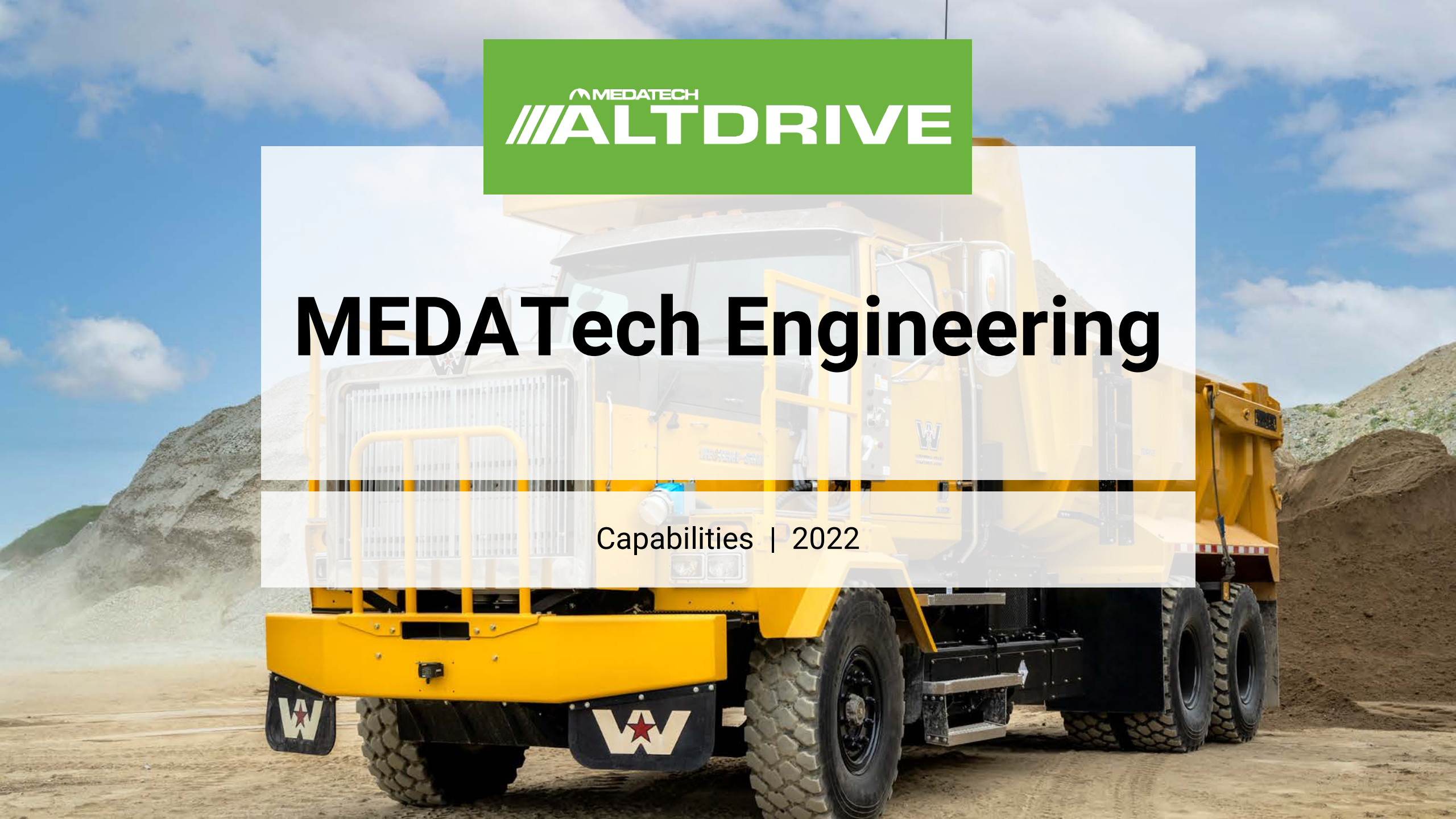
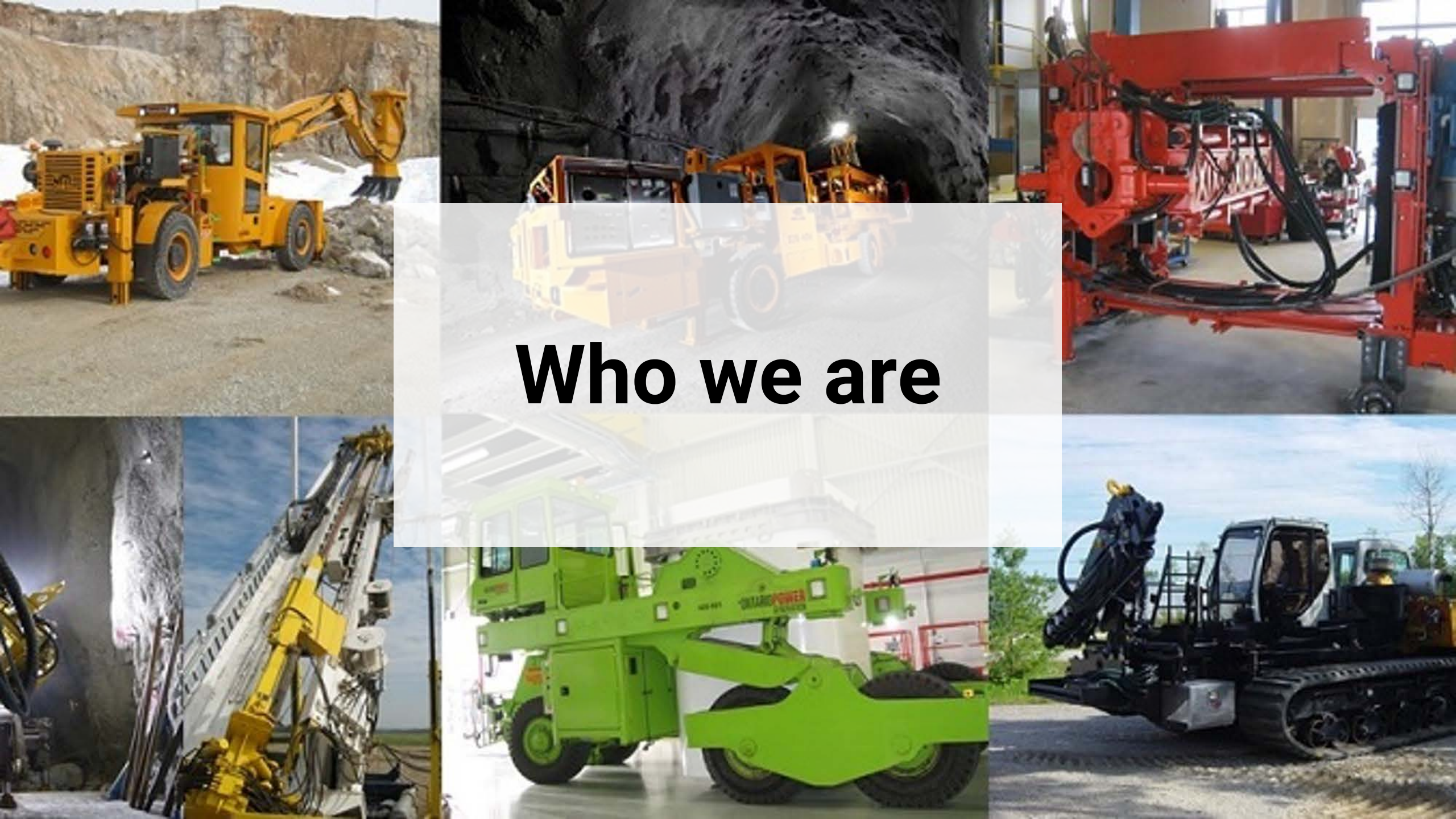


