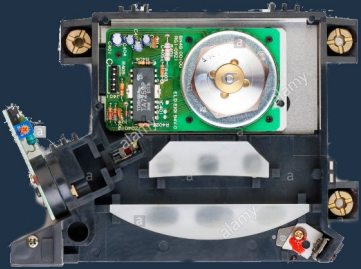


HEXA  STORM

We boost Laser Direct Imaging with prisms

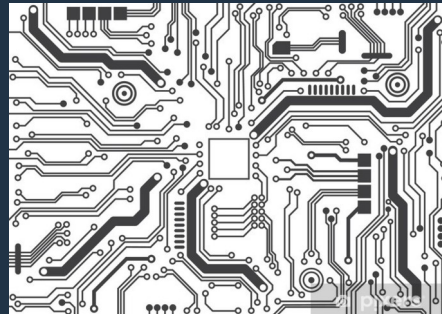
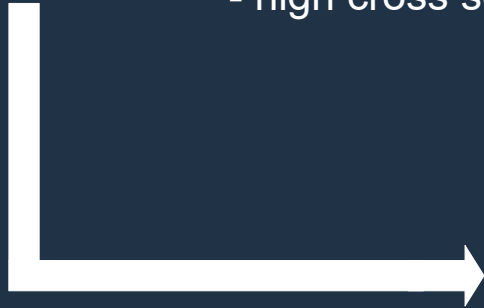
www.hexastorm.com – sales@hexastorm.com

Laser Direct Imaging



Mirrors

- + long line
- + incumbent
- not telecentric
- > 3 optical components
- high cross scan error

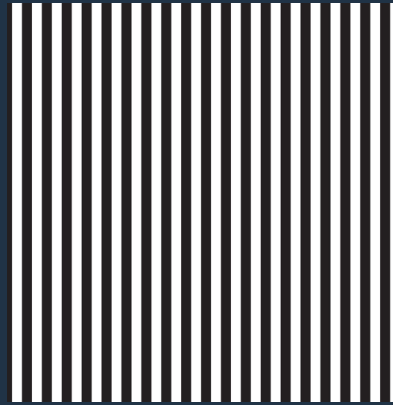
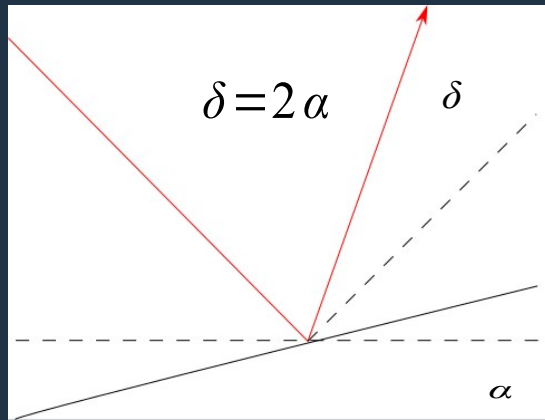


Prisms

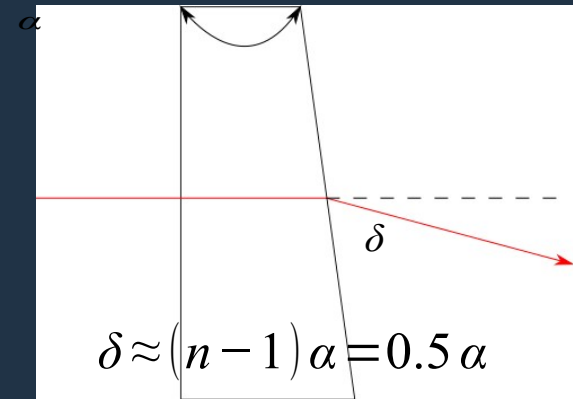
- + telecentric
- + > 2 optical components
- + low cross scan error
- short line
- new entrant



cross scan error explained



Line pattern



Prisms are four times more accurate than mirrors



HEXASTORM Laser Direct Imaging technology



Optimized Gateway



Control Software



High Precision Mechanics



High Precision Optics

Cross scan error

4x lower

Projection

telecentric

Printing resolution

10 micron

Optical elements

2

Medical imaging



Lithography



3D printing



Food



Entry Market: PCB prototyping

- 13.3k PCB prototype systems over 150K\$
- revenue LPKF 25 million USD 2015

	Number of layers	Minimum Line Width	Cost
Nano Dimension DragonFly	<17 layer PCB	90 micron	\$150K
BotFactory Squink	2* layer PCB	254 micron	\$4k
Optomec Aerosol Jet	3D object with embedded wiring	254 micron	\$400k
LPKF mechanical milling	<8 layer PCB	100 micron	\$6-17K
LPKF laser milling	<8 layer PCB	50 micron	\$100K
LPKF laser transfer printing	Individual layers	unknown	unknown
Volterra V-One	2* layer PCB	200 micron	\$4.2K
Bungard	2* layer PCB	50 micron	unknown
Prism scanner	2* layer PCB	25 micron	300\$ per module

