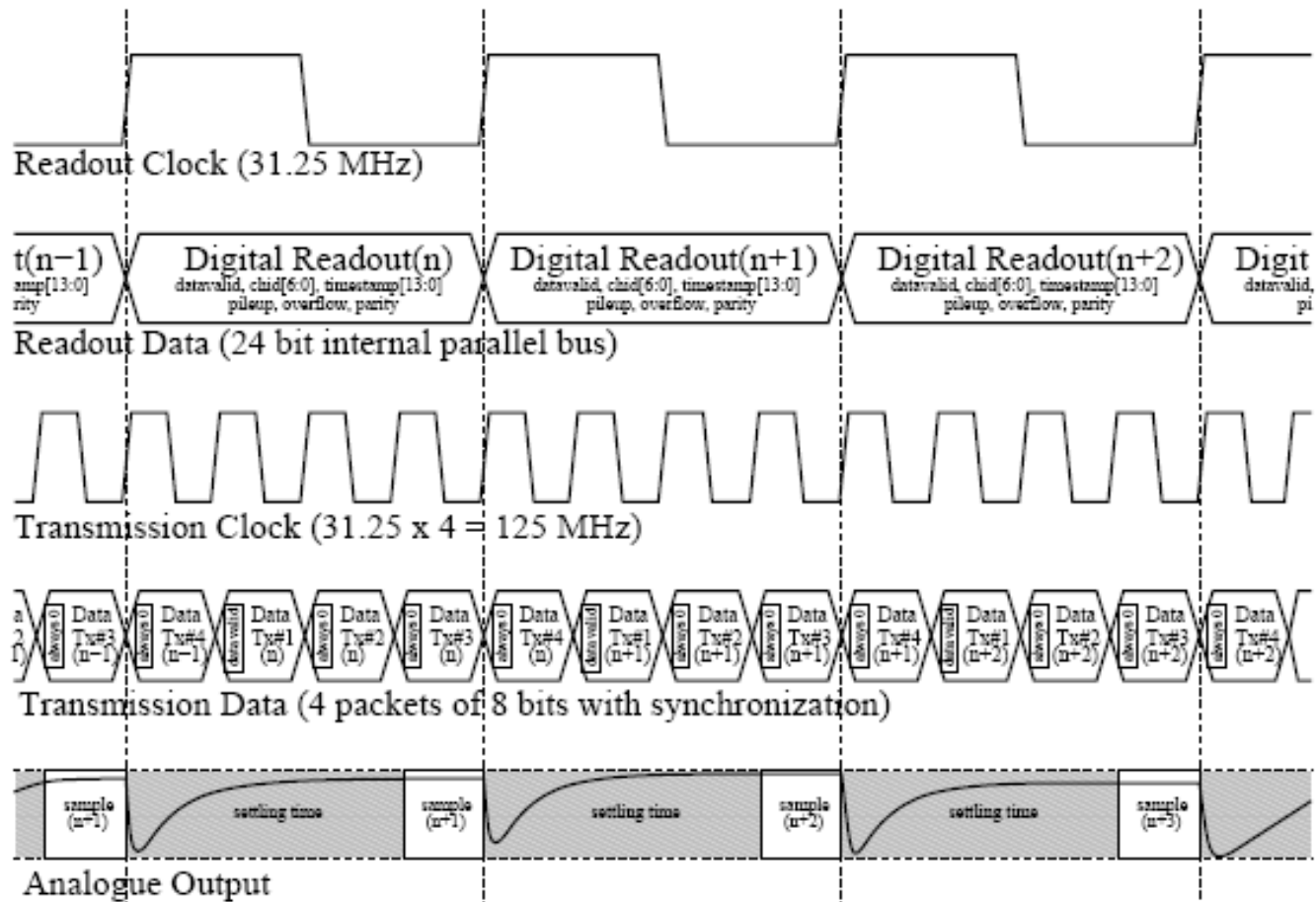
Data: A4210001  --  DV: 1, TS: 1807 (010010001000 01), ID: 0 (0), PileUp: 0, OverF : 0, Parity: 1
Data: A4210100  --  DV: 1, TS: 1807 (010010001000 01), ID: 1 (1), PileUp: 0, OverF : 0, Parity: 0
Data: A4210301  --  DV: 1, TS: 1807 (010010001000 01), ID: 2 (3), PileUp: 0, OverF : 0, Parity: 1
Data: A4210200  --  DV: 1, TS: 1807 (010010001000 01), ID: 3 (2), PileUp: 0, OverF : 0, Parity: 0

Data: B5110001  --  DV: 1, TS: 1223 (011010100100 01), ID: 0 (0), PileUp: 0, OverF : 0, Parity: 1
Data: B5110100  --  DV: 1, TS: 1223 (011010100100 01), ID: 1 (1), PileUp: 0, OverF : 0, Parity: 0
Data: B5110301  --  DV: 1, TS: 1223 (011010100100 01), ID: 2 (3), PileUp: 0, OverF : 0, Parity: 1
Data: B5110200  --  DV: 1, TS: 1223 (011010100100 01), ID: 3 (2), PileUp: 0, OverF : 0, Parity: 0