MEDATECH ALTDRIVE

MEDATech Engineering

Capabilities | 2022



Who we are

Innovation is Who We Are

An Innovator First

- Fast to fail
- Faster to succeed

M OBILE

E QUIPMENT

D ESIGN &

A UTOMATIO N

T ECHNOLOGY

MEDATech has been designing and building custom-engineered mobile equipment and systems for customers across the globe since 2003.

MEDATECH ENGINEERED SOLUTIONS

Engineering services: from consulting to software development to engineer/design/build

MEDATECH BORTERRA

Advanced drilling equipment

MEDATECH ALTDRIVE

All-electric powertrains

Company Profile

MEDATech's core business is mobile equipment design, prototyping & testing services for the construction, mining, transportation & energy sectors. We have offices in Collingwood ON (HQ), Calgary AB and Ocala FL.

Team Experience

We solve a wide range of technical problems involving mechanical, hydraulic, electronic equipment and rechargeable energy systems.

- **Our strength** Product development
- **Our value** Quickly making your product vision a reality

Strategic Focus

- Develop long term partners – Technology, Manufacturing and Customers
- Highly dependable, innovative solutions
- Focus on safety, economy and productivity
- AGILE methodology: develop prototypes within aggressive timelines

Our Team

Robert Rennie
President & Owner

Mark Seeber
Senior Technical Advisor

We are 35 people strong.
Our management team:

- Engineers, technicians, operators and mechanics
- Years of experience in all facets of machine control

John Arnold
General Manager

Our Team

We are 35 people strong. Our management team:

- Engineers, technicians, operators and mechanics
- Years of experience in all facets of machine control

Darren Mueller
Sales & Marketing Director

Andrew Severs
Engineering Services Director

Paul Cholewa
Chief Technology Officer

Scott Dalrymple
Senior Design Engineer
& Product Manager for Borterra

Our Clients


VALE


MacLean Engineering


GOLDCORP


WESTERN STAR


Torex Gold
RESOURCES INC.


nwmo
NUCLEAR WASTE
MANAGEMENT
ORGANIZATION


Southern
Company


A.C.T.


Vermeer


ZAMBONI
Nothing else is even close


OSHKOSH


GHH
FAHRZEUGE


CUBEX


ONTARIO POWER
GENERATION


ANDRITZ
Hydro


KELLER
NORTH AMERICA


Amalgamated Mining
Group


KOVATERA


ARMSTRONG


MEDATECH
ALTDRIVE

Our Partners

Battery systems

XALT solutions are defined by the remarkable combination of exceptionally high energy and performance density with an extremely compact design, modular structure, and maximum flexibility.

On-board chargers and power electronics

One of the world's largest providers of power conversion and power management solutions.

Electric motors, generators, power electronics and control systems

Suitable for the commercial, automotive, marine, mining, rail, motorsports and recreational vehicle markets.

Charging solutions & robotics

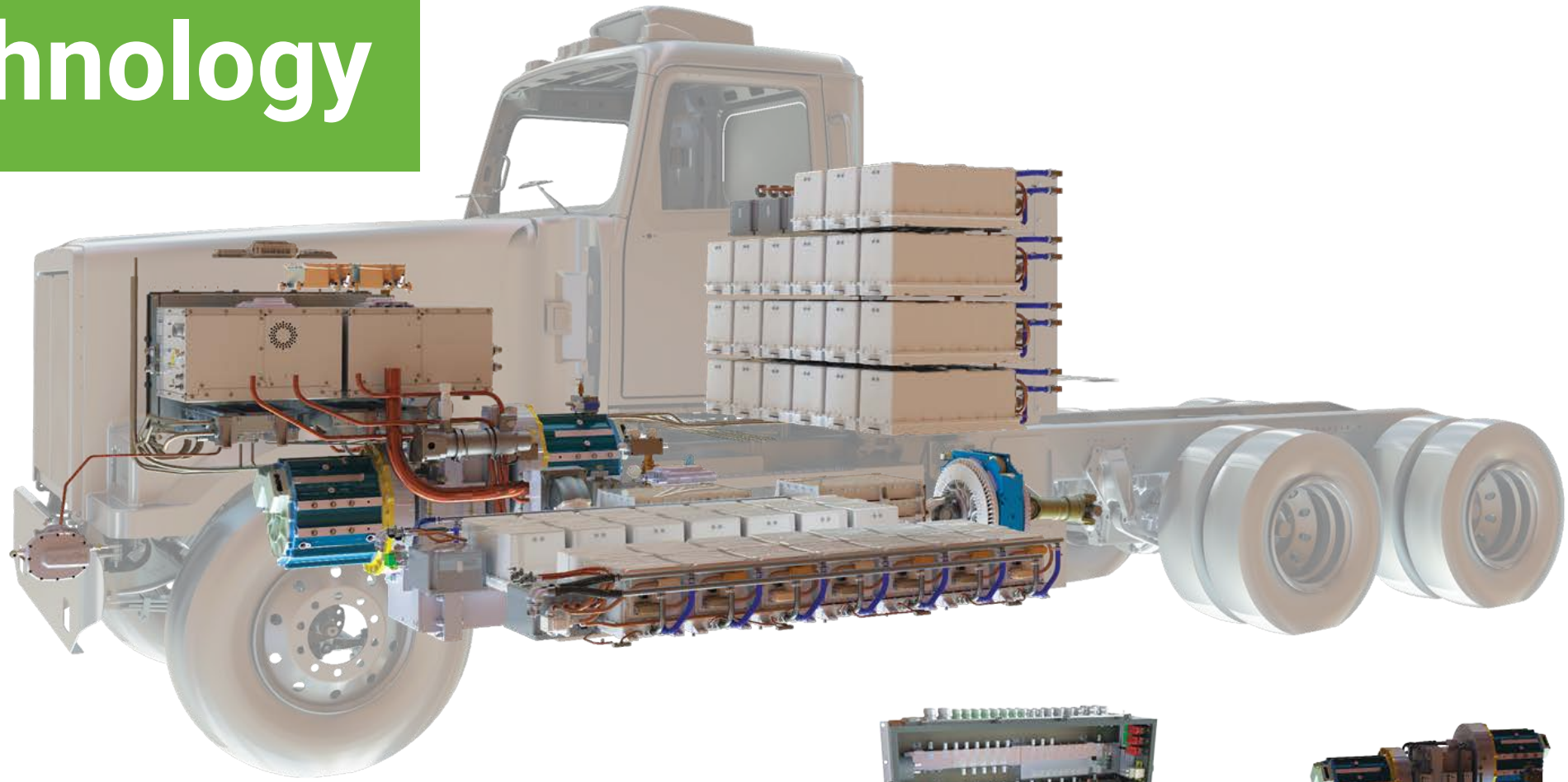
ABB Charging Solutions and ABB Robotics supply ABB Robotics is a pioneer in robotics, machine automation and the full range of fast and ultra-fast EV charging solutions.

