

www.concretewatcher.com

WHATIS CONCRETE WATCHER™?



The concept is very simple:

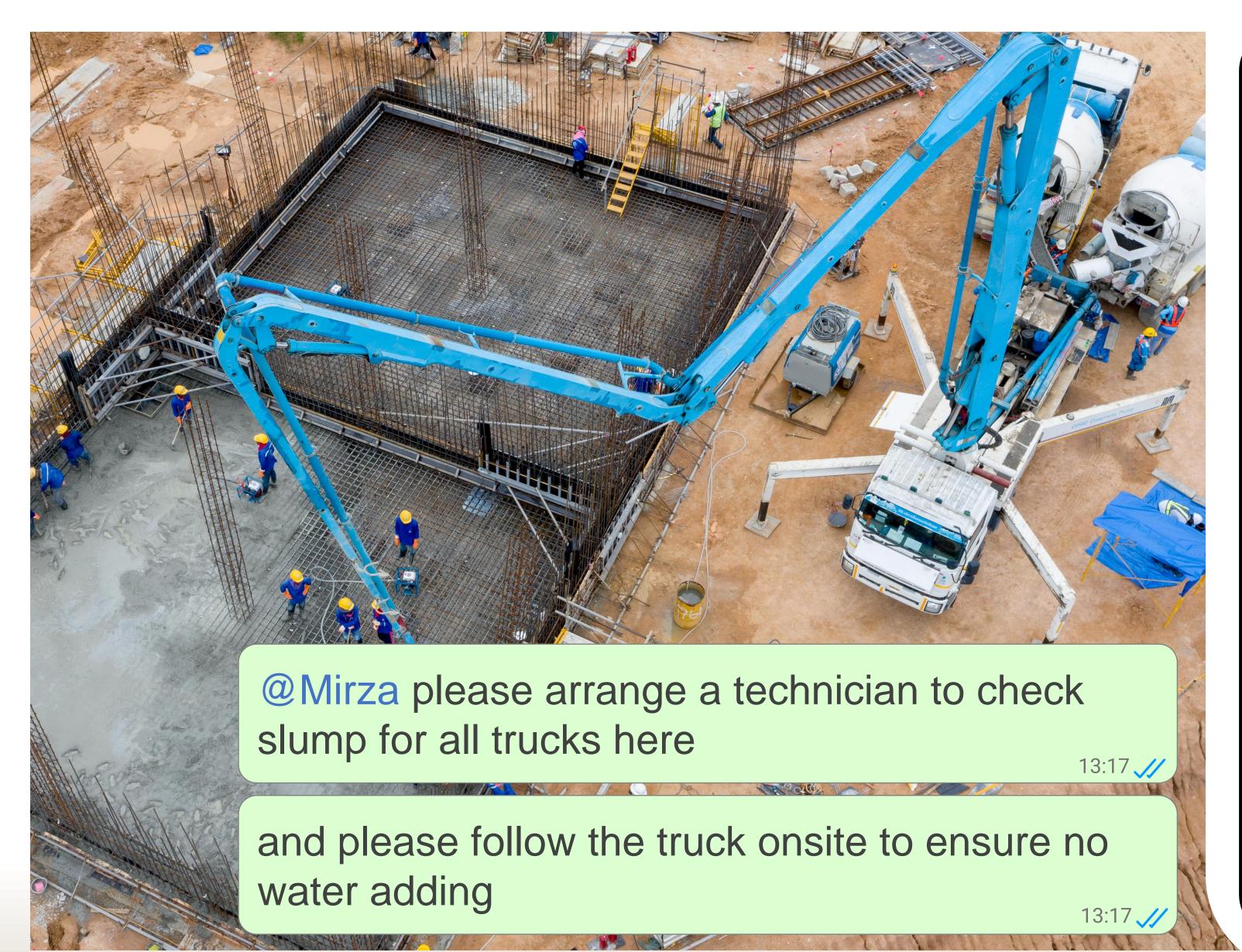
A technology that allows you to know what's happening to your concrete, as if were looking at it yourself.

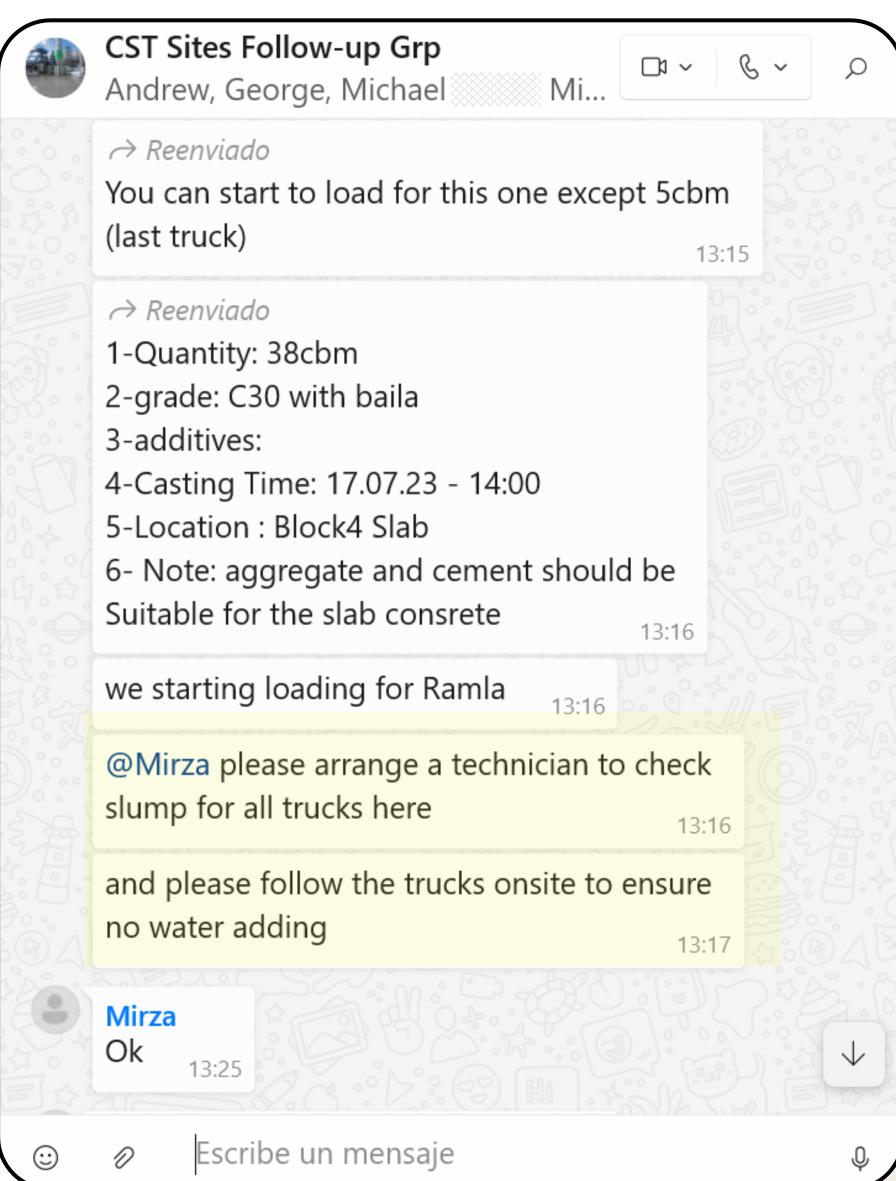
CONCRETE WATCHER™ records and analyzes everything that happens inside the drum, via video recordings across the whole process: before you start loading, during transport and discharge, until the truck returns to the plant.

