



# MEDATech Overview

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

T

N  
ECHNOLOGY

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



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



*Advanced drilling equipment*



*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

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**Darren Mueller**  
Sales & Marketing Director



**Andrew Severs**  
Engineering Services Director

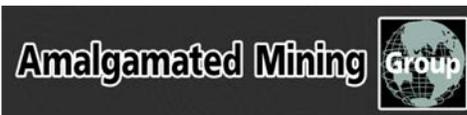


**Paul Cholewa**  
Chief Technology Officer



**Scott Dalrymple**  
Senior Design Engineer  
& Product Manager for Borterra

# Our Clients



# 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



## REQUEST

OEM/end user requests a modified or completely new machine design/build

## 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

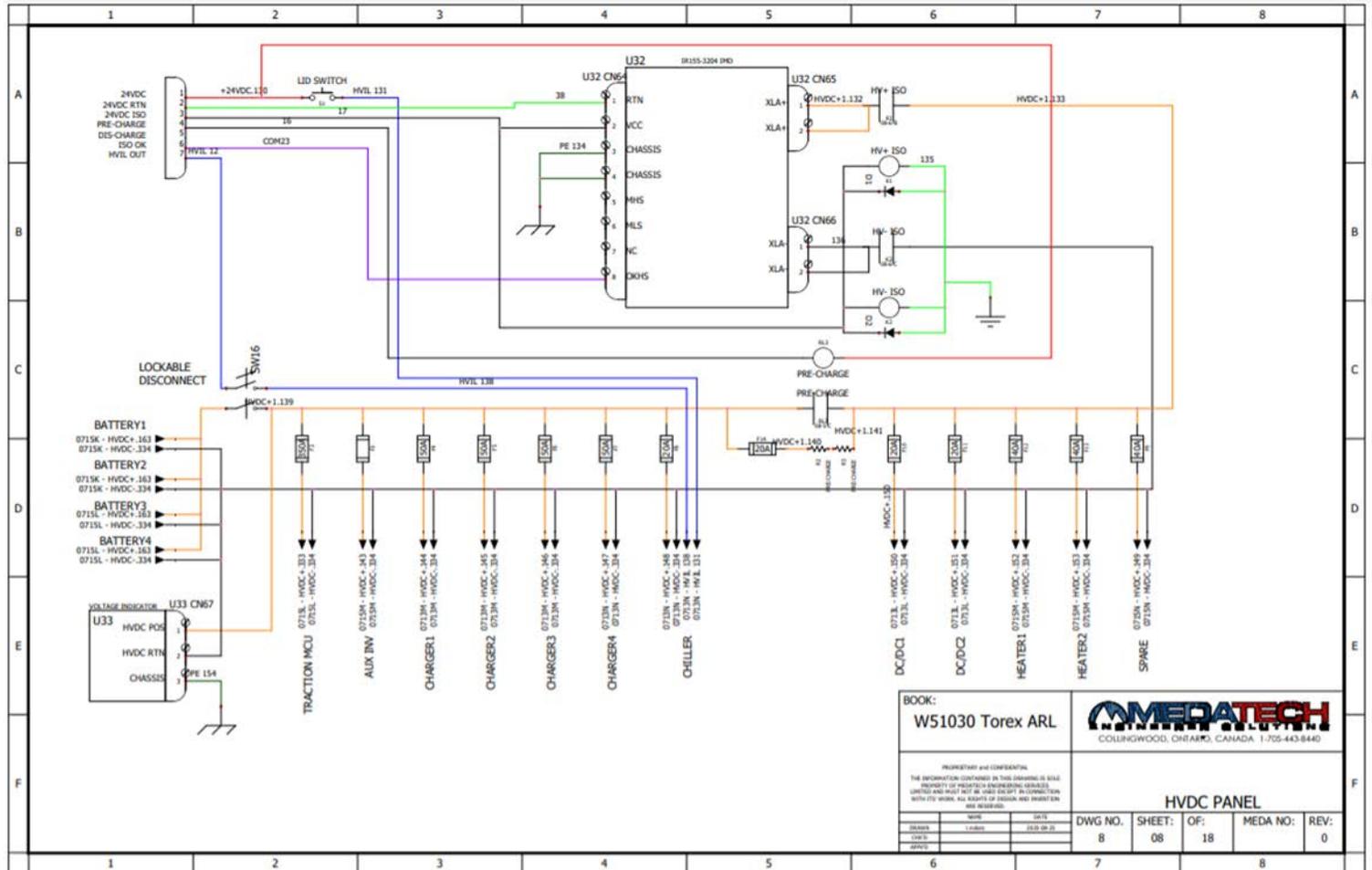
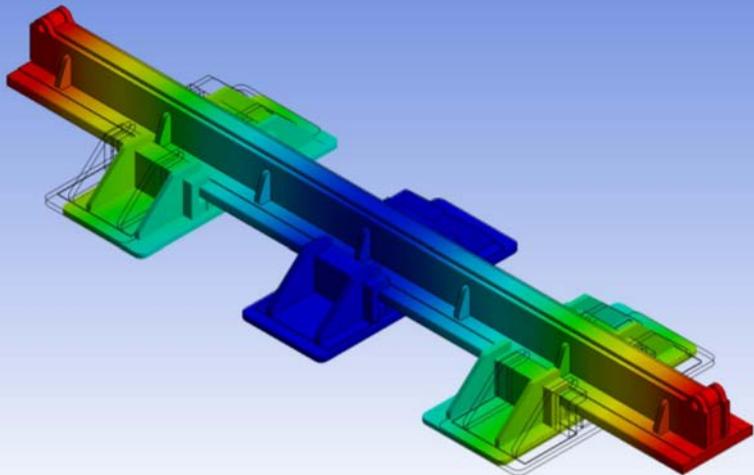
Provide ongoing engineering support