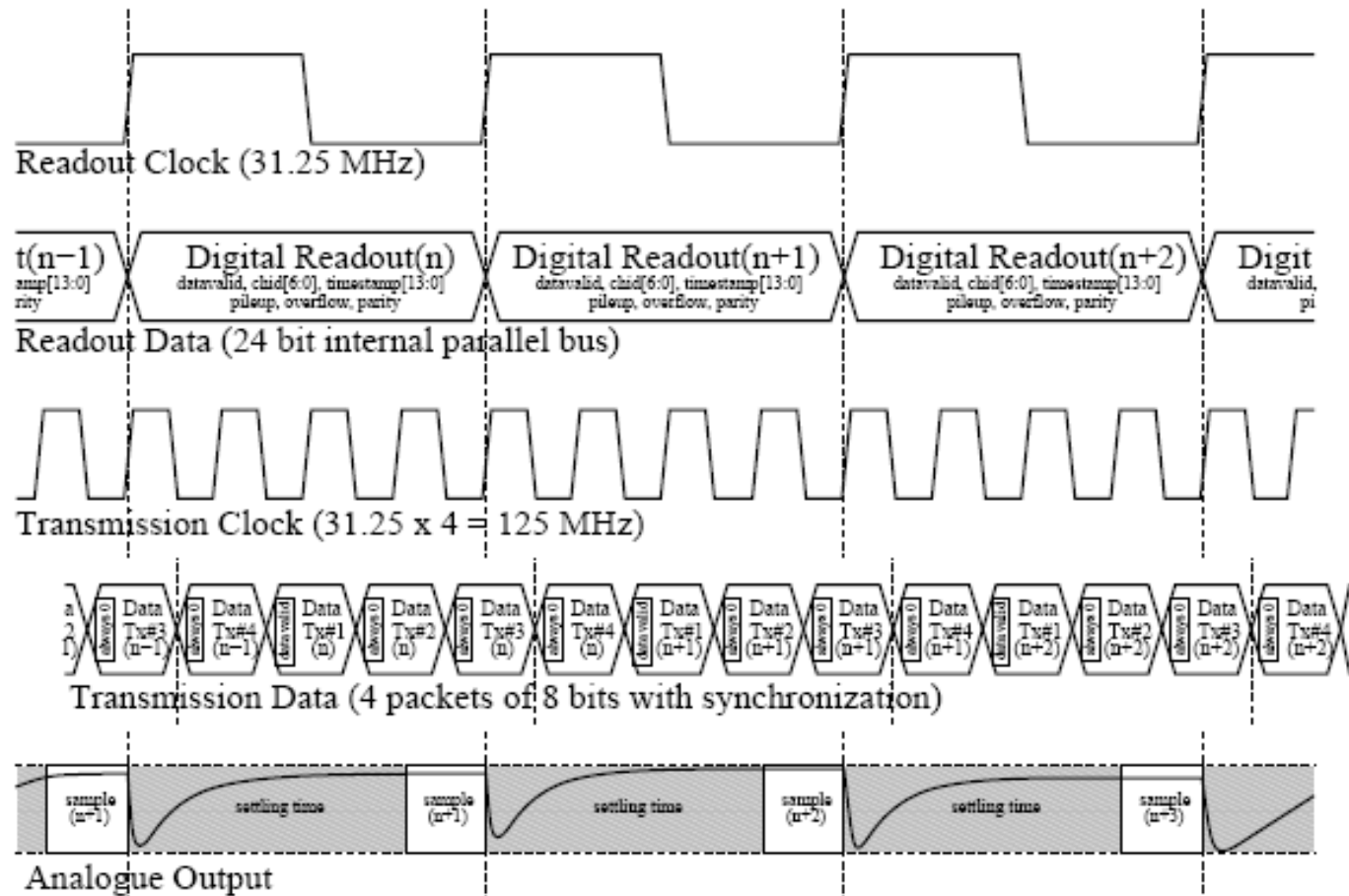
Data: BA410000  --  DV: 1, TS: 1439 (011101010000 01), ID: 0 (0), PileUp: 0, OverF : 0, Parity: 0
Data: BA410101  --  DV: 1, TS: 1439 (011101010000 01), ID: 1 (1), PileUp: 0, OverF : 0, Parity: 1
Data: BA410300  --  DV: 1, TS: 1439 (011101010000 01), ID: 2 (3), PileUp: 0, OverF : 0, Parity: 0
Data: BA410201  --  DV: 1, TS: 1439 (011101010000 01), ID: 3 (2), PileUp: 0, OverF : 0, Parity: 1
```

```
SysCore>
```

Measurements (1)



Measurements (2)



Conclusion

- Data is valid at rising edge of the Transmission Clock (128 MHz)
- TS-Reset has to be used for stable Readout Clock (32 MHz)
- Readout of the Mask-Bits using I²C only works with disabled „test trigger enable“ bit
- The TS seems not be valid
- The nXYTER doesn't produce test signals at activated „test pulse enable“ bit
- The SysCore Board consumes about 1.3 A (50°C)
- Linux is running on SysCore
- The I²C connection between SysCore and nXYTER is working fine