Technical Capabilities

Our Technology

Additionally, MEDATech solves:

- Temperature Management
- Cab HVAC
- Off-Board Fast Charging Stations
- Auxiliary Hydraulics
- Vehicle Control (VMU)
- EV Software



Chargers

Chillers

DC/DC

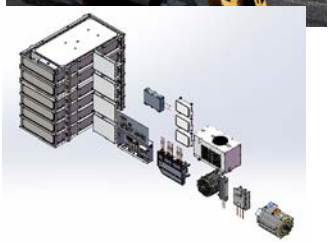
HV Power Distribution Unit

Motors and Gearbox

MEDATECH ALTDRIVE MEDATECH

Highlights

EV HEAVY EQUIPMENT ENGINEERING, DESIGN AND BUILD



2015
- Begin Development of Altdrive™ technology, Patent Pending
- Design/Build Maclean EV Bolter

2016
- Design/Build Maclean EV Boom Truck

2017
- ALTDRIVE™ kit production for BEV
- Design/ Build of First ALTDRIVE™ Road Grader

2018
- Design/Build of Minecat UT150 Pickup Truck

2019
- Design of Minecat MC150 Utility Tractor
- Design/Build MK-42 EV Haul Truck

2020
- Design/Build Western Star 4900XD EVHaul Truck Feasibility
- CAT 777 EVHaul Truck
- Design/Build GHH EV Scoop

2021
- EV Fleet Optimization Software (EV-FOS)
- Ultra Fast Charging 600 to 1200KW

2022
- Deliver first on-highway haul truck equipped with ALTDRIVE powertrain to Teck Resources

Our Technology

APPLICATION ANALYSIS

Advanced software simulations for optimized drive solutions

ENGINEER

Complete ground-up engineering work: Mechanical, Hydraulic, Electrical & Software engineering

BUILD

Complete ground-up prototype build

TEST

Perform testing & commissioning

DRAWINGS

Provide as-built drawings, documentation and models

SUPPORT

Provide ongoing engineering support

Our Technology

MEDATech handles every aspect of EV-powered vehicle design and creation.

- Project Management
- Battery Packaging
- Electrical & Mechanical Engineering
- Human Machine Interface (HMI)
- Vehicle Control (VMU)
- Cab Controls and HVAC
- EV Software
- Telematics
- System Design
- Autonomous System Design

