

Aplicacion de tecnicas revolucionarias de inspeccion de tuberias (CCTV) para obtener resultados superiores en el diagnostico de redes subterraneas



IBAK siempre el motor clave de la industria del alcantarillado

El pasado



1955

El presente



2023

El futuro



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makes the
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IBAK – The inventor of sewer inspection

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Technical revolution by IBAK
World's first sewer inspection
camera in 1956



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1982 – The First Pannable Camera

- previous systems with axial view only
- integrated panning mechanism to look onto the pipe wall
- also available as „portable“ tractor system



Rohrleitungskamera **RAX11** Color



Farbfernsehen für Kanalrohre

Farbfernsehkamera für Brunnen

Blickverswenkung bis 220°

90° Öffnungswinkel

CCD-Technik, robust, wasserdicht CCD-Technik, farbgetreu

PAW 112/131/42/0000

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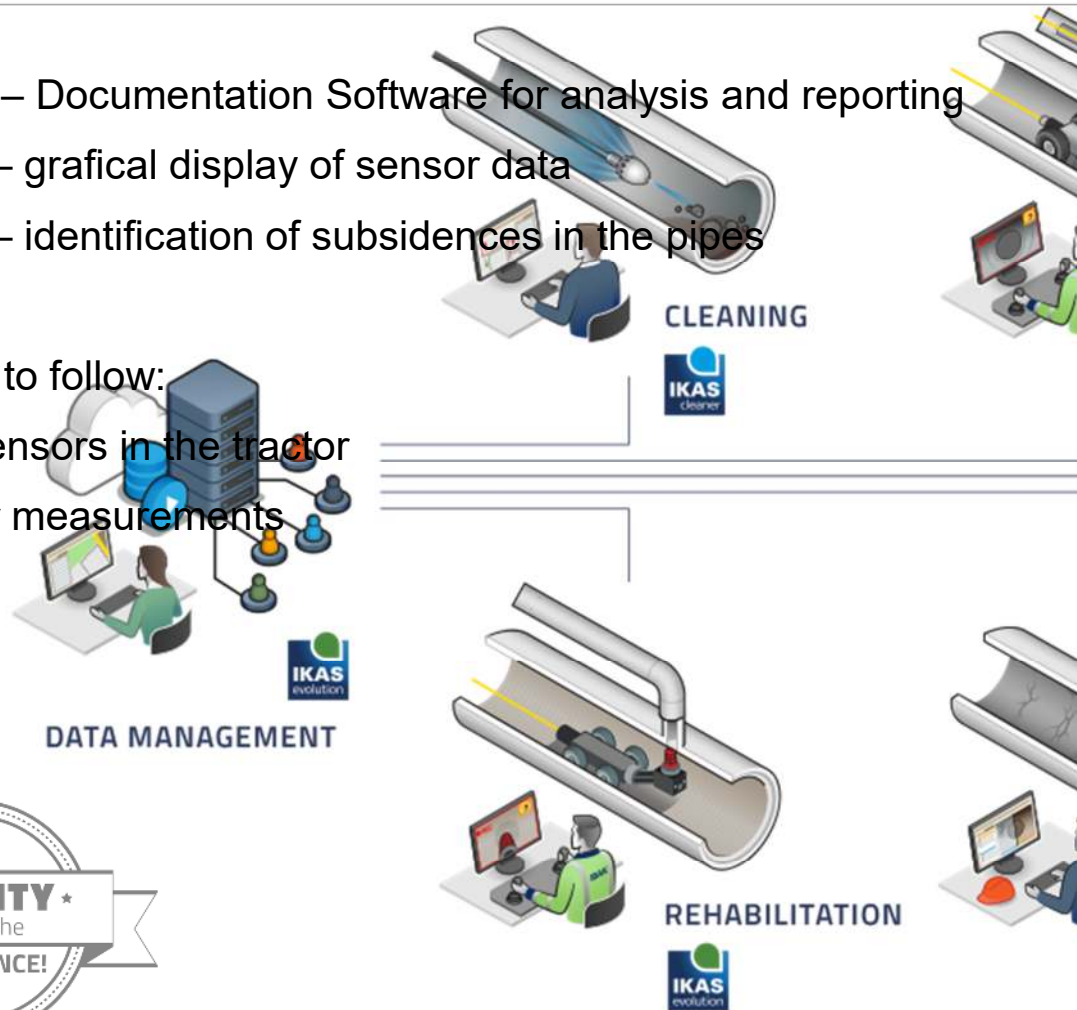
Digital Data Processing and Sensors