Future Markets: Laser Microscope

Competitive Landscape

Leica microsystems

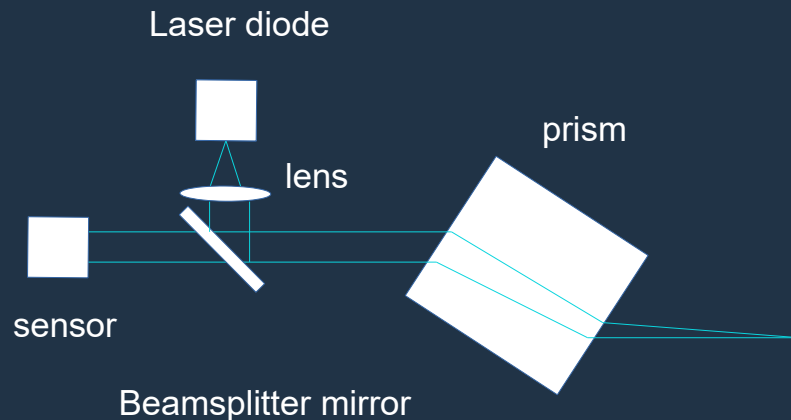
Nikon corporation

Olympus Corporation

Carl Zeiss AG

Brucker and Asylum

Thorlabs



Facts:

price laser microscope 80K – 250K USD

DIY laser microscope (100K views YouTube)

2D sensors very fast; allows transition to 2D



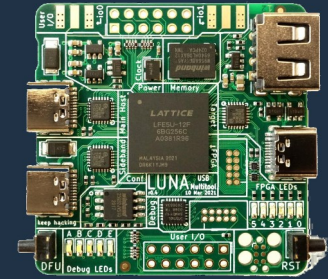
Target Customer Profile



Engineer & Hardware Hacker
Needs: Tailored Solution & Education

Examples

- **Luna (Gateway for USB)**
sales 300K \$
price 149\$

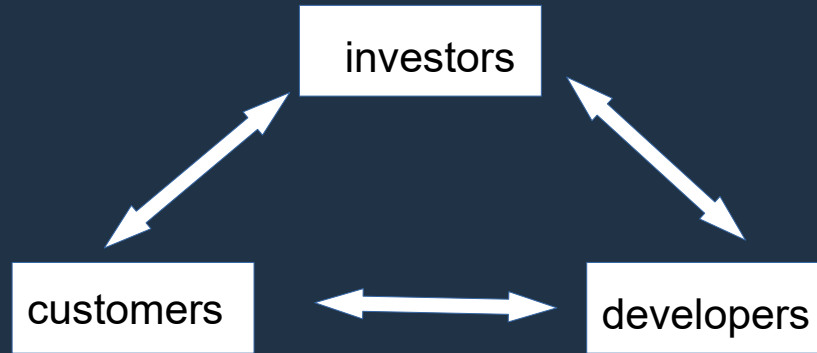


- **Precursor (Gateway with Phone)**
sold 300K \$
price 565\$



Business Strategy

key stakeholders:



Closed source:

- traditional model
- unfathomable wealth
- lock-in



Open source:

- network effects
- feedback
- marketing
- visibility engeneers
- finished product not required
- regulator can enforce open-source