# 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



# 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

# 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

**HV Battery Drive Systems + TMS**

**Cab Controls and HVAC**

**Auxiliary Drive Control Design**

**Vehicle Drive Control and Data Logging**

**Implement Control System Design**

**Drive-by-Wire Steering Control Design**



# Material Handling & Robotics

**Borterra RodBot™**

Smart Material Handling Systems

# Fully Digital Control Technology

## Advanced smart-control systems for any application:

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



# Fully Digital Control Technology

## 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



# 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

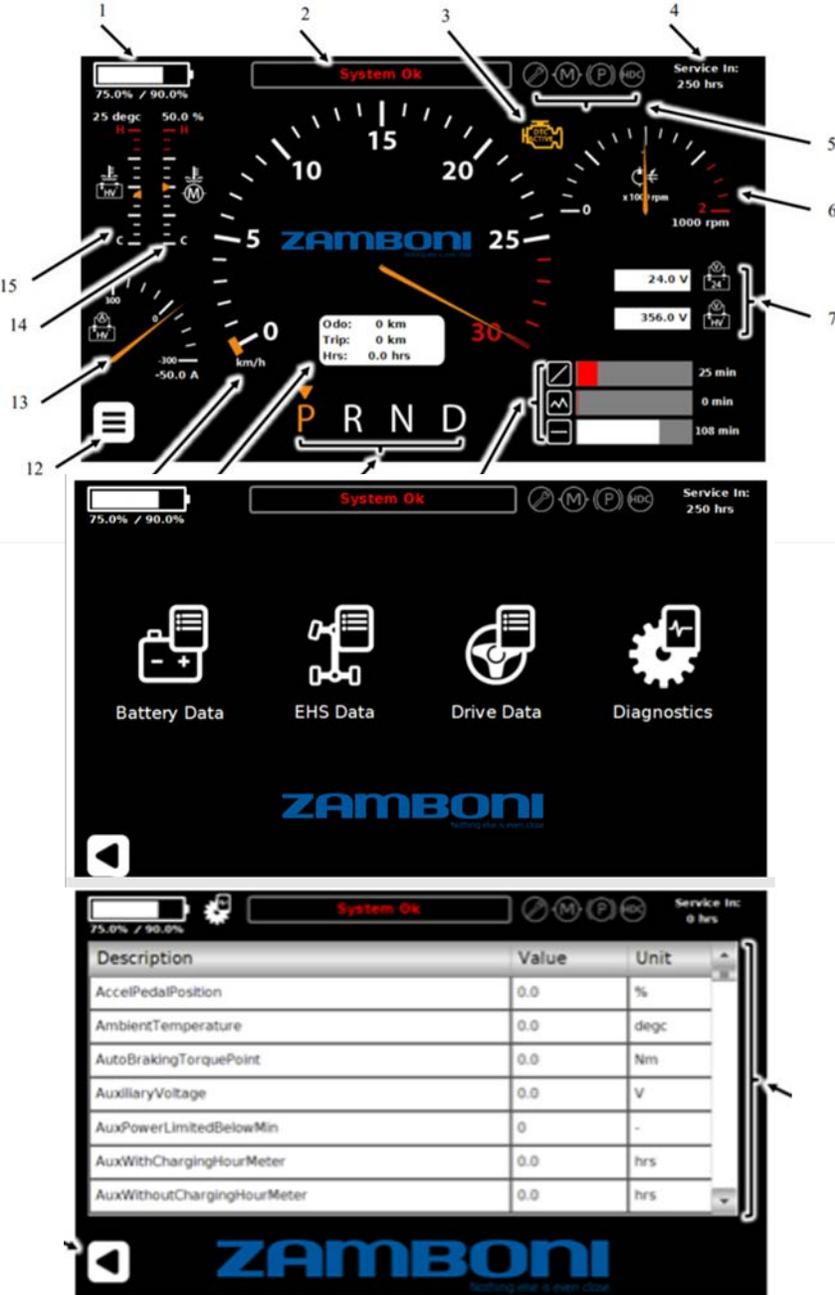
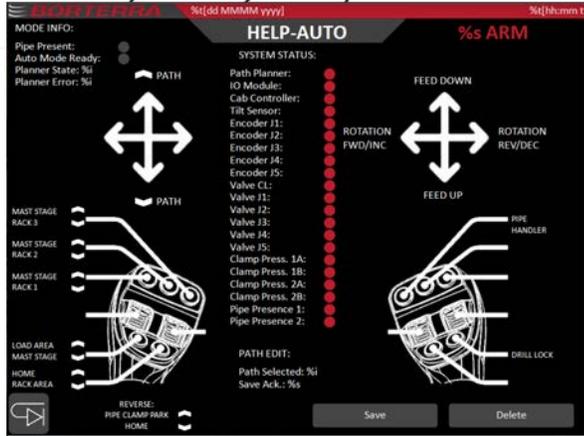


Figure 3: Diagnostic Data Screen

# Control System Development

Bridging the gap between operator and machine:

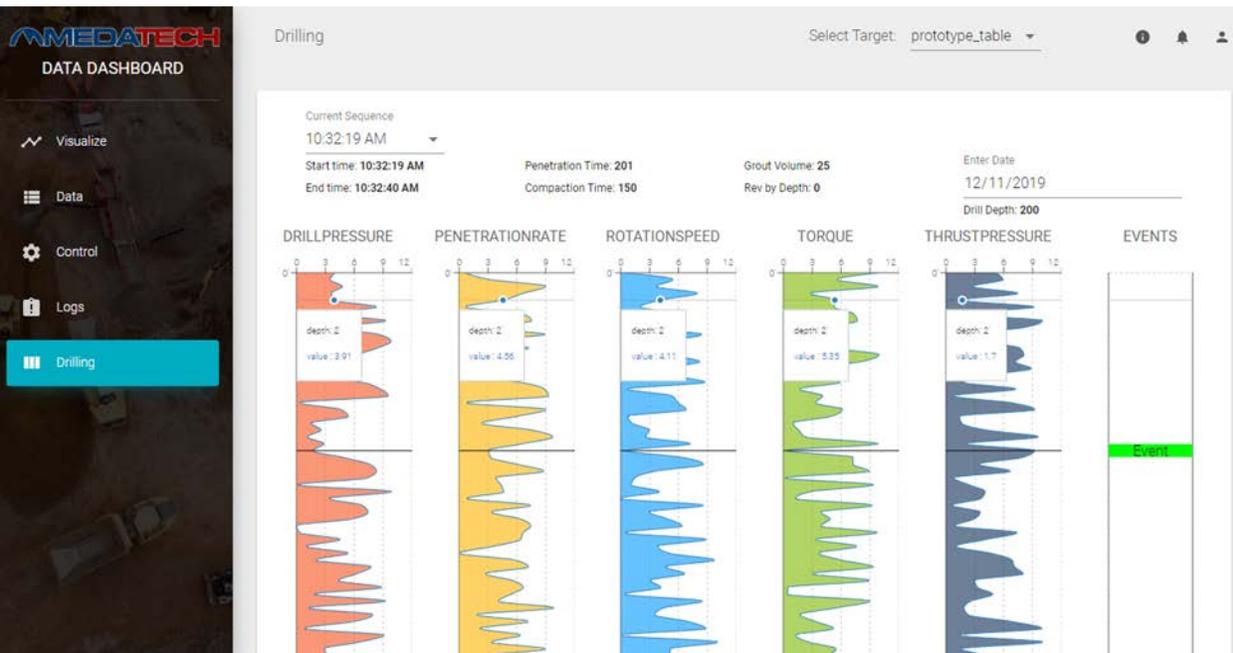
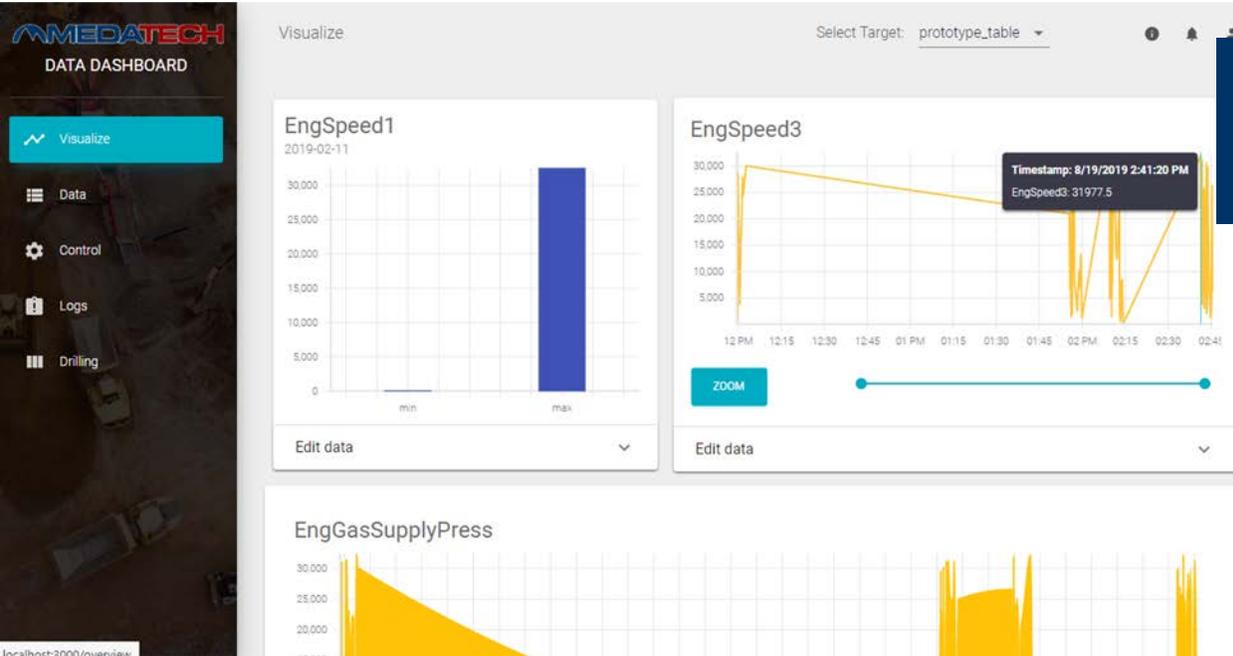
- Human-Machine Interface (HMI)
- Electrical control systems
- Test and validation (Electronic testing Lab)



# Web-Based Telematics

Delivering cloud-stored data for advanced analytics and modeling:

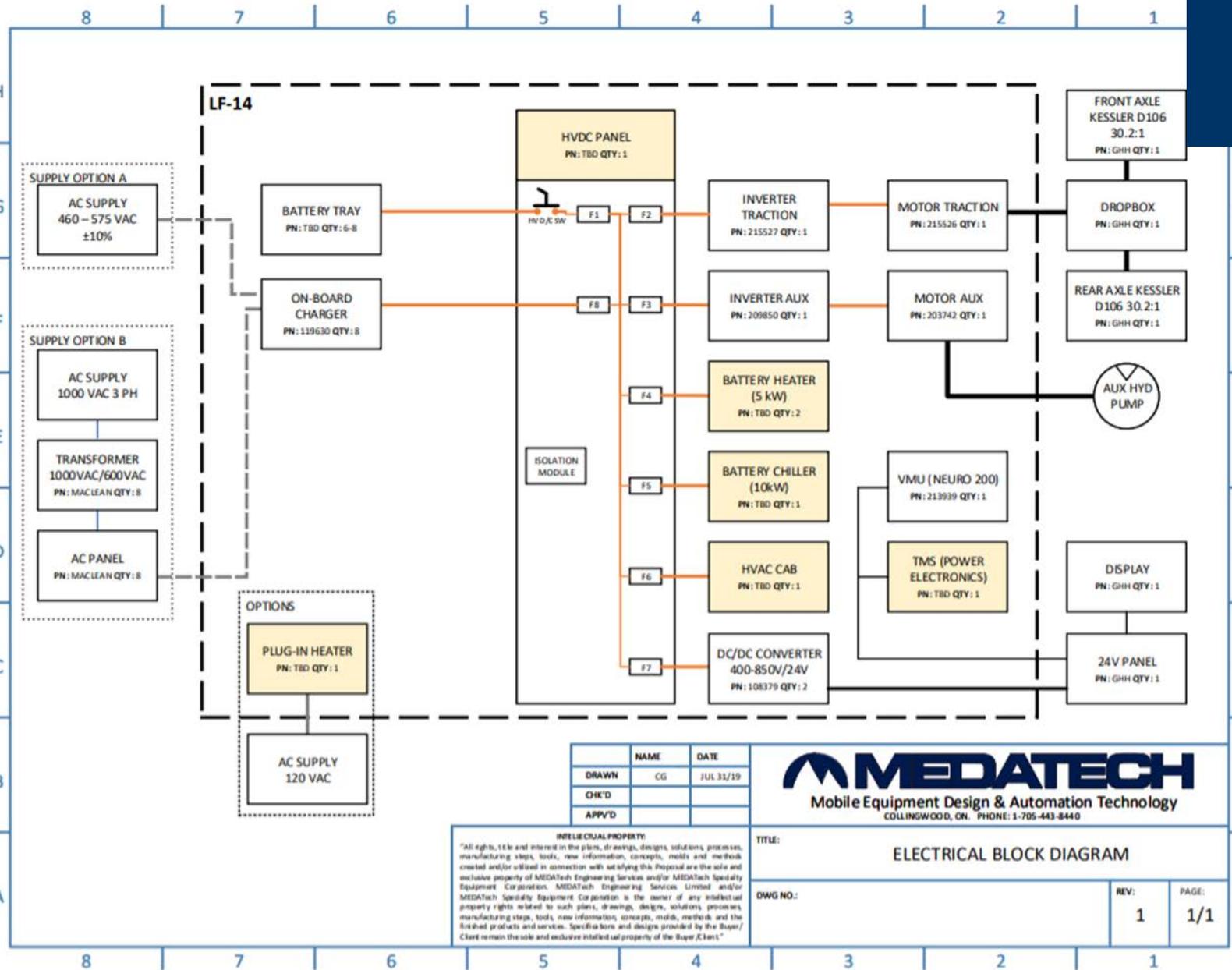
- In-house-designed Graphical User Interface (GUI)
- Drag-and-drop DBC files
- Application-specific data visualization, including charts & plots
- Download tabular data & event logs