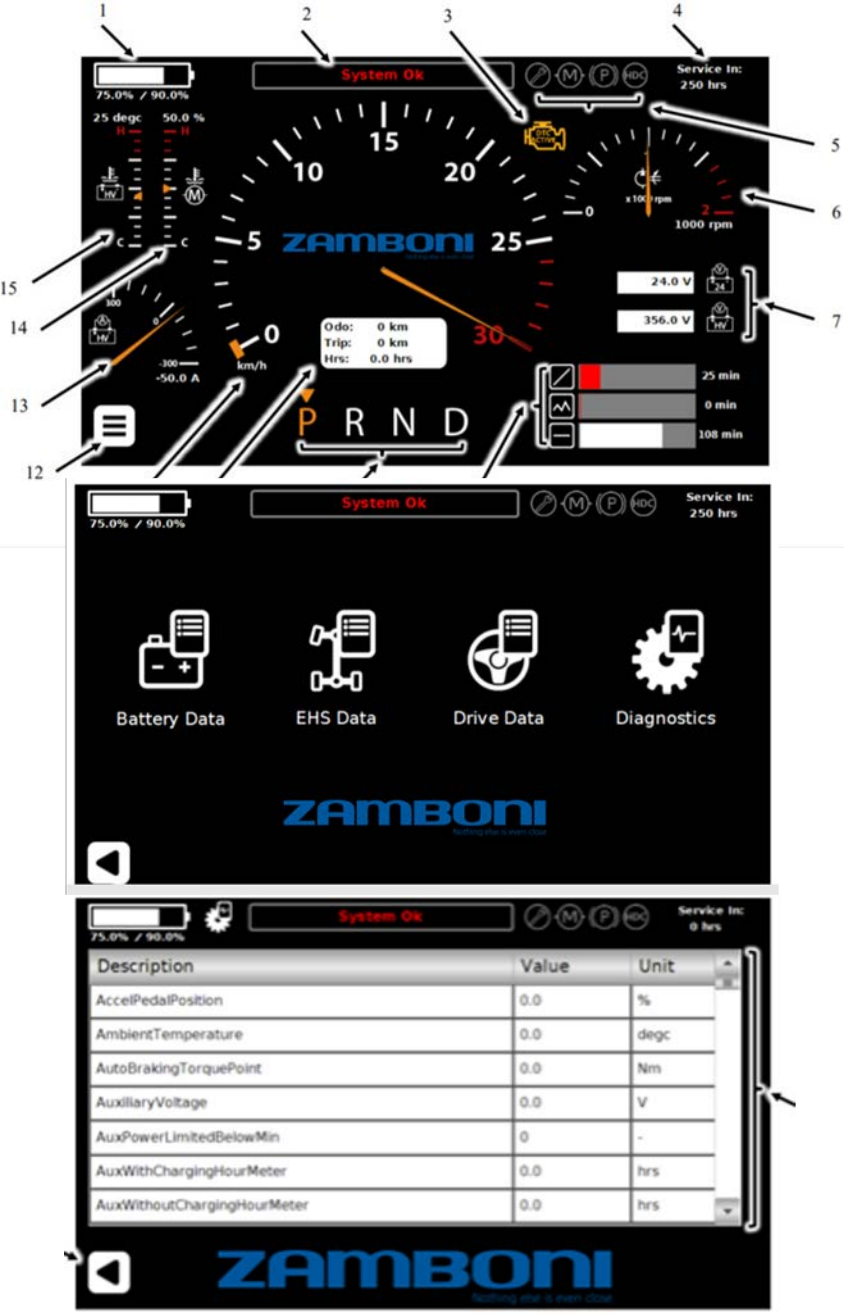
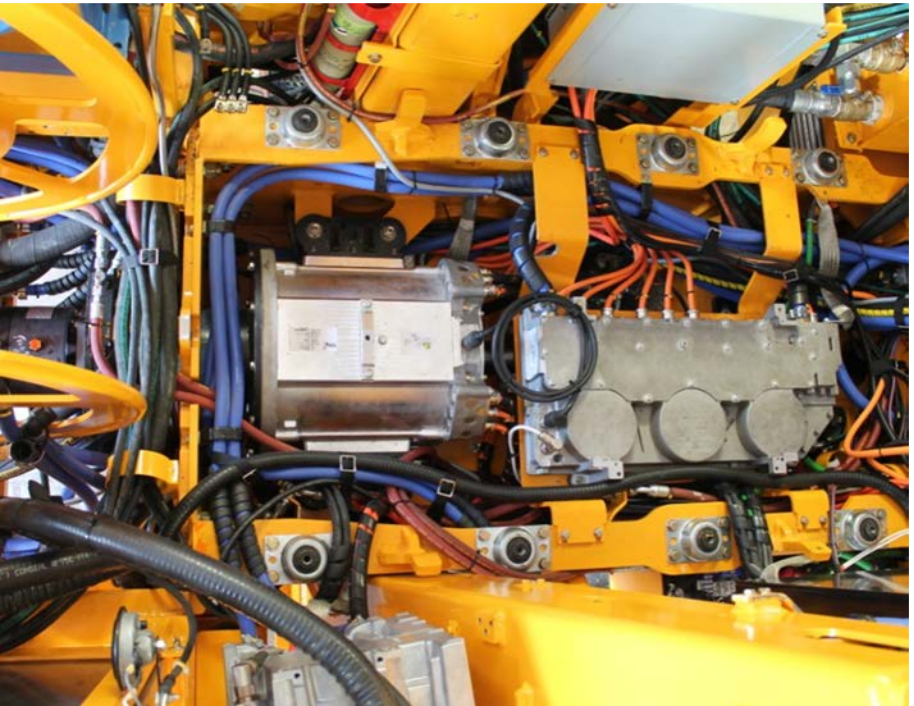


Figure 3: Diagnostic Data Screen

Our Technology

MEDATech solves:

- Battery-electric drives
- Human-Machine Interface (HMI)
- Vehicle Management Units (VMU)
- Temp Management Systems (TMS)
- Cab controls and HVAC
- Off-board fast charging stations
- Auxiliary hydraulics
- EV software



EV Off Hwy Rugged Work Cycles – Our Specialty

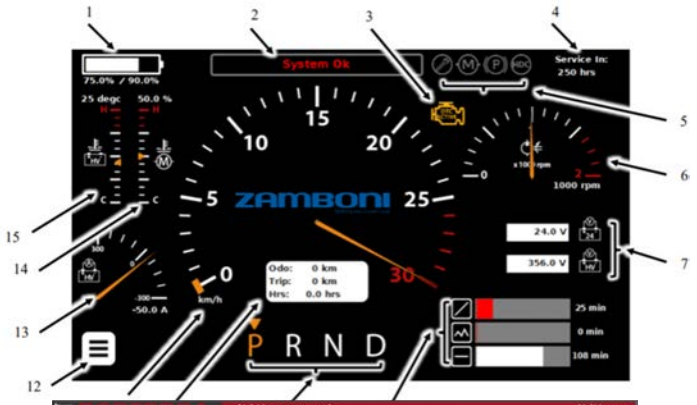
High-Power Electric Vehicle Technology

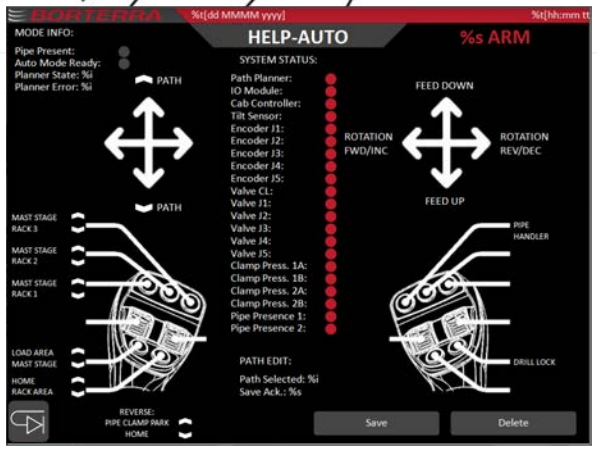
- 500KW output
- 308 KWH capacity
- 100-200 KW onboard charging capacity
- Autonomous ultra-fast 600KW charging

