



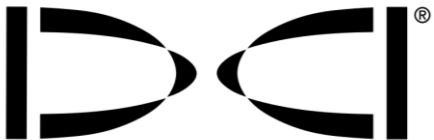
Advancements in Walk-Over Locating Systems. From AI Integration to High-Accuracy Geopositioning.

30th DCA Annual Congress, September 30, October 2, 2026 - Rome, Italy

Renzo Chirulli (*), Yusuf Bařaran (), Bjorn Van de Weghe (**)**

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(**) DCI – Territory Manager EMEA



HORIZONTAL DIRECTIONAL DRILLING SKILLED PEOPLE SHORTAGE



AGING WORKFORCE



NOT ENOUGH NEW
PEOPLE ENTERING



SPECIALIZED SKILLS
TAKE TIME TO LEARN



HIGH DEMAND
FEW QUALIFIED

WE HAVE
THE WORK.
BUT NOT
THE PEOPLE.



**THE HDD INDUSTRY IS FACING
A SKILLED LABOR SHORTAGE**

The HDD Industry Has a Problem



- The shortage of new personnel is a challenge felt across Europe in the HDD industry
- This prevents many companies from expanding the size of their drilling fleets, despite the growing demand for HDD
- **Technology must play a crucial role** in simplifying traditionally complex operations, reducing the learning curve required to operate HDD systems
- This approach can be applied to all subsystems that make up HDD technology, and particularly to **walk-over guidance systems.**

Advanced walk-over systems

› Making Complex Operations Simple

- › AI-powered automatic frequency selection
- › Automatic calibration

› Extending the Range of Applications

- › The vantages of a wireless transmission of signals and data
- › Optimized transmission power
- › Maximized battery life
- › Extended depth and range capabilities

› Delivering Accurate Bore Mapping and Data Logging

- › Integration with a high-accuracy positioning system
- › Simplified data logging

› Two Case Studies



Advanced walk-over systems

› Making Complex Operations Simple

- › AI-powered automatic frequency selection
- › Automatic calibration

› Extending the Range of Applications

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- › Optimized transmission power
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› Delivering Accurate Bore Mapping and Data Logging

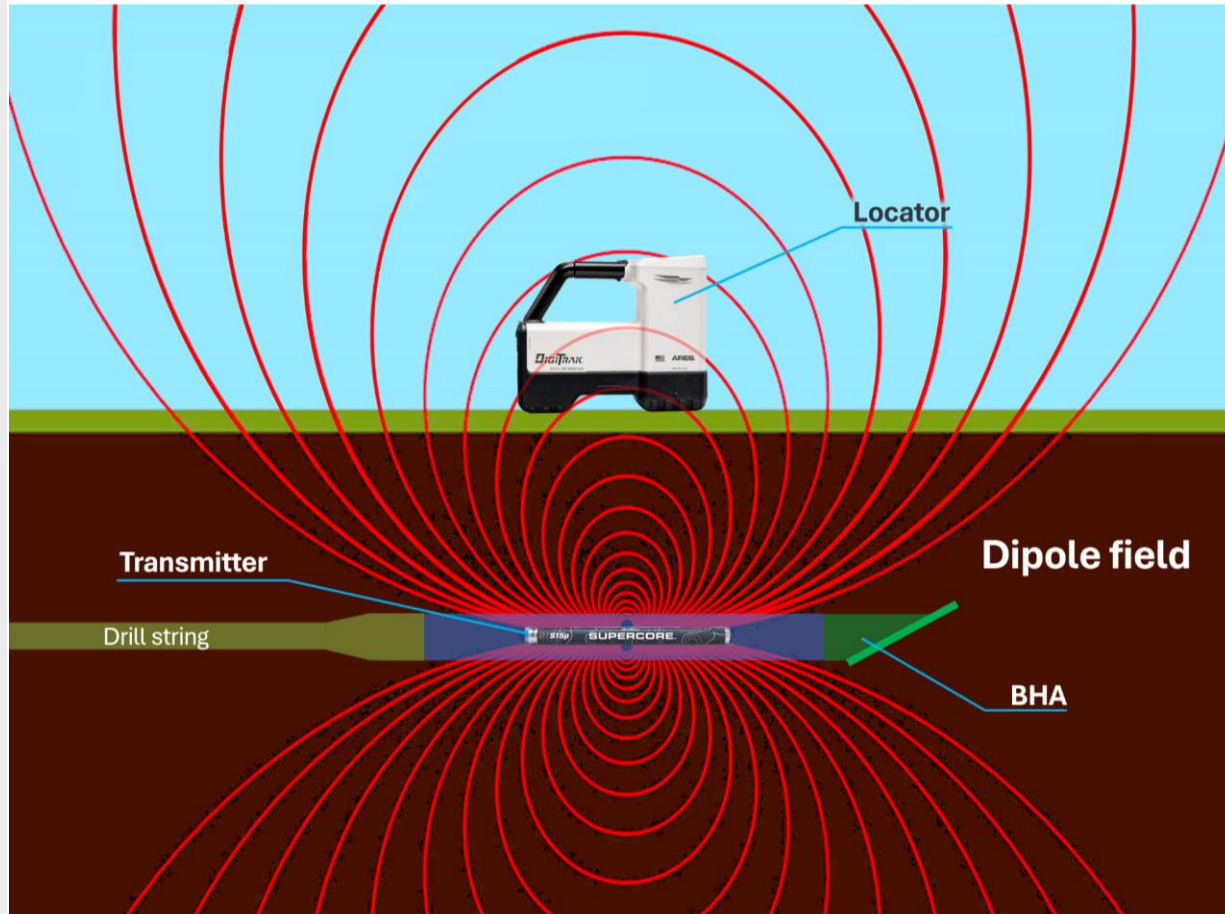
- › Integration with a high-accuracy positioning system
- › Simplified data logging

› Two Case Studies



UNDERSTANDING SIGNAL

The magnetic field



What is the signal?

- Magnetic Signal
- Elliptical shaped field lines
- Signal strength - depth

Signal gives us:

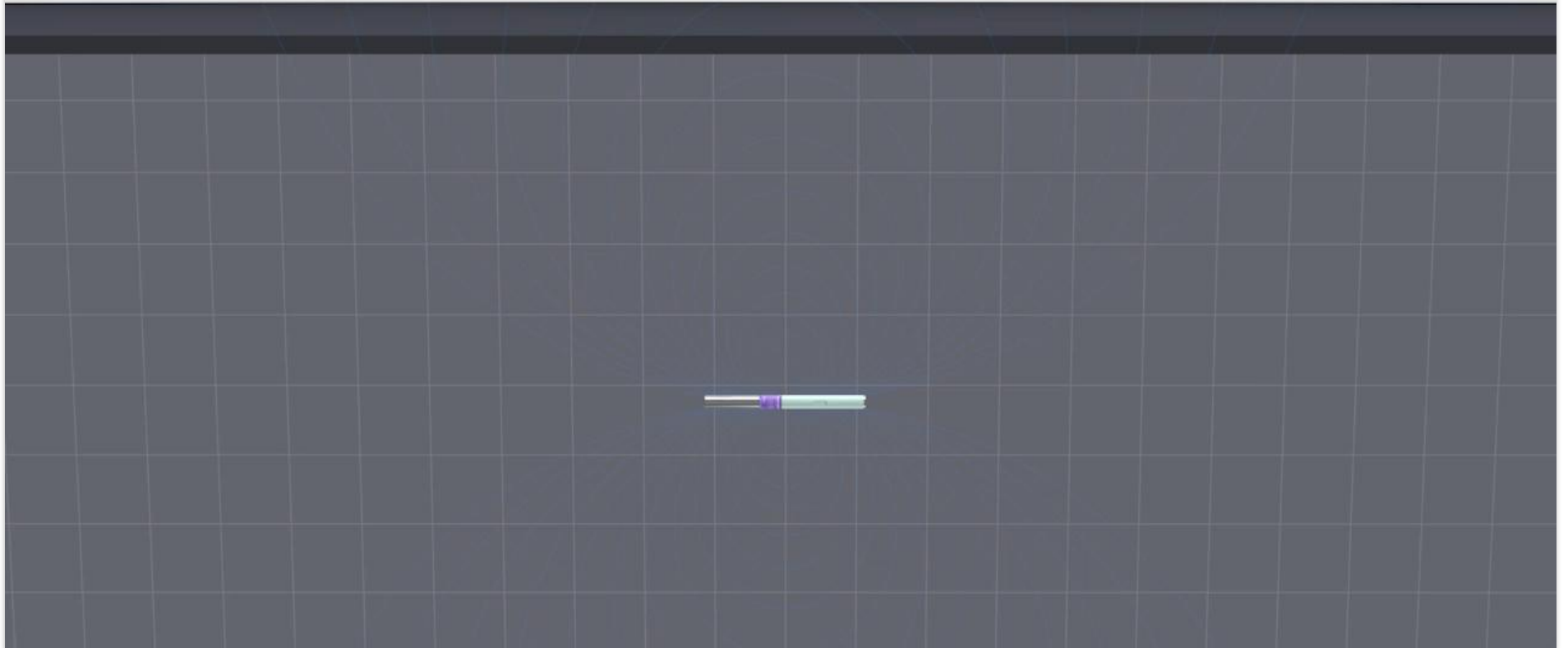
- Location
- Heading
- Depth
- Data (clock, pitch, pressure, etc.)

UNDERSTANDING SIGNAL

The magnetic field

Transmitter

Signal Field



UNDERSTANDING SIGNAL

Active Interference

Anything that emits a signal or generates its own magnetic field

Electromagnetic Interference (EMI)



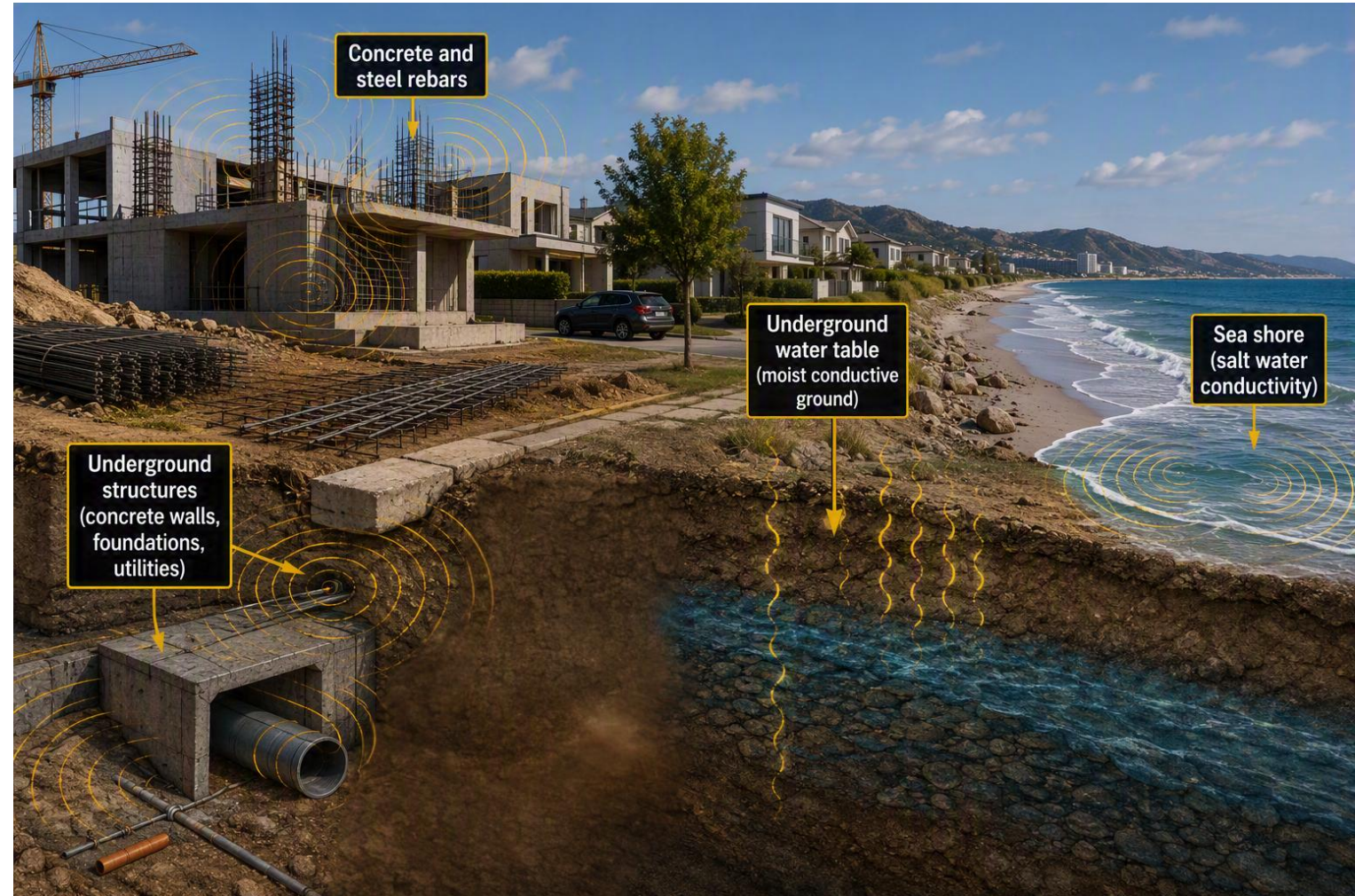
DCA

UNDERSTANDING SIGNAL

Passive Interference

Anything that blocks, absorbs or distorts a magnetic field

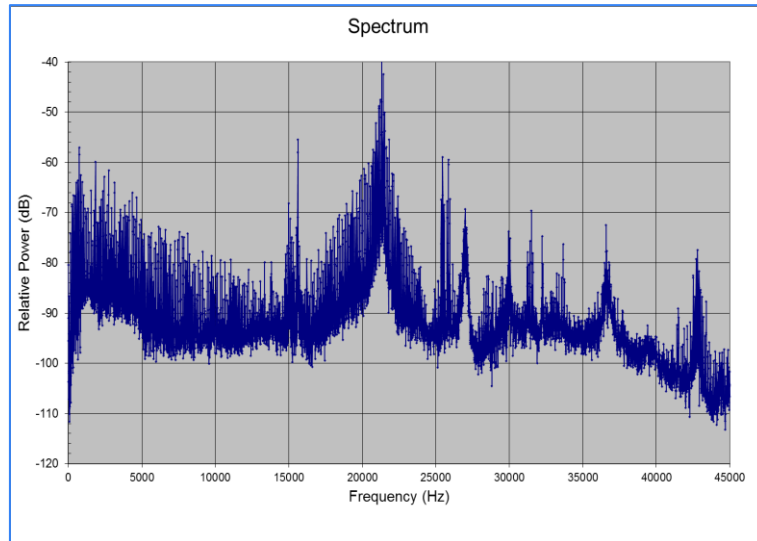
Electromagnetic Interference (EMI)