1987 – Documentation Software for analysis and reporting

- grafical display of sensor data
- identification of subsidences in the pipes

Later to follow:

tilt sensors in the tractor
laser measurements



ESTING

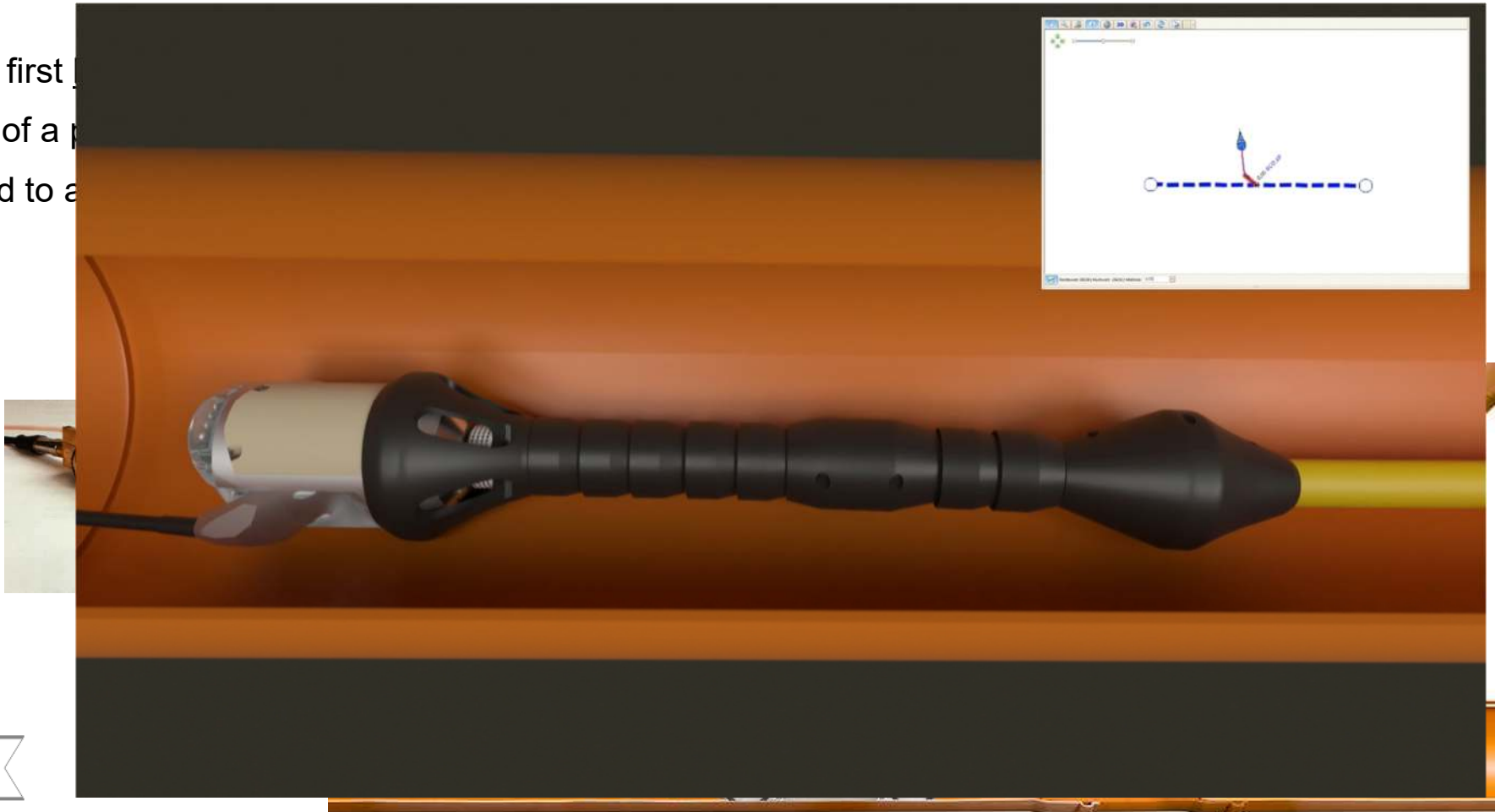
REHABILITATION PLANNING



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1993 – The first LISY

- world's first
- launch of a
- no need to a



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3D GeoSense – Pipe run survey

