FROM SUFFICIENT TO EFFICIENT

Real-Time Asset Performance Monitoring

3dSignals

The Challenge

Are You Getting The Most Out of Your Production Floor?

- Are all your machines **currently** working as planned?
- Where are your **bottlenecks**?
- Is the night shift as **efficient** as the morning one?
- Are all your machines **optimally** utilized?

The Vision – Gradual Transition to Industry 4.0

Digitalization

Computerization
Connectivity

Business Intelligence

Visualization
Analysis

Artificial Intelligence

Predictive maintenance
Self-optimization

→

Industry 4.0

→ Only 8% of machines worldwide are connected to network →

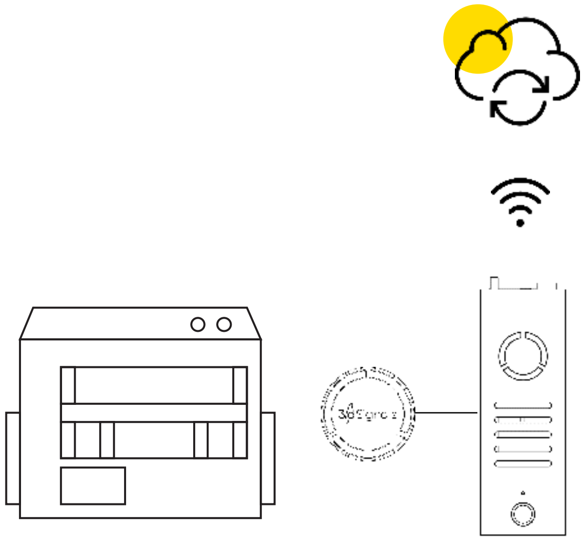
+ Old machines
+ No sensors installed
+ Different controllers
+ Proprietary protocols

The Solution –
Plug & Play Digitalization

3d Signals – Welcome to the Digital Era

In a few hours

Digitalization

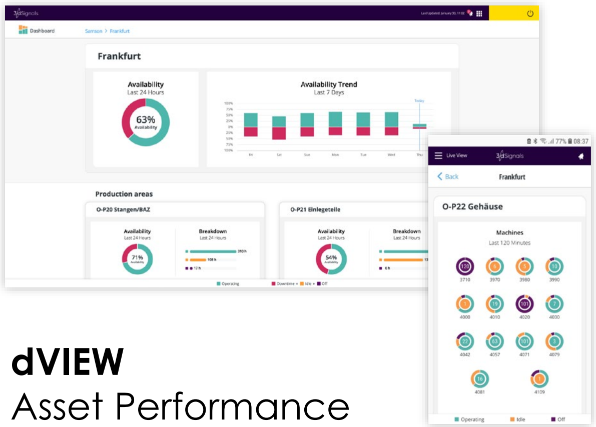


Cloud
Analysis

dEDGE
Data
Acquisition

From day one

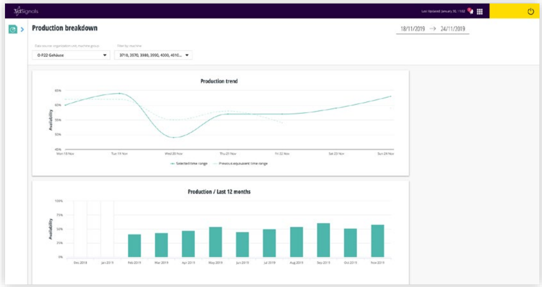
Business Intelligence


Dashboard
Frankfurt
Availability
Last 24 Hours
63%
Availability Trend
Last 7 Days
Production areas
O-P20 Stangen/BAZ
O-P21 Einlegeteile
Breakdown
Last 24 Hours
71%
54%
Live View
Back
Frankfurt
O-P22 Gehäuse
Machines
Last 120 Minutes
Operating
Idle
Off

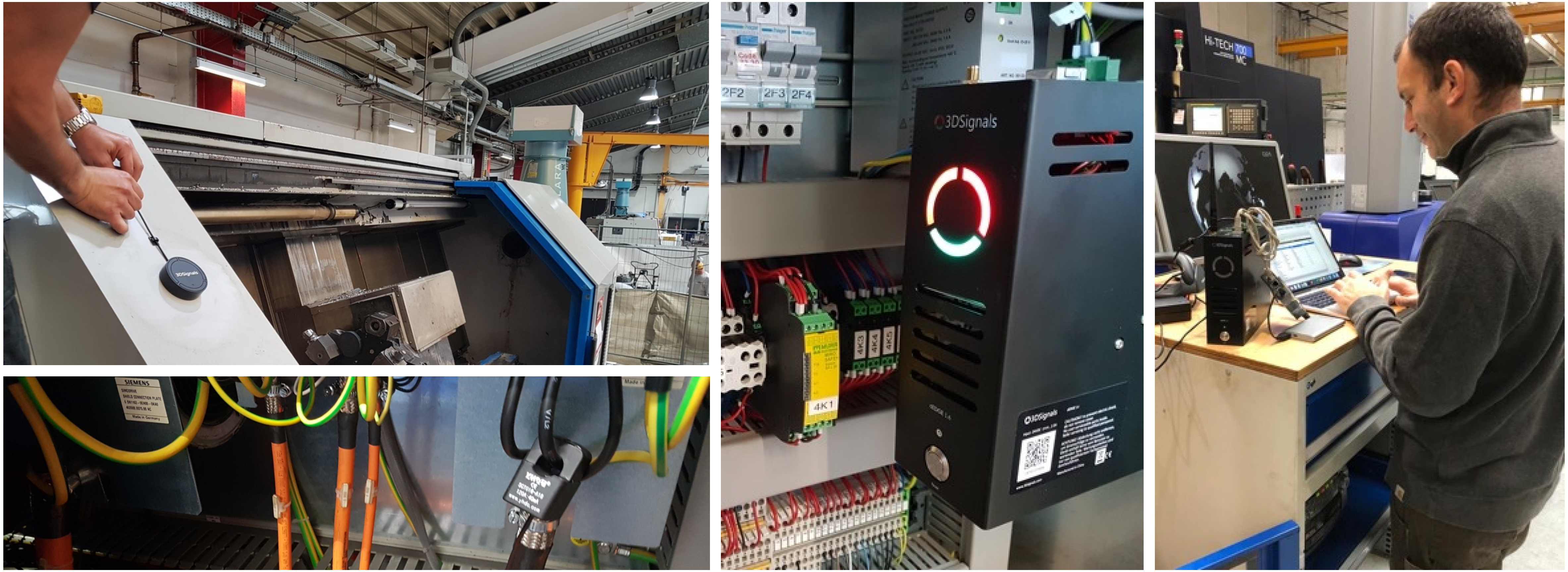
dVIEW
Asset Performance
Monitoring software