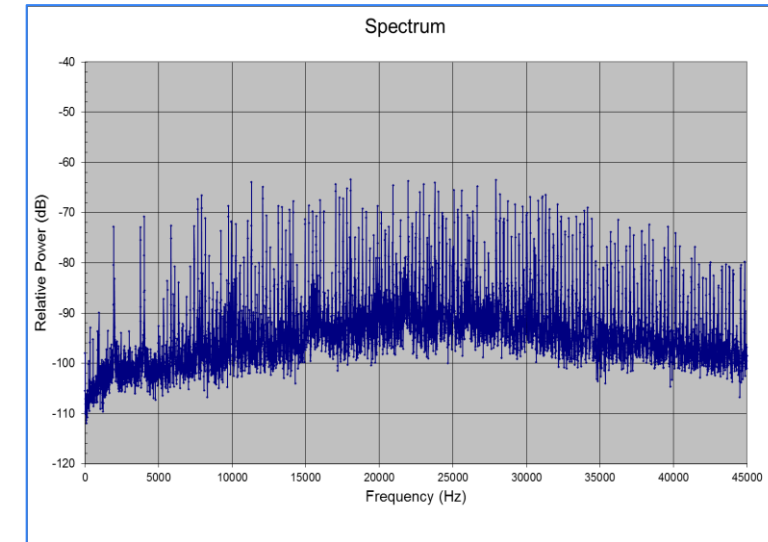
UNDERSTANDING SIGNAL

Active interference

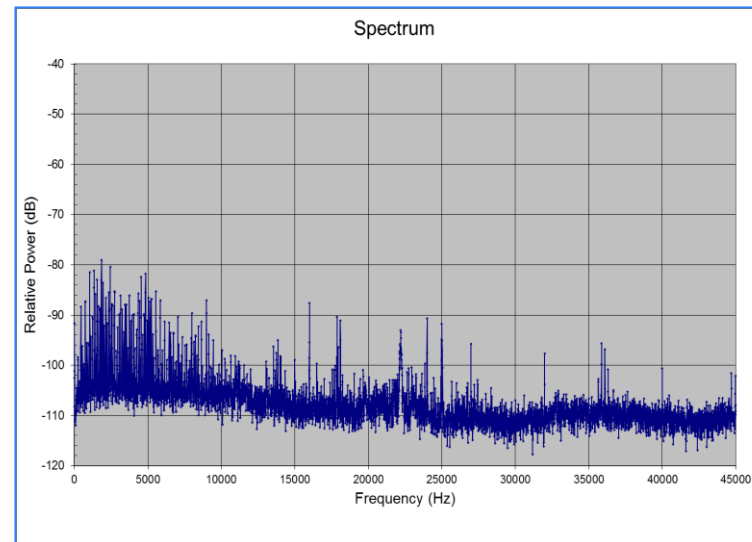
Power Lines



Transformer



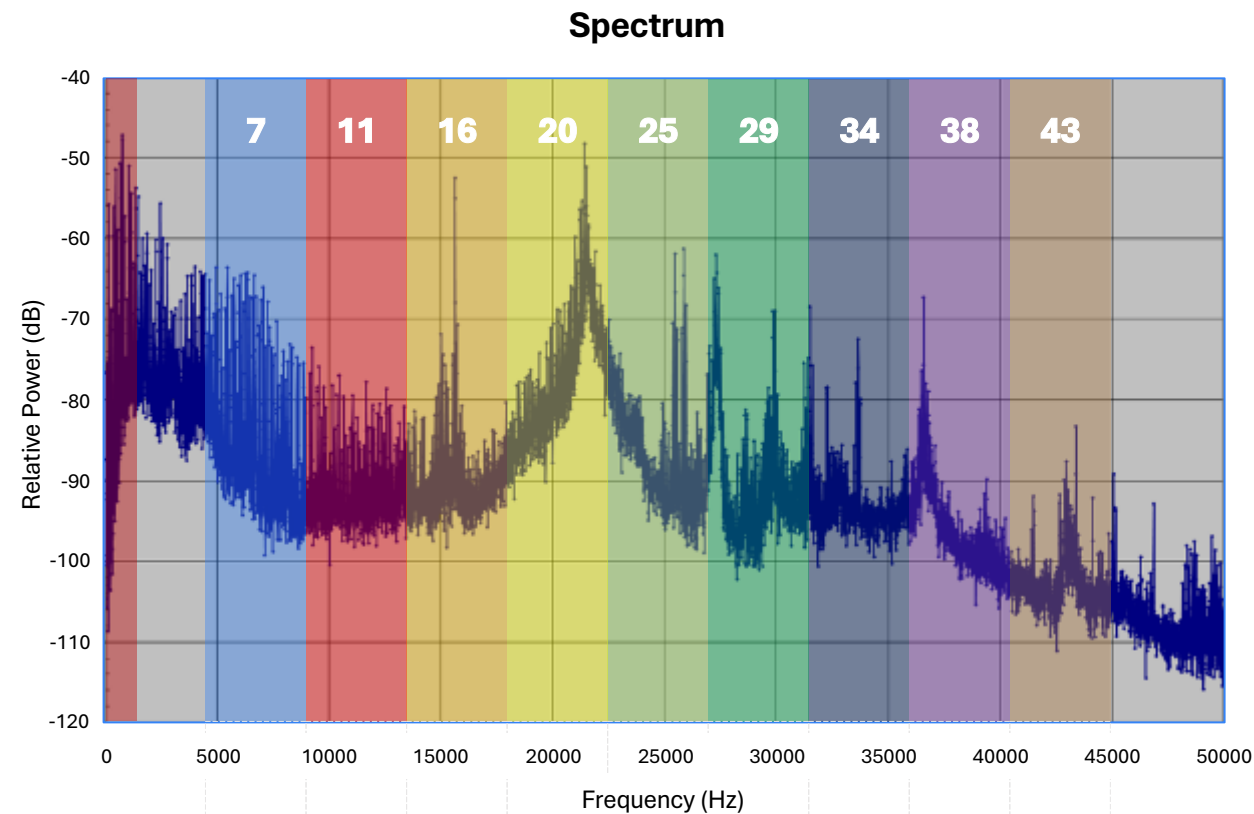
Traffic Signal



FREQUENCIES OPTIMIZATION

Available Frequency Bands

- Range of thousands of frequencies grouped into 9 bands
- The locator scans 8000+ frequencies
- The operator is getting the most chances to find the ideal frequencies for each unique jobsite

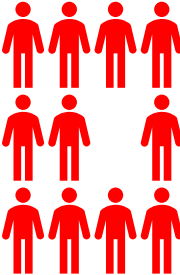
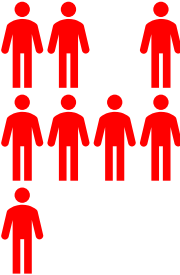
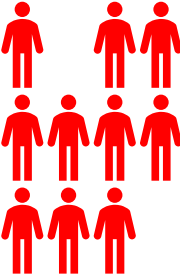
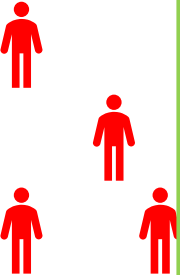
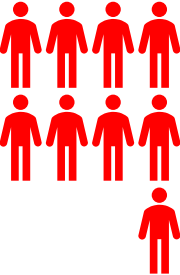


