MARINTEC LTD
marine & industrial technology

MoTeC

Maximising Efficiency

THE POWER OF INFORMATION

: Who we are...

- **Respected provider of quality electronic technology solutions and services**
- **Land and marine applications**
- **Over 150 years collective in house electronics experience across 7 staff**
- **5 Qualified experienced electronic technicians**
- **Based ex Timaru (New Zealand), with clients as far away as Argentina**
- **SiteSafe SiteWise Member**
- **Secondary ACC WSMP Accreditation**

Is your vessel efficient? Are you sure?
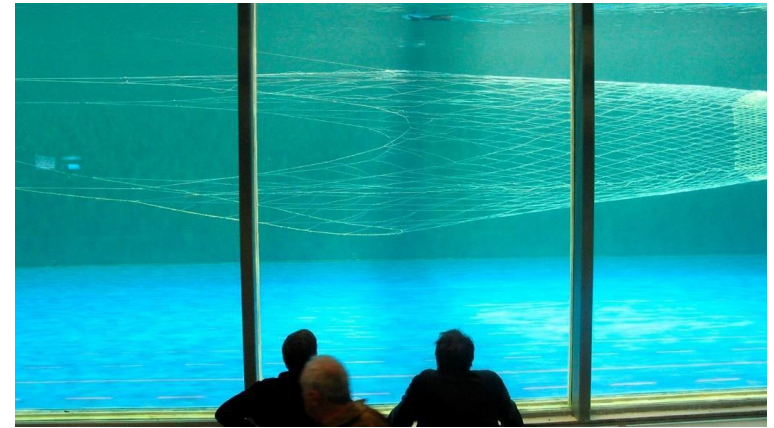
Are your crews efficient?

*How do you know this...and is it **better** or **worse** than yesterday or last week or last year? Is that a **hunch** or **fact**?*

Is your hardware efficient?
We are talking Trawl doors, Nets, Warps, Sweeps, Bridles, Fuel consumption, Power Generation, Refrigeration and so much more….
…and what influence does each have on the other?

*Ever changed a **prop** or a set of **doors** or **net** or **engine**.... and wondered if the vessel was **holistically** any more or less efficient? ...*

Well now there is a system designed to display
Quantitative Vessel Efficiency
in your wheelhouse...in real-time!
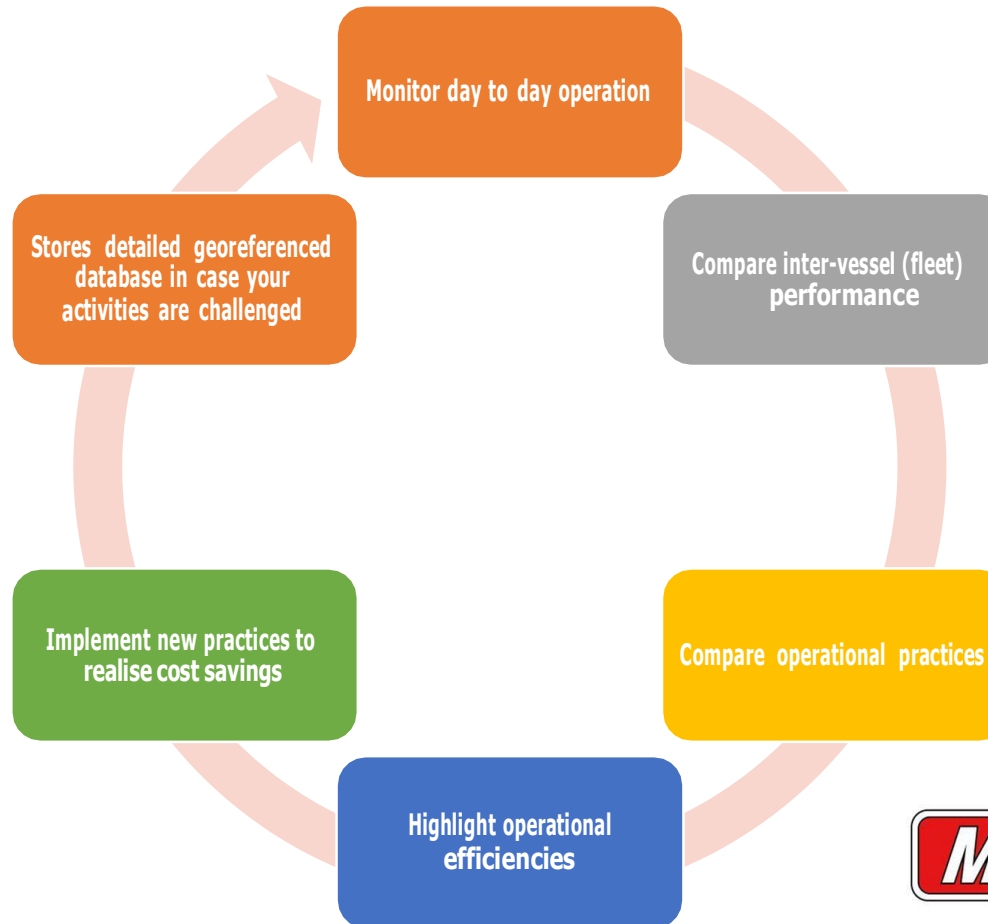
Who are:

