

DFM Precision

Unlock efficiency
and savings

FUEL FLOW METERS

Monitor fuel consumption in real-time and in various operating modes, driving significant cost savings.

Fuel consumption monitoring

Machine hours monitoring

Fuel consumption optimization

Fuel misuse and theft detection



TECHNOTON

Why Rosco?

Seamless implementation and support

From product provision to training and installation, we've got you covered.

Direct manufacturer collaboration

Any issue? We liaise directly with the manufacturer ensuring a tailored solution for your fleet.

Trusted by the largest mines

Dozens of mines across the Americas trust our commitment to delivering promised outcomes.

Advanced Precision Monitoring

Insightful Diagnostics, Proactive Analysis

Detect changing conditions and anomalies to make timely informed decisions and foresee potential issues.

Validation Tool

Gauge the effectiveness of fuel-saving strategies and solutions. Utilize raw data to pinpoint areas for potential improvements in your operations.

Embrace the Cleaner Future of Mining

Fuel is the lifeblood of your operations. With DFM, ensure you're using it wisely.

Slash your operating costs, decrease your carbon footprint, and step into the future of efficient fleet management.

Applications



Trucks



Loaders



Excavators



Dozers





DFM BENEFITS

Total Fuel Consumption	1076 m ³
Idle Mode	132 m ²
Optimal Mode	364 m ²
Overload	580 m ²



Attention!
Technical service required.



Unmatched Precision

- Direct fuel consumption measurement unaffected by terrain or vibration.
- Accurately monitor fuel use for both mobile and stationary equipment with a flow rate range from 1 to 25,000 l/h.
- High accuracy, error margin is just 0.5–3%
- Precise fuel monitoring through the use of two DFM units connected in differential measurement

Built-in Autonomy

- Equipped with a built-in battery for autonomous operation, ideal for situations without an on-board power network.
- Enable predictive maintenance with remote engine and fuel system diagnostics.
- CanUp module connected with SIM card for seamless data retrieval.

Comprehensive Monitoring

- Record engine operation time, including load modes: “Idle,” “Optimal,” and “Overload.”
- Track 35+ additional parameters and counters for in-depth analysis.
- Measure flow rates separately for “supply” and “return” fuel lines.

Seamless Integration

- MasterCan Digital Display and Control: For diagnostics, can be used only for maintenance.
- FMS Crocodile: Read other J1939 data available onboard the vehicle.
- Non-invasive, easy installation
- DAC Digital to Analog converter to add other Technoton sensors, switches and options.

Fraud Detection

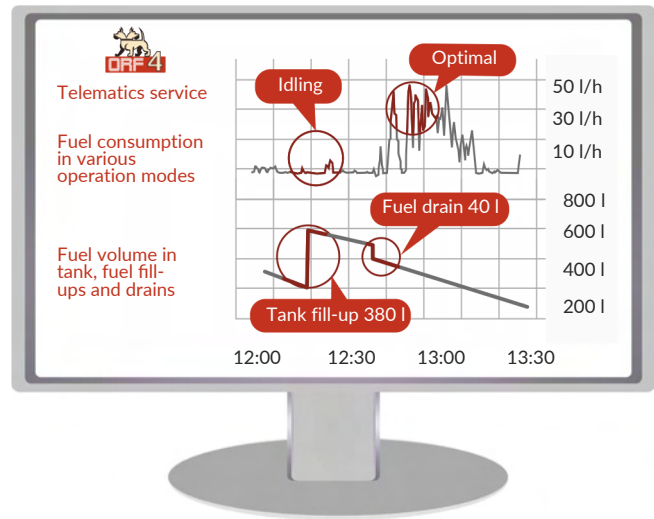
- Detect and record fraud attempts, including magnet interference and data tampering, ensuring the integrity of your fuel data.





Monitoring Parameters

- Exact volume of fuel remaining in tank
- Fuel consumption and engine working time – total and by operation modes: “Idling”, “Optimal”, “Overload”
- Position of attachments – bucket, blade, drill
- Temperature and pressure of liquids and other operational parameters of engines
- GPS location, route

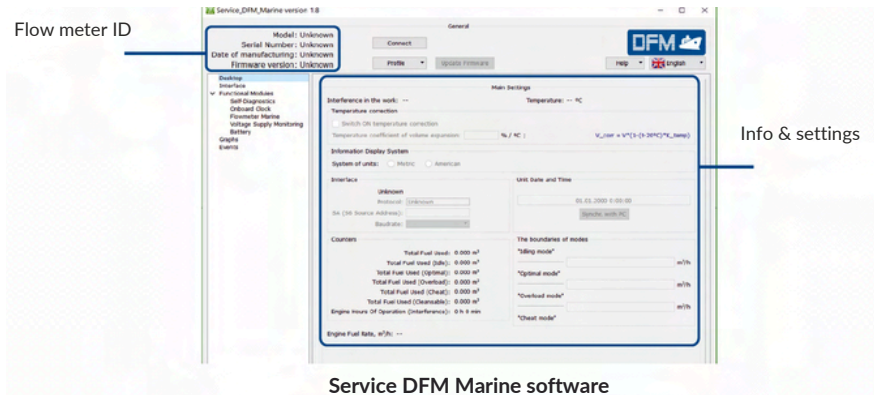


Online Notifications

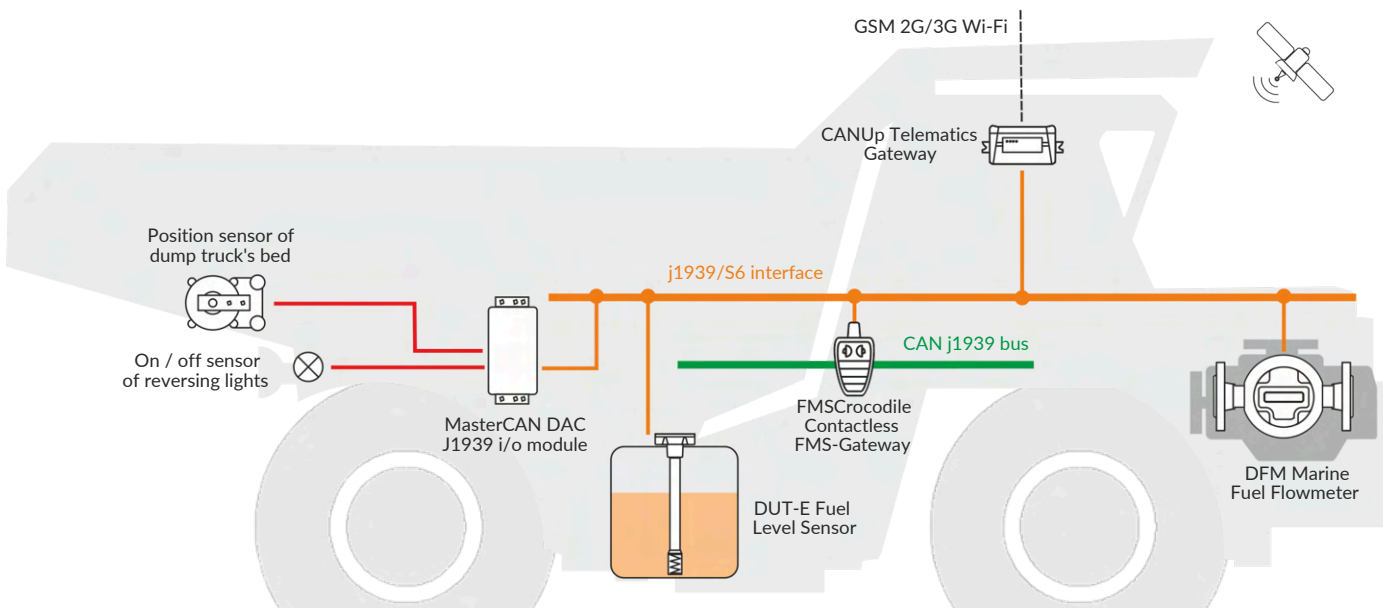
- Fuel tank fill-up, draining from tank
- Exit from defined polygon (geofencing)
- Exceeding fuel consumption quota

Precise Flow Meter Configuration

- Consumption mode boundaries
- Temperature correction coefficient
- Adjustment coefficient
- Two-flowmeter operation mode
- Units of measurement selection