The recordings are analyzed in real-time on the truck itself using the latest **Artificial Intelligence** technology.

AREAL AND WORLDWIDE NEED







SYSTEM COMPONENTS





Watertight protection box for the electronics



High-definition camera





Tablet/mobile device for the cabin (optional)

WHAT DOES IT DO, AND HOW?



✓ Continuous recording

The system records videos continuously, it doesn't miss anything.

✓ Guaranteed traceability

The videos are short (30-60 secs) that are unequivocally associated to each truck, timestamped with exact date and time.

✓ A.I. analysis on the truck

Does not depend on network connection.

✓ Alerts and events management on the truck

The driver may (optional) watch the videos and real-time alerts even without network connection, the unit produces its own local Wi-Fi network. He can take notes, report water/admixture/fiber additions, test results, etc.

If the driver does not perform these tasks, they can be done later via the management app.

✓ Automatic data transmission

The system uses a SIM card to transmit data to the cloud sever. With minimum signal it sends real-time analytics by the AI; with better mobile connection (4G/5G) or with the plant's Wi-Fi it uploads the videos to the cloud server, so they can be watched by any authorized user remotely.

✓ Online access in real time

Once the data has been successfully uploaded (analysis and video files) they are deleted from the truck, and they become available online by phone or PC.

✓ Management app

The system features a full-fledged management app that includes a fleet dashboard for real-time status, automatic alerts, historical records, analytics and statistics, etc.

✓ Customizable immediate alerts

Important events can be immediately informed by email, WhatsApp, Telegram, on the management app, etc.

✓ Automatic sleep mode

When the truck is inactive the videos are analyzed and a "no activity" tag is created, and the superfluous video files are discarded. Video upload is automatically re-activated when any relevant activity is detected, such as drum rotation, water addition, etc.

THE A.I. CAN DO THE SAME AS A PERSON



THAT'S LOOKING INSIDE THE DRUM

- ✓ Determine the content and state of the truck Empty, loading, loaded, unloading, even if there is washing water inside from a previous trip.
- ✓ Measure rotation speed and direction

 Automatically records these parameters during the whole delivery process, including control of retempering.
- ✓ Detect water additions

 Also admixtures, and estimate their volume (based on total addition time).
- ✓ Evaluate slump in real-time

 And other parameters such as incomplete mix (lumps), segregation, etc.
- ✓ Control loading and unloading

 Know the exact duration of the loading and pouring processes, and detect interruptions in the pour.
- ✓ Calculate remaining concrete volume

 Knowing the volume loaded into the truck and controlling the number of rotations where concrete is discharged, estimate the remaining volume in real-time, also useful for partial returns.

- ✓ Inform of spillage during transport

 Immediate alert when it detects that concrete is pouring out while the drum rotates in the mixing direction, indicating an involuntary spill during transport.
- ✓ Control maintenance

 Detect wear or loss of plates, wear of the blades, hardened concrete build-up behind the blades (by volume difference), etc.



BUT THE A.I. IS BETTER AT IT THAN ANY HUMAN

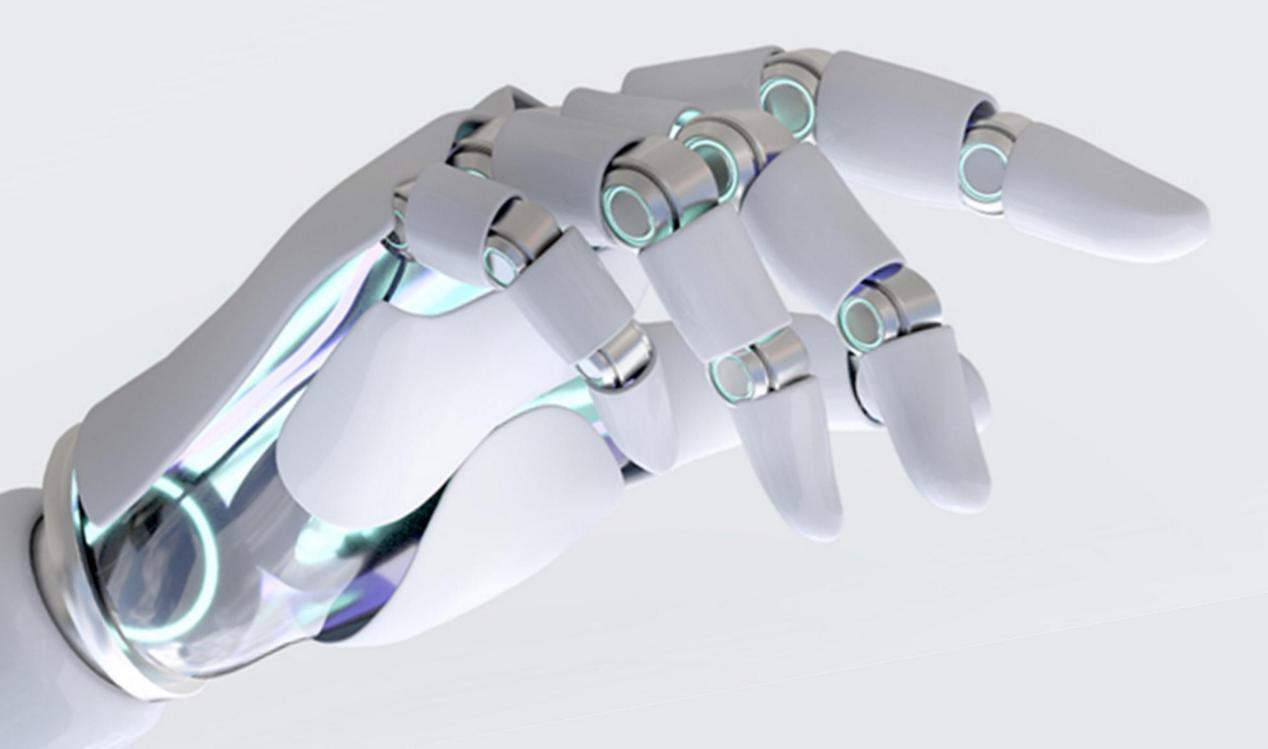


BECAUSE...