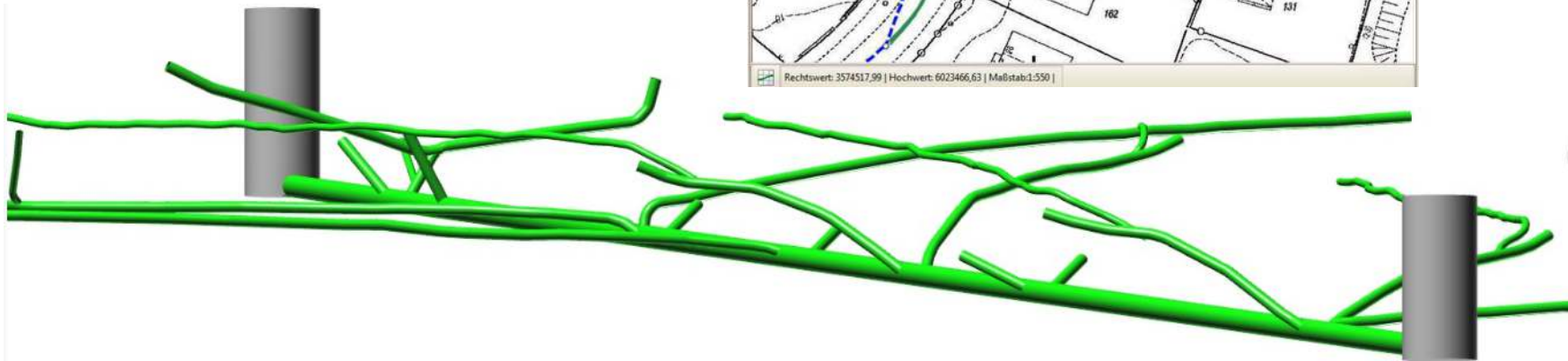
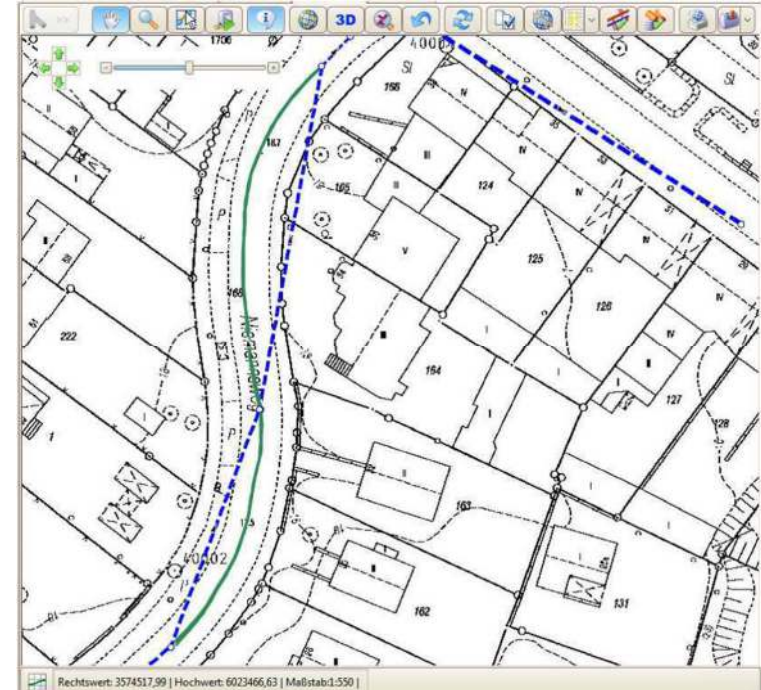
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Motion sensor in the camera measures all motions
Combination with length counter

Identification of the real direction and curves of pipes

Used for unknown pipes or correction of wrong data

Available for lateral networks and mainlines



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2001 – Introduction of PANORAMO



- Spherical image scanner for creation of 3D films
- The 360° view allows scanning and analysis of the entire pipe
- Condition assessment in the office independently of the scan

High inspection speeds, no stopping

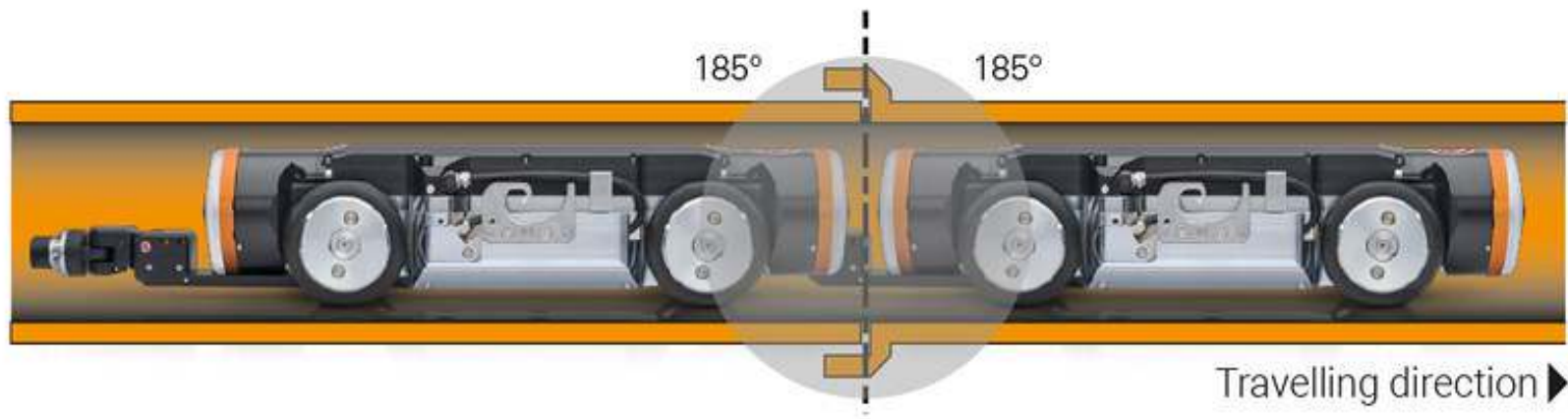
- Google Streetview started 2007

PANORAMO, PANORAMO 150, PANORAMO SI



PANORAMO – The complete inspection

IBAK



2 scans (forwards, backwards) capture 100% of the pipe
Digital analysis in the office



PANORAMO – The complete inspection

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Unfolded view allows for rapid overview and defect recognition