Within 2-3 months

Proven Productivity improvement


Production breakdown
Production trend
Production / Last 12 months

Connecting a Machine within Hours


3DSignals
SIEMENS
2F2
2F3
2F4
4K1
HI-TECH 700 MC

If You Can Measure It, You Can Improve It

GEHÄUSEFERTIGUNG · BODY MANUFACTURING
Gehäusefertigung
Body Manufacturing

Key Advantages

Hassle Free
We do everything

Accuracy
The sensors don't lie

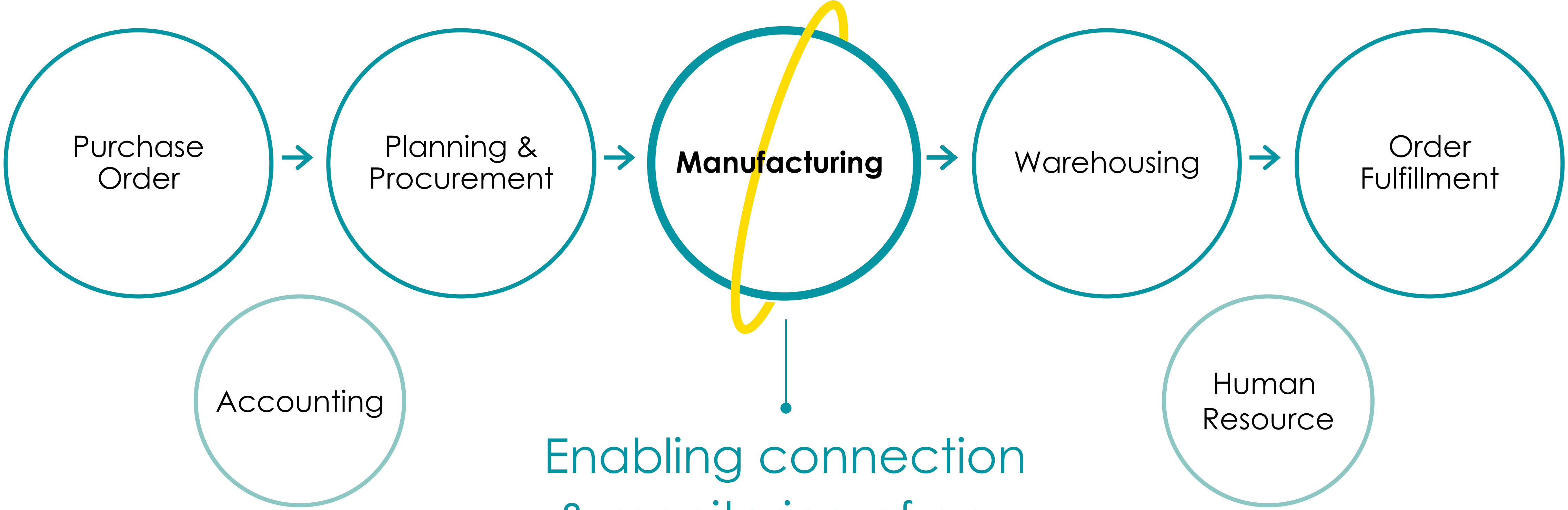
Fast Insights
Results within hours

Security
No digital connectivity with machines

Interoperability
One dashboard for all machines

Growing Value
New capabilities on existing hardware

Enabling Connection of the Shop Floor to ERP



Purchase Order → Planning & Procurement → **Manufacturing** → Warehousing → Order Fulfillment

Accounting

Human Resource

Enabling connection & monitoring of any machine, regardless of brand, make or model

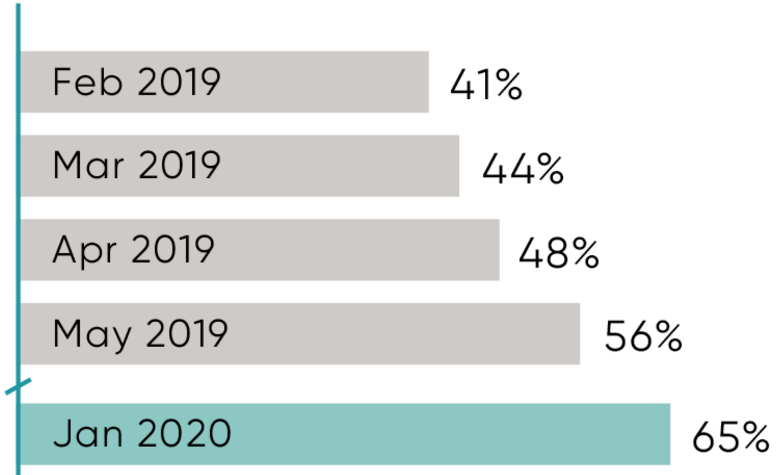
Case Study – SAMSON AG

Case Study – Samson AG

- >$600M revenues
- >4,000 employees
- 18 sites around the world
- Manufacturing control valves, regulators and accessories for process control
- 3d Signals solution installed on >100 machines, in 5 different manufacturing sites
- Multiple users in the organization, from the shop floor to the board room