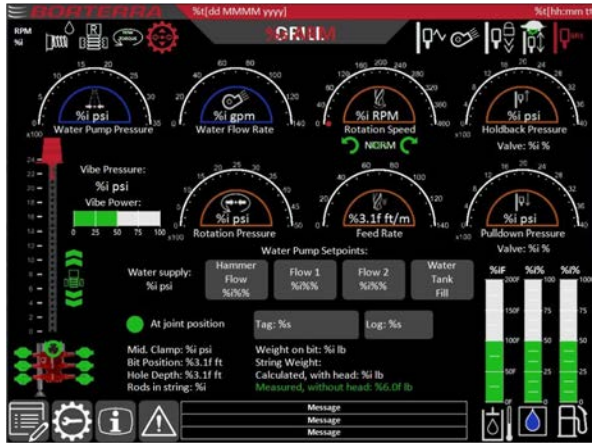
Ultra-High-Power Electric Vehicle Technology

Off-Hwy Heavy Hauling

- >700 KW output
- >480 KWH capacity
- 100-200 KW onboard charging capacity
- Autonomous ultra-fast 600KW charging





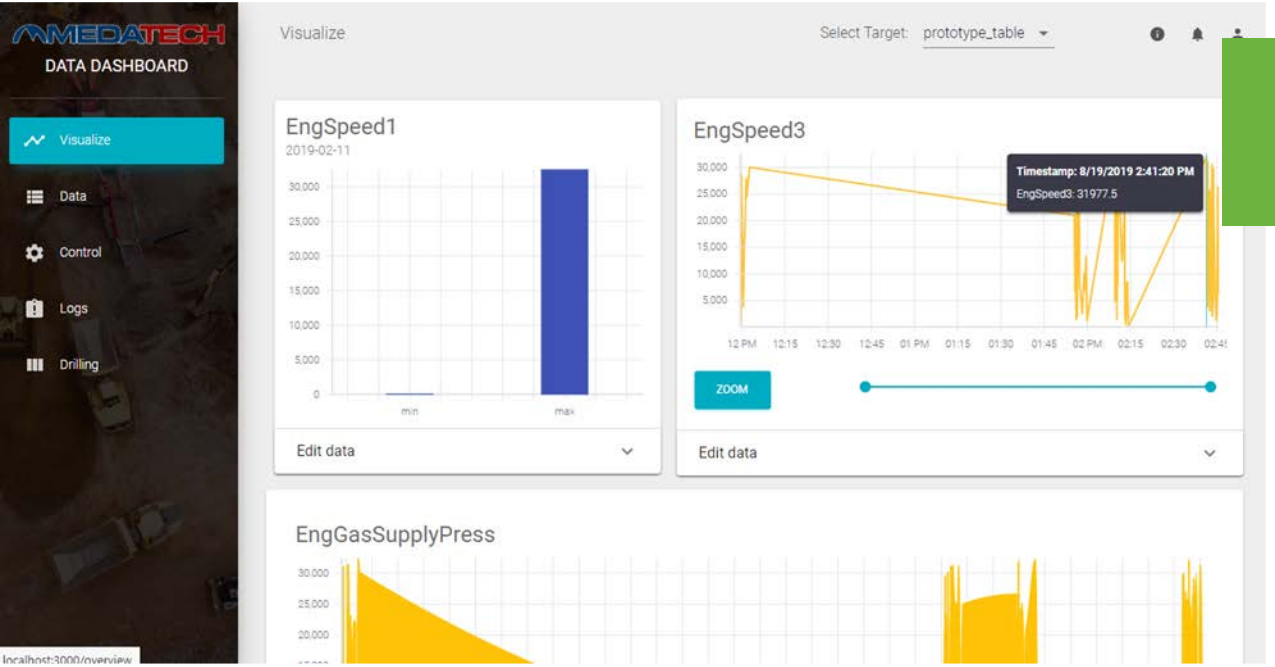


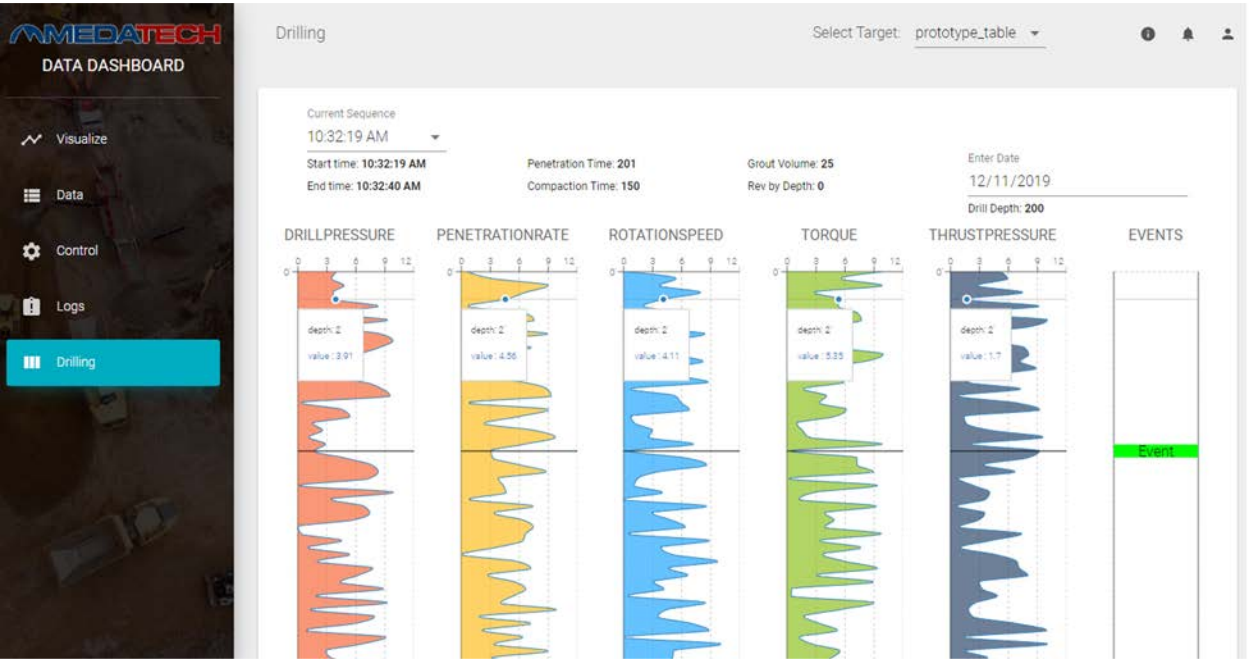
Control System Development

Bridging the gap between operator and machine:

- Human-Machine Interface (HMI)
- Electrical control systems
- Test and validation
  (Electronic testing Lab)