- ✓ It's always alert: "doesn't sleep"

 Evaluates everything, all the time: does not get tired, or bored, or distracted.
- ✓ Learns continuously: "doesn't stop"

 It's "one brain with many eyes": the more units are installed, the faster, better, and more things it learns.



- ✓ Evaluates objectively: "doesn't cheat"

 Based on facts and real data, does not "tip the scale" to obtain a result it likes.
- ✓ Records everything in detail: "doesn't forget"
 The video recordings are hard evidence of what happened inside the drum, they contain as much detail as it's possible to collect for loading and mixing, water or admixture additions, pour, etc.
- ✓ Alerts immediately: "doesn't forgive"

 As soon as any important event takes place, it immediately sends a message to all relevant personnel.

PATENTED TECHNOLOGY



The Concrete Watcher™ technology has been filed for patents in Europe and USA



Justificante de presentación electrónica de solicitud de patente

Este documento es un justificante de que se ha recibido una solicitud española de patente por vía electrónica utilizando la conexión segura de la O.E.P.M. De acuerdo con lo dispuesto en el art. 16.1 del Reglamento de ejecución de la Ley 24/2015 de Patentes, se han asignado a su solicitud un número de expediente y una fecha de recepción de forma automática. La fecha de presentación de la solicitud a la que se refiere el art. 24 de la Ley le será comunicada posteriormente.

Número de solicitu	d: P202230151
Fecha de recepció	n: 24 febrero 2022, 14:22 (CET)
Oficina recepto	a: OEPM Madrid
Su reference	a: 13315
Solicitan	e: CONCRETE QUALITY, S.L.U.
Número de solicitante	s: 1
Pa	s: ES
Títu	o: MÉTODO IMPLEMENTADO POR ORDENADOR, PRODUCTO DE ORDENADOR Y SISTEMA PARA MEDICIÓN SIN CONTACTO DE PROPIEDADES REOLÓGICAS DE UN PRODUCTO FLUIDO DERIVADO DEL CEMENTO



Page 1 of 3

P.O. Box 1450 Alexandria, VA 22313 - 1450 www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION # 18/172,472

RECEIPT DATE / TIME 02/22/2023 12:15:37 PM ET ATTORNEY DOCKET # DIS-29

Title of Invention

COMPUTER-IMPLEMENTED METHOD, COMPUTER-BASED PRODUCT, AND MONITORING SYSTEM FOR CONTACTLESS ASSESSMENT OF RHEOLOGICAL PROPERTIES OF FLUID CEMENT-BASED PRODUCTS

Application Information

APPLICATION TYPE Utility - Nonprovisional Application under 35 USC 111(a)