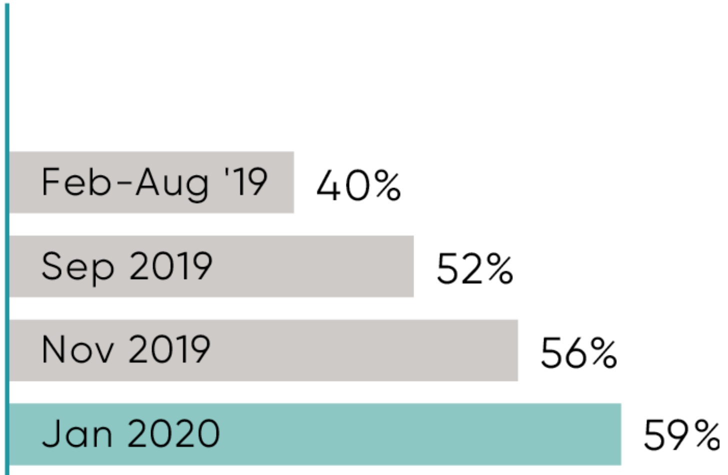
Improve Machine Availability

EARLY ADAPTOR



Production floor 22

+36% in 4 months
+58% in 12 months



Whole factory

+48% in 12 months

Reduce Manpower Costs

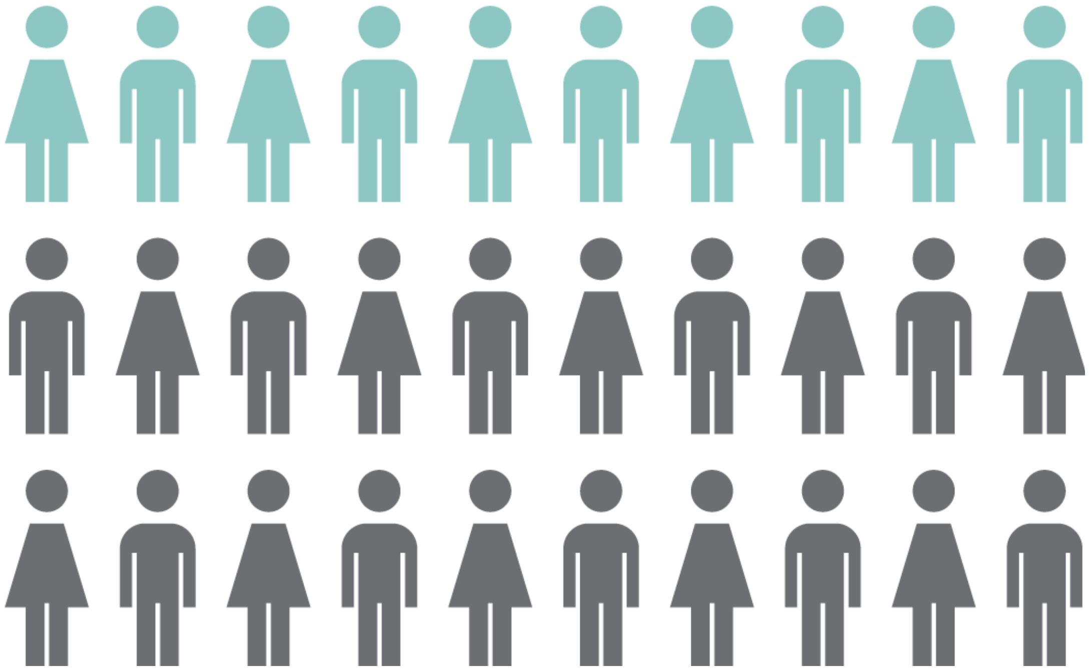
EARLY ADAPTOR

Production floor 22

Cancelled night shift of temporary workers

Estimated saving

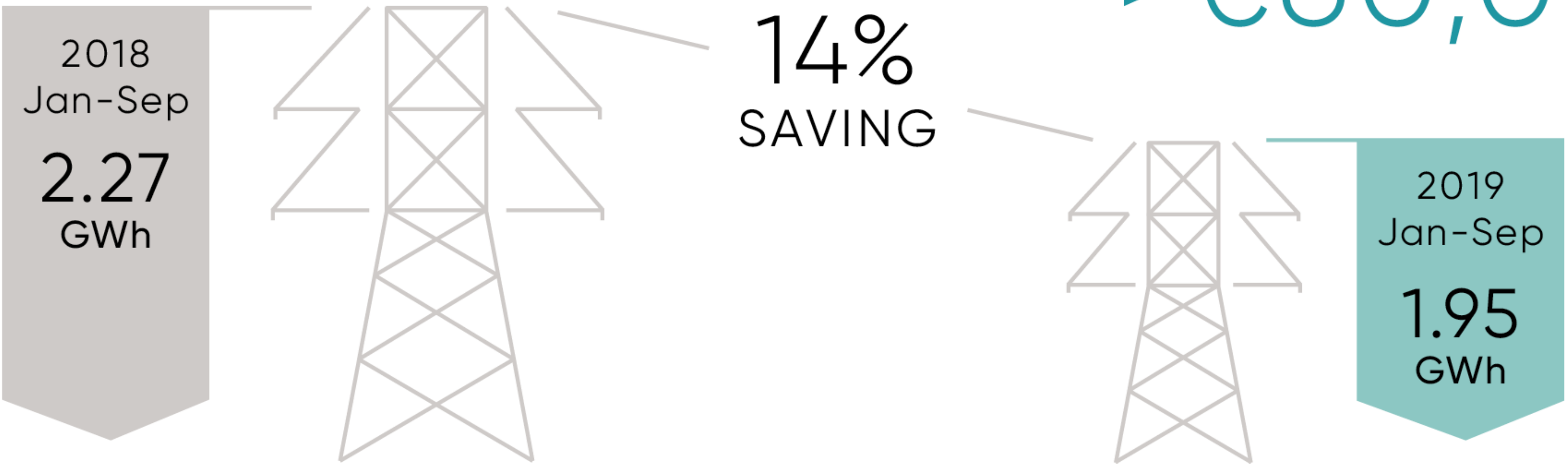
€700,000/year



Reduce Energy Consumption by Preventing Machine Idle Time

Production floor energy saving –

>€60,000



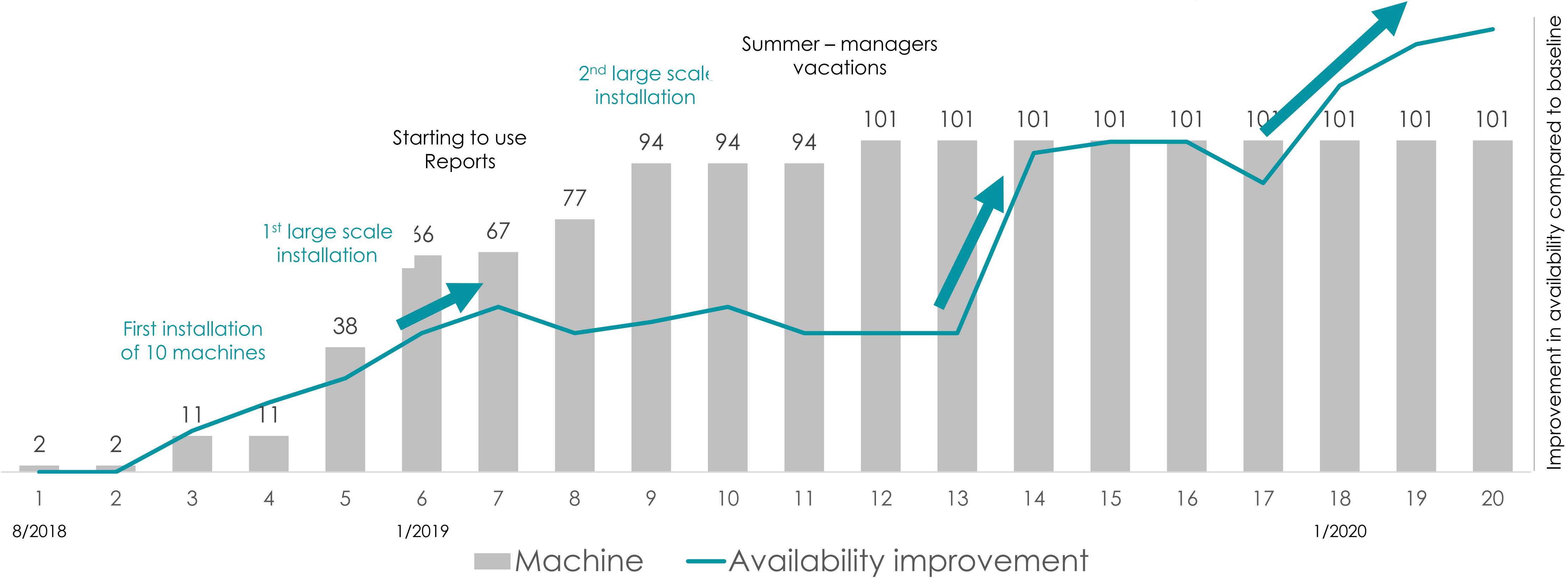
2018
Jan-Sep
2.27
GWh

14%
SAVING

2019
Jan-Sep
1.95
GWh

Upscaling Leads to Improvement Leaps

"If you measure it,
it will improve"



First installation
of 10 machines

1st large scale
installation

Starting to use
Reports

2nd large scal
installation

Summer – managers
vacations

Release of
Public View

Starting to use
Shift Planning

Implementing KPIs per floor. Every
shift starts with public view review

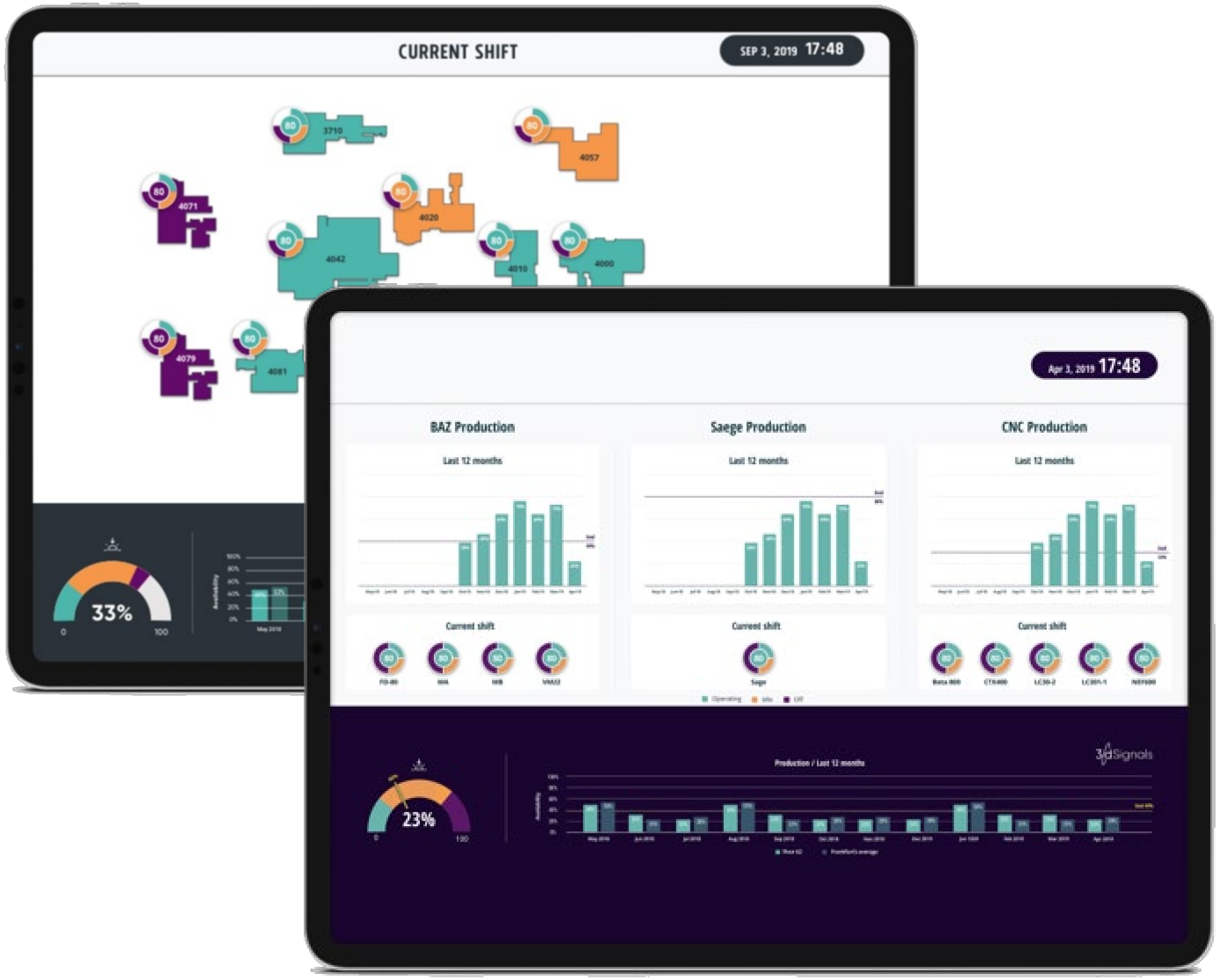
Dr. Andreas Widl
CEO
SAMSON employs more than
4000 people worldwide,

Product Highlights

Public View

Real-time visualization of a production area, available as part of dView, or on a large public screen

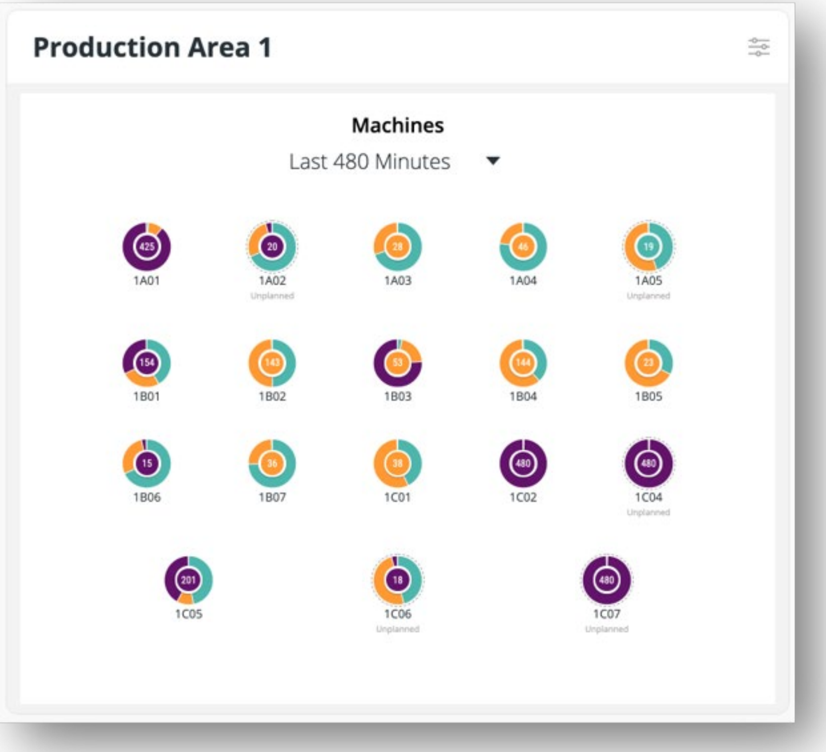
- Enhancing transparency and motivation to meat common goals
- Selection of one out of several alternative views, based on manager’s preference