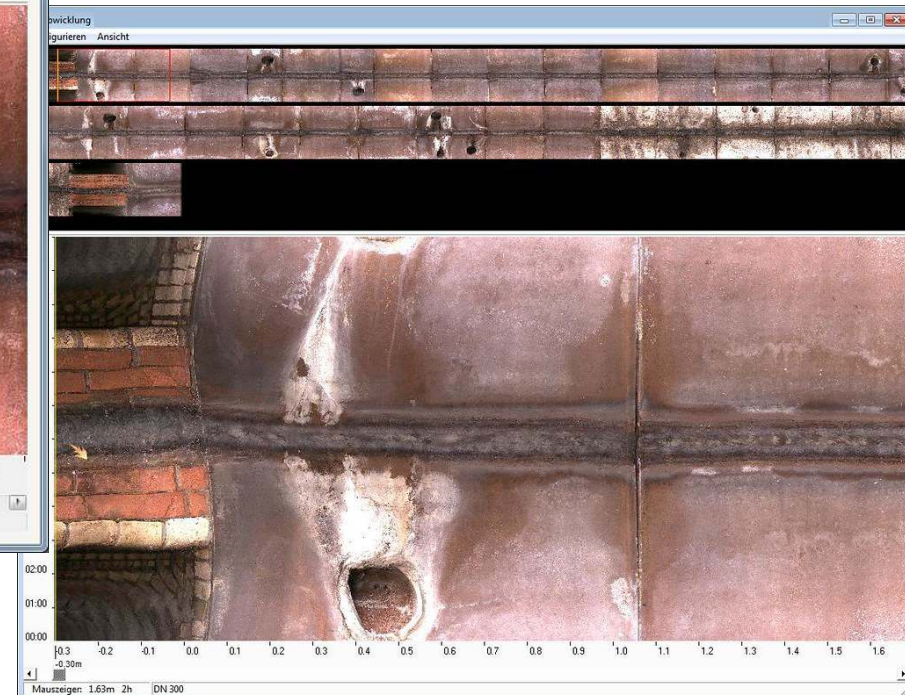


PANORAMO – The complete inspection

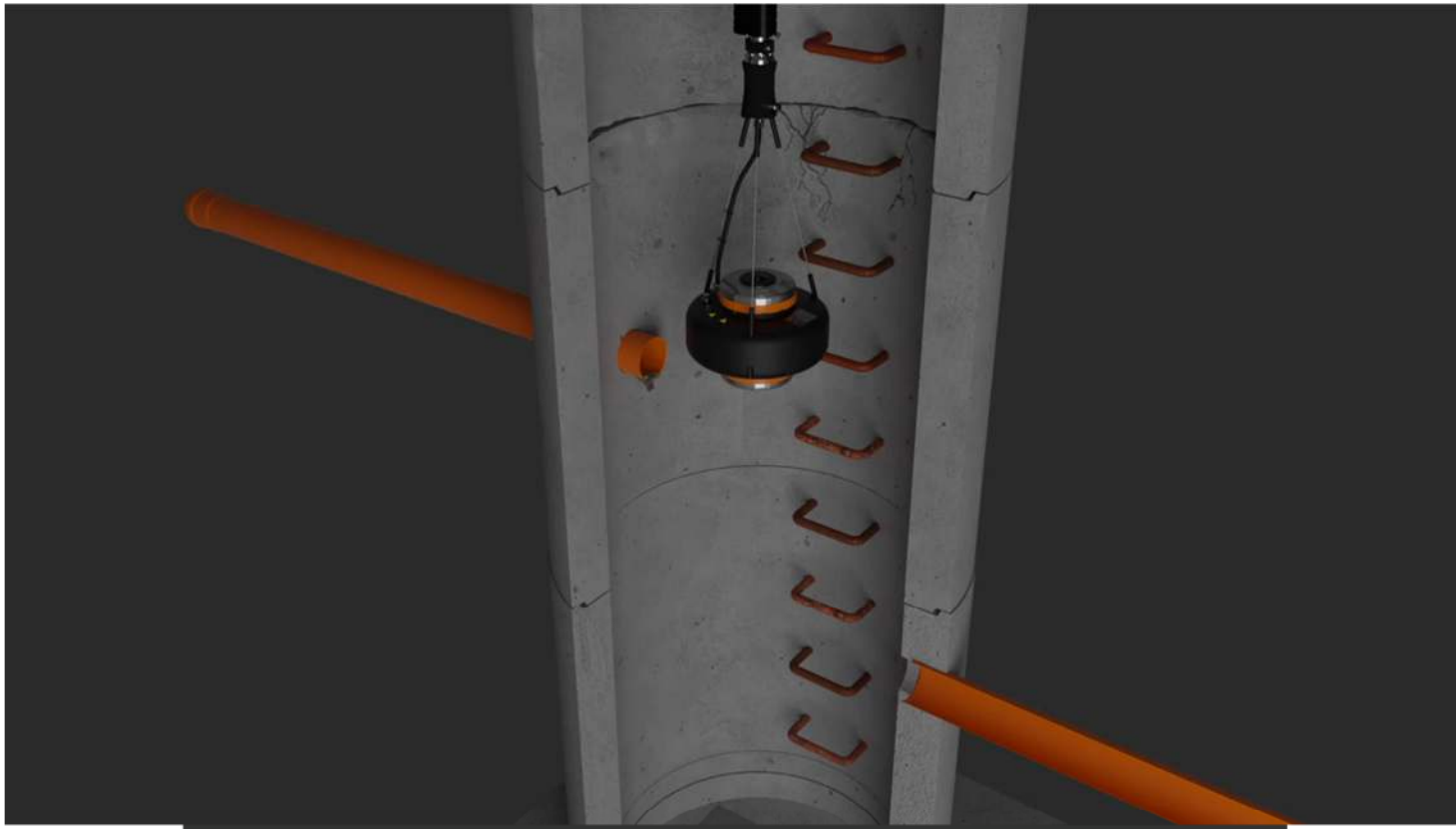
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PANORAMO SI – Vertical Inspections

