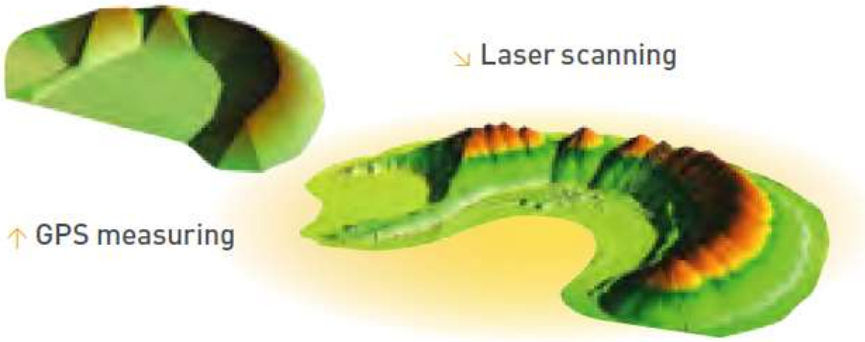
ONE BUTTON 3D SCANNING - OBS

Ing. Vítězslav Obr, Ph.D., ISM PRESIDIUM MEETING
25. 6. 2015, 12:00-12:15

Open pit value proposition to Barric

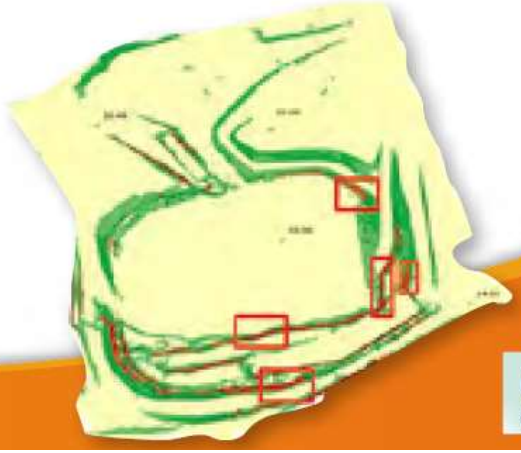
3D Precise Volume Control



3D Project Scheduling Control

3D Project Geometry Control

3D Rock Slope Stability Control

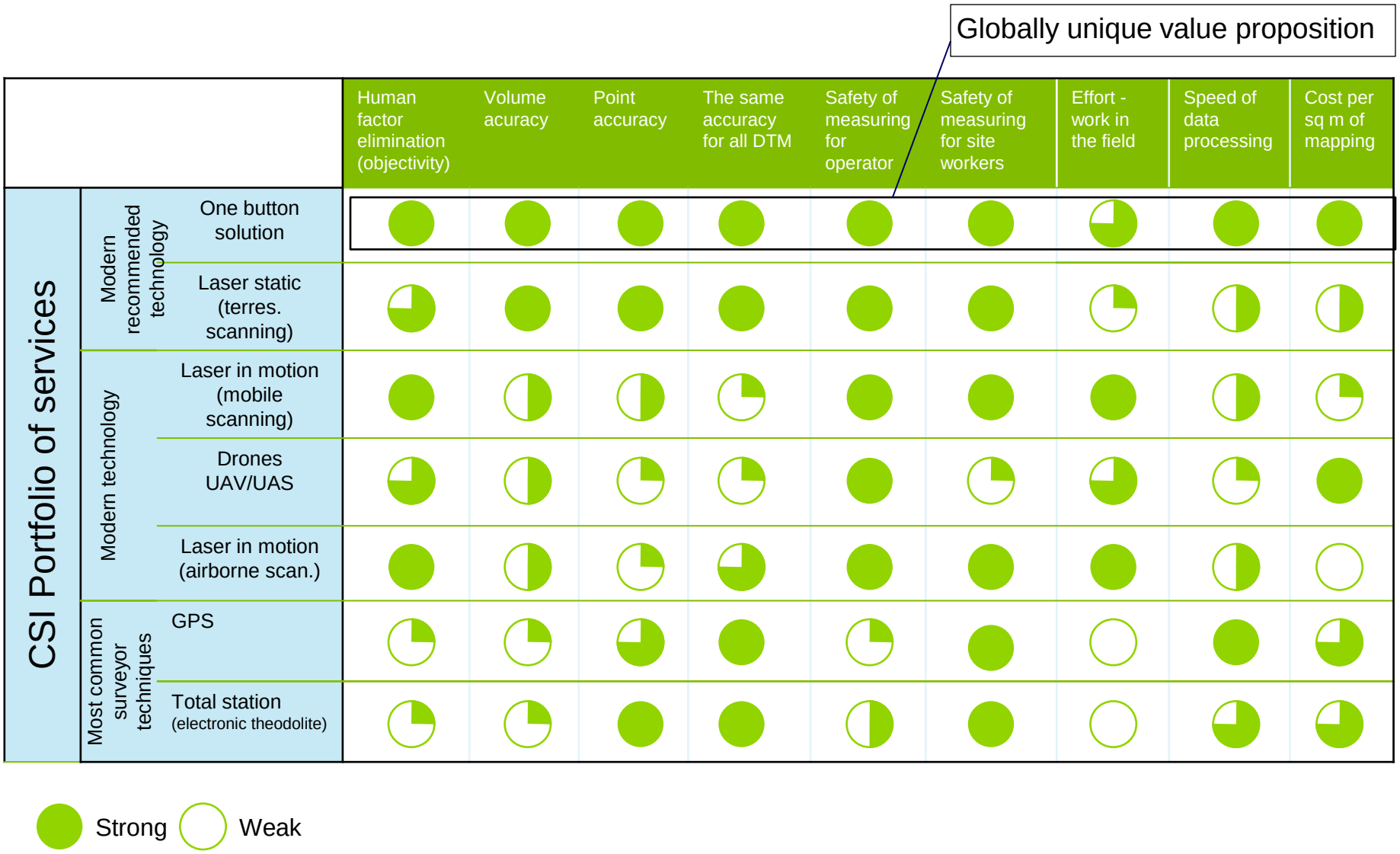


UNITED REGISTRAR OF SYSTEMS
ISO 9001
Quality management systems

Concept of One Button Solution

With our One Button Solution (OBS) mines do not need surveyor specialists to collect and analyze mapping data. Instead general staff from the mine operations are able to do this job. It is fast, easy, and the results are available digitally with only one click. The data is valuable for day-to-day efficient mine operation, lowering costs and increasing returns.

Value proposition of Control System International



VALUE PROPOSITION – OPEN PIT

Control System Interantional

Open pit excavation

	nr.	Value proposition factor	Description
Monetary benefits	1	Savings on truck costs needed to remove the blasted material (remove muck piles) by optimal allocation	One button 3D scanning can reduce the amount of trucks and mechanization needed to remove muck piles and trasport the ore to crusher/mill. In other words mine operation knows exactly how many full loaded trucks are needed for each loading area which allowed optimal allocation of trucks=>optimal utilization. The situations when there is excess (not fully loaded trucks) or shortage (not enough trucks to remove the material) of truck capacity are avoided.
	2	Avoiding costs associated with inaccurate slope inclination of the ramps	If the ramp exceeds the steep of 8% the consumption of the fuel and wear of the trucks is greater.