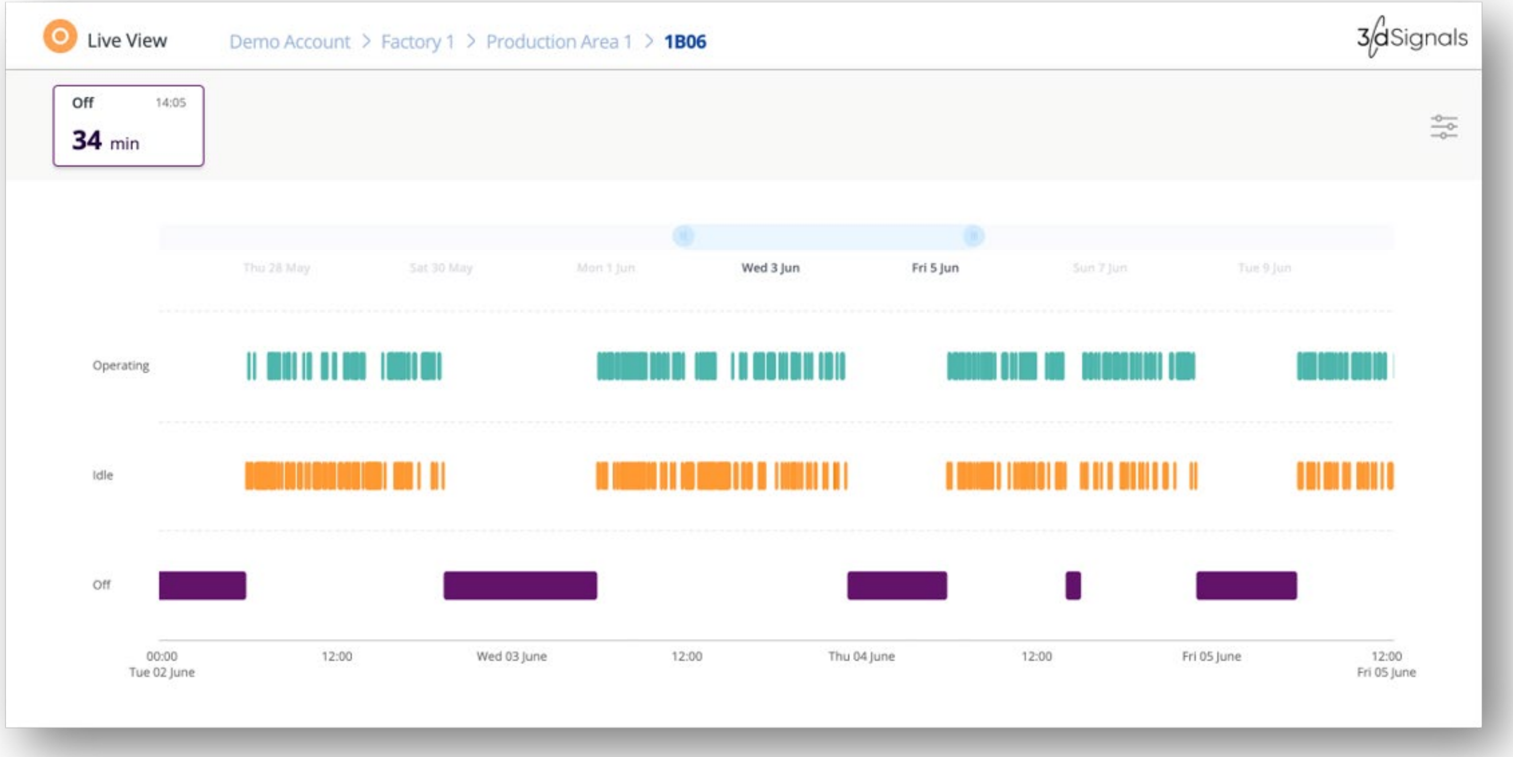

CURRENT SHIFT
SEP 3, 2019 17:48
3710
4057
4071
4020
4042
4010
4000
4079
4081
33%
0
100
Apr 3, 2019 17:48
BAZ Production
Saege Production
CNC Production
Last 12 months
Current shift
23%
Production / Last 12 months
3dSignals

Live View

Real-Time > History > Alerts > Vs. Plan > Optimization

Real-Time machine performance Monitoring


Production Area 1
Machines
Last 480 Minutes
425
1A01
20
1A02
Unplanned
28
1A03
46
1A04
19
1A05
Unplanned
154
1B01
143
1B02
53
1B03
144
1B04
23
1B05
15
1B06
36
1B07
38
1C01
480
1C02
480
1C04
Unplanned
201
1C05
18
1C06
Unplanned
480
1C07
Unplanned

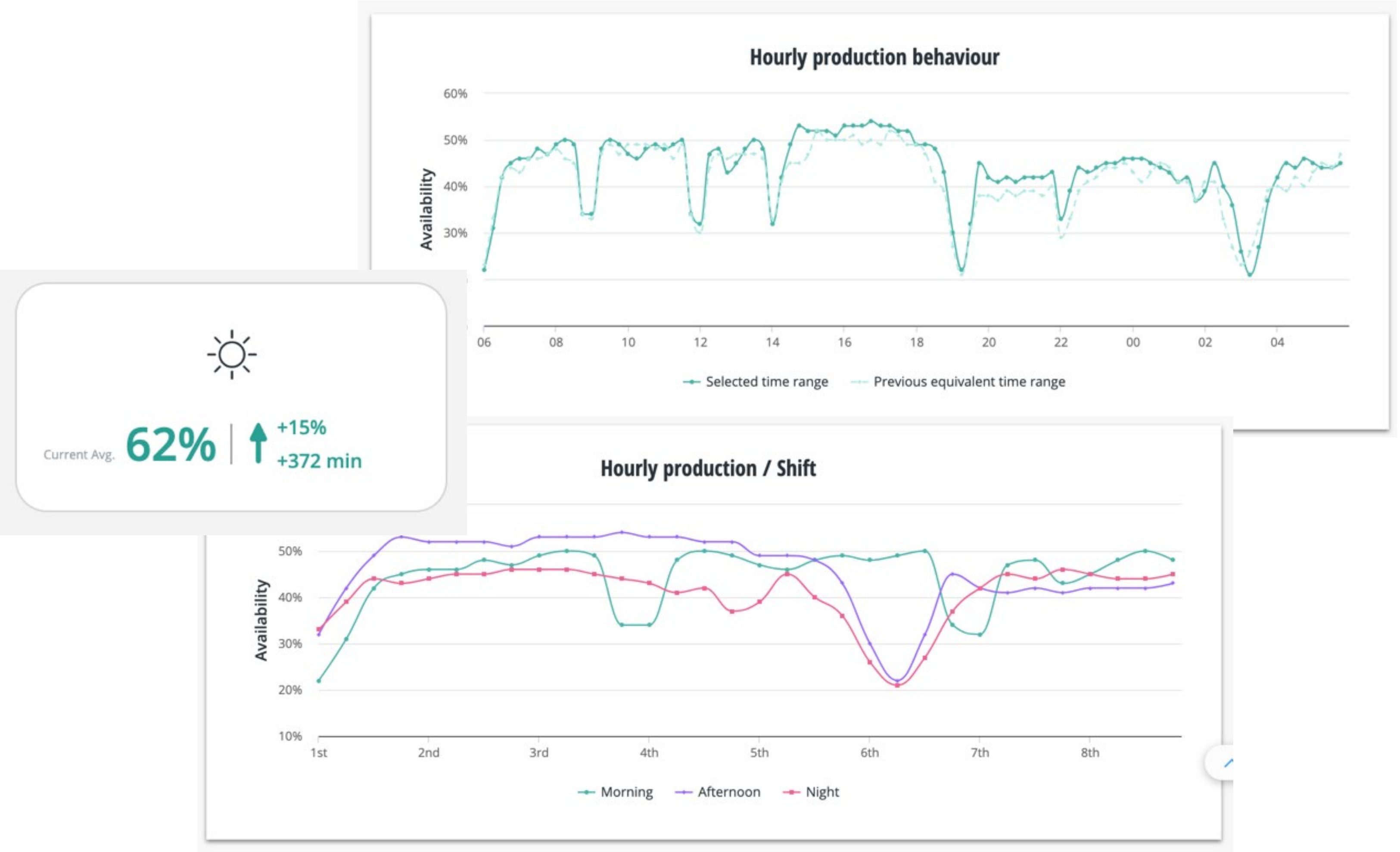

Live View
Demo Account > Factory 1 > Production Area 1 > 1B06
3dSignals
Off
14:05
34 min
Thu 28 May
Sat 30 May
Mon 1 Jun
Wed 3 Jun
Fri 5 Jun
Sun 7 Jun
Tue 9 Jun
Operating
Idle
Off
00:00
Tue 02 June
12:00
Wed 03 June
12:00
Thu 04 June
12:00
Fri 05 June
12:00
Fri 05 June