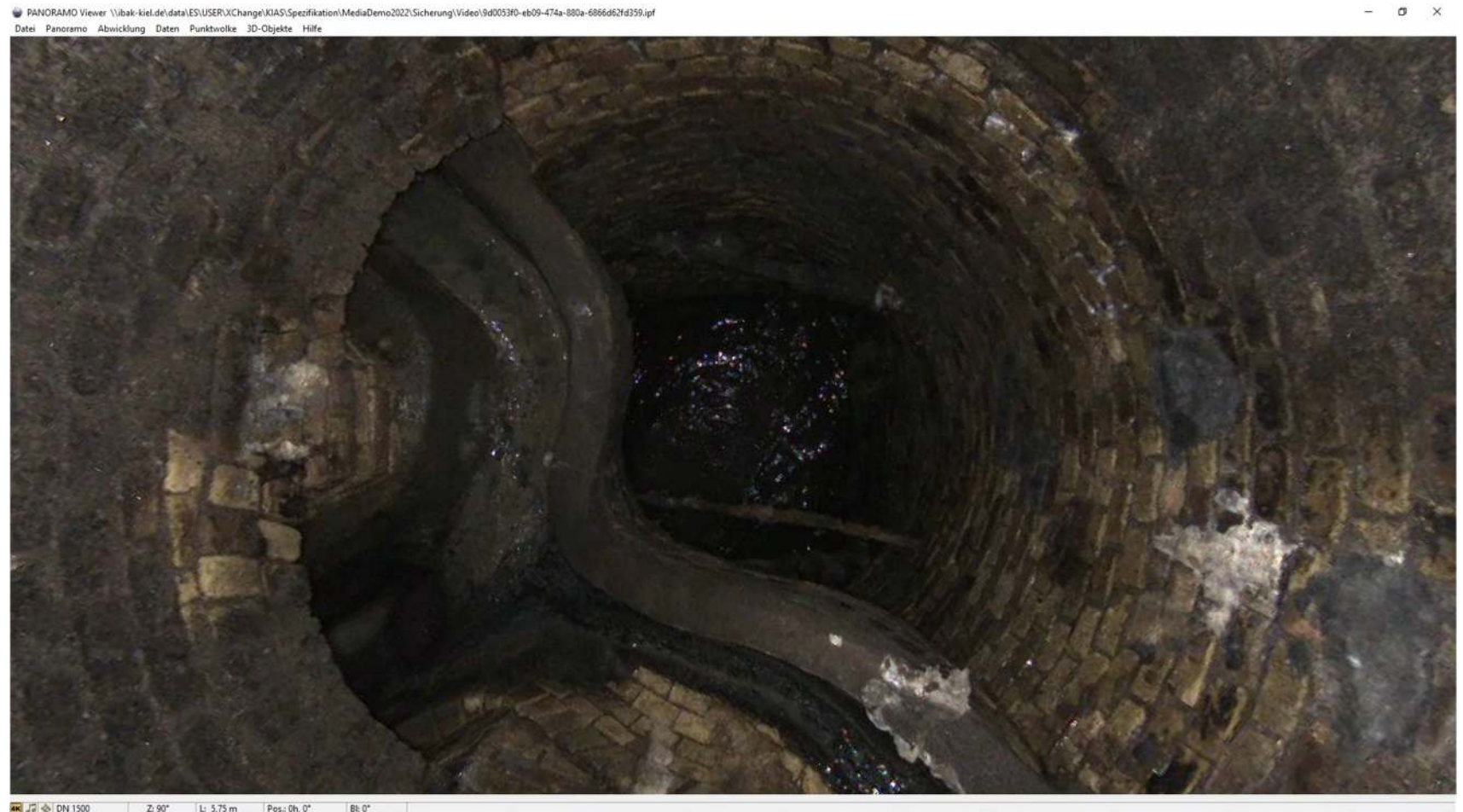


Generation of 3D point cloud based on photo data
Measurement of distances, diameters...

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PANORAMO SI – Vertical Inspections