	3	Avoiding cleaning of residual explosives before another round of blasting	After each explosion the bores containing old explosives need to be cleaned. With CS work flou and OBS technology we know exactly where the dangerous not cleaned boreholes are. Therefore it is possible to avoid this work and plan next drilling. This CS work flow was approved by the Swedish mining authority.
Qualitative benefits	4	Precise separation of ore from waste directly in the pit.	OBS technology allowed precise comparison of realyty (3D rock model) with a geological model of ore and provide valuable information for better separation of waste and ore directly in the pit.
	5	3D design of mine is continuously updated and monitored	
	6	Safety	Secondary product of periodical daily 3D laser mapping of mine is information about any deformation of rock walls. Timely identification of any dangerous deformation or rock slides can save environment and lives
	7	Environment	Daily monitoring of dikes or dumps (e.g. tiling ponds dikes) can provide timely information about potential risk

Conclusion

Why with us?

- ✓ More than 10 years of surveyance in mining
- ✓ Our unique SW solution and methodology has been developed continuously, step by step for many years based on experiences from real projects and customer's needs
- ✓ Hundreds of mining and other earth moving projects including industry leaders
- ✓ Established at sites in Canada and Scandinavia
- ✓ Experienced R&D in-house team
- ✓ 30 experienced staff members
- ✓ Cooperation with universities
- ✓ Experiences with Ground LiDAR, UAV mapping and mobile scanning
- ✓ Official Riegl distributor

Why with us?

