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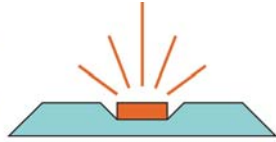
# **System technology for POF inhouse networks**

Hans Kragl

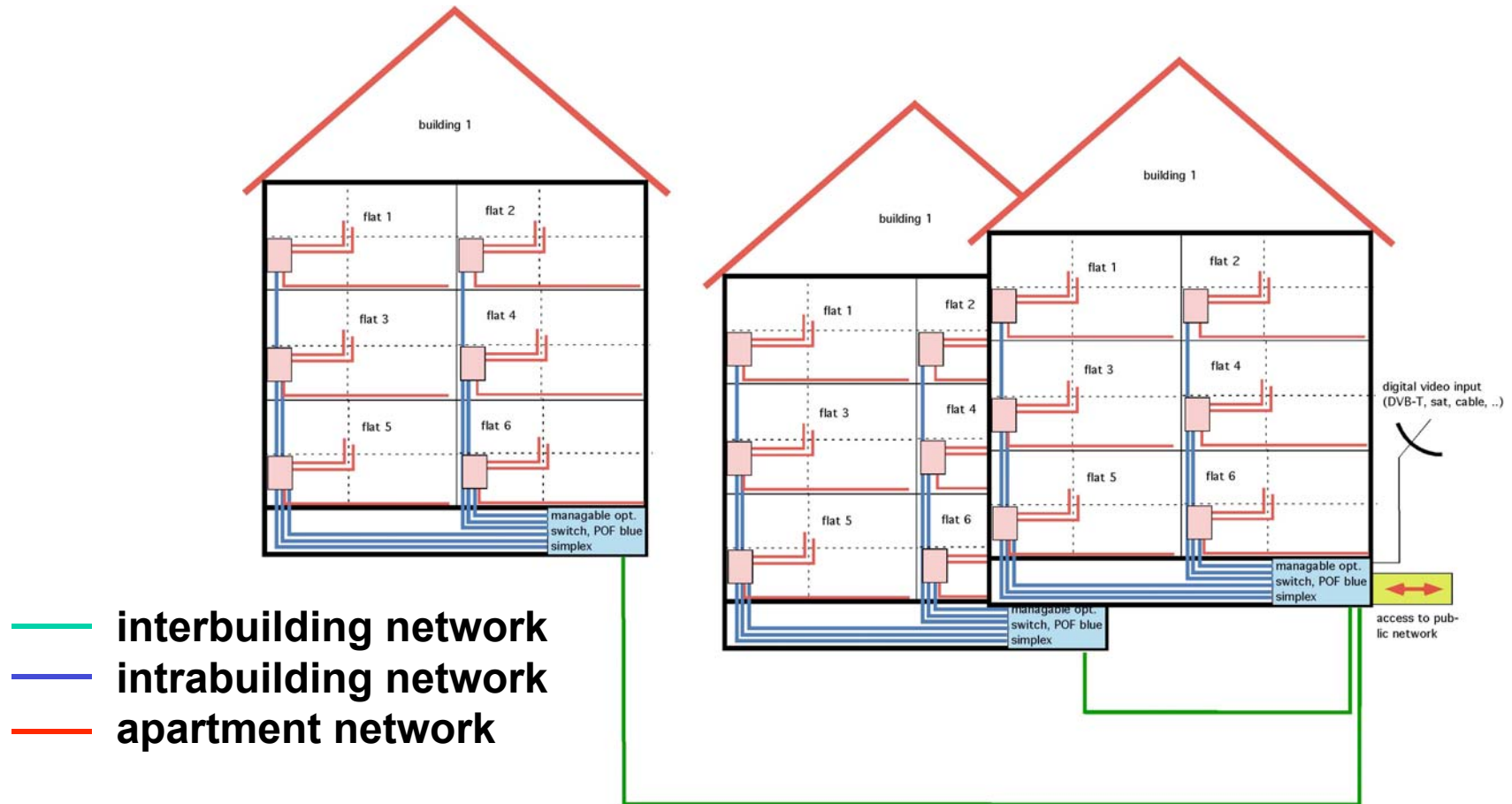
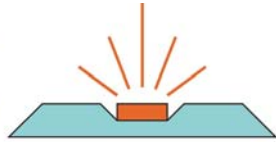
DieMount GmbH  
Giesserweg 3  
38855 Wernigerode