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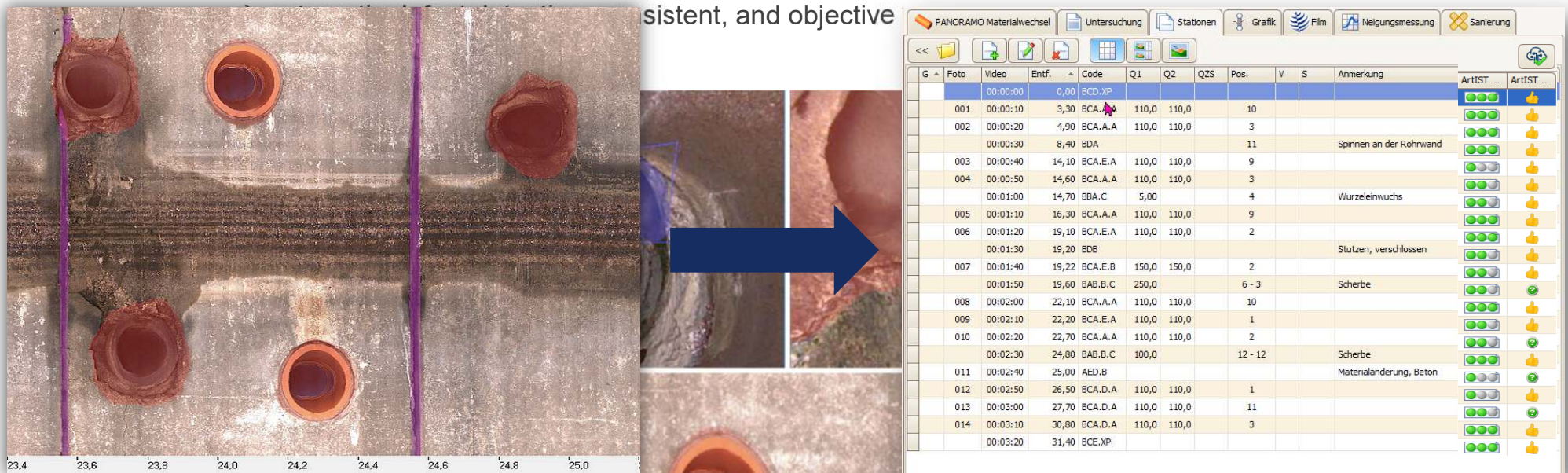
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IBAK ArtIST – AI in Sewer Inspection

Workflow: Upload of scans to cloud, download of condition data into the inspection software

- Artificial Neural network / AI algorithm trained with millions of sewer data

sistent, and objective



G	Foto	Video	Entf.	Code	Q1	Q2	QZS	Pos.	V	S	Anmerkung	ArtIST ...	ArtIST ...
			0,00	BCD.XP									
001	00:00:10	3,30	BCA.A.A	110,0	110,0		10						
002	00:00:20	4,90	BCA.A.A	110,0	110,0		3						
	00:00:30	8,40	BDA				11				Spinnen an der Rohrwand		
003	00:00:40	14,10	BCA.E.A	110,0	110,0		9						
004	00:00:50	14,60	BCA.A.A	110,0	110,0		3						
	00:01:00	14,70	BBA.C	5,00			4				Wurzeleinwuchs		
005	00:01:10	16,30	BCA.A.A	110,0	110,0		9						
006	00:01:20	19,10	BCA.E.A	110,0	110,0		2						
	00:01:30	19,20	BDB								Stützen, verschlossen		
007	00:01:40	19,22	BCA.E.B	150,0	150,0		2						
	00:01:50	19,60	BAB.B.C	250,0			6 - 3				Scherbe		
008	00:02:00	22,10	BCA.A.A	110,0	110,0		10						
009	00:02:10	22,20	BCA.E.A	110,0	110,0		1						
010	00:02:20	22,70	BCA.A.A	110,0	110,0		2						
	00:02:30	24,80	BAB.B.C	100,0			12 - 12				Scherbe		
011	00:02:40	25,00	AED.B								Materialänderung, Beton		
012	00:02:50	26,50	BCA.D.A	110,0	110,0		1						
013	00:03:00	27,70	BCA.D.A	110,0	110,0		11						
014	00:03:10	30,80	BCA.D.A	110,0	110,0		3						
	00:03:20	31,40	BCE.XP										

All adjustments to the ArtIST data by the operator are returned to ArtIST- feedback loop

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AI Control – Outlook to the future

Autopilot to control the movements of cars / planes



(Semi-) Autonomous Inspection and Rehabilitation Systems
 – it's not science fiction, but already real
 – in the very beginning, not ready for sale