Roadmap

5 laser heads

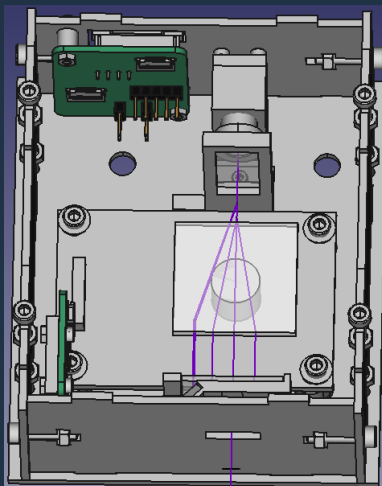
adapt gateway
test new motor

50 laser heads

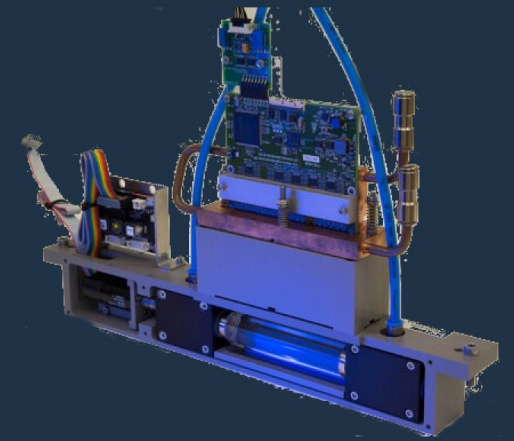
improve stitching
PCB exposure

500 laser heads

laser microscope
balance motor
improve assembly process



SWOT Analysis





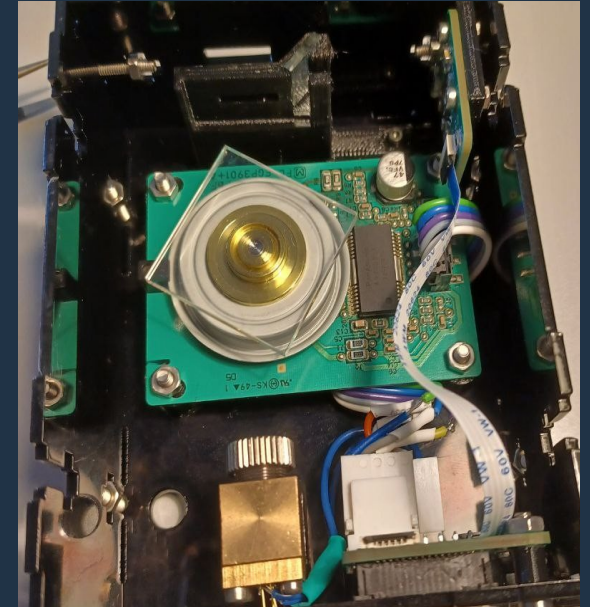
	Positive	Negative
Internal	<u>Strengths</u> marketing customer feedback no skills / funding gap	<u>Weaknesses</u> submodule no exclusivity solo founder
External	<u>Opportunities</u> chip shortage open source adoption selective laser sintering AM industry growth	<u>Threats</u> Chinese clones AMSystems open-source cannibals

AMSystems:
prism engine with plurality of lasers
backed by Dutch state
closed source
illumination under angle

HEXA STORM

Company Factsheet

- Incorporation date: 1-03-2017
- Legal form: ZZP (freelancer)
- Domicile: Netherlands
- Shareholders: 1
- Current funding: via job
- IP:  open source hardware
- Awards: Award in  Hackaday Prize 2019



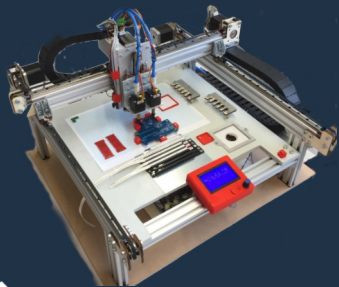
Manufacturing Process



encasing with laser cutter



parts with FFF printer



PCB with pick and place



Quick facts

Bill of materials: 70\$

Lead time prisms: 2 months

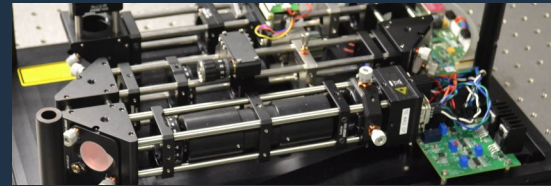


About Me

Founder - **HEXA**  **STORM**



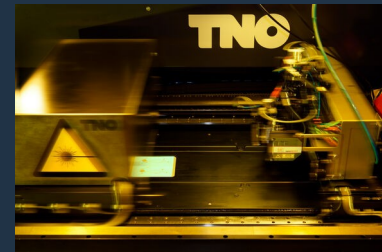
Optical Design Engineer -  **NTS** OPTEL



Data Scientist -  **DSM**



3D Printing Expert - **TNO**



open source
hardware