PATENT# -

CONFIRMATION# 4521

FILED BY Jamie Levine

PATENT CENTER# 61630886

FILING DATE -

CUSTOMER# 20311

FIRST NAMED Juan Manuel PEREIRA

INVENTOR

AUTHORIZED BY Elizabeth Lee

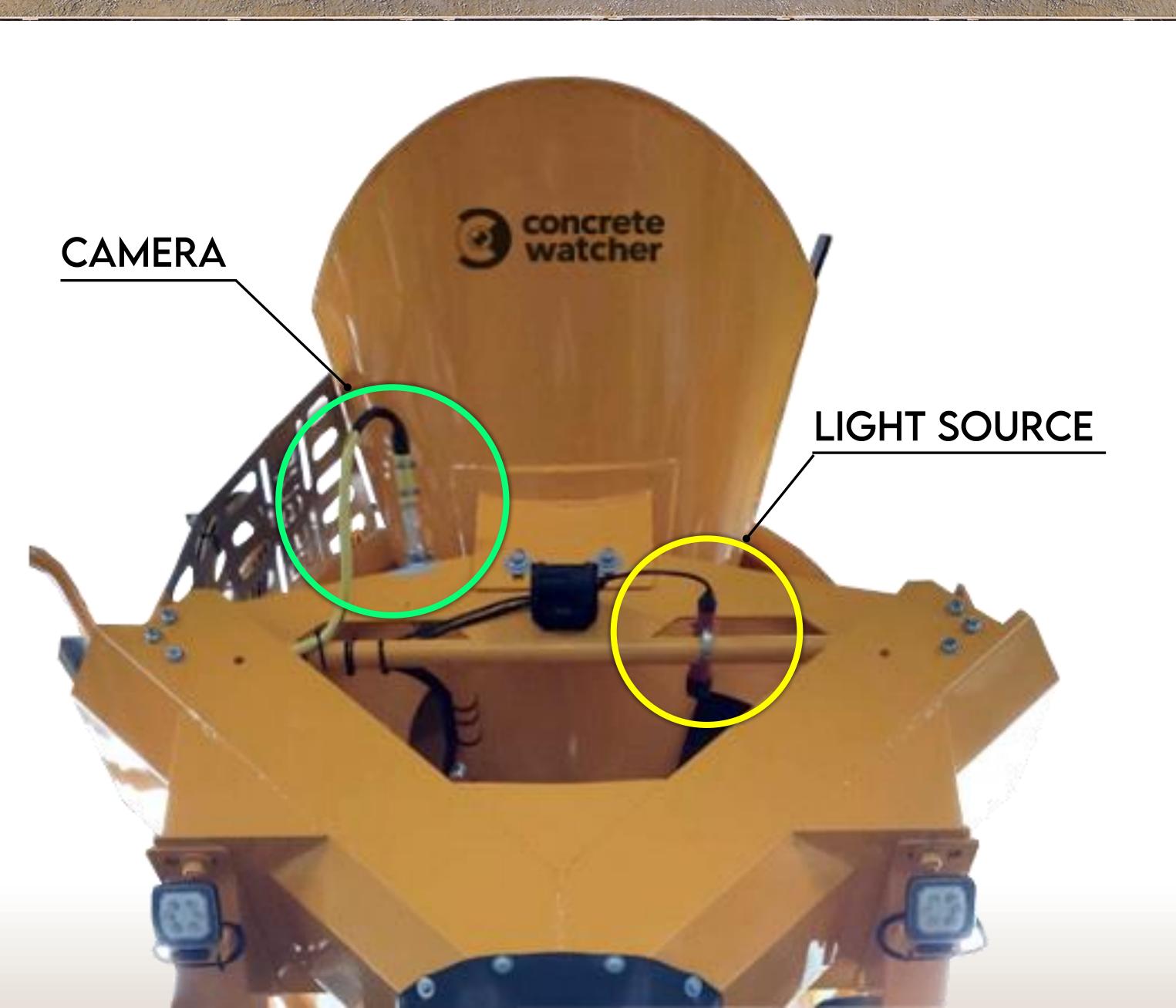
CORRESPONDENCE -ADDRESS

Documents

TOTAL DOCUMENTS: 5

EASY INSTALLATION





Installed in Belgium

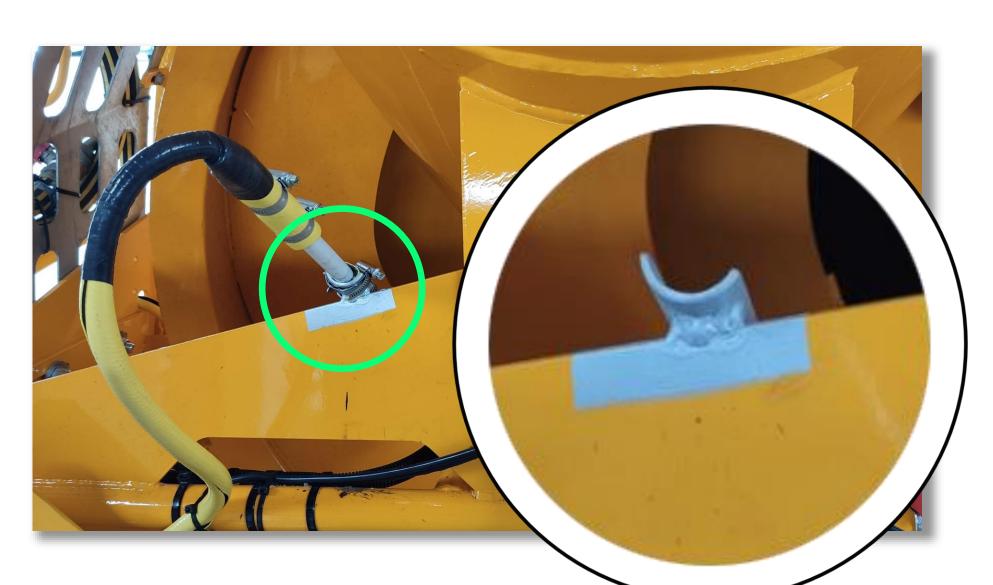




Fixing of the box with the electronics

INSTALLATIONDETAILS

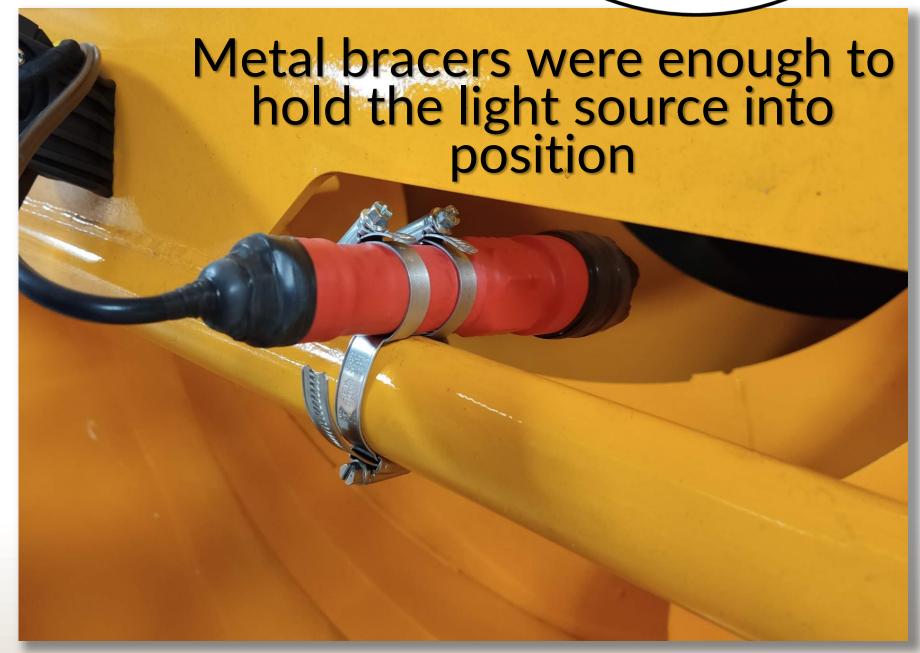




Small welded support









FLEXIBLE INSTALLATION





Standard position (below) alternative (left), fixed with welded stirrups.

Installed in **Dubai**





TECHNICAL SPECS



- ✓ Power supply: 24 V DC
- ✓ Max. consumption: 100 W
- ✓ Consumption in sleep mode: <20 W
 </p>
- ✓ Case dimensions: 32 x 24 x 14 cm
- ✓ Case weight: <3 kg
- ✓ Case protection: IP56
- ✓ Camera protection: IP67
- ✓ Light source protection: IP65
- ✓ Camera cable length: 5 m
- ✓ Light source cable length: 6 m
- ✓ Power cable length: 6 m
- ✓ Power cable type: 2 x 1,5 mm²
- ✓ All cables with outdoors protection
- ✓ Camera cable with additional protection against wear
- √ 4G/5G connectivity: SIM card (micro size)
- ✓ Wi-Fi connectivity: Yes (own network and plant's Wi-Fi)



RECORDINGS EXAMPLES



This video shows the light source lighting up the bottom of the drum, to detect washing water and concrete remainders before loading.



Drum rotating, notice down-right the water and admixture hoses. Observe water addition at 0:37 seconds.





RECORDINGS EXAMPLES



Pouring concrete, observe that the end of the last blade can be seen in the video, allowing to detect when concrete is being poured.