www.motec.com.au

- **Founded in 1987 (Australia)**
- **World leaders in engine management & data acquisition technology**
- **State-of-the-art hardware**
- **User friendly software**
- **Dedicated R&D facility**
- **Uncompromising approach to quality**

Why Log Data?

Monitor day to day operation

Compare inter-vessel (fleet) performance

Compare operational practices

Highlight operational efficiencies

Implement new practices to realise cost savings

Stores detailed georeferenced database in case your activities are challenged
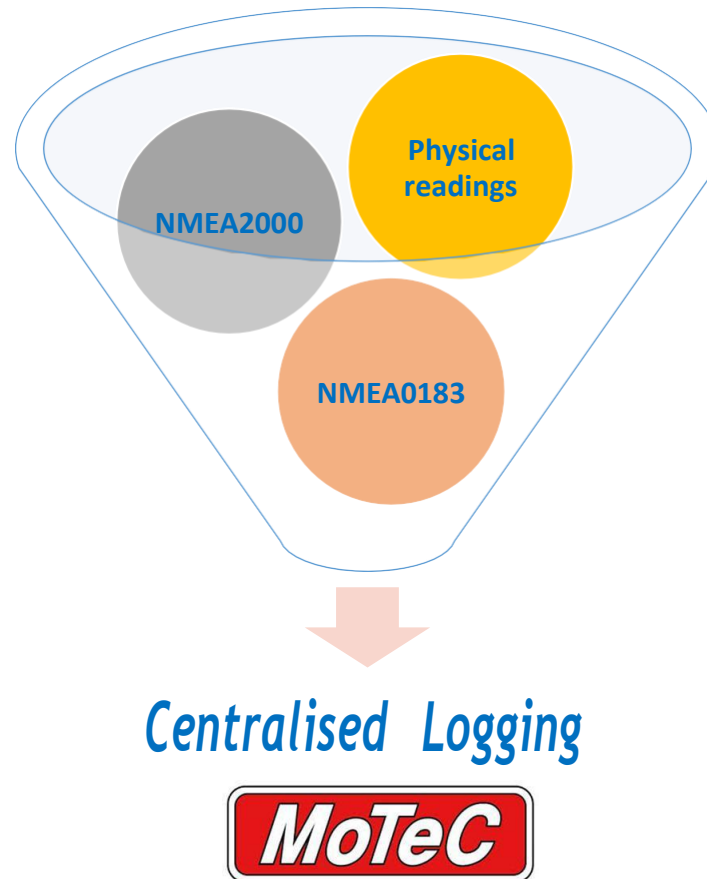
What Data can be Logged?

- GPS Data
- (Position, COG, Time/Date etc.)
- Wind Data
- Bow Thruster Load
- Refrigeration Temp
- Shaft Generator Loads
- Aux Generator Loads
- Line Hauler Operation
- Fuel Usage
- Turbo Speed
- Turbo Overspeed Hours

NMEA2000

Physical readings

NMEA0183

Centralised Logging

- RPM, Prop Pitch, Fuel Flow
- Pressure: Fuel, Filter, Crankcase, Cooling water, Oil, Oil intercooler, Gearbox lube oil etc.
- Temp: Fuel, Cooling water, Oil, Oil intercooler, Individual exhaust gas temp for each cylinder, Bearing, Gearbox lube oil etc.
- Engine & Turbo RPM
- Engine Hours
- Fuel Rack

"Through MoTeC fuel savings we were able stay at the fishing grounds three weeks longer than ever before!"

-NZ Deepwater Longline Operator

Case Study #1 – New Trawl Doors

New doors said to be more efficient than existing doors

Recorded vessel data with MoTeC while towing old doors

Installed new doors and re-recorded tows with MoTeC

Net spread well with new doors (confirmed with net monitoring*)

BUT MoTeC identified significant fuel consumption increase!

Doors swapped, several times, but same result

New doors deemed unsuitable in spite of manufacturer claims

Results were confirmed within just a few trips

KEEP MANUFACTURERS HONEST!