Band number	sub	7	11	16	20	25	29	34	38	43
Range (kHz)	0,3 - 0,7	4,5 - 9,0	9,0 - 13,5	13,5 - 18,0	18,0 - 22,5	22,5 - 27,0	27,0 - 31,5	31,5 - 36,0	36,0 - 40,5	40,5 - 45,0

FREQUENCIES OPTIMIZATION

The Hostel analogy



									
Room	7	11	16	20	25	29	34	38	43
Occupancy									

FREQUENCIES OPTIMIZATION

The Hostel analogy

Hostel = Frequency band
Room = Frequencies in a single band
Occupancy = Relative Power (dB) - Noise

Hostels	7	11	16	20	25	29	34	38	43
Rooms	900+	900+	900+	900+	900+	900+	900+	900+	900+
Occupancy									

Modern walk-over system scans 8000+ frequencies, more than 900 per band.
For each band, the system selects the best **150** frequencies.

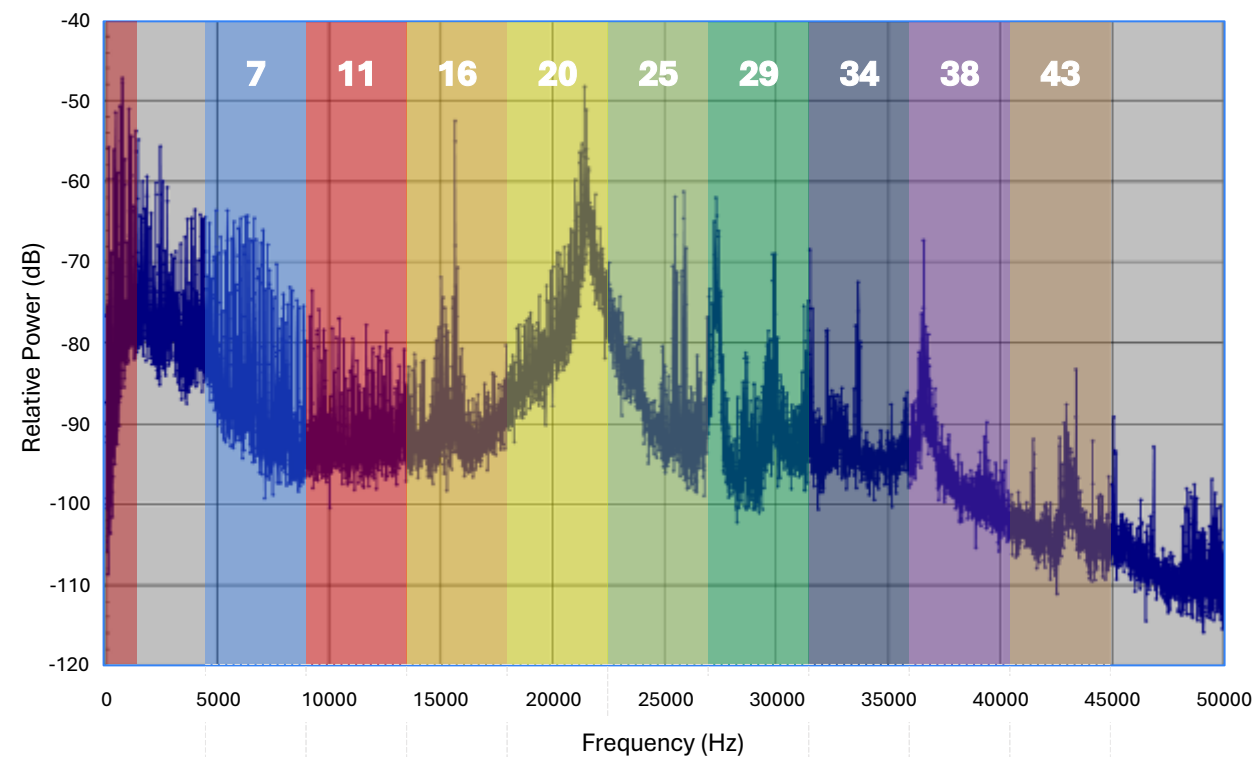
In the hostel analogy, the system inspects (scan) more than 900 rooms (frequencies) in 9 different hostels (frequency bands) and selects the less crowded 150 rooms (frequencies) per hostel (frequency band), finally indicating the two best hostels (frequency bands).

FREQUENCIES OPTIMIZATION

Automatic selection



Spectrum



Band number	sub	7	11	16	20	25	29	34	38	43
Range (kHz)	0,3 - 0,7	4,5 - 9,0	9,0 - 13,5	13,5 - 18,0	18,0 - 22,5	22,5 - 27,0	27,0 - 31,5	31,5 - 36,0	36,0 - 40,5	40,5 - 45,0



Automatic Selection

The system:

- Scans 8,000+ frequencies
- Memorizes your bore path and recommends the best bands and power levels
- Increased safety: no need to monitor your screen while walking your bore

Good For:

- Jobsites with multiple sources of interference
- Newer crews/team members



Manual Selection

The system:

- › Scan and re-scan manually

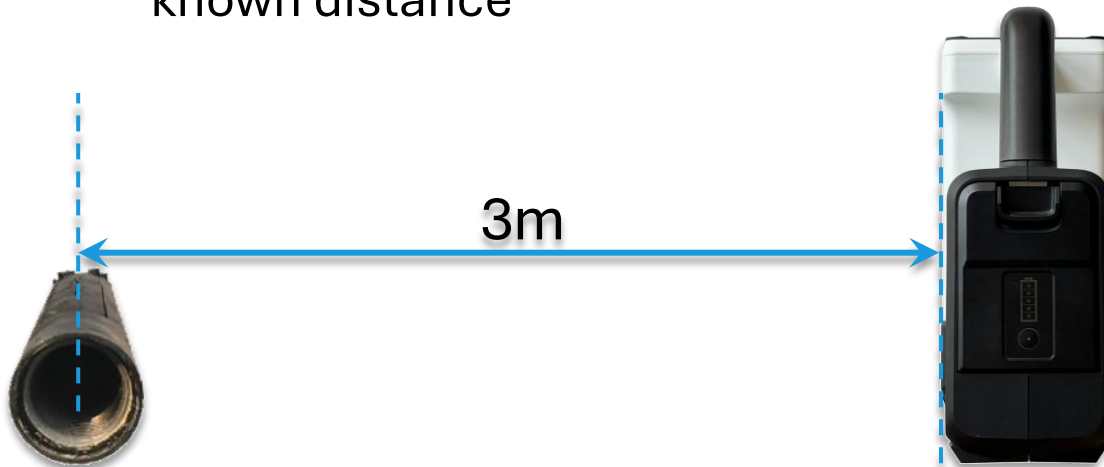
Good For:

- › More fine-tuning and customization
- › Experienced locators



One-click CALIBRATION

- Signal Strength = Depth
 - The stronger the signal the shallower the depth
 - The weaker the signal the deeper the depth
- Calibration converts signal strength into a known distance