Recorded in Belgium



The concrete volume poured and remaining can be calculated based on the number of rotations while pouring (also depends on workability).



Download this video

RECORDINGS EXAMPLES



Concrete spilled during transport (0:15 s). Concrete detected as being poured while the drum rotates in the "loading" direction.



Recorded in the **UK**



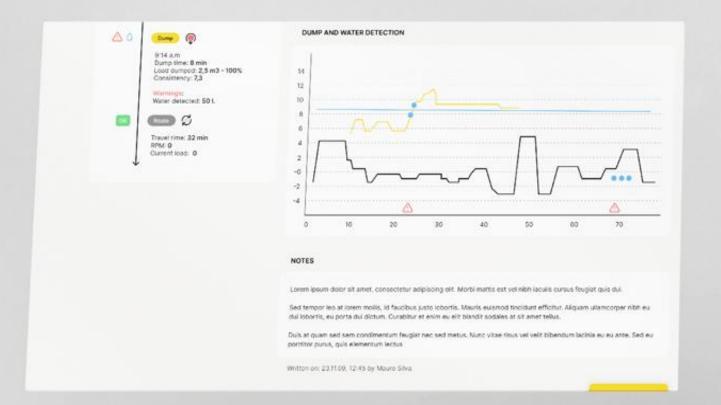
We can cross-reference this alert with the GPS location at that time to know exactly where the spill is located.