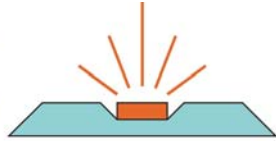
[www.diemount.com](http://www.diemount.com)

**FGT 5.4.1 Meeting, Erlangen, July 17<sup>th</sup>, 2007**



- 1. Telecom and datacom infrastructure for the last 300m**
- 2. Intra building networks: required network equipment**
- 3. Apartment network: required network equipment**
- 4. System solutions with POF SFP transceivers**





**— Inter building network** (→ Dr. A. Bluschke, Teleconnect)

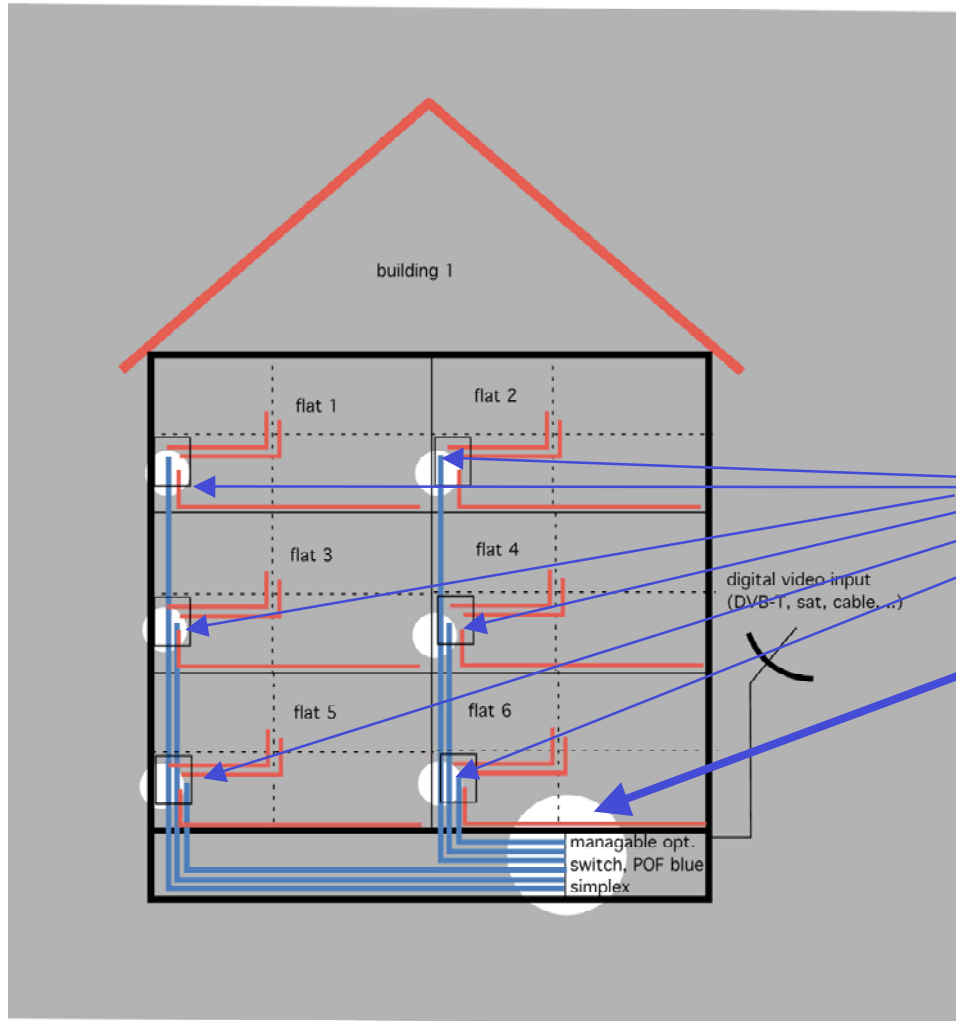
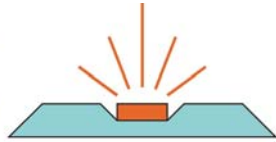
300m	<ul style="list-style-type: none"> <li>• datarate flexible ~ 100 Mbit/s</li> <li>• 520nm wavelength</li> <li>• VDSL2 coding</li> <li>• duplex standard (1mm core, NA=0.5) POF</li> </ul>
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**— Intra building network** (German „Netzebene 4“)