Reports

Real-Time > **History** > Alerts > Vs. Plan > Optimization

Identify trends and make comparisons

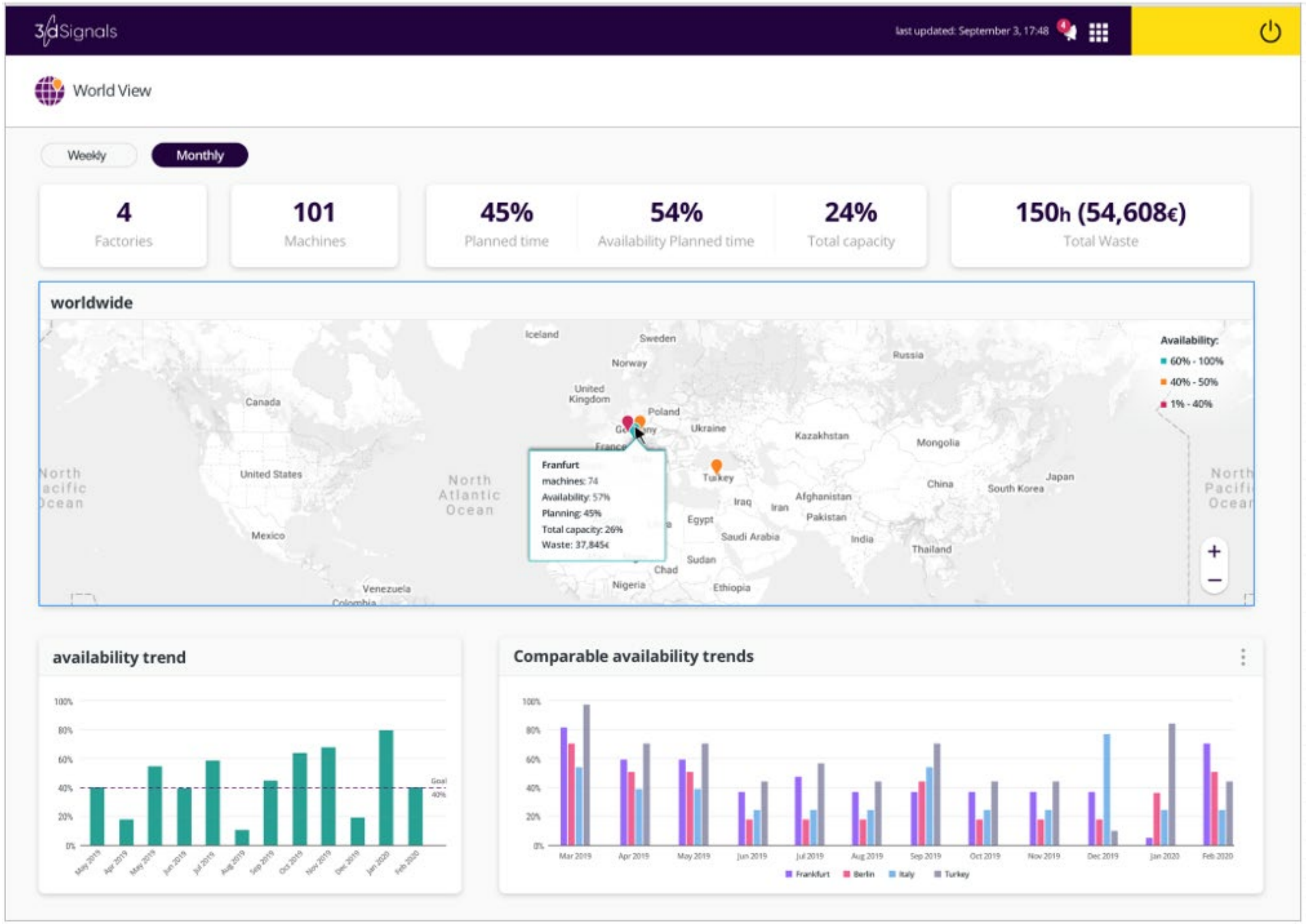
- Machine vs. machine
- Floor vs. floor
- Shift vs. shift
- Time frame vs. previous
- Etc.



World View

Real-Time > **History** > Alerts > Vs. Plan > Optimization

- A dashboard to monitor all your sites
- A bird’s eye view of your organization’s availability, utilization and waste parameters
- Consolidated and per-factory data in a single view
- Weekly and monthly resolution


3dSignals
last updated: September 3, 17:48
World View
Weekly
Monthly
worldwide
Iceland
Sweden
Norway
United Kingdom
Poland
Germany
Ukraine
France
Russia
Kazakhstan
Mongolia
Canada
United States
Mexico
Venezuela
Colombia
North Atlantic Ocean
North Pacific Ocean
Turkey
Iraq
Iran
Afghanistan
Pakistan
China
South Korea
Japan
India
Thailand
Egypt
Saudi Arabia
Sudan
Chad
Nigeria
Ethiopia
Availability:
60% - 100%
40% - 50%
1% - 40%
availability trend
100%
80%
60%
40%
20%
0%
Goal 40%
May 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
Dec 2019
Jan 2020
Feb 2020
Comparable availability trends
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
Dec 2019
Jan 2020
Feb 2020
Frankfurt
Berlin
Italy
Turkey