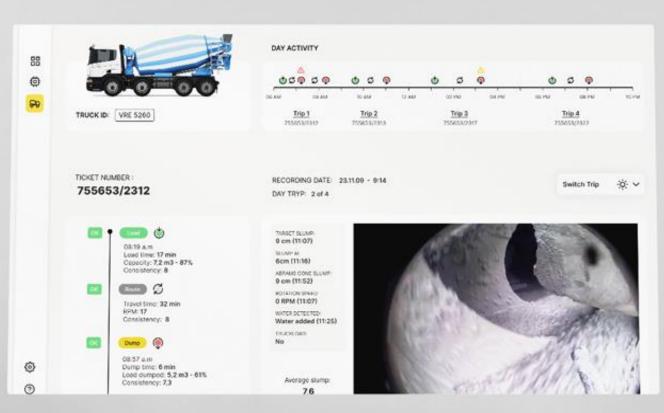


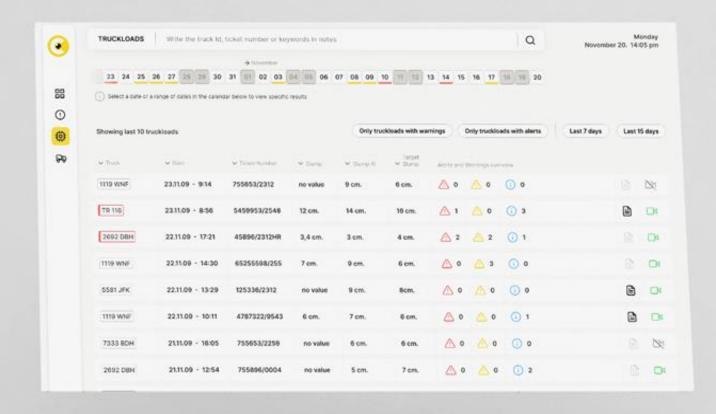
Download this video

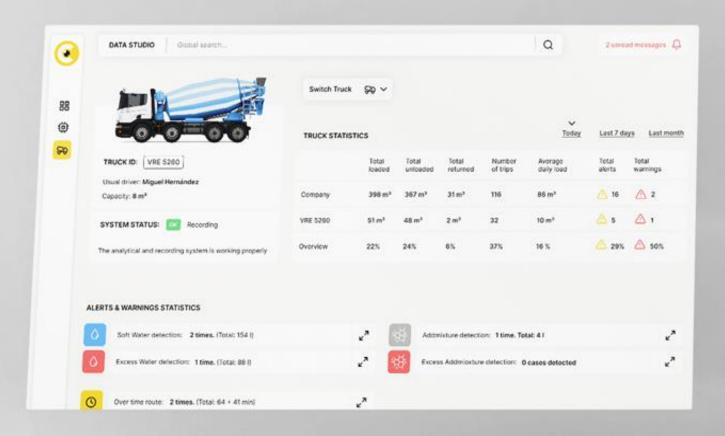
THE ULTIMATE MANAGEMENT TOOL

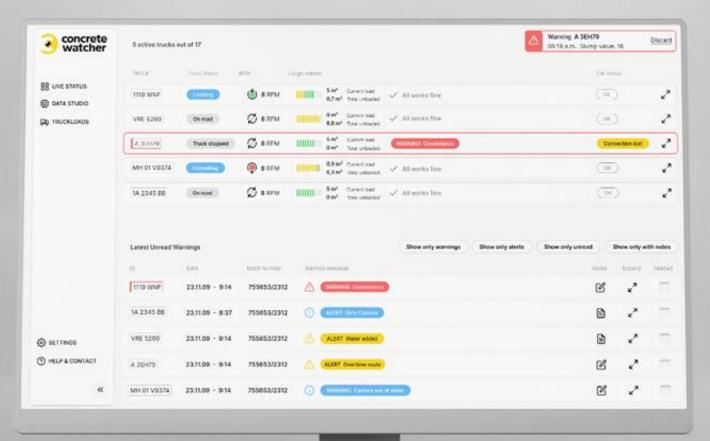










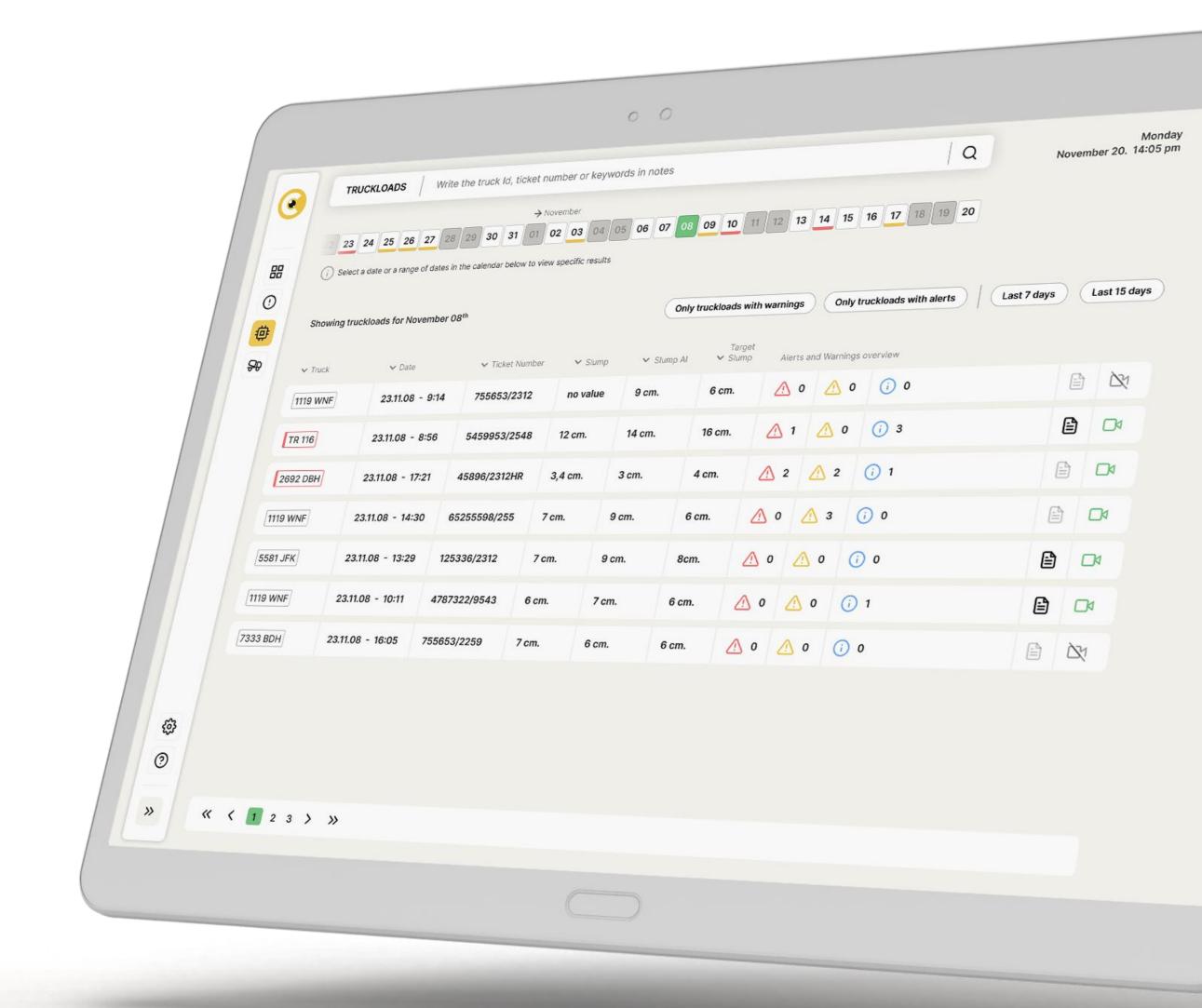


	LAST JOURNEYS OF VRE 5260								
	tim	Train Number	Owner	Sing	Story At	Target. Sump			
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	23.11.09 - 08:19	755648/2311	œ.	no values	9 cm.	6 cm.			01
	23.11.09 - 08:19	755648/2311	04	9 cm.	9 cm.	6 cm.			E38
	23.11.09 - 08:19	755648/2311	WARRINGS	50 cm.	9 cm.	17 cm.	Δ		D
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	23.11.09 - 08:19	755648/2311	OK	9 cm.	9 cm.	6 cm.			0
	23.11.09 - 08:19	755648/2311		no values	9 cm.	6 cm.			0
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THE ULTIMATE MANAGEMENT TOOL



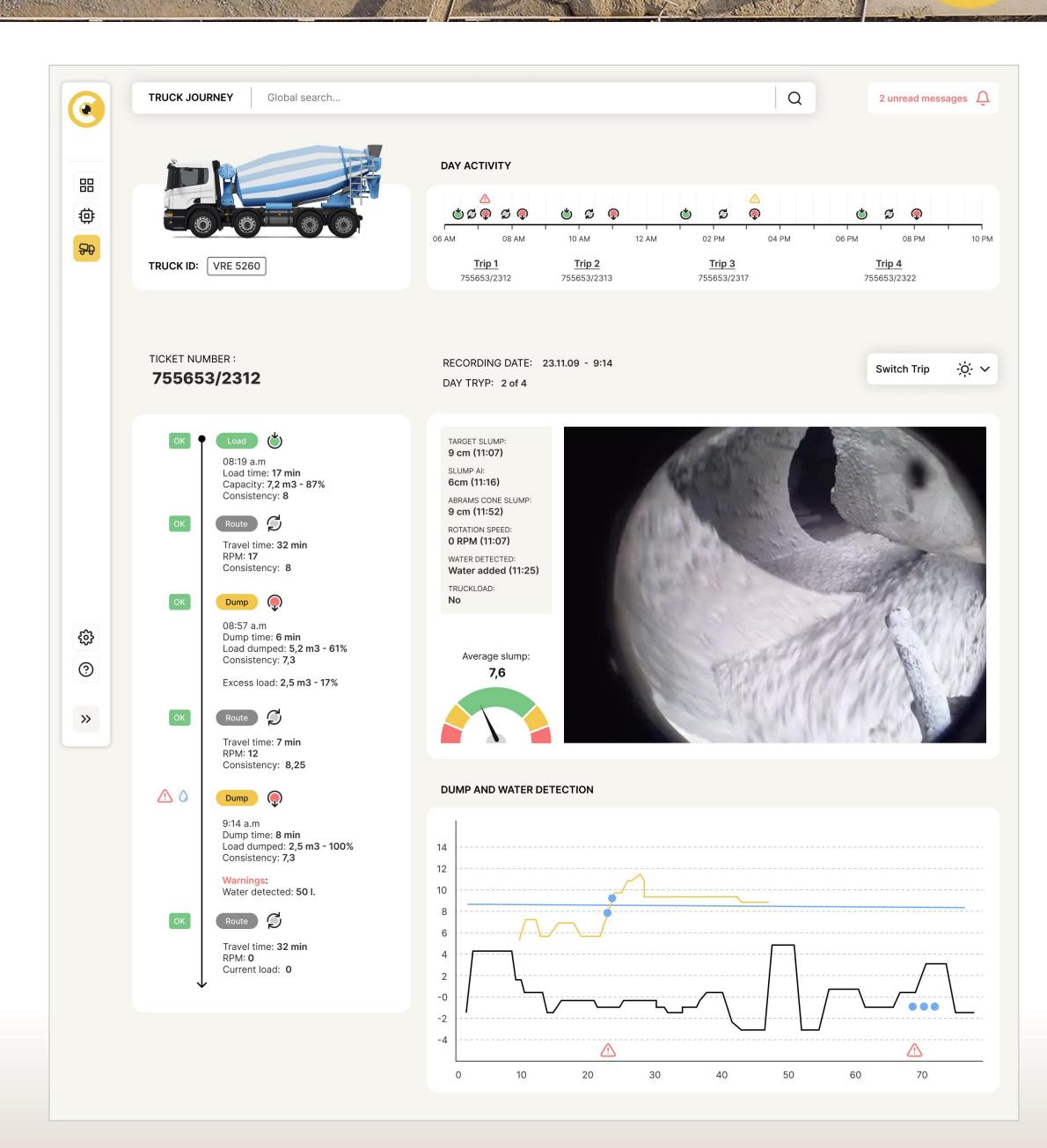
- ✓ Fleet status in real-time
- ✓ Alerts listing
- ✓ Detailed daily activity log for each truck
- ✓ Truck management and statistics
- ✓ Historical of records and alerts
- ✓ Customizable analytics
- ✓ Immediate alerts by email, WhatsApp, Telegram, etc.