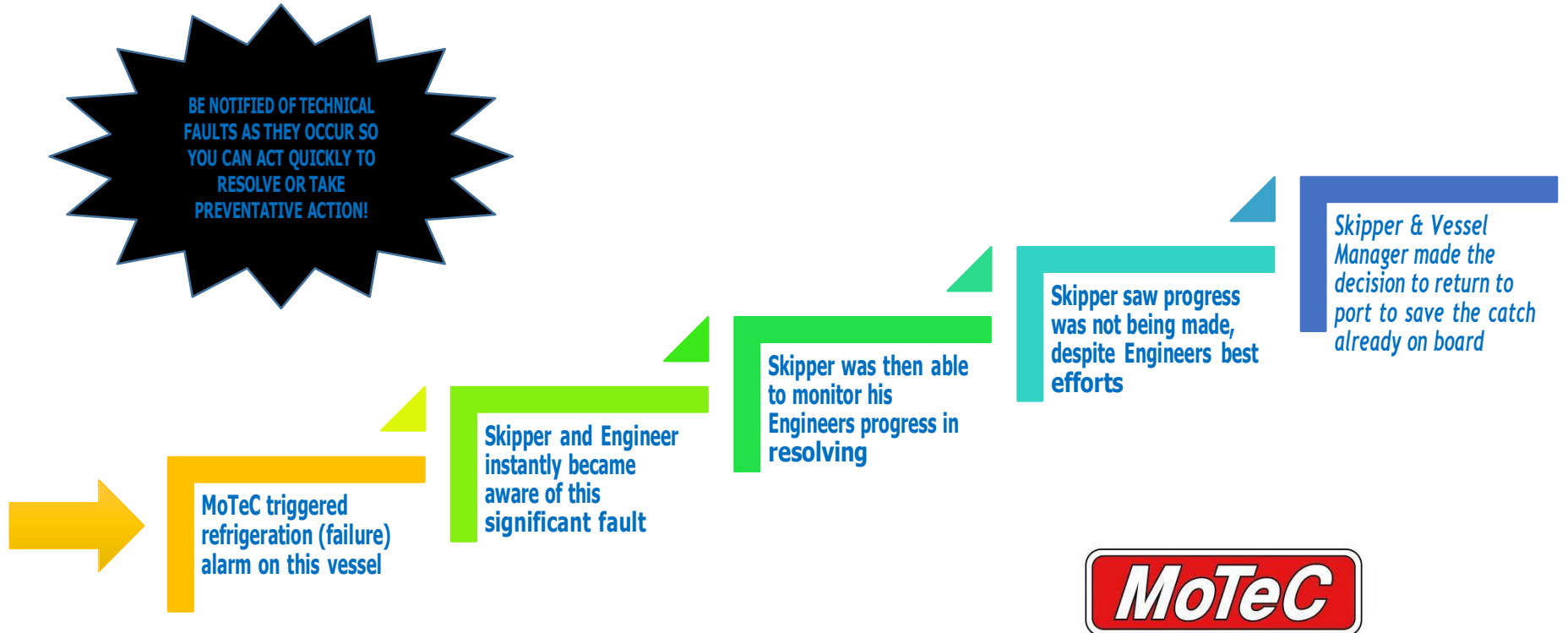**MAKE SURE THEIR EQUIPMENT REALLY IS AS EFFICIENT AS THEY STATE!**

NOTE:

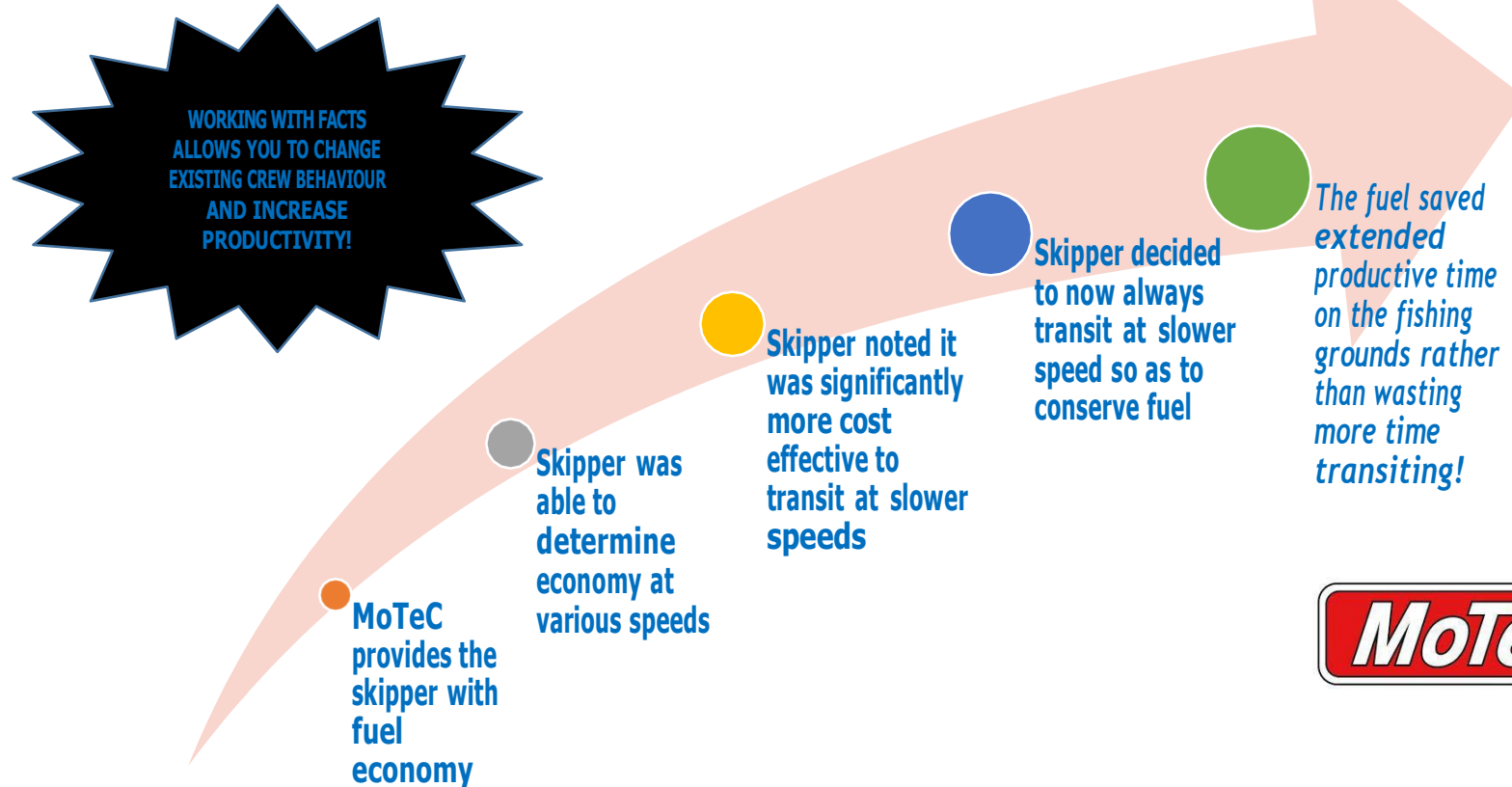(1) *THE VESSEL WAS EQUIPPED WITH AN EXTENSIVE ELECTRONIC ACOUSTIC NET MONITORING SYSTEM

(2) THE CATCH WAS DOWN EACH TIME THE NEW DOORS WERE FITTED

Case Study #2 – Refrigeration Fault

BE NOTIFIED OF TECHNICAL FAULTS AS THEY OCCUR SO YOU CAN ACT QUICKLY TO RESOLVE OR TAKE PREVENTATIVE ACTION!

MoTeC triggered refrigeration (failure) alarm on this vessel

Skipper and Engineer instantly became aware of this significant fault

Skipper was then able to monitor his Engineers progress in resolving

Skipper saw progress was not being made, despite Engineers best efforts

Skipper & Vessel Manager made the decision to return to port to save the catch already on board

Case Study #3 – Fuel Preservation

WORKING WITH FACTS ALLOWS YOU TO CHANGE EXISTING CREW BEHAVIOUR AND INCREASE PRODUCTIVITY!

MoTeC provides the skipper with fuel economy

Skipper was able to determine economy at various speeds

Skipper noted it was significantly more cost effective to transit at slower speeds

Skipper decided to now always transit at slower speed so as to conserve fuel

The fuel saved extended productive time on the fishing grounds rather than wasting more time transiting!

Case Study #4 – Vessel Trim Efficiency

Vessels have tanks throughout the vessel

This particular vessel was not using her bulbous bow tanks

The crew were unaware of the effect this had on vessel trim

Empty bow tank/s results in "bow up" trim

MoTeC was quick to identify that the vessel was far more fuel efficient when trimmed correctly

The skipper made the decision to have the tanks trimmed to suit the original vessel plan

IDENTIFY AND CORRECT POOR OPERATIONAL PRACTICES!

The vessel now uses less fuel to reach the fishing grounds at the same steaming speed!

MoTeC

Case Study #5 – Throttle vs. Speed

MORE THROTTLE DOES NOT NECESSARILY MEAN MORE SPEED!!!

MoTeC

OBSERVATION OF NZ DEEP-WATER VESSELS USING MOTEC SHOWED THERE WAS LITTLE POINT USING OVER 75% PITCH... AS VERY LITTLE ADDITIONAL SPEED WAS GAINED...AND YET FUEL CONSUMPTION STILL INCREASED SIGNIFICANTLY!