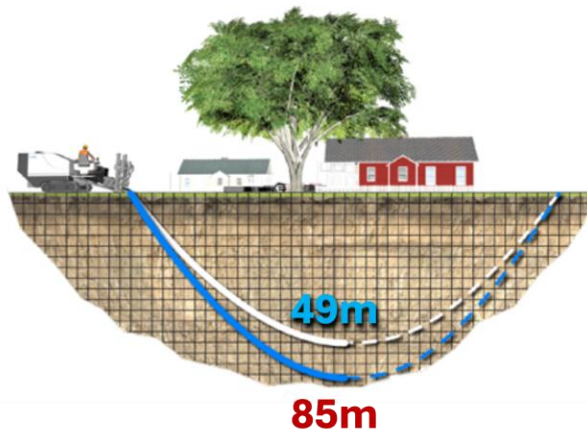
Depth/data ranges vs battery life



High Power Mode

Wideband  **10** Hours  **49m** Depth range  **85m** Data range

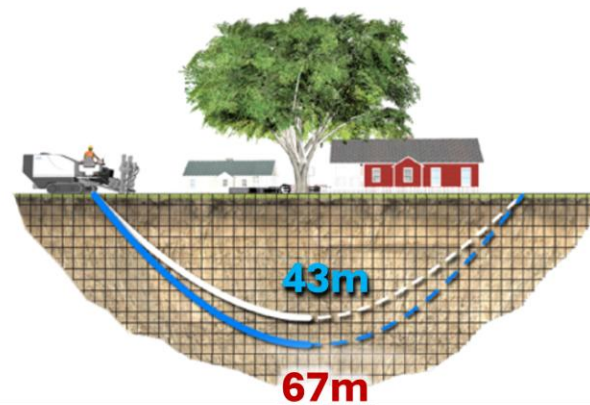
Rebar  **10** Hours  **24m** Depth range  **76m** Data range



Standard Power Mode

Wideband  **35** Hours  **43m** Depth range  **67m** Data range

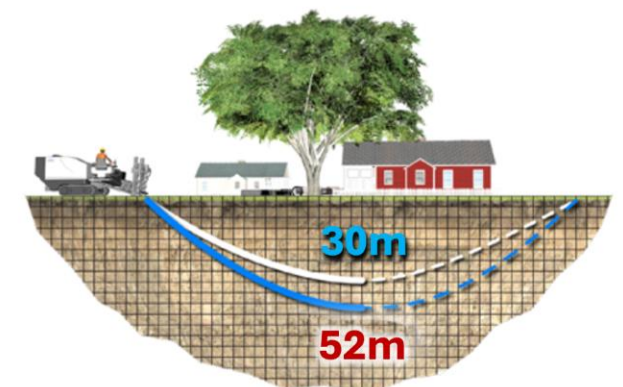
Rebar  **35** Hours  **23m** Depth range  **61m** Data range



Low Power Mode

Wideband  **100** Hours  **30m** Depth range  **52m** Data range

Rebar  **100** Hours  **15m** Depth range  **49m** Data range





- **Wireless:** no cable needed inside the drill string.
- **Extended frequency range:** enhanced capability to combat EMI.
- **All-in-one functionality:** wideband, rebar, and pressure measurement on the same transmitter. Switch modes when needed.
- **Extended depth and data ranges:** ideal for deep and long shots.
- **Easy to learn, simple to use:** with AI Powered Setup, you can onboard new operators faster.
- **Profitable:** spend less and get more. No rental fees, no royalties, no guidance engineer costs, and no costly lost-in-hole fees.



Wireless Easy Profitable



Case history #1

OST BAU GmbH

Salzderhelden, Göttingen, Germany
Power transmission lines for wind farms

June 2025



Case history #1

- › **Where:** Salzderhelden, Göttingen, Germany
- › **When:** June 2025
- › **What:** Power transmission lines for wind farms - Five parallel bores, each with a depth of up to 41 m
- › **Soil:** Sandstone (UCS = 50 MPa, RQD = 60%)
- › **Required accuracy:** 10%
- › **Notes:** This successful test saved the customer more than EUR 60,000

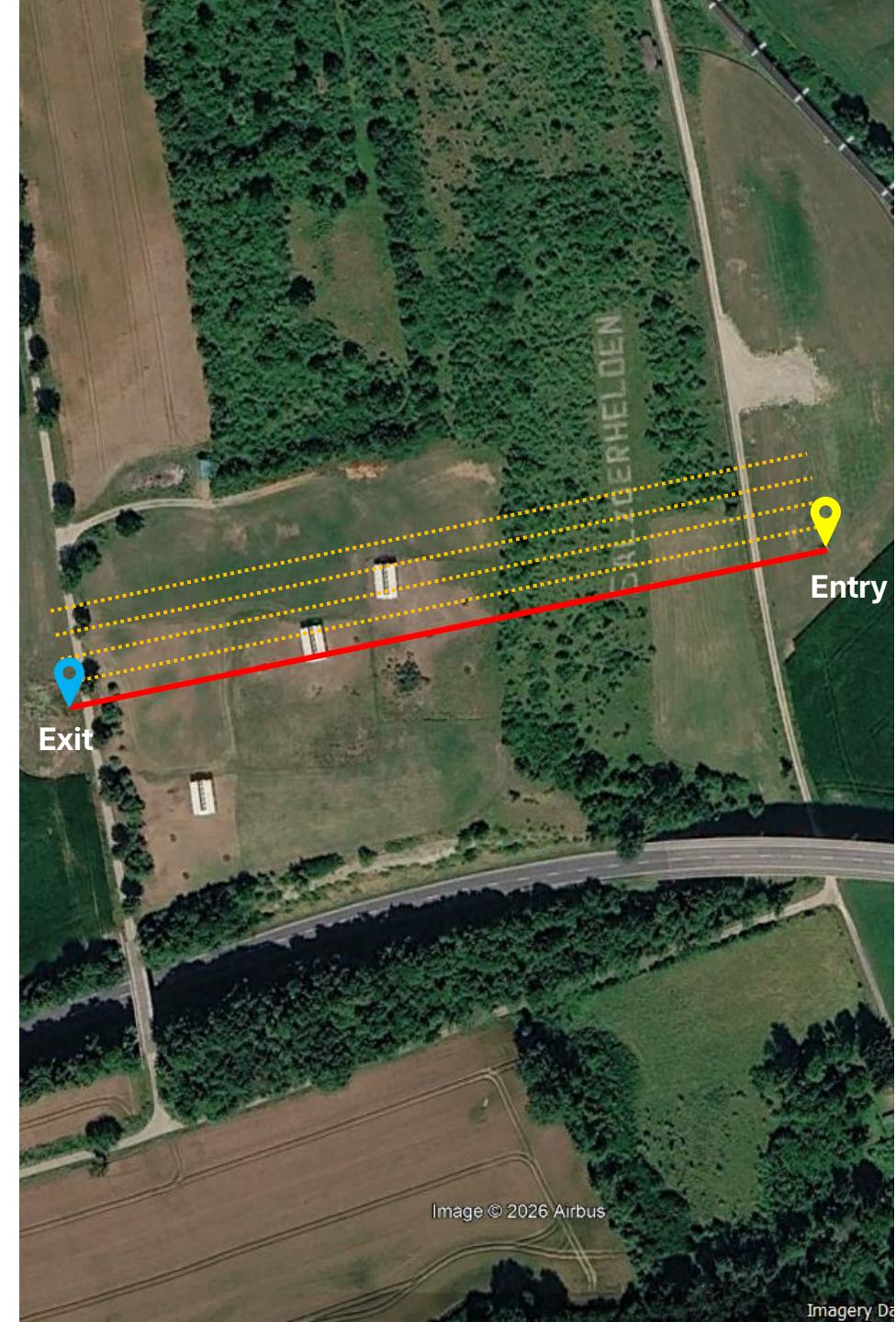


Image © 2026 Airbus

Imagery D



BORE#1

Length: 285 m

Max depth: 39 m

Duration: 4 days

Notes:

- Single slot Rockmaster
- Salzderhelden hill, 33 m difference in elevation
- Never lost the signal during the entire bore



BORE#2

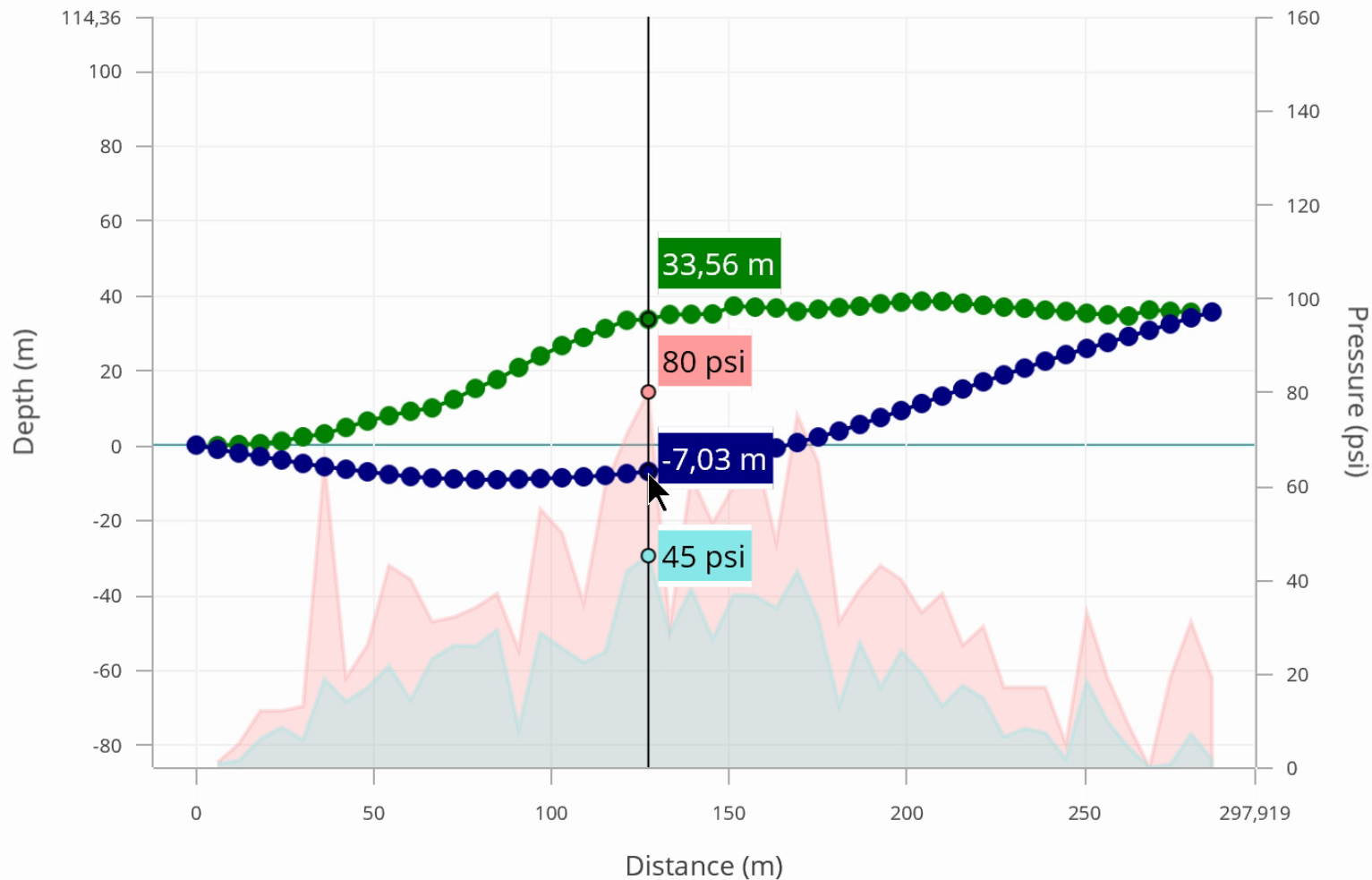
Length: 285 m

Max depth: 41 m

Duration: 4 days

Notes:

- 2-slot housing, with lower signal degradation
- The new rechargeable battery provided 11 hrs in high power mode
- Never lost the signal during the entire bore