# 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



# EV Simulation

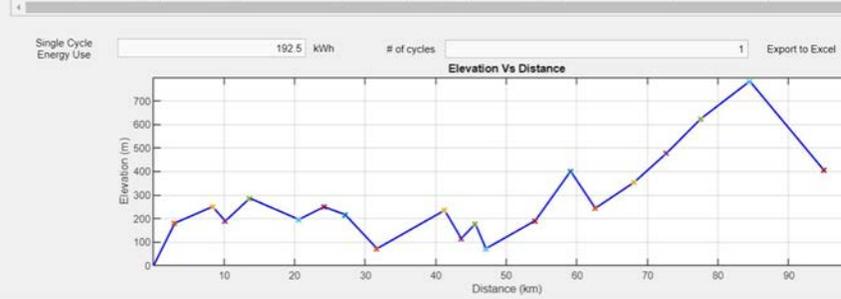
Drive Cycle Excel Test

	A	B
1	Distance(km)	12
2	Grade (%)	-3
3	Mass (kg)	60000

.xlsx File  
Drive Cycle C:\Users\d.mueller\Desktop\Simulation Software\HVC drive cycle - Ashcroft to Kelowna.xlsx

Segment	Avg Grade (%)	Distance (km)	Max Speed (km/h)	Mass (kg)	SOC (%)	kWh Remaining	kWh Used/Segment	Elec Power (kW)	Brake Power
10	-5.1000	2.3500	50	19644	53.8298	166.8725	-3.3364	-70.9880	
11	3.1000	2	100	19644	51.3520	159.1912	7.6813	384.0627	
12	-7	1.5000	50	19644	52.4540	162.6073	-3.4161	-113.8690	
13	1.7000	7	100	19644	45.7373	141.7857	20.8216	297.4513	
14	4.2000	5	100	19644	38.4407	119.1662	22.6195	452.3907	
15	-4.5000	3.5000	50	19644	39.7350	123.1784	-4.0122	-57.3173	
16	2	5.5000	100	19644	34.1348	105.8172	17.3611	315.6572	
17	2.7000	4.6000	100	19644	28.8061	89.2988	16.5184	359.0959	
18	3	4.8900	100	19644	22.8459	70.8223	18.4706	377.8436	
19	2.3000	6.9000	100	19644	15.4142	47.7841	23.0382	333.8866	
20	-3.6000	10.5000	50	19644	17.9001	55.4905	-7.7064	-36.6971	



**MEDATECH ALTDRIIVE**

Update Data

Voltage v600

Vehicle Speed (Flat) 70 km/h

Grade Range (2 to -2)

Vehicle Speed (Down) 38.5 km/h

Vehicle Speed (Up) 70 km/h

Num. Motors 2

Discharge C-Rate 3

Charge C-Rate 3

Battery Capacity 212 kWh

Battery Capacity %DOD 80

Gear Ratio 1 3.73 ratio

Gear Ratio 2 2.2 ratio

Driveline Efficiency 98

Rolling Resistance 1

Rolling Radius 0.496 m

Loaded Vehicle Mass 65000 kg

Unloaded Vehicle Mass 19144 kg

Auxiliary Power 7 kW

Frontal Area 9 m<sup>2</sup>

Drag Coefficient 0.704

Grade (%)	Speed (km/h)	Range (km)	Power (kW)	Mot Eff (%)	Brake Power (kW)	Continuous Mot Power (kW)	Speed(k)
0	68.2500	55.9000	207.2000	83.7000	0	0	493.9979
1.0000	68.2500	33.5000	345.9000	89.5000	0	0	493.9979
2.0000	68.2500	23.9000	487.0000	91.4000	0	0	493.9979
5.0000	45.7500	12.7000	606.8000	94.0000	0	0	517.3364
10.0000	0	0	0	0	0	0	68
15.0000	0	0	0	0	0	0	57
20.0000	0	0	0	0	0	0	45
25.0000	0	0	0	0	0	0	37
30.0000	0	0	0	0	0	0	12
35.0000	0	0	0	0	0	0	0
7.5000	16.2500	8.4000	329.4000	87.5000	0	256.9793	68

Include Negative Grade Export to Excel Export Grade (Bottom Row) 7.5 %

## 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



# How can we help you?

1(705) 443-8440  
[sales@medatech.ca](mailto:sales@medatech.ca)