70m	<ul style="list-style-type: none"> <li>• datarate fixed, 100 Mbit/s Fast Ethernet</li> <li>• 470nm wavelength</li> <li>• 4B5B coding</li> <li>• simplex standard POF</li> </ul>
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**— Apartment network** (German „Netzebene 5“)

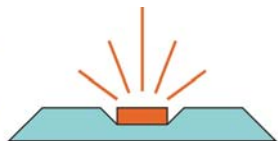
30m	<ul style="list-style-type: none"> <li>• datarate fixed, 100 Mbit/s Fast Ethernet</li> <li>• 650nm wavelength</li> <li>• 4B5B coding</li> <li>• simplex standard POF</li> </ul>
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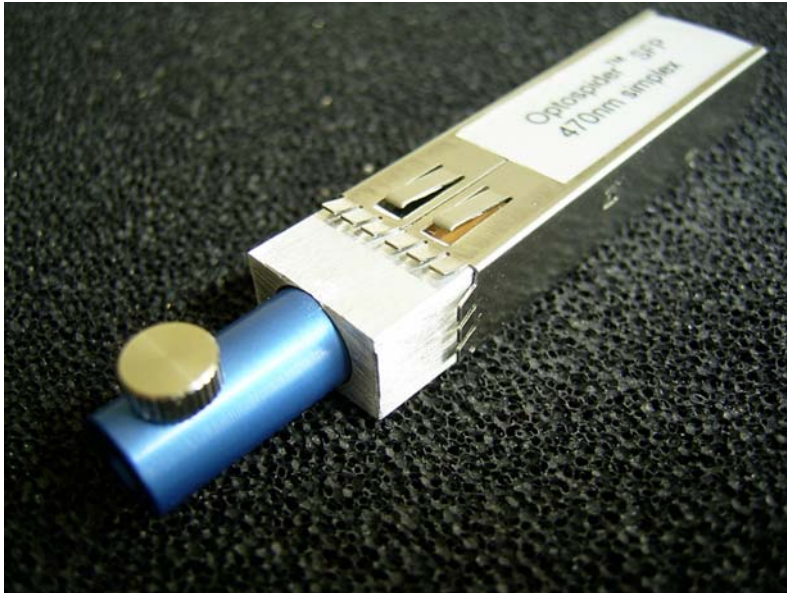
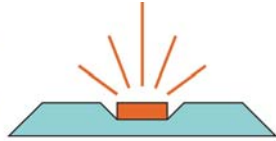
POF cable terminations  
in intra building

network:

- apartment entry
- central node



- **Available equipment:**
  - professional switch units made by big switch manufacturers like Cisco, Hewlett Packard, 3com, Allied Telesis, ....
  - No POF ports in these modules!
- **Offer POF specific switch equipment?**
  - Customers prefer to maintain their switch supplier
  - E.g. Cisco knowhow not easy to acquire
- **Ask the big manufacturers to use POF transceiver?**
  - No optical POF standard for Fast Ethernet for the foreseeable future
  - If feasible, long and time consuming approach
- **Approach therefore:**
  - POF SFP transceivers



## **POF SFP:** Optospider™ SFP 470nm simplex

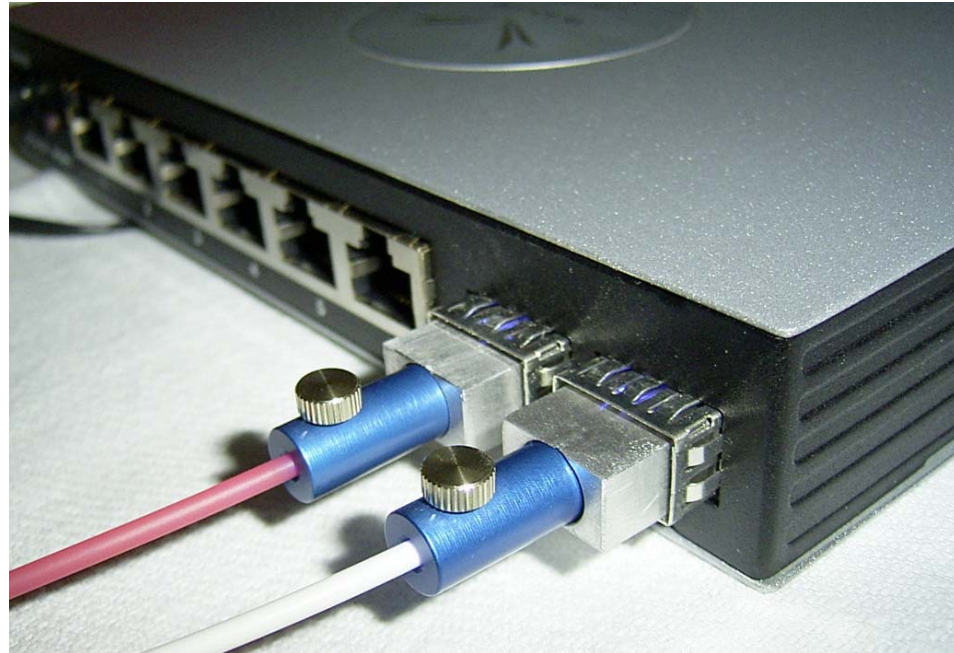
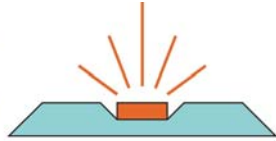
- 100 Mbit/s
- 70m guaranteed
- 470nm wavelength