Rod Number

21

Type

Locate Line

Pitch

11,0%

Depth

40,59 m

Terrain Height

33,56 m

Relative Depth

-7,03 m

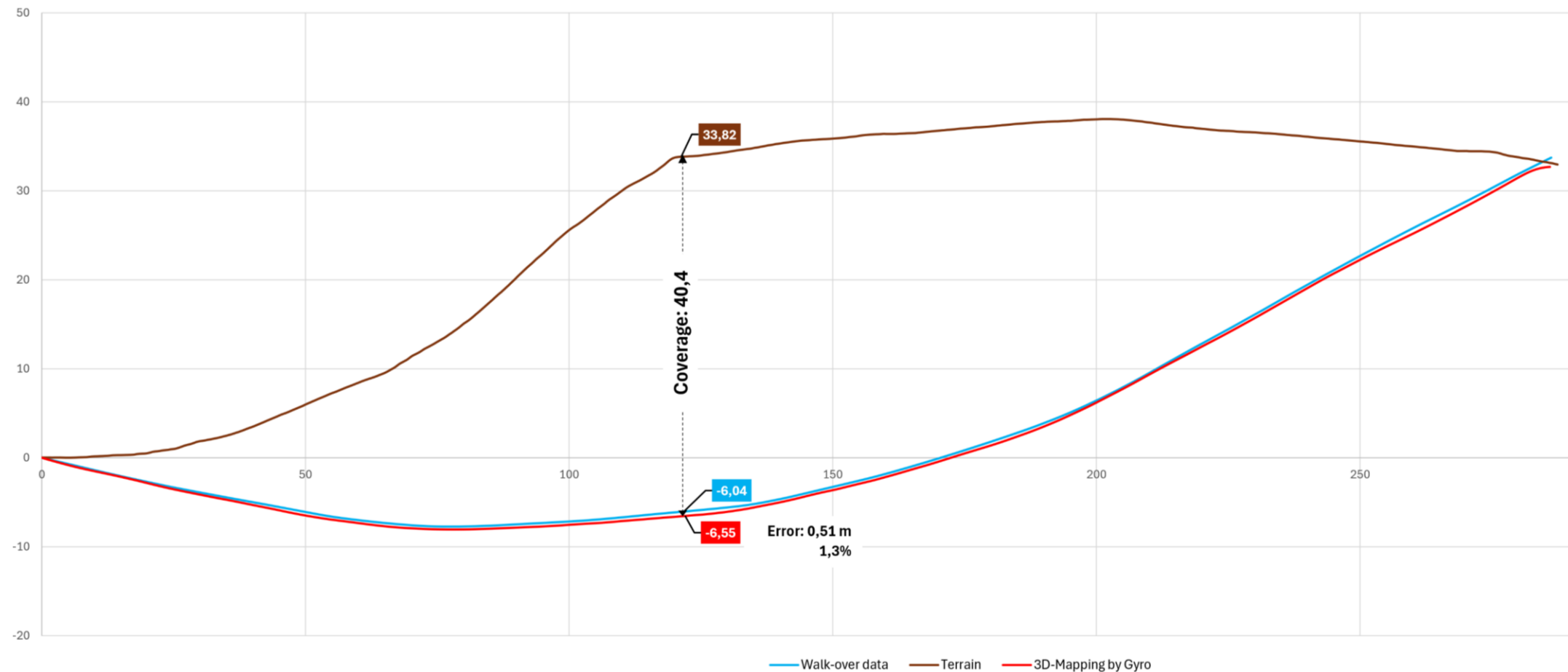
Position from Entry

COMPETITIVE EDGE

- Accuracy requirements were consistently achieved without difficulty
- Could go as deep as needed
- All this with a 15" transmitter – no additional transmitter-housing costs



Case history #1



ACCURACY

▶ 0,51 m over 40,4 m of coverage → 1.3% error in depth



Case history #2

Welvreugd Drilling BV

Maasland, The Netherlands

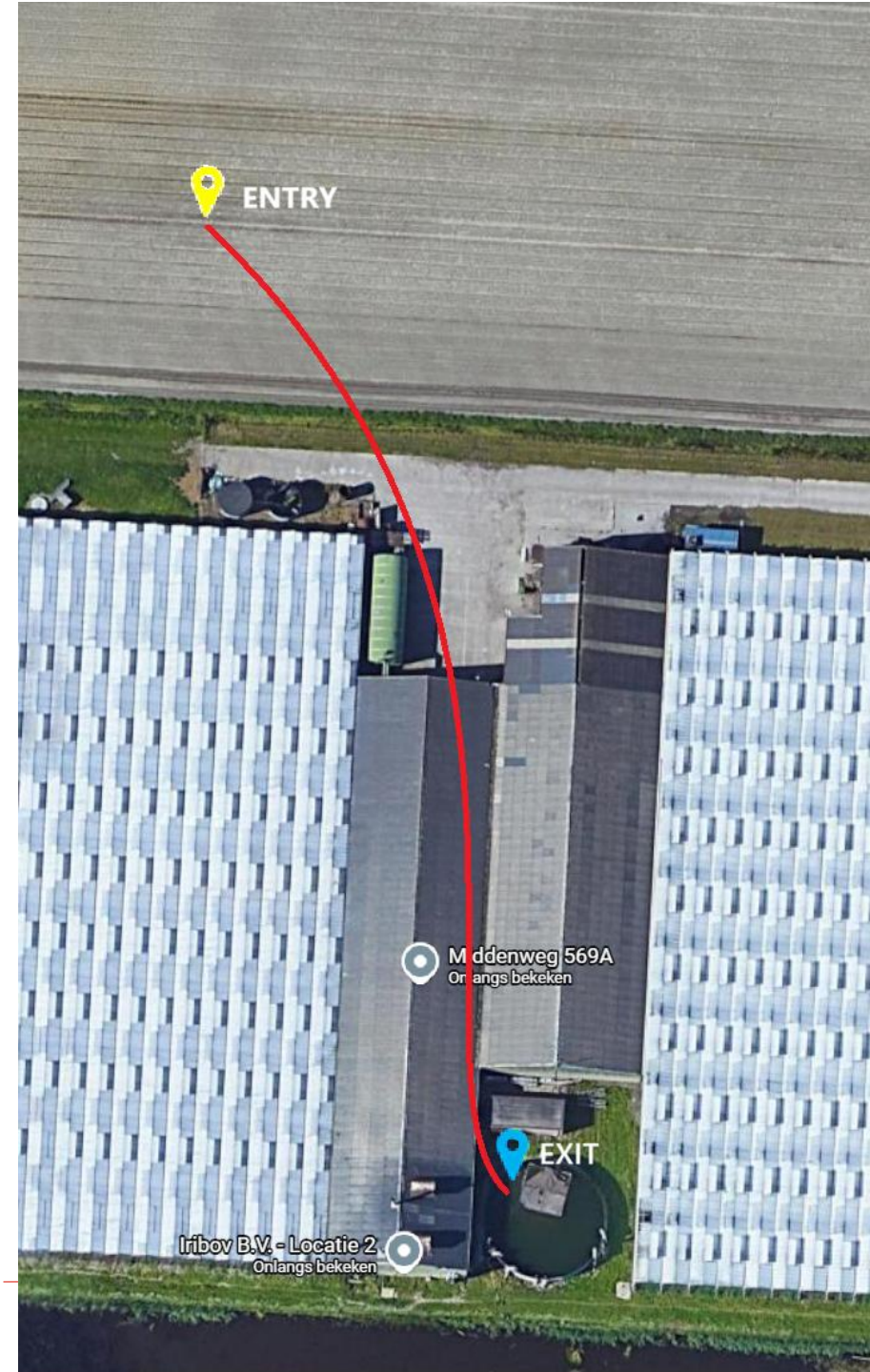
Power distribution line for a green house, on-site connection

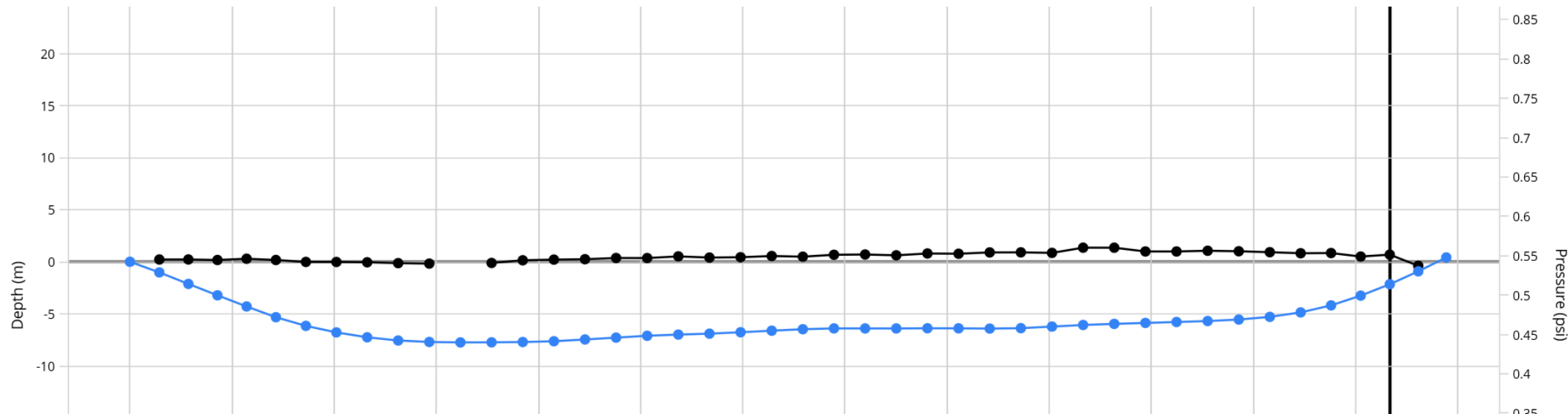
March 2026



Case history #2

- › **Where:** Iribov BV, Heerhugowaard, The Netherlands
- › **When:** 25 March 2026
- › **What:** Power distribution lines for an on-site connection – within 10 cm from the power connection of an existing pump
- › **Interference:** high power electricity cabin, greenhouse, production area, reinforced concrete floors and walls, underground brackish water
- › **Soil:** clay
- › **Required accuracy:** 10 cm maximum from the connection of the basin pump
- › **Notes:** This successful bore saved the customer the rental of a gyro