0% - 30% Pitch
Fuel Usage Similar (minimal)*

30% - 75% Pitch
Fuel Usage Proportional to Vessel Speed*
(sweet spot)

75% - 100% Pitch
*Fuel usage increases rapidly with little bearing on vessel speed**

*BASED ON OUR EXPREIENCE WITH NZ DEEP-WATER VESSELS EQUIPPED WITH MOTEC

"Trials with MoTeC proved Dyneema trawls to be more efficient, and we were able to save 2000 litres of fuel per day!"

-NZ Deepwater Trawl Operator

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Typical MoTeC Vessel Configuration

CONNECT AND LOG EXTERNAL NMEA0183/2000 DISPLAYS/SENSORS E.G. GPS, SOUNDER, WEATHER, NET MONITORING (SPREAD, CATCH ETC), PROP PITCH ETC.

MoTeC C187
Bridge Logging Display

PC with MoTeC software
(existing PC can be utilised)

NETWORK EXAMPLE:
-SKIPPER PC
-ENGINE ROOM PC
- SKIPPER PC
- INTERNET
- ETC.

WHEELHOUSE

ENGINE ROOM

CAN-BUS CABLE

MoTeC E816 Input Expander Module

Optional Engineers MoTeC Display/s

FUEL FLOW SENSOR

Main Engine/s

FUEL FLOW SENSOR

Genset/s

Tank Monitoring

Freezer/s

Fuel Tank/s

FUEL RETURN

ADD AS MANY SENSORS & DISPLAYS AS REQUIRED

C187 7" Display Logger

- **Sophisticated 7"high resolution anti-reflective ultra bright display**
- **Custom Design graphic layouts and schemes**
- **Programmable LEDs & Alarms**
- **Available as a display-logger, or as a display only (for 2nd station/s)**
- **Multiple CAN-Bus**

INPUTS:	ANALOGUE AND DIGITAL (ON/OFF)
OUTPUTS:	DIGITAL (ON/OFF) FOR INDICATORS, BUZZER OR RELAY
COMMS BUS:	CONNECT TO BOAT DATA (E.G. GPS)
CAN BUS:	(1) TYPICALLY FOR INPUT EXPANDER IN ENGINE ROOM, &
	(2) CONFIGURED FOR NMEA2000 OR J1931
	(3) AUX GEN SET ETC.

C187 Dimensions

Measurements in mm.

196.2

122.5

40.7
33.4
24.9

12.5

143.0

R412.0

R6.7

44.3

34.0

R5.0

81.5

31.4

R5.0

M5 Mounting studs (3x)
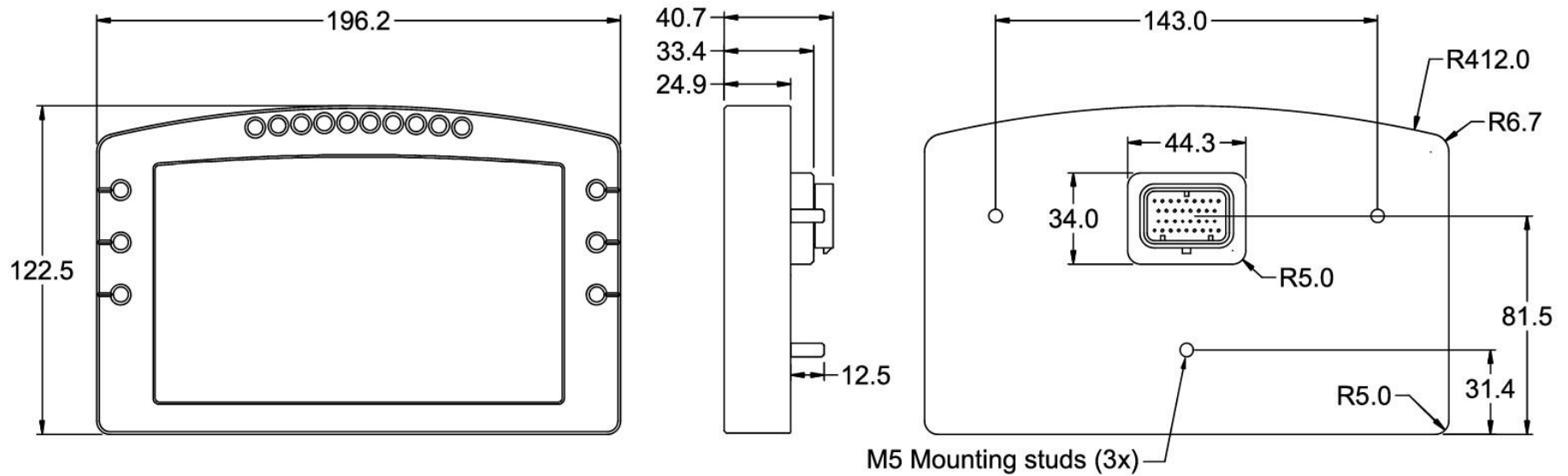
C1812 12″ LCD Display Logger