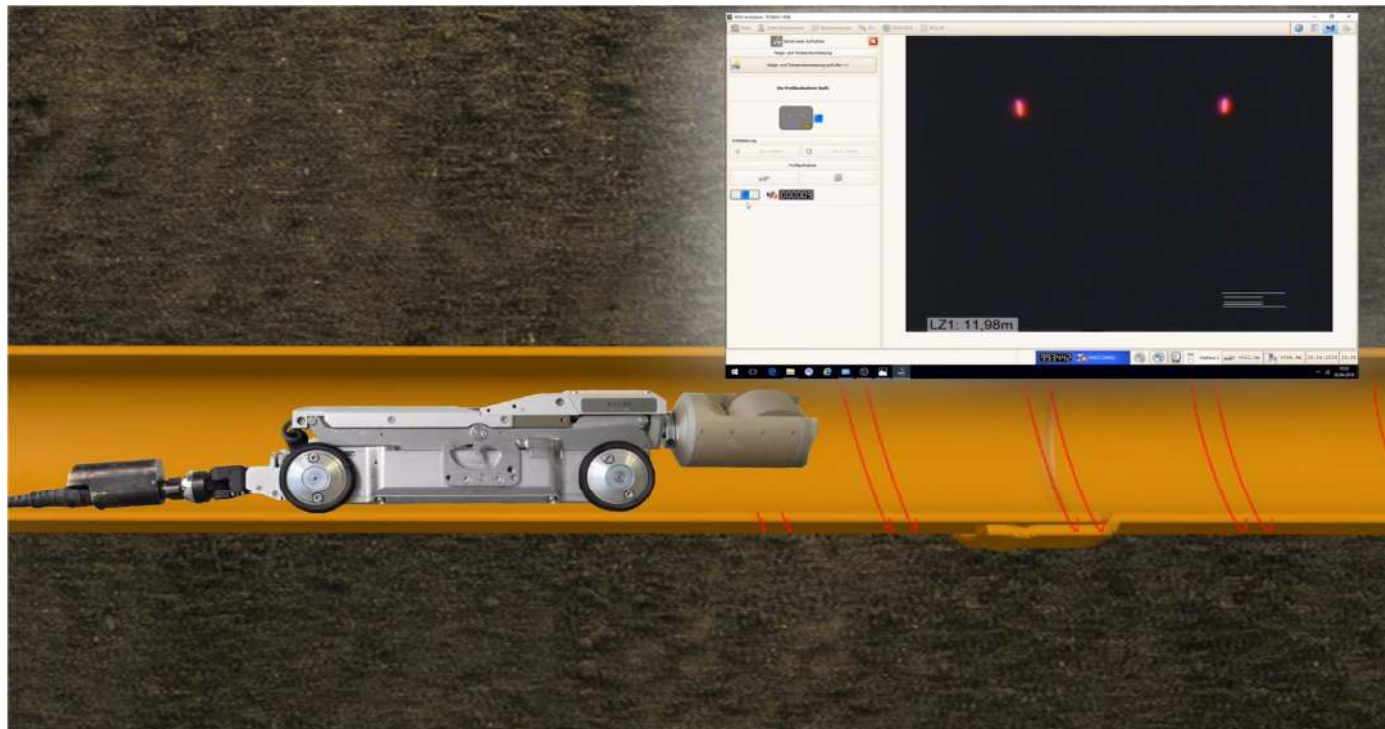
**Next presentation at Ro-Ka-Tech Exhibition in Germany
 May 9th – 12th**

Combination with ArtIST (automated detect



Continuous Profile Analysis

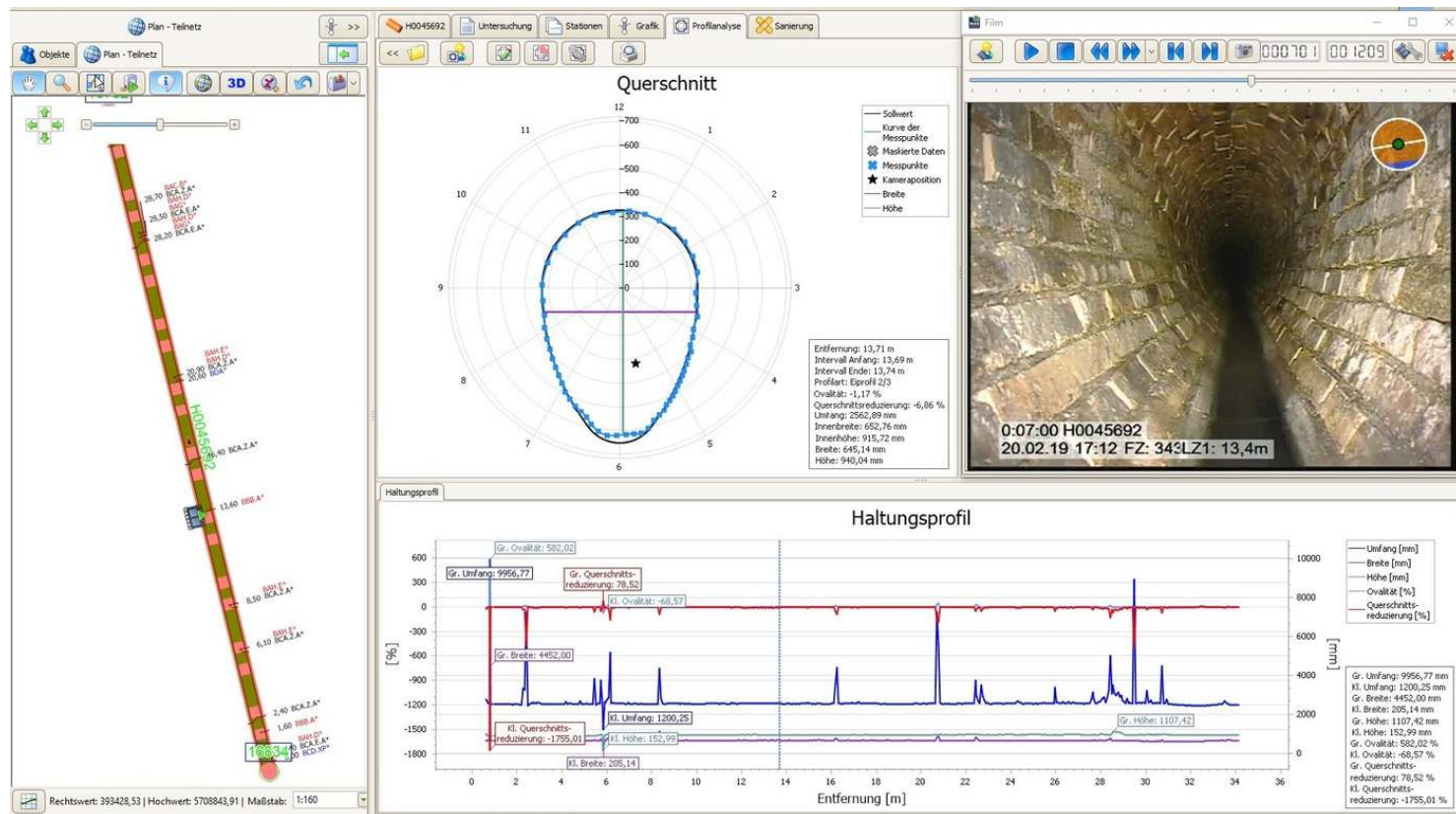
- flexible pipes (PVC) can be deformed and reduce water capacity
- Camera with lasers used to spirally scan pipe deformation up to 2.000 mm



