



# DEWESoft®

C A S E S T U D I E S



# RTK MEASUREMENT ON CRANES

## ABSTRACT

This application note shows how Dewesoft products provide an effective solution for a quick validation of crane boom positioning in the field. The mobile measurement instruments and the easy-to-setup software are used for checking position parameters and relative movement of top of the boom on the mobile/truck cranes. Such system is useful in the development and production phase to evaluate the stiffness of cranes boom.



## INTRODUCTION

The client, a huge truck-crane manufacturer in Germany, is developing and producing high-load truck cranes for worldwide market. Since material technology has advanced, the crane manufacturer also wants to test new materials to see the limits with the goal to increase length and load capacity of the crane. Two most crucial facts for them are the external environment and the ratio between length and angle of the boom and load on it, at which they allow working with the crane, and at which they do not recommend it, because it's either to high wind or the load is to high.

## MEASUREMENT SETUP

### DATA ACQUISITION SYSTEM

- VGPS-HS-RTK (100 Hz GNSS receiver with support of GPS/GLONASS and 2 cm position accuracy with Real-time kinematics GNSS technology)
- Additional fixed base station to transmit RTK correction data
- Industrial bluetooth connection to the top of the boom



### SOFTWARE

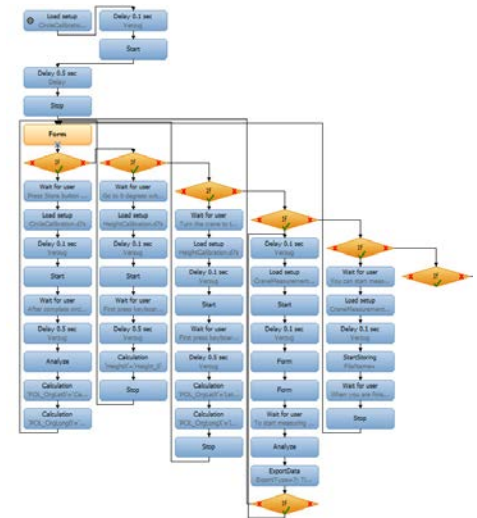
- Dewesoft X2
- Special sequence, which includes center calibration procedure



Photo of system installed on the top of the cranes boom, base station inside the factory and first measurement screen, to check bending and relative movement of the boom.

## SEQUENCE/POLYGON SETUP

Since the customer wanted a turn-key solution, we had to pack the complete package in an easy-to-use hardware and software. Therefore all the complicated Math, which is needed to calculate relative distance of the movement and bending of the boom is hidden inside the Dewesoft sequencer. With this, the operator has a very easy screen to work with, and is able to perform the measurement in a couple of minutes after mounting the kit.



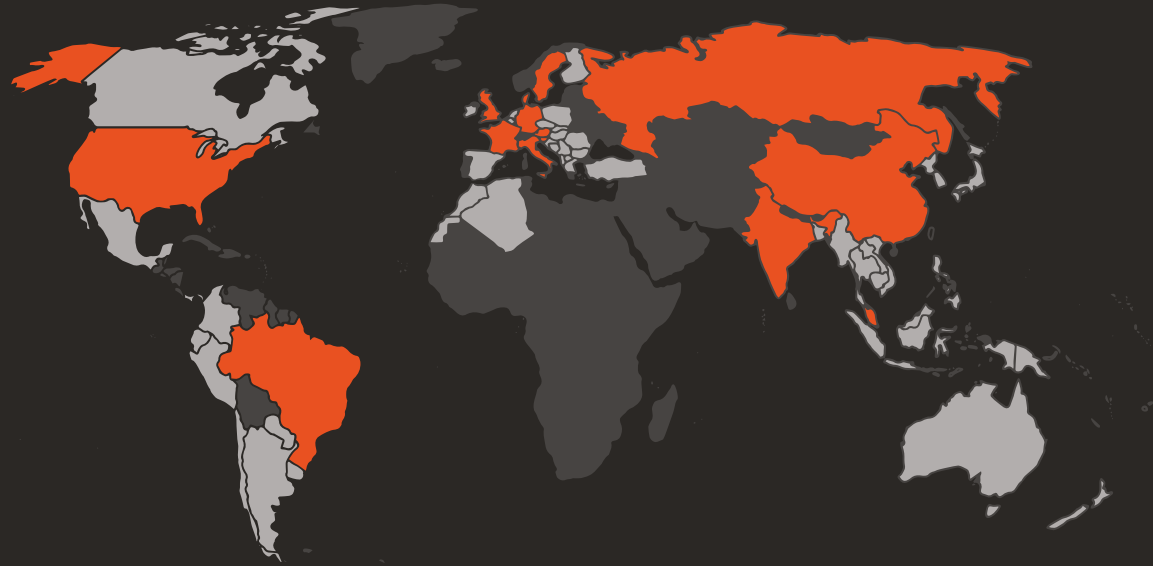
## ANALYSIS

The display on the right was created for easier online indication to the operator, where he can input certain values as for instance load, angle, number of booms used, ... All those parameters are saved inside the data file and later on exported to MATLAB® for further development calculations and simulations.

Weight (t)	5,00	GPS radius	2034	Distance from rotation center in all 3 axes
Base angle (°)	45,00	20340	002	
Head angle (°)	0,00		1550	
Pressure (bar)	5,00	Speichern		
Rope length (m)	50,00	Stop		

## CONCLUSION

Measuring and clarifying the limits is crucial for operation of such a huge truck crane. Since customers of cranes are sometimes walking on the limit of the cranes capabilities, they have to be aware of the limits and in which weather conditions lift the load and in which not, because the consequences can be devastating. With such a system, the manufacturer is able to test the limits of the crane and also compare bending of different designs or different used materials. The complete installation including measurement and calibration (with a prepared sequence) takes around 1 h, which is also a huge improvement, because so far all the tests were performed manually (big possibility of error and accuracy around 1 m).



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