**NEW PRODUCT
Available Q2
2016**

E816 Input Expander
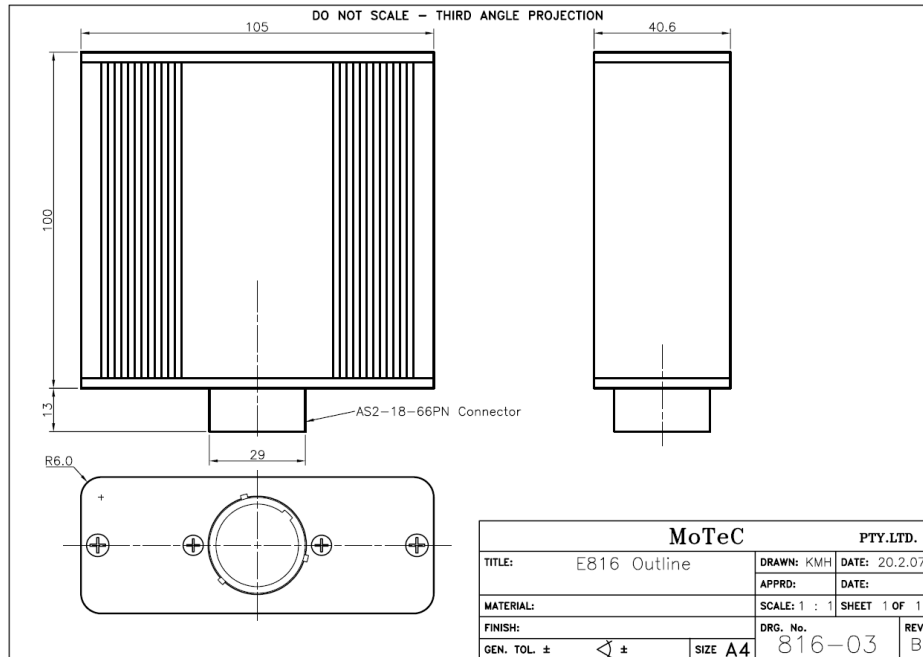
- **Connection point for Engine Inputs and Fuel Meters**
- **Typically located in Engine Room or MCR**

OLDER ENGINES MAY REQUIRE ISOLATORS

Engine Room Data Cabinet
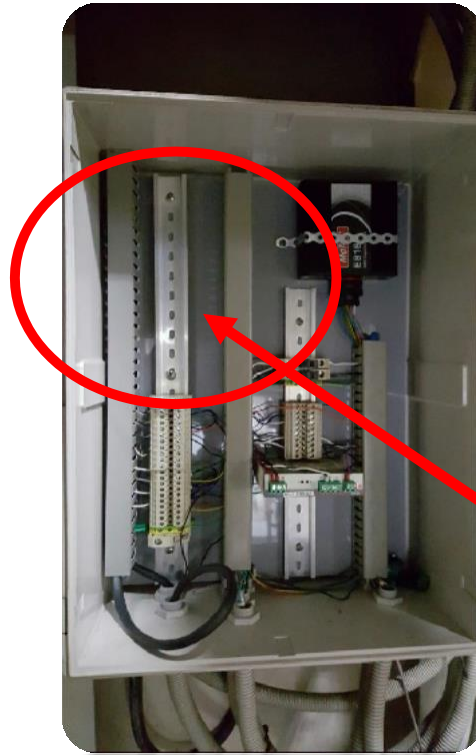
Note:
Additional room is set aside for possible future system expansion

Fuel Meters

- **Compatible with many respected brands**
- **Diesel: 2 fuel meters per engine**
- **LFO: 1 fuel meter per engine (depending on heater configuration)**

Data Analysis

Data is logged at sea

Monitor or analyse system data at sea*

Or, Email selected data ashore for analysis

Or, Remote access by shore based party*

Or, Download on next port call for analysis

*LIVE OR RECORDED DATA

Live Telemetry Monitor
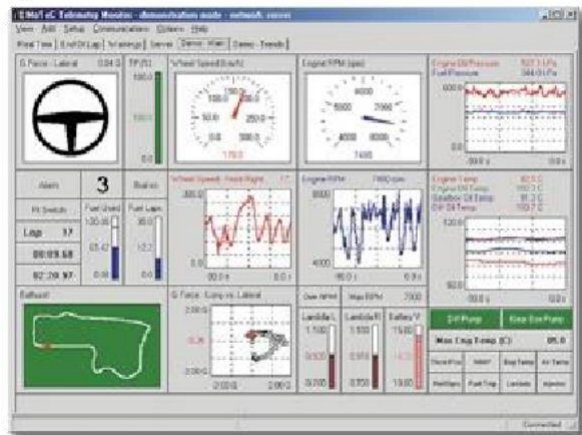
- **Monitor real-time transmitted system data**
- **Multiple display pages or views**
- **Customisable to specific user requirements**
- **User-configurable warning alarms**
- **Warning bars and views (alarm breach)**
- **Save each view to a file**