EVERYTHING UNDER CONTROL



- ✓ Removes the largest blind spot in the delivery process, from the load until the return to plant.
- ✓ Avoids quality issues detecting water additions and washout water remaining in the drum.
- ✓ Controls the performance of the concrete products and also the drivers.
- ✓ Immediate alerts and hard evidence of any unauthorized addition or tampering, from any source.
- ✓ Keeps full automatic records of every single delivery for total traceability.
- ✓ Complies with project requirements that demand automated slump control on delivery.
- ✓ Generates new knowledge about the delivery process and concrete behavior in transit.



FULL-FLEDGED QA/QC SYSTEM



We also feature a complete QA/QC "Concrete Quality" that manages:

- ✓ Materials testing compliance (aggregates, cement, etc.)
- ✓ Mix design management and optimization
- ✓ Connects to the batch system to record and analyze actual batch weights
- ✓ Automatic weather information for each project
- ✓ On-site testing of concrete (slump, air %, etc.)
- ✓ Any type of test specimen and their tests
- ✓ Sensors and monitoring devices connection
- ✓ Statistics, analytics, reports, ITP, etc.



When both systems work in synergy you can obtain complete traceability without any blind spots:

- ✓ Before production (raw materials)
- ✓ Production (actual batch records)
- ✓ In-transit (Concrete Watcher™)
- ✓ On-site testing (slump, air, density, etc.)
- ✓ Long and short term (test specimens, sensors, weather)

The combination of both systems will allow synergies such as prediction of strengths and durability JUST BEFORE POURING, and others.

A self-driving system!

100% visibility over the whole process

ATPLANT



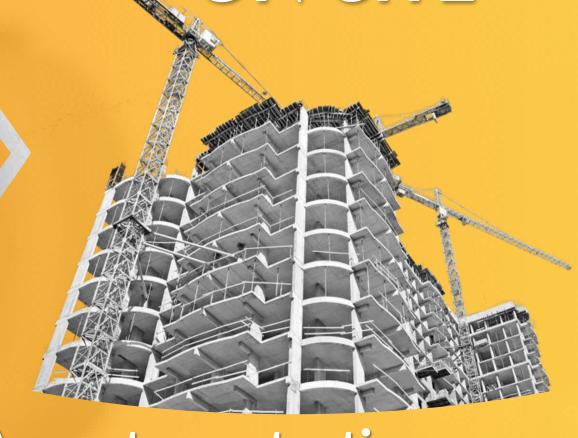
✓ Raw materials characteristics and real-time batch records

IN TRANSIT



✓ A.l. control over water additions, workability, etc.

ON SITE



- ✓ Acceptance testing
- ✓ Strength and durability
- ✓ Sensors and weather data

Complete QA/QC Management and Business Intelligence



When someone tells us "this specimen is not ok"...

...we'll be able to answer "that's true, it's the specimen that's not ok, because

I can prove that my concrete is performing just fine".



WHAT'S COMING IN THE FUTURE?



SHORT TERM

- ✓ Integration with QA/QC system that will allow predicting strengths and durability at the moment of pouring concrete on site
- ✓ Integration with Digital Delivery Ticket
- ✓ Integration with GPS tracking systems

MID TERM

- ✓ Alerts for limits of water additions, waiting times, etc., to guarantee performance
- ✓ Automatic generation of water/admixture vs slump charts
- ✓ Dynamic mix optimization taking into account transport and weather conditions

LONG TERM

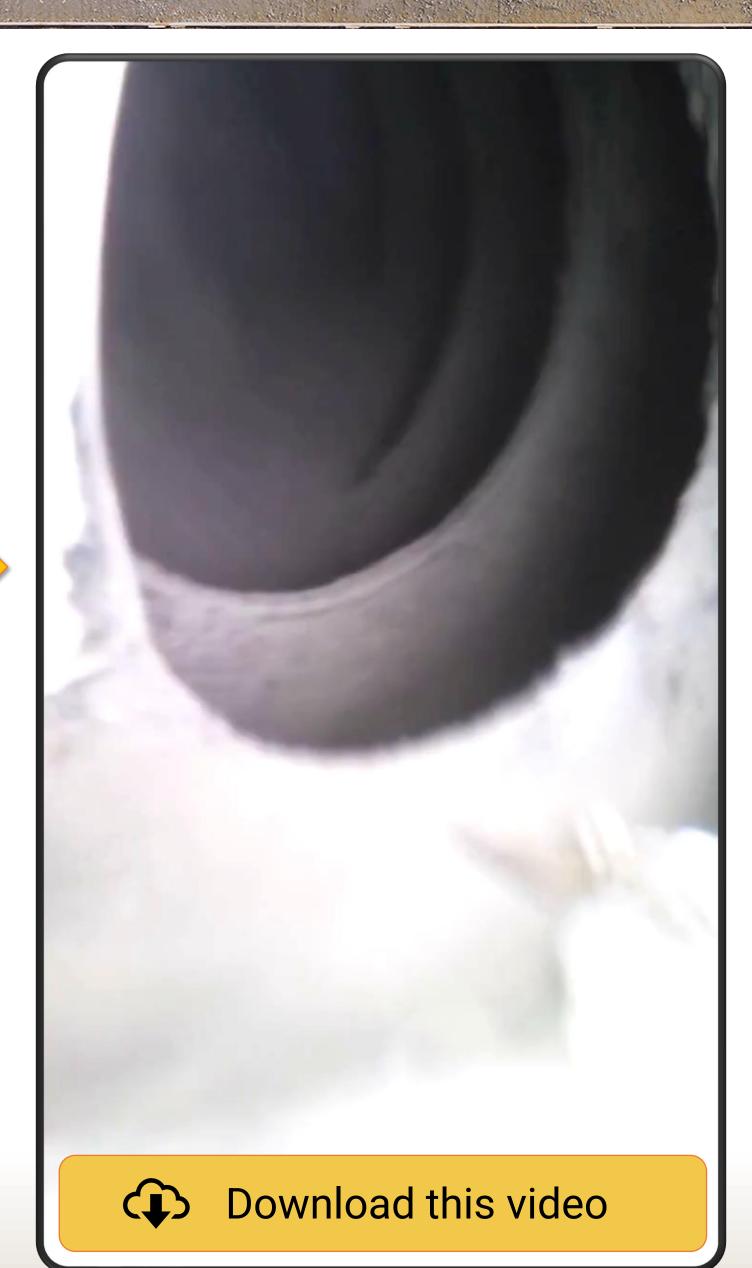
- ✓ Changes in the relationship with testing laboratories and QC on site
- ✓ Reduction or complete elimination of acceptance testing -> Digital Testing Standards
- ✓ 100% autonomous trucks that automatically manage the concrete and delivery