Web-Based Telematics

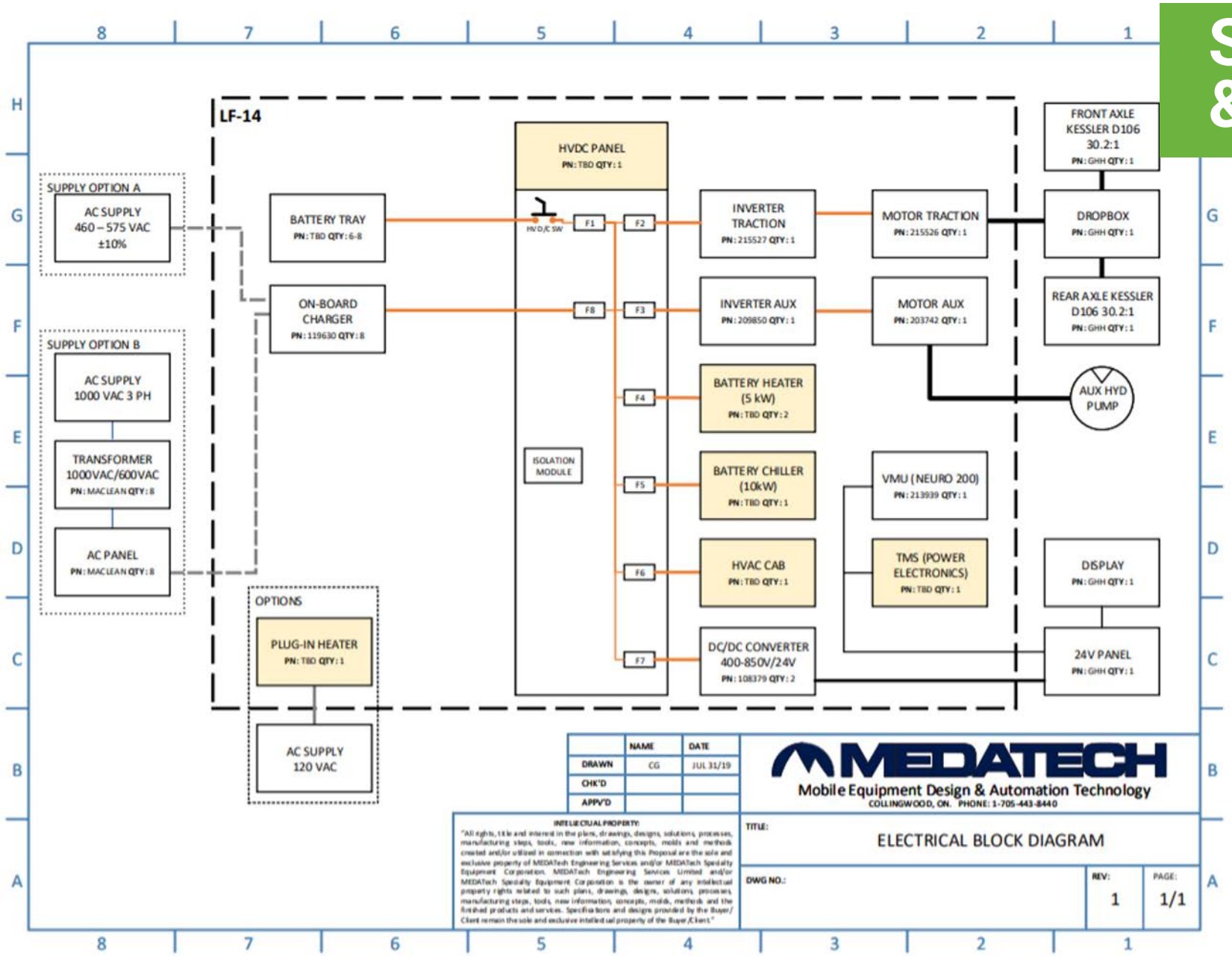




Delivering cloud-stored data for advanced analytics and modeling:

- In-house-designed Graphical User Interface (GUI)
- Drag-and-drop DBC files
- Application-specific data visualization, including charts & plots
- Download tabular data & event logs

System Design & Architecture



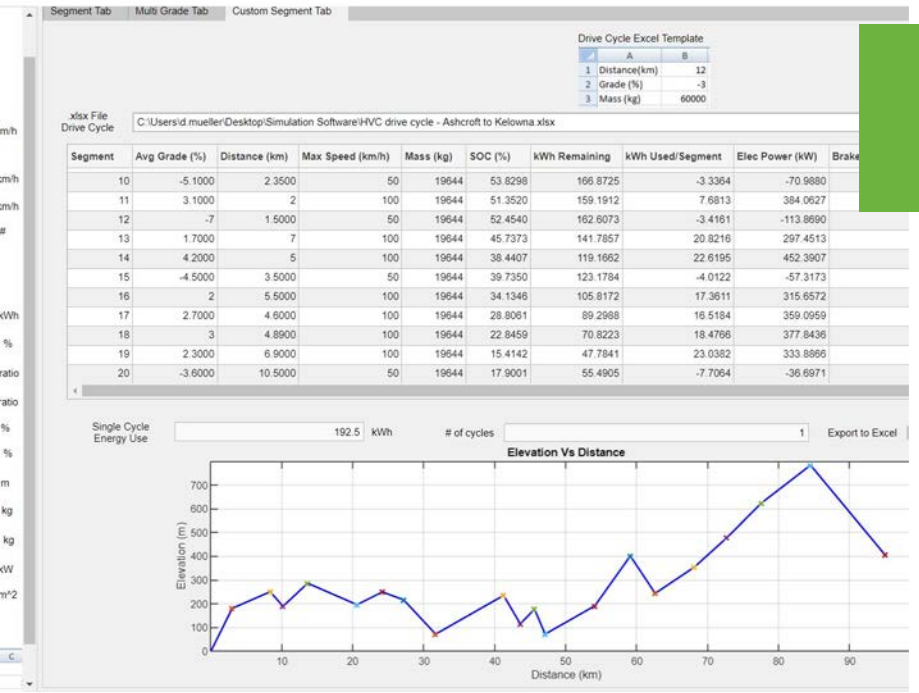
From consulting to software development, system architecture & prototyping:

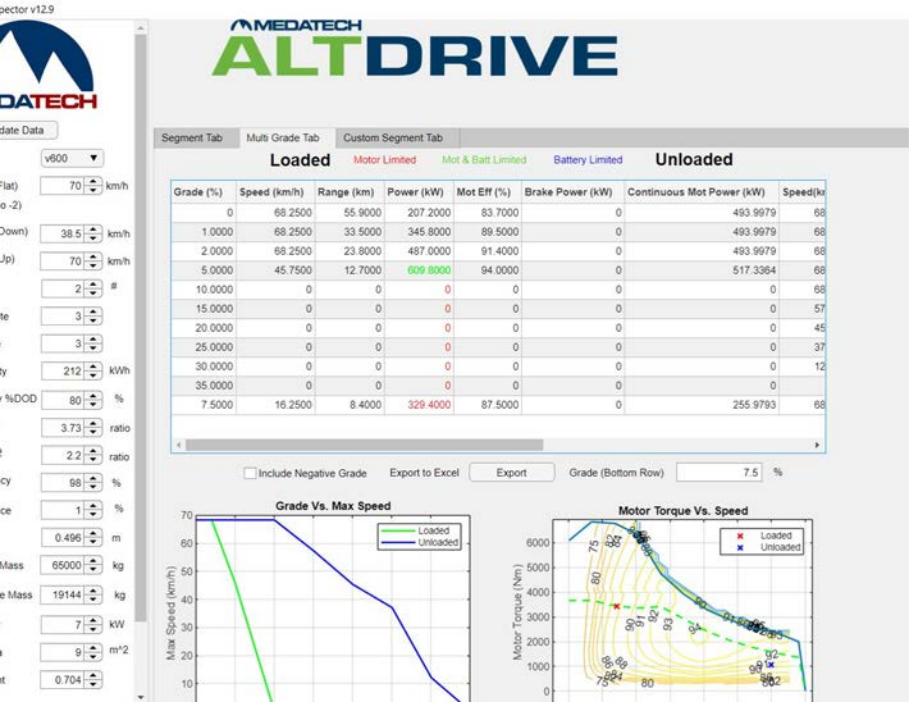
- Requirements & functional specifications
- Architecture & diagramming
- Model-based design and simulation (MATLAB®/Simulink)
- CAN-based control system engineering
- Functional safety systems & standards
- Electromobility simulations for EV component integration
- Software development

MEDATECH ALTDRIVE

MEDATech Engineering

EV Simulation





In-house software design:

- Validate drive power/energy requirements
- Validate auxiliary power/energy requirements
- Calculate required gear ratios
- Battery and motor efficiencies
- Analyze and compare duty cycles

Material Handling & Robotics

Borterra RodBot™

Smart Material Handling Systems

MEDATech Engineering

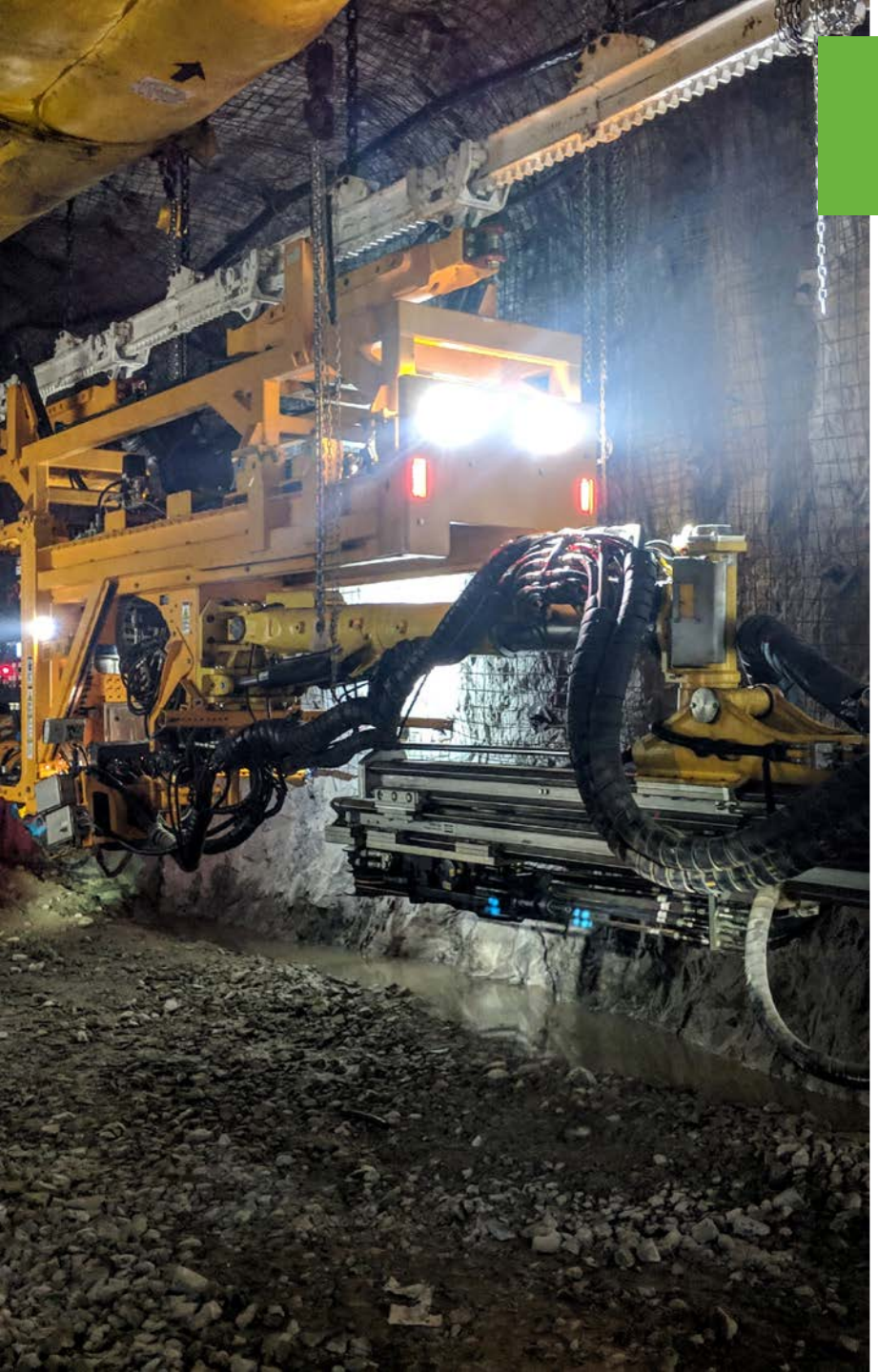
Fully Digital Control Technology

Advanced smart-control systems for any application

- Design & engineering
- Bench testing & installation
- Support & service

Telematics system technology

- Fully-engineered telematics systems for any application
- Simple web user interface/dashboard