4 Factories

101 Machines

45% Planned time

54% Availability Planned time

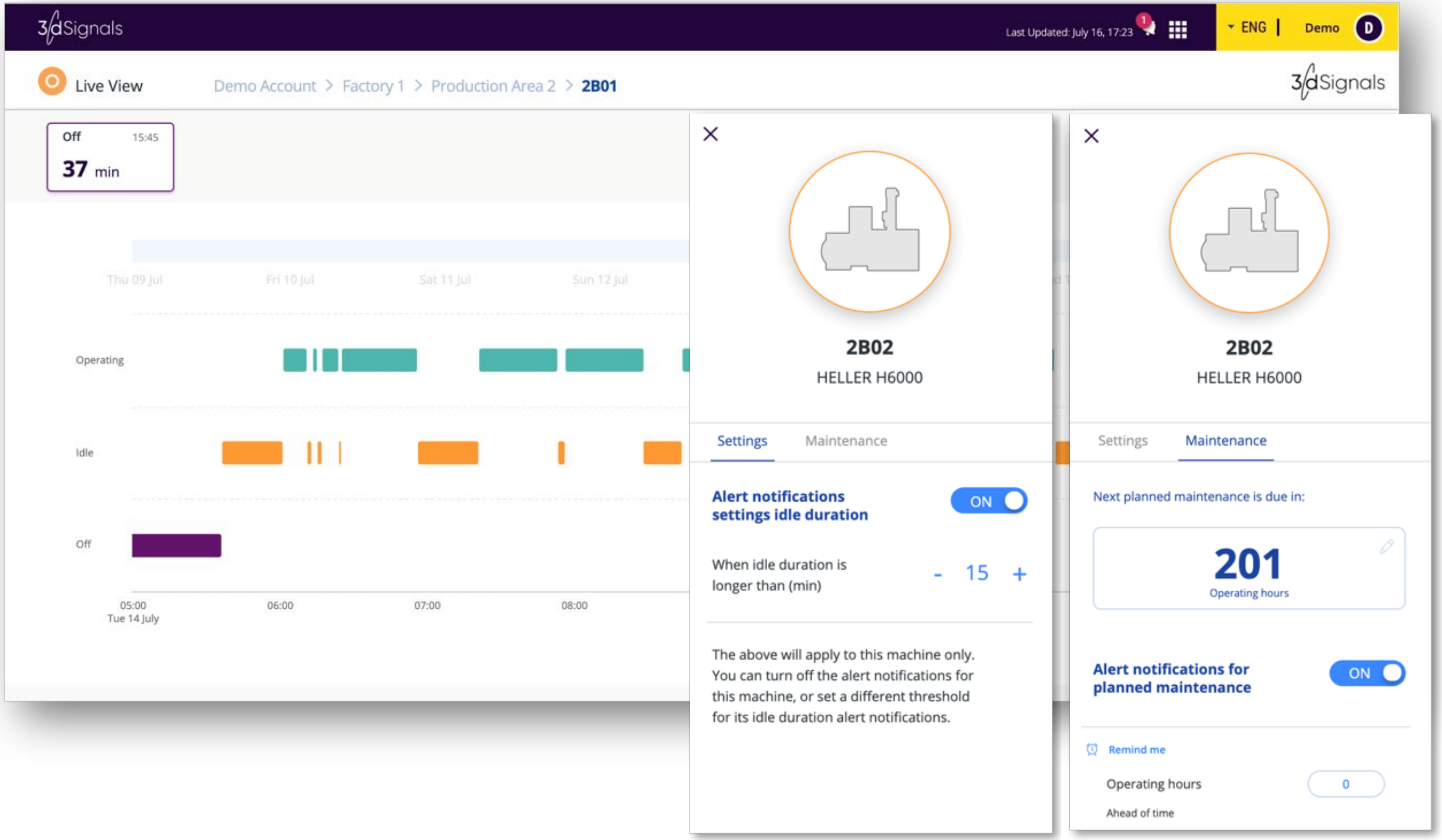
24% Total capacity

150h (54,608€) Total Waste

Franfurt
machines: 74
Availability: 57%
Planning: 45%
Total capacity: 26%
Waste: 37,845€

Alerts

SMS notification for long idle durations based on personal specifications


3dSignals
Last Updated: July 16, 17:23
ENG
Demo
D
Live View
Demo Account > Factory 1 > Production Area 2 > 2B01
3dSignals
Off 15:45
37 min
Thu 09 Jul
Fri 10 Jul
Sat 11 Jul
Sun 12 Jul
Operating
Idle
Off
05:00
Tue 14 July
06:00
07:00
08:00
2B02
HELLER H6000
Settings
Maintenance
2B02
HELLER H6000
Settings
Maintenance

Alert notifications settings idle duration ON

When idle duration is longer than (min) - 15 +

The above will apply to this machine only. You can turn off the alert notifications for this machine, or set a different threshold for its idle duration alert notifications.

Next planned maintenance is due in:

201 Operating hours

Alert notifications for planned maintenance ON

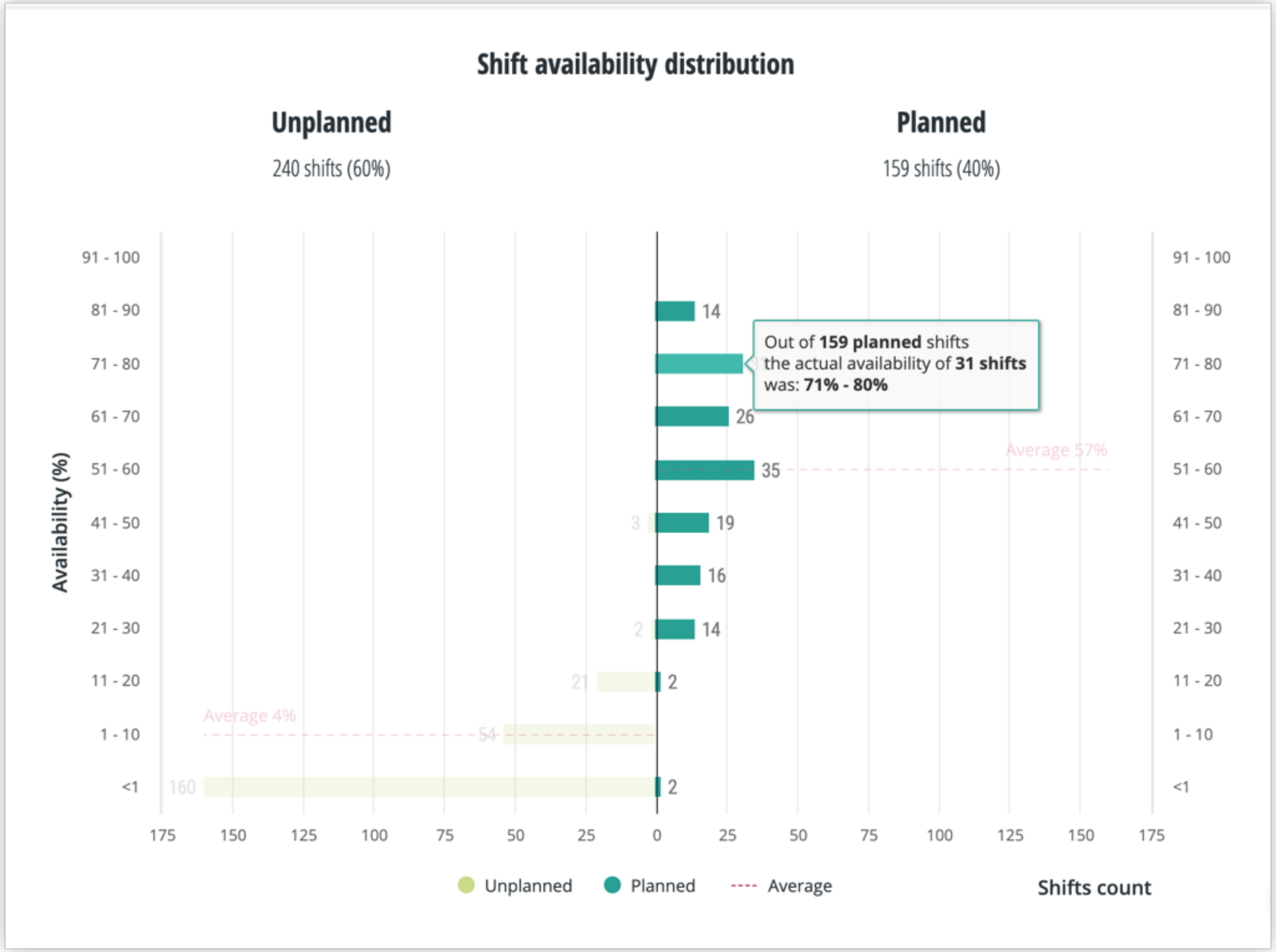
Remind me

Operating hours 0

Ahead of time

Actual vs. Planning

- Shift planning compared to actual production, highlighting:
    - Planned shift which were underutilized
    - Overtime during unplanned shifts



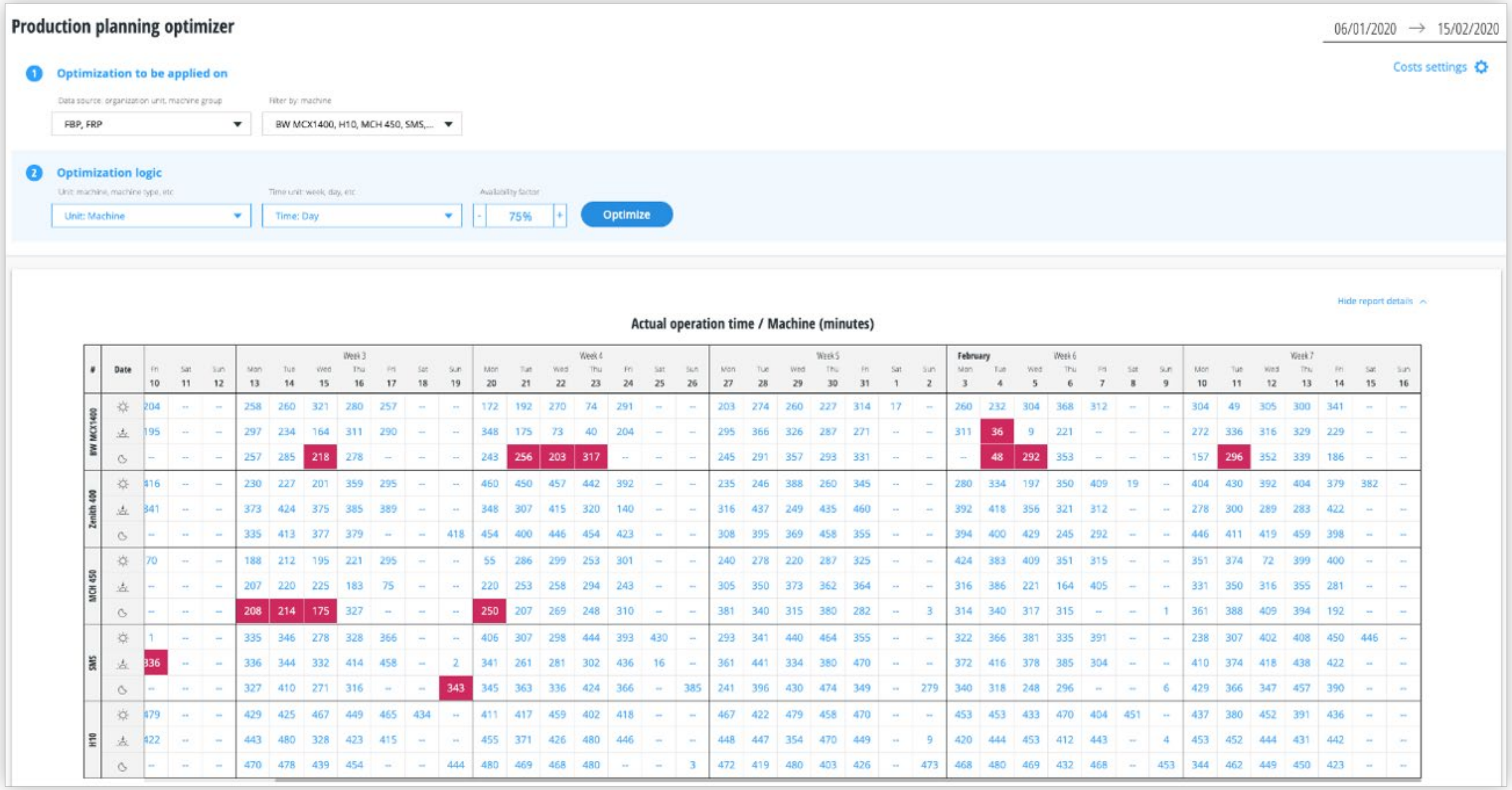
Out of **159 planned** shifts the actual availability of **31 shifts** was: **71% - 80%**