**100 Mbit/s compatible products on Gbit/s SFP ports according to manufacturers data sheet:**

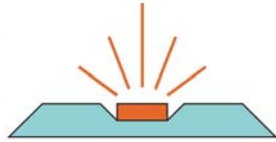
**Cisco:** Catalyst 3750, 3560, and 2970 series switches

**Hewlett Packard:** 2800, 2810, 2900, 3500yl series

**... many other manufacturers:** see published compatibility lists

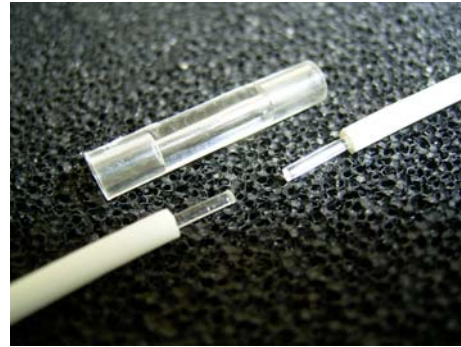


- POF SFP prototypes available
- Full compatibility with small SFP switches (e.g. Wamin CS-Fx2)
- Compatibility (firmware!) with high end professional switches must be checked.
- Cooperation with system houses and telecom operators wanted!



## **POF splices:**

- <math><0.5\text{dB}</math> attenuation depending on surface quality
- return loss sufficient for simplex operation

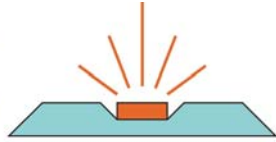


## **POF endface preparation by diamond machining**



**media converter  
Optospider™ CS-110 470nm simplex  
for apartment entry**



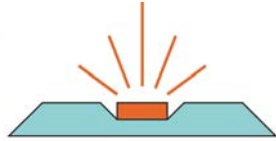


## SIGNALTEK™ FO – Multimedia-Kabel- Qualifizierer from Ideal Industries

Attenuation and BERT measurement for

- copper cable
- SM glass fiber
- MM glass fiber and
- POF in near future?

The module comprises an universal SFP  
port!