Full System Design/Build Services

Technical capabilities:

- Full dynamic structural analysis
- Model-based design and simulation (MATLAB® / Simulink)
- CAN-based control-system engineering
- Full electrical-system design for high voltage and control systems
- Vehicle dynamic analysis
- Specialty engineering

Software Development

A key strength

- Local / IoT solutions
- Automatic & virtual testing and validation

Project Management

Seamless project management

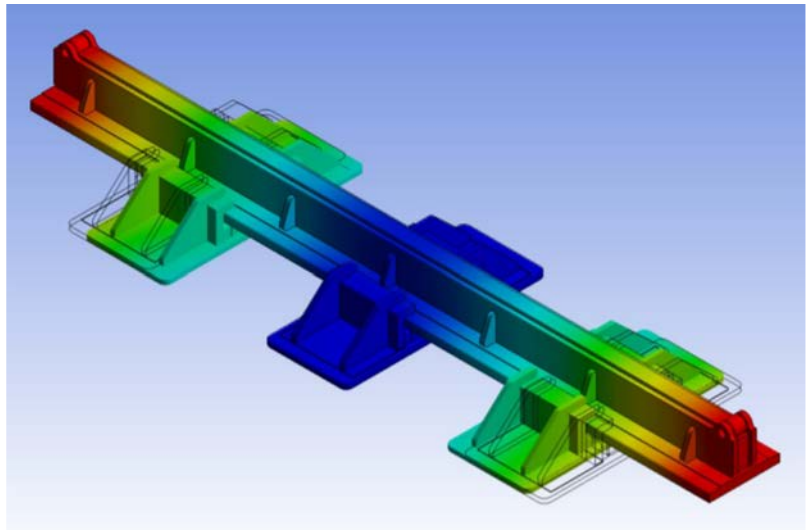
- For OEM/supplier design/build project teams
- Testing & validation
- Support for the complete vehicle

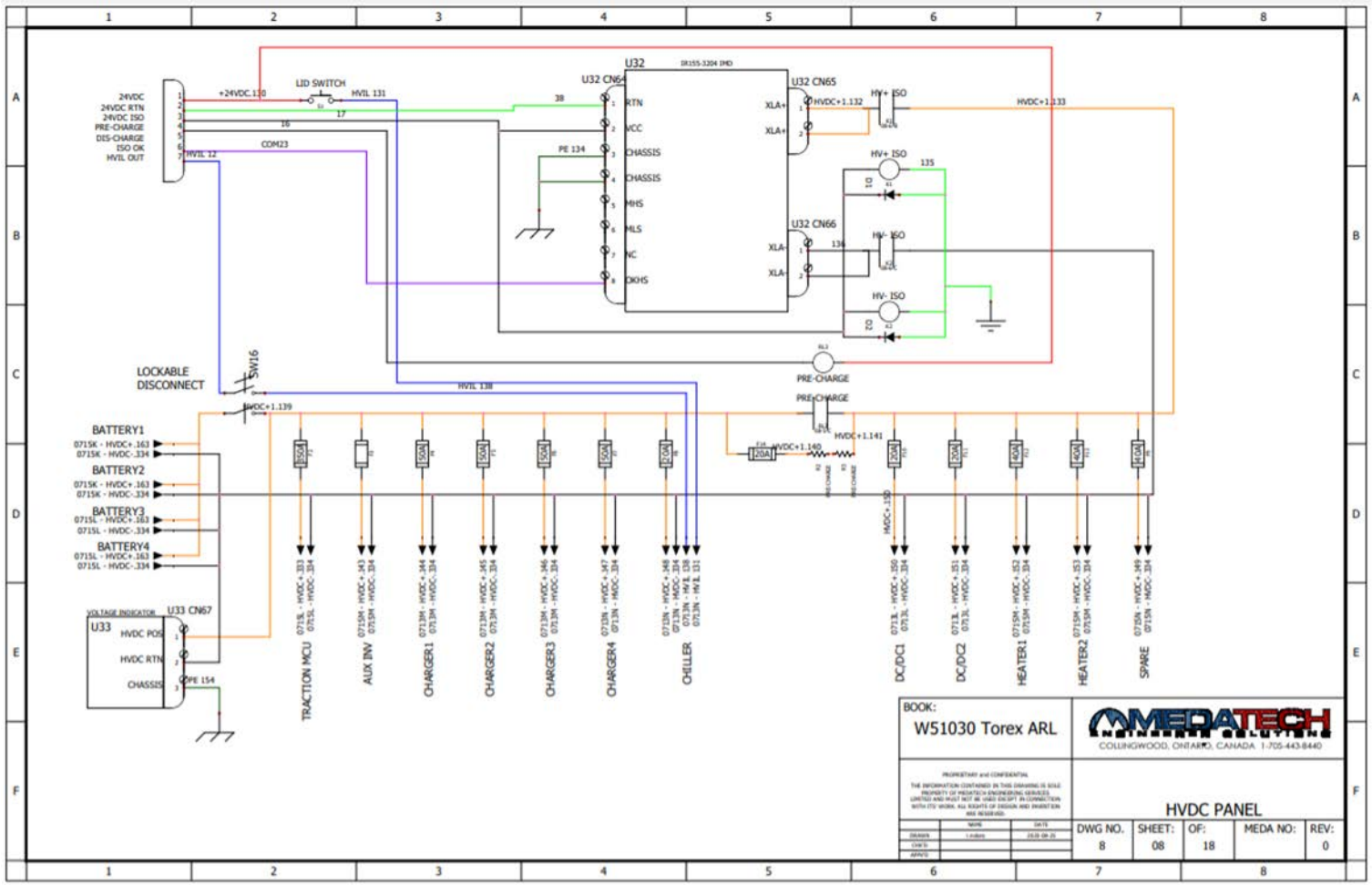
Mechanical and Electrical Engineering

Mobile engineering: from concept and design to build and testing

- Schematics & panel design: high/low voltage power distribution
- Component selection
- Mechanical / hydraulic engineering
- 3D modelling
- Structural analysis
- Functional safety implementation

Mechanical and Electrical Engineering





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How can we help you?
1(705) 443-8440
sales@medatech.ca