HOW DO YOU CLEAN THE CAMERA?







Recorded in Tenerife, Spain



HOW DO YOU CLEAN THE CAMERA?



With water and a cloth, just like the truck is cleaned with a hose and a brush.

- ✓ Automatic alert when the camera needs cleaning.
- ✓ The camera is **easily accesible** when the driver washes the truck.
- ✓ The camera has a special protection that withstands scratching, oils, acid.
- ✓ It's completely watertight, can be washed with the hose and use a piece of cloth to dry water droplets afterwards.



Concrete Watcher™ is just another truck system that needs some looking after and maintenance.

This routine maintenance is the responsibility of any driver.

Recorded in Tenerife, Spain







HOW DO YOU DEAL WITH THE DRIVERS?



Same as you did with the GPS.

- ✓ People resist being controlled, and usually the ones that resist the most are the ones that need more control.
- ✓ Monitoring technologies and digitalization are a clear trend in all aspects of modern life, resisting is a lost battle.
- ✓ Some **standards** already consider these kind of systems, even they are still not commonplace requirements in most projects.
- ✓ Whoever was not able to implement GPS tracking due to drivers' resistance has a problem... that has nothing to do with the camera.



WHAT'S THE PRICE?



Take advantage of our introductory offer.

PRICING SCHEMA

- ✓ Hardware purchase (one-time payment), one unit per truck, installed by each client.
- ✓ Software subscription (annual payment), one subscription per truck.
- ✓ SIM data cards supplied by each client with their own data plan. Same for the plant's Wi-Fi.

CONDITIONS

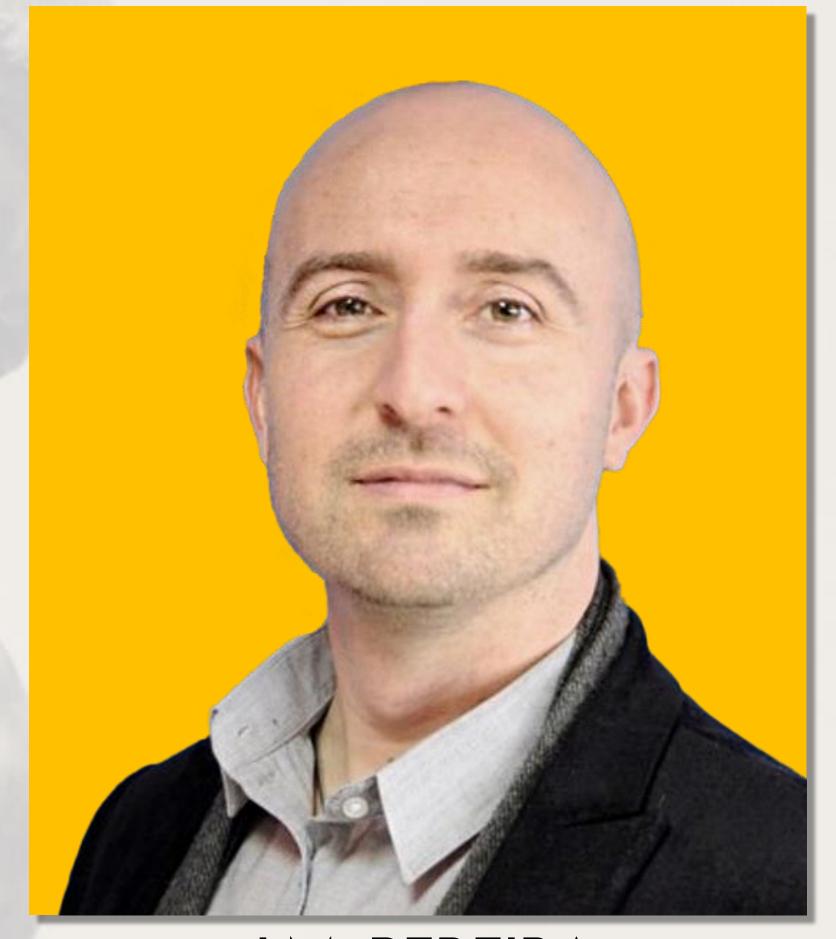
- ✓ The system does not have any consumables or elements that suffer wear on use. No hidden costs.
- ✓ No users limits for the management web-based app (drivers, plant operators, managers, etc.).
- ✓ The QA/QC system Concrete Quality is optional and allows to make strength and durability predictions before pouring, entails a separate subscription.
- ✓ The hardware units have guarantee for factory defects, not covering damage by misuse or lack of proper maintenance.

THE PRICE... IN PRIVATE, DEPENDS ON MULTIPLE FACTORS.



"As the GPS provides the advantage of knowing where your trucks are at all times,

Concrete Watcher[™] provides the obvious advantage of knowing what's happening with your concrete, at all times".



J.M. PEREIRA
INVENTOR & FOUNDER





THIS CHANGES EVERYTHING

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