i2 Analysing Software

- **Analyse real-time or historical logged data**
- **Simple intuitive user interface**
- **Customised to specific user requirements**
- **Graphs, gauges and reports can be analysed simultaneously**
- **User settings, screen layouts and maths are stored with each project**
- **Easy to work with multiple vessels and to compare data in a fleet environment**
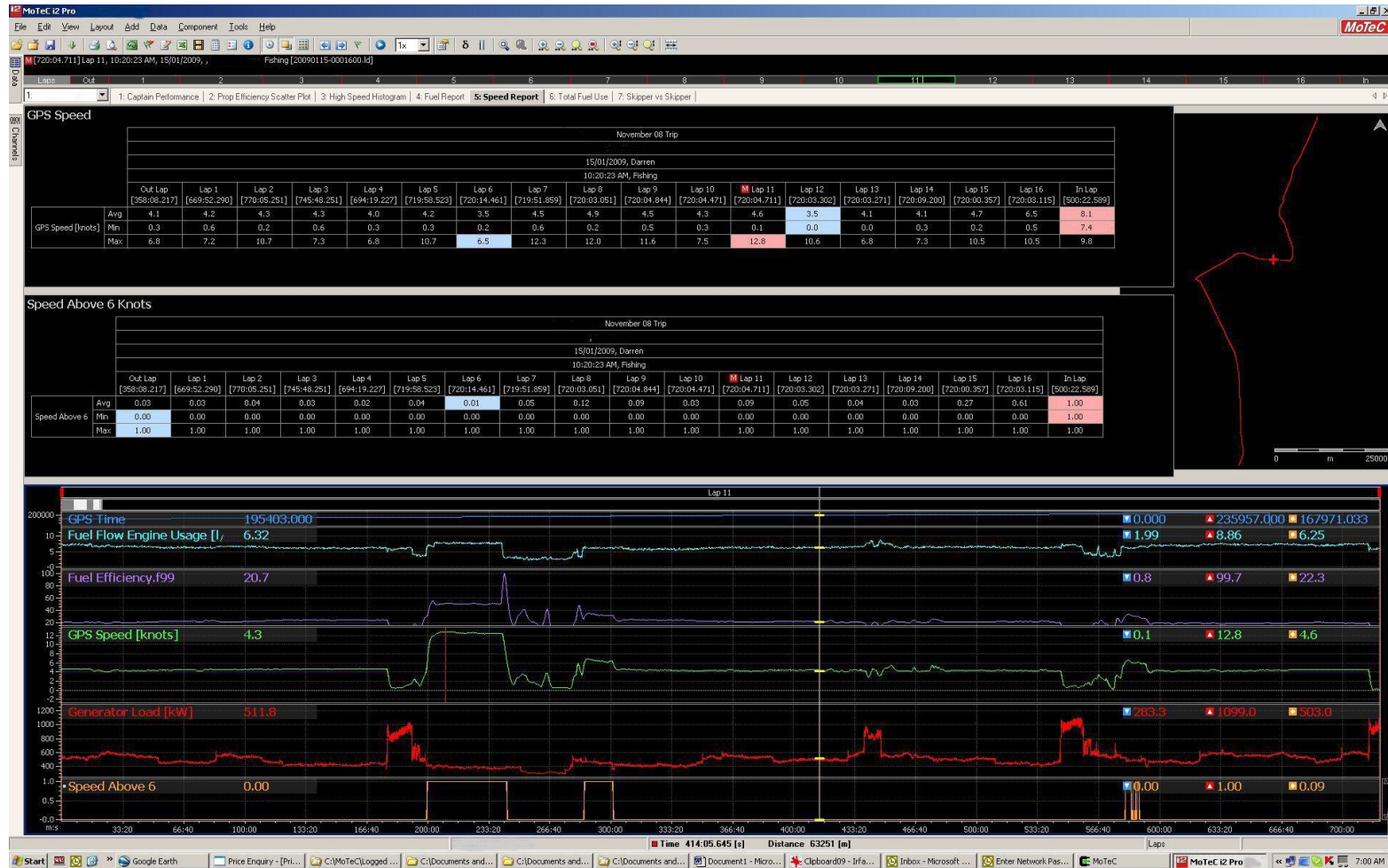
We recommend:
- **i2 Standard for on-vessel application, and**