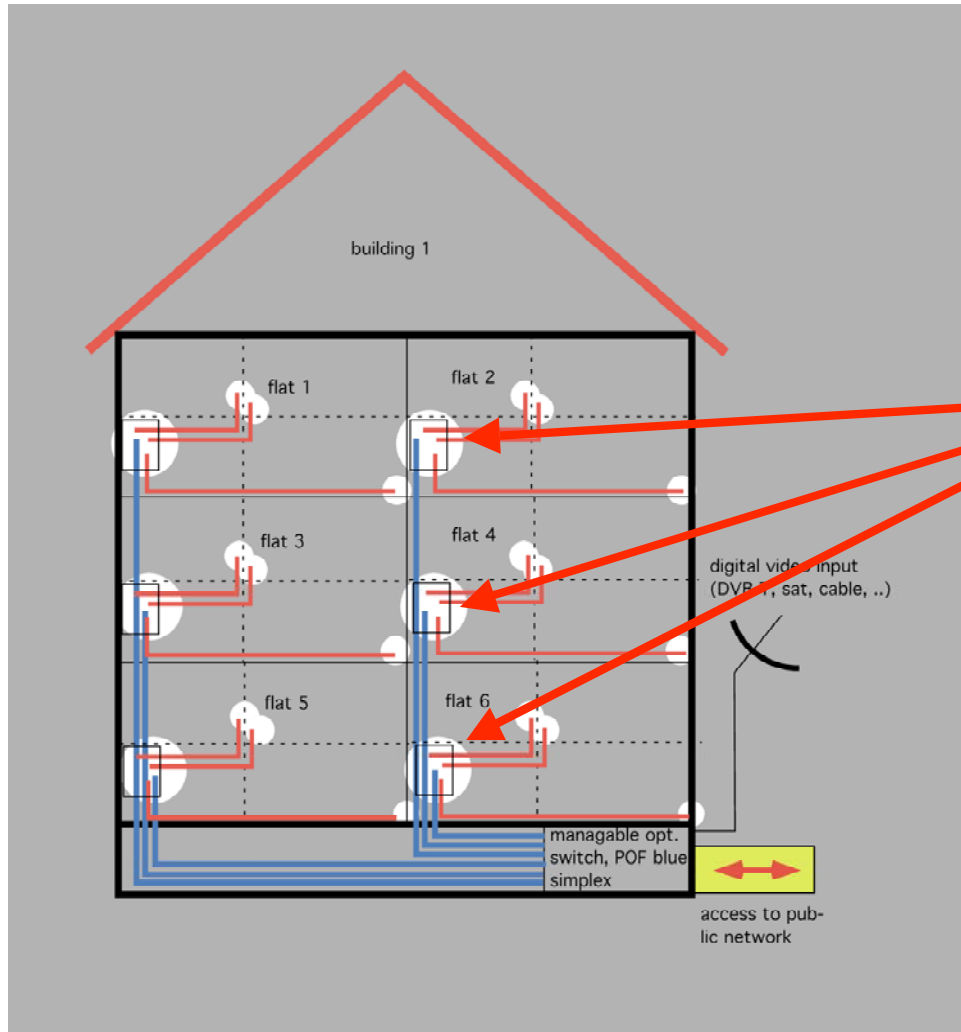
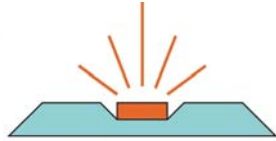


The POF SFP 470nm simplex is the difficult type of transceiver due to:

- 3.3V to 5V conversion
- splitter integration and
- 470nm stable casting materials

The list of the following transceiver types is derived easily:

- 650nm duplex (70m, small form factor connector required)
- 470nm duplex (120m, small form factor connector required)
- 650nm simplex (30m)

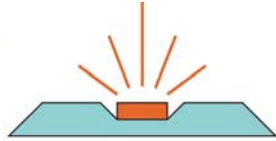


POF cable terminations  
in apartment networks:

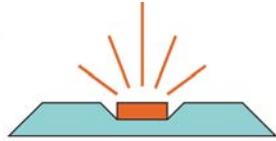
- apartment entry

central node

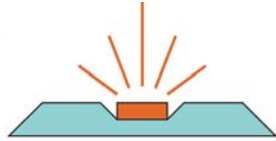
- network module



- Up to now optical switches with more than one optical port for consumer applications (!) are not available, till now.
- Datacom switches are too expensive for private customers (>400 Euro).
- The development of multiple optical port consumer switches suffers from the uncertainty of knowledge about the number of ports, do we need 2, 3, 4, .... optical ports? Manageable?
- Standardized optical POF interface not expected soon.
- The use of electrical switches in combination with media converters is a little bit inconvenient.



- Wamin CS-Fx2 is a small, low cost optical switch comprising 2 SFP ports and 6 electrical RJ-45 ports.
- Each SFP port can be loaded with e.g. a POF SFP 650nm simplex, **if required.** **The customer is not forced to buy components he does not need at present.**
- Further models comprising more than 2 SFP ports expected. (CS-Fx2 is designated for daisy chain operation for FTTH.)

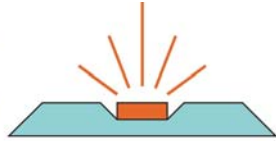


**Customer Premises Equipment (CPE) modules are designed as future universal home gateways for all broadband tripleplay applications (IPTV, VoIP, internet).**

A POF transceiver in the CPE increases fabrication costs and is superfluous for all customers that prefer WLAN or plc (>60%?).

POF SFP might be the option of choice: the costs for a SFP port (cage + connector) are in the order of 1 Euro.

**→ POF SFP import system flexibility to inhouse  
networks.**



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Thank you very much  
for your attention!