Optimization Tools

Real-Time > History > Alerts > Vs. Plan > **Optimization**

Save money through better planning:

- Underutilized shifts are highlighted
- Wasted cost is calculated based on preset shift cost, for shifts that could have been combined with other shifts / eliminated



Production planning optimizer

06/01/2020 → 15/02/2020

Costs settings ⚙

① **Optimization to be applied on**

Data source: organization unit, machine group: FBP, FRP ▼

Filter by: machine: BW MCX1400, H10, MCH 450, SMS,... ▼

② **Optimization logic**

Unit: machine, machine type, etc: Unit: Machine ▼

Time unit: week, day, etc: Time: Day ▼

Availability factor: - 75% +

Optimize

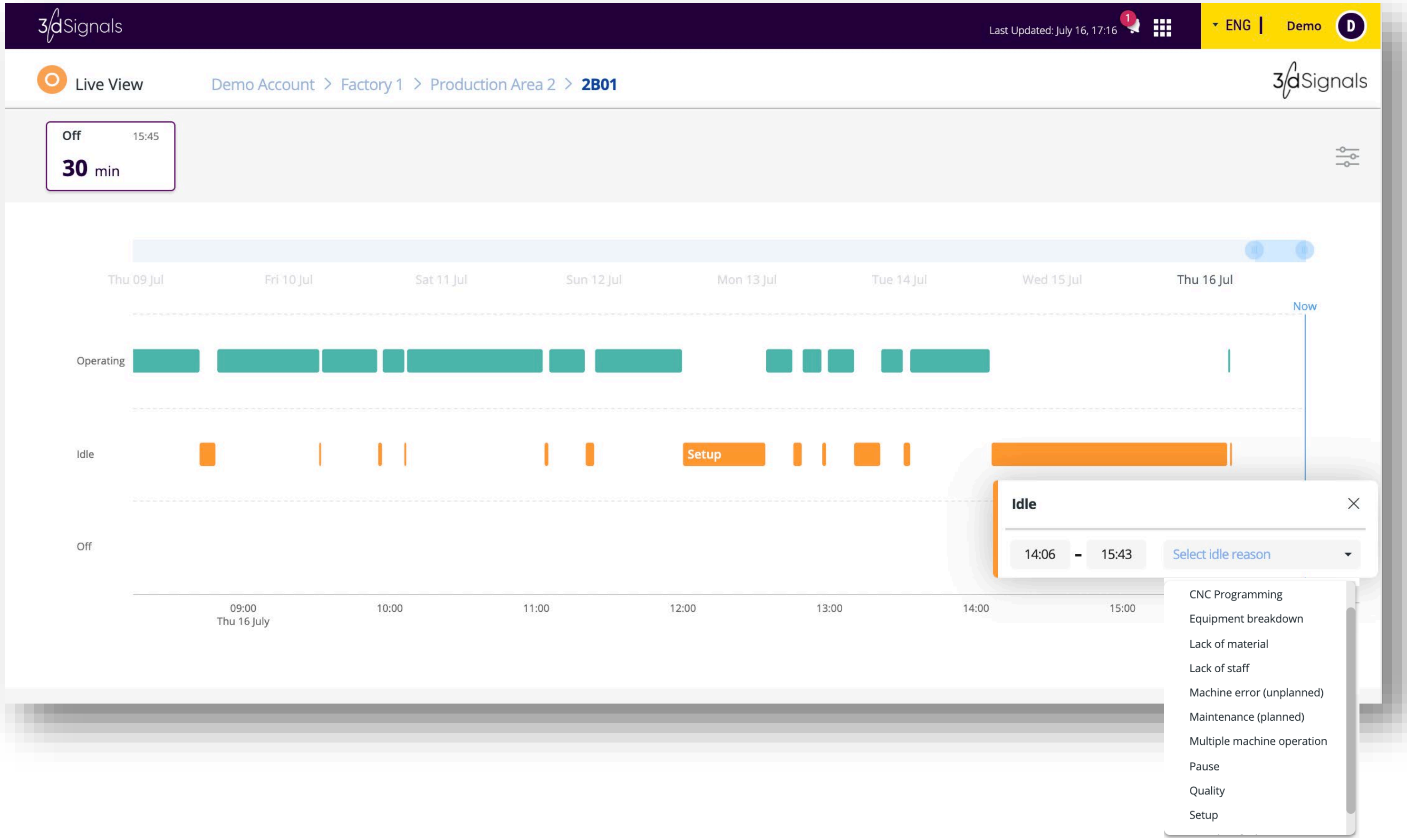
Hide report details ^

Actual operation time / Machine (minutes)

#	Date				Week 3							Week 4							Week 5							February Week 6							Week 7						
		Fri 10	Sat 11	Sun 12	Mon 13	Tue 14	Wed 15	Thu 16	Fri 17	Sat 18	Sun 19	Mon 20	Tue 21	Wed 22	Thu 23	Fri 24	Sat 25	Sun 26	Mon 27	Tue 28	Wed 29	Thu 30	Fri 31	Sat 1	Sun 2	Mon 3	Tue 4	Wed 5	Thu 6	Fri 7	Sat 8	Sun 9	Mon 10	Tue 11	Wed 12	Thu 13	Fri 14	Sat 15	Sun 16
BW MCX1400	☼	204	--	--	258	260	321	280	257	--	--	172	192	270	74	291	--	--	203	274	260	227	314	17	--	260	232	304	368	312	--	--	304	49	305	300	341	--	--
	🌅	195	--	--	297	234	164	311	290	--	--	348	175	73	40	204	--	--	295	366	326	287	271	--	--	311	**36**	9	221	--	--	--	272	336	316	329	229	--	--
	☾	--	--	--	257	285	**218**	278	--	--	--	243	**256**	**203**	**317**	--	--	--	245	291	357	293	331	--	--	--	**48**	**292**	353	--	--	--	157	**296**	352	339	186	--	--
Zenith 400	☼	416	--	--	230	227	201	359	295	--	--	460	450	457	442	392	--	--	235	246	388	260	345	--	--	280	334	197	350	409	19	--	404	430	392	404	379	382	--
	🌅	341	--	--	373	424	375	385	389	--	--	348	307	415	320	140	--	--	316	437	249	435	460	--	--	392	418	356	321	312	--	--	278	300	289	283	422	--	--
	☾	--	--	--	335	413	377	379	--	--	418	454	400	446	454	423	--	--	308	395	369	458	355	--	--	394	400	429	245	292	--	--	446	411	419	459	398	--	--
MCH 450	☼	70	--	--	188	212	195	221	295	--	--	55	286	299	253	301	--	--	240	278	220	287	325	--	--	424	383	409	351	315	--	--	351	374	72	399	400	--	--
	🌅	--	--	--	207	220	225	183	75	--	--	220	253	258	294	243	--	--	305	350	373	362	364	--	--	316	386	221	164	405	--	--	331	350	316	355	281	--	--
	☾	--	--	--	**208**	**214**	**175**	327	--	--	--	**250**	207	269	248	310	--	--	381	340	315	380	282	--	3	314	340	317	315	--	--	1	361	388	409	394	192	--	--
SMS	☼	1	--	--	335	346	278	328	366	--	--	406	307	298	444	393	430	--	293	341	440	464	355	--	--	322	366	381	335	391	--	--	238	307	402	408	450	446	--
	🌅	**336**	--	--	336	344	332	414	458	--	2	341	261	281	302	436	16	--	361	441	334	380	470	--	--	372	416	378	385	304	--	--	410	374	418	438	422	--	--
	☾	--	--	--	327	410	271	316	--	--	**343**	345	363	336	424	366	--	385	241	396	430	474	349	--	279	340	318	248	296	--	--	6	429	366	347	457	390	--	--
H10	☼	479	--	--	429	425	467	449	465	434	--	411	417	459	402	418	--	--	467	422	479	458	470	--	--	453	453	433	470	404	451	--	437	380	452	391	436	--	--
	🌅	422	--	--	443	480	328	423	415	--	--	455	371	426	480	446	--	--	448	447	354	470	449	--	9	420	444	453	412	443	--	4	453	452	444	431	442	--	--
	☾	--	--	--	470	478	439	454	--	--	444	480	469	468	480	--	--	3	472	419	480	403	426	--	473	468	480	469	432	468	--	453	344	462	449	450	423	--	--