- **i2 Pro for shore based application (advanced analysis)**
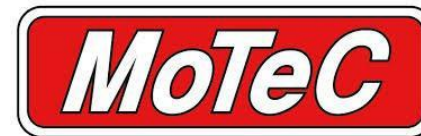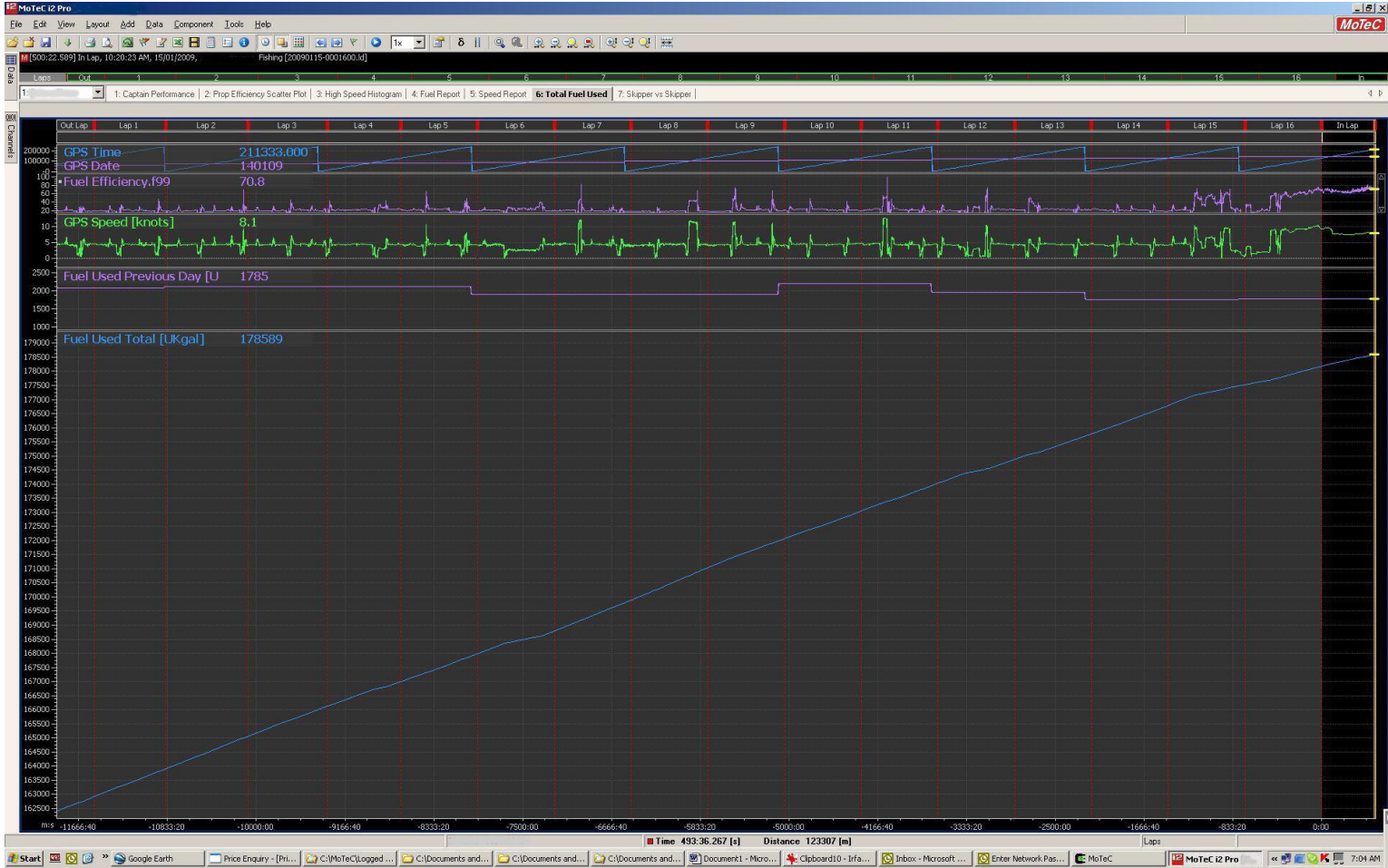
Example: High Speed Histogram

Example: Total Fuel Used

Example: Compare Vessels/Crews

Client Configuration Examples

The
QUANTITATIVE
APPROACH TO UNDERSTANDING YOUR VESSEL THROUGH COMPREHENSIVE DATA ANALYSIS

Contact us:

MARINTEC LIMITED

21A Butler St, 7910
Timaru
New Zealand

P: +64 3 688 8506
info@marintec.co.nz

www.marintec.co.nz