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Continious Profile Analysis

- Also available for egg-shaped pipes
- Integrated in IBAK's sewer analysis software or stand alone



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MicroGator Air – The powerfull pneumatic cutter

most cutter

IBAK deve

- 80% mo
- 35% mo
- Travel D
- Camera
- and Air



One system – two applications:
combination with camera tractor
on the same cable and control unit



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MicroGator Air – Silence is the key

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Most cutter systems require large generators, pumps, compressors

- Noisy, emissions, high cost of operation

Challenges:

- operation at night time
- noise-sensitive areas (hospitals, nature/wildlife reserves)
- stress for the operators, skilled labor shortage
- CO² / gases, Public tenders asking for locally emission-free operation

Solution: Electric Cutting with battery-operated systems



noise-free cutting, no gases
can be combined with electric vans



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Ultra High Pressure (UHP) Nozzle for cutting

- A rotating UHP cleaning nozzle is operated on a MicroGator carrier system
- Efficient and controlled removal of tough deposits such as concrete, minerals
- Working Pressure 600 to 2.500 bar
- Blocked pipes over long distances can be efficiently opened within a very short time and under camera observation
- Removal of roots



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Ultra High Pressure (UHP) Nozzle for cutting

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Gracias por su atención!



¿Alguna pregunta?
Visítanos en stand 57 y al
pabellon aleman.



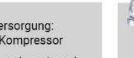
Overview



IBAK-Fräs- und Saniersysteme/Cutting and Rehabilitation Systems

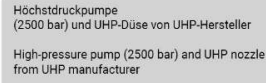
MicroGator Air/MainLite-System/MicroGator Air/MainLite System

Mobilier Einsatz oder als Fahrzeugsystem/Mobile use or as a vehicle based system

MainLite easy Kabeltrommel/ Cable Reel KT156 	MainLite fit/solid Kabelwinde/ Cablewinch KW206/306 	BP100 	BS10 
Wasserstrahlfräsen/ UHP Cutting 	Pneumatisch Fräsen und Sanieren/ Pneumatic cutting and rehabilitation 		Inspizieren/Inspection 
MG GT Lite 	ST50 Kamerareinigung/ for camera cleaning 	Energieversorgung: externer Kompressor Energy supply: external compressor 	T66 mit ORION/ T66 with ORION 
Hochdruckpumpe (2500 bar) und UHP-Düse von UHP-Hersteller 	Schlauchtrommel/ Hose Reel ST100 	Batterieversorgung/Battery power supply 	
Optionen/ Options 			
Fahrwagenzusatz/tractor extension 			
Hütchen setzen über MicroGator-Air-Adapter/Setting top hats via MicroGator Air adapter 			
Manschetten setzen über MicroGator-Air-Adapter/Setting cuffs via MicroGator Air adapter 			

MicroGator-System MicroGator System

Fahrzeugsystem/Vehicle based system

Kabelwinde KW100/ Cable winch KW100 	BS7 	Batterieversorgung/ Battery power supply 
Wasserstrahlfräsen/ UHP Cutting 	Elektrisch Fräsen und Sanieren/ Electric cutting and rehabilitation 	
MicroGator GT 	Optionen/ Options 	Inspizieren/ Inspection 
Hochdruckpumpe (2500 bar) und UHP-Düse von UHP-Hersteller 	Diverse Wechsellköpfe/ Various exchangeable heads 	mit ORION (2.9) über ORION-Adapter With ORION (2.9) via ORION adapter 
Fahrwagenzusatz/ Tractor extension 	FrontCam 	
Hütchen setzen über MicroGator-Adapter/Setting top hats via MicroGator adapter 		
Manschetten setzen über MicroGator-Adapter/Setting cuffs via MicroGator adapter 		

Adapter MicroGator Air

Quick-Lock-Adapter

- Connections of camera and Quick-Lock coupling will be mounted on holder of air motor
- No additional air will be required for the packer. Existing infrastructure will be used
- **Advantage:** no additional camera is required because of re-mounting the CutterCam



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Adapter MicroGator Air

Adapter for Top Hat-Packer

- Top Hat Adapter incl. camera to be mounted on holder of air motor
- Camera will be installed either in or on top of the adapter dependent on the pipe dimension
- **Advantage:** no additional camera is required because of re-mounting the CutterCam



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MicroGator GT Lite

- Adaption with Swivel Joint and UHP nozzle the same like MicroGator GT
- Special supply line for water and air to assure proper camera cleaning, which will be provided with small twin hose
- **Advantage:** fully embedded in the MainLite family → KW206 as control line