Idle Reason Analysis

- Allows employees on the shop floor to input reasons for downtime, whether planned or unplanned
- Enables further analysis to identify bottlenecks and improve operations
- Reasons are customizable per customer


3dSignals
Last Updated: July 16, 17:16
ENG
Demo
D
Live View
Demo Account > Factory 1 > Production Area 2 > 2B01
3dSignals
Off 15:45
30 min
Thu 09 Jul
Fri 10 Jul
Sat 11 Jul
Sun 12 Jul
Mon 13 Jul
Tue 14 Jul
Wed 15 Jul
Thu 16 Jul
Now
Operating
Idle
Setup
Off
09:00
Thu 16 July
10:00
11:00
12:00
13:00
14:00
15:00
Idle
Select idle reason
CNC Programming
Equipment breakdown
Lack of material
Lack of staff
Machine error (unplanned)
Maintenance (planned)
Multiple machine operation
Pause
Quality
Setup

Idle

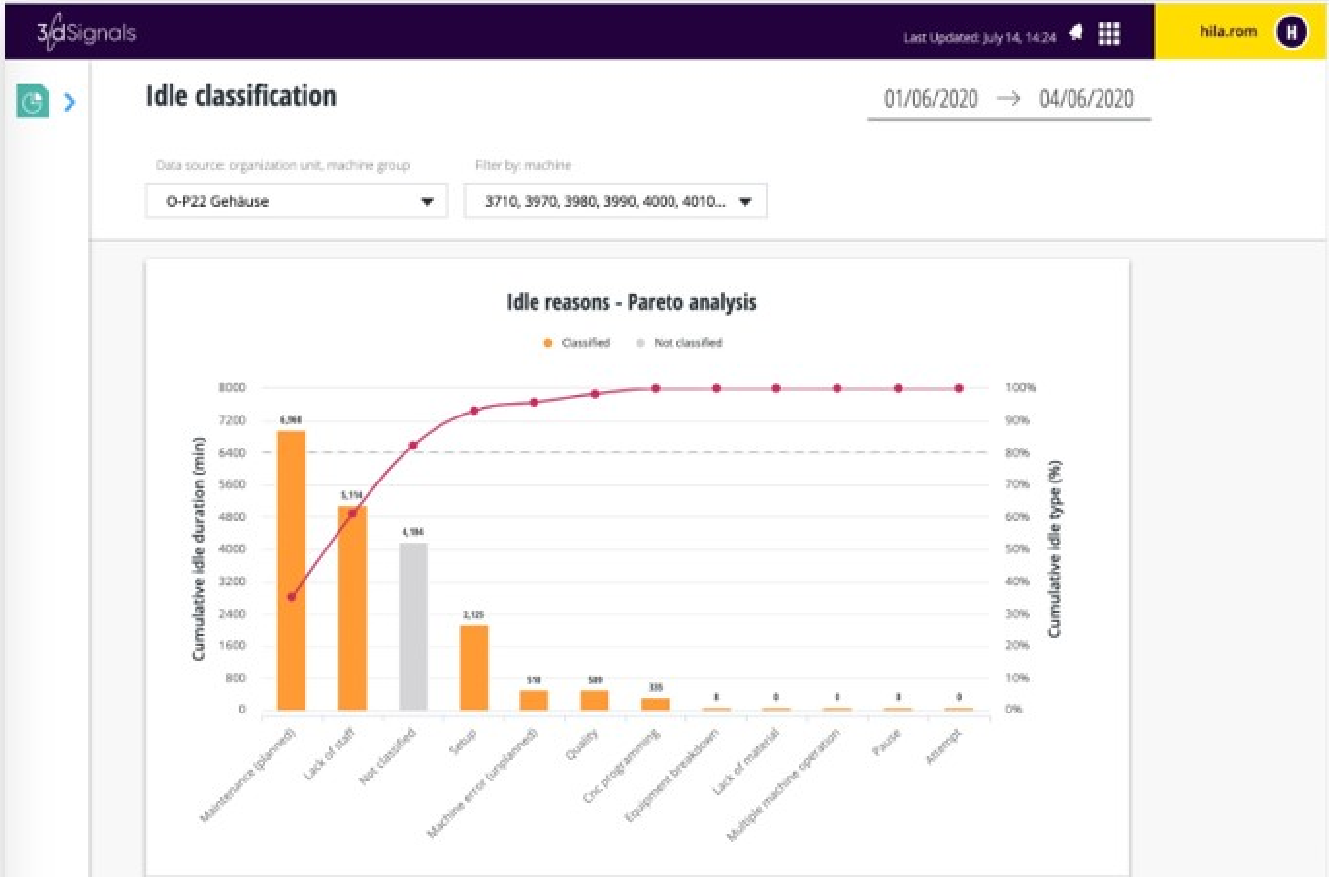
14:06 - 15:43

Idle Reasons Report

Real-Time > History > Alerts > Vs. Plan > **Optimization**

Paretto analysis of idle reasons to identify the 20% of reasons that cause the 80% of idle durations

- Per machine or group of machines
- Per idle reason


3dSignals
Last Updated: July 14, 14:24
hila.rom
H
Idle classification
01/06/2020 → 04/06/2020
Idle reasons - Pareto analysis
● Classified
● Not classified
8000
7200
6400
5600
4800
4000
3200
2400
1600
800
0
Cumulative idle duration (min)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative idle type (%)
Maintenance (planned)
Lack of staff
Not classified
Setup
Machine error (unplanned)
Quality
Cnc programming
Equipment breakdown
Lack of material
Multiple machine operation
Pause
Attempt

Data source: organization unit, machine group: O-P22 Gehäuse

Filter by: machine: 3710, 3970, 3980, 3990, 4000, 4010...

About Us

About Us

- Founded in **October 2015**
- Raised **$27M** to date
- **3** approved & pending **patents**
- Top 100 Europe Award winner
- 2020 Technology Pioneers
- Members of the **Open Industry 4.0 Alliance**

RED HERRING

WORLD ECONOMIC FORUM | 20 YEARS

Technology Pioneers 2020

OPEN INDUSTRY 4.0 ALLIANCE

Our investors:

SOMV | GROVE VENTURES | DIVEdigital | MERCURA CAPITAL GmbH

Your Factory is Industry 4.0 Ready

Let us help you realize it

- 11 sites across Germany
- Additional sites in Europe, US & Israel
- >250 machines
- ± 50 machine brands

— Heller
— DMG MORI
— AXA
— OKUMA
— Trumpf

— METRUS
— Chiron
— INDEX-TRAUB
— MIKRON
— Etc.

Germany sites

Management Team

Ariel Rosenfeld
CEO
Prev. M-Systems
B.Sc. I&M Eng.

David Koren
VP R&D
Prev. M-Systems, SanDIsk
B.Sc. E. Eng.

Yoni Yuval
VP Sales
Prev. Lead-IT, Valire
MBA

Danya Golan
VP Marketing
Prev. SolarEdge
M.Sc. Neurobiology

Yifat Ferber
VP Product Strategy
Prev. SAP
M.Sc. Technology & IS

Galia Kedmi Fragman
VP Business Development
Prev. SanDisk, SRL Group
MBA

Markus Löhr
MD, 3d Signals GmbH
Prev. HKS
Dipl.-Ing. (FH) Mechanical Eng.

Advisory Board

Dr. Andreas Widl

Vorstandsvorsitzender, SAMSON AG,

Claus Garnjost

Ehemals Leistritz AG, DMG MORI AG,

Heller Maschinenfabrik GmbH

3dSignals

THANK YOU.

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