Evaluation factor		Competitior	
	Control System OBS		Other solutions (e.g. Maptek)
SW		Cloud post processing • We have less functionality coverd.. • Our usability of is better, no specialist required Or any kind of third part software Sirovision, Mapteck Vulcan, Micro Mine, Data Mine, Surpack…		Maptek Vulcan
HW		OBS is utilizing Riegl scanners which are better in all technical parameters (accuracy, speed, range, size, weight)		Maptek scanners are 10 times slower and less accurate. Yu are not able to scan whole open pit mine with stockpiles in required time (within couple hours) and you are not able to provide essential data when you need it. The accuracy limit the scanner usage for rock slide stability monitoring or for shotcreting thickness or for underground convergence control
Ease of implementation		No training required		Training required
Ease of operation		One button scanning & one click cloud postprocessing		Training required for data acquisition as well as for data postprocessing.
Cost of operation		no needs of specialist or surveyors (saving on labour), HW start around $120k, you can utilize cloud post processing and pay just exactly for what you need (software saving, labor saving, training saving)		Maptek are quite expensive utilizing their advantage of market penetration by software Vulcan (HW start around $170k)
Overall assessment				We consider Maptek as worse added value because only in one criteria (SW) are equal to our proposition. In total cost it is significantly worse…

Why with us?

	OBS - Control System	uGPS Rapid Mapper™	Maptek
	This is two very different technologies regarding the principle of accuracy measuring and data post processing. Mobile systems are fast but there are principally design for city mapping, to get basic overview of surrounding (in underground we say to get basic information about tunnel system).You never get centimeters accuracy to be able to control deformation or shotcrete thickness and you can't to use this system for effective underground development optimizing. Other very important thing is, that you need to be in motion to be able to do mapping and to be able to get any information about your position - this is technical background principle => you are not able to use this system for front face survey => you will not able to do adaptive blasting - improving drilling plans and charging after each blast result analyze on front face. And there is no any system of accuracy control, just do the mapping twice and compare - but you always get very different value. This system is designed for final project control with relative accuracy - you will not get good global accuracy. Control System OBS can be upgraded to be able to do also mobile mapping but by effective combination of Stop & Go with mobile mapping you get best from both. But we do not recommend do mobile mapping in underground - there is no reason to map 10-20km per day. You need control front face and do several faces per day.		Above all Maptek is software company specialized in mine planning and operation software. They do also hardware - 3D laser scanner but this is their side business and the hardware is 10 years behind Riegl which is part of OBS solution from Control System. Maptek is really good in their software Vulcan and this software perfectly work with Maptek scanners but also with Riegl scanner. Riegl scanners are better in all parameters (durability, speed of mapping, accuracy, range, size and weight, and price!!!). Riegl innovate their scanners every year and in their portfolio you can find over 20 scanners with thousand of accessories. Maptek do just 1 or 2 models.
Different technology	Stop & Go (also mobile if require)	Mobile mapping	Stop & Go
Speed of mapping	1-5 km undeground /day (OBS Stop & Go process)	1-10 km undeground /day	0.5 - 1km
Speed for front-face mapping (3 scan positions)	1-2 min	-	10min
Teoretical accuracy	2mm	3cm	8mm
Global accuracy	2mm-10mm	50mm - 500mm or more	10-30 mm
Accuracy secure (control)	selve automated process	No	selve process
3D mapping difficulties	extremly easy (no trayning)	complicated	easy
Post-processing difficulties	easy	very complicated	moderate
Post-processing principe	cloud automated / (or desk top sw)	desk top software	desk top software
Use data in special software	Control System Mine Map Cloud Postprocessing	???	Matek Vulcan
Use data in other software	Dessault, Sirovision, Mapteck Vulcan, Micro Mine, Data Mine, Surpact, …	???	???
Shotcreting thickness	100%	25%	75% (low accuracy)
Frontface mapping	100%	5%	75% (slow)
Tunnel mapping	100%	100%	75% (slow)
Stope mapping	100%	0%	50% (too heavy)
Undeground deformation control	100% (0.5mm in relative convergence control)	0%	25% (low accuracy)
Open pit mapping	100%	50% (short range)	75% (slow)
Stock pile mapping	100%	50% (short range)	75% (slow)
3D Geomtery Control (undeground)	100% (CS Mine Map - part of OBS)	75% (low global accuracy)	100% (PerfectDig SW)
3D Geomtery Control (open pit)	100%	75% (low global accuracy)	100%

References