Drill Data Points Summary

FLP(Front Locate) - LL(Locate Line) - PO(Pitch Only) - BL(No Data)

Removed Hidden Added Edited

Rod ID	Pitch	Depth	X Distance	Reading Type	Bore Length
0	-33.6%		0.00 m	PO	0.00 m
1	-37.4%	1.24 m	2.87 m	LL	3.05 m
2	-40.3%	2.35 m	5.72 m	LL	6.10 m
3	-36.6%	3.39 m	8.56 m	LL	9.15 m
4	-38.5%	4.58 m	11.42 m	LL	12.20 m
5	-33.4%	5.49 m	14.29 m	LL	15.25 m
6	-23.3%	6.14 m	17.22 m	LL	18.30 m
7	-18.7%	6.76 m	20.21 m	LL	21.35 m
8	-12.3%	7.20 m	23.22 m	LL	24.40 m
9	-8.1%	7.43 m	26.26 m	LL	27.45 m
10	-1.1%	7.52 m	29.30 m	LL	30.50 m
11	-1.7%		32.35 m	PO	33.55 m
12	+2.3%	7.62 m	35.40 m	LL	36.60 m
13	-0.6%	7.85 m	38.45 m	LL	39.65 m
14	+5.6%	7.84 m	41.50 m	LL	42.70 m
15	+5.5%	7.71 m	44.55 m	LL	45.75 m
16	+6.2%	7.64 m	47.59 m	LL	48.80 m
17	+5.4%	7.46 m	50.64 m	LL	51.85 m
18	+2.1%	7.51 m	53.69 m	LL	54.90 m

19	+3.8%	7.31 m	56.73 m	LL	57.95 m
20	+5.1%	7.20 m	59.78 m	LL	61.00 m
21	+4.8%	7.17 m	62.83 m	LL	64.05 m
22	+4.4%	6.96 m	65.87 m	LL	67.10 m
23	+0.8%	7.07 m	68.92 m	LL	70.15 m
24	-1.0%	7.10 m	71.97 m	LL	73.20 m
25	+0.9%	7.02 m	75.02 m	LL	76.25 m
26	+0.2%	7.18 m	78.07 m	LL	79.30 m
27	-0.6%	7.16 m	81.12 m	LL	82.35 m
28	-1.1%	7.31 m	84.17 m	LL	85.40 m
29	+3.6%	7.28 m	87.22 m	LL	88.45 m
30	+6.5%	7.08 m	90.27 m	LL	91.50 m
31	+3.6%	7.42 m	93.31 m	LL	94.55 m
32	+3.4%	7.31 m	96.36 m	LL	97.60 m
33	+2.7%	6.86 m	99.41 m	LL	100.65 m
34	+3.1%	6.77 m	102.46 m	LL	103.70 m
35	+3.0%	6.75 m	105.51 m	LL	106.75 m
36	+6.4%	6.56 m	108.56 m	LL	109.80 m
37	+10.5%	6.21 m	111.59 m	LL	112.85 m
38	+17.9%	5.68 m	114.61 m	LL	115.90 m
39	+27.3%	5.03 m	117.59 m	LL	118.95 m
40	+37.4%	3.75 m	120.49 m	LL	122.00 m
41	+39.4%	2.84 m	123.34 m	LL	125.05 m
42	+49.6%	0.53 m	126.13 m	LL	128.10 m
43	+47.7%		128.87 m	PO	131.15 m





▼ Log summary

# of rods	43
Total bore distance	128.87 m
Maximum bore depth	7.85 m

Rod	Pitch	Depth	Distance
0	↘ -33.6%	--	0.00 m
1	↘ -37.4%	1.24 m LL	2.87 m
2	↘ -40.3%	2.35 m LL	5.72 m
3	↘ -36.6%	3.39 m LL	8.56 m
4	↘ -38.5%	4.58 m LL	11.42 m
5	↘ -33.4%	5.49 m LL	14.29 m
6	↘ -23.3%	6.14 m LL	17.22 m
7	↘ -18.7%	6.76 m LL	20.21 m
8	↘ -12.3%	7.20 m LL	23.22 m
9	↘ -8.1%	7.43 m LL	26.26 m
10	↘ -1.1%	7.52 m LL	29.30 m
11	↘ -1.7%	--	32.35 m
12	↗ +2.3%	7.62 m LL	35.40 m

Type	Pitch Only
Pitch	-33.6%
Depth	--
Terrain Height	--
Relative Depth	0.00 m
Position from Entry	0.00 m
Bore Length	0.00 m
Data Point Info	
Comment	
Rod Length	0.00 m
Timestamp	25-Mar-2026 12:12 PM
Fluid Pressure	

Rod	Pitch	Depth	Distance
31	↗ +3.6%	7.42 m LL	93.31 m
32	↗ +3.4%	7.31 m LL	96.36 m
33	↗ +2.7%	6.86 m LL	99.41 m
34	↗ +3.1%	6.77 m LL	102.46 m
35	↗ +3.0%	6.75 m LL	105.51 m
36	↗ +6.4%	6.56 m LL	108.56 m
37	↗ +10.5%	6.21 m LL	111.59 m
38	↗ +17.9%	5.68 m LL	114.61 m
39	↗ +27.3%	5.03 m LL	117.59 m
40	↗ +37.4%	3.75 m LL	120.49 m
41	↗ +39.4%	2.84 m LL	123.34 m
42	↗ +49.6%	0.53 m LL	126.13 m
43	↗ +47.7%	--	128.87 m

--
Terrain Height
--
Relative Depth
0.42 m
Position from Entry
128.87 m
Bore Length
131.15 m

Data Point Info

Comment

Rod Length

3.05 m

Timestamp

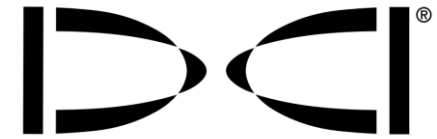
25-Mar-2026 3:31 PM

Fluid Pressure

COMPETITIVE EDGE

- ▶ Rebar frequency was giving accurate depth readings
- ▶ No interference from the high-power electricity cabin due to AI optimization
- ▶ No expensive tooling needed, fast setup/drill time, 3h15m, lunch included
- ▶ All this with a walk over system – traditionally the customer would use gyro steering in these conditions due to the high failure rate with traditional walk over systems.

THANK YOU FOR YOUR ATTENTION!



EMEA TERRITORY MANAGERS



**Yusuf
Başaran**

Territory Manager EMEA
at Digital Control



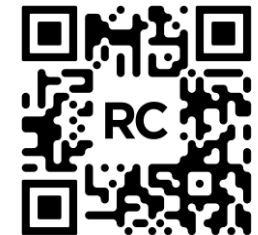
**Bjorn
Van de Weghe**

Territory Manager
at Digital Control



**Renzo
Chirulli**

Territory Manager
Mediterranean Region at
Digital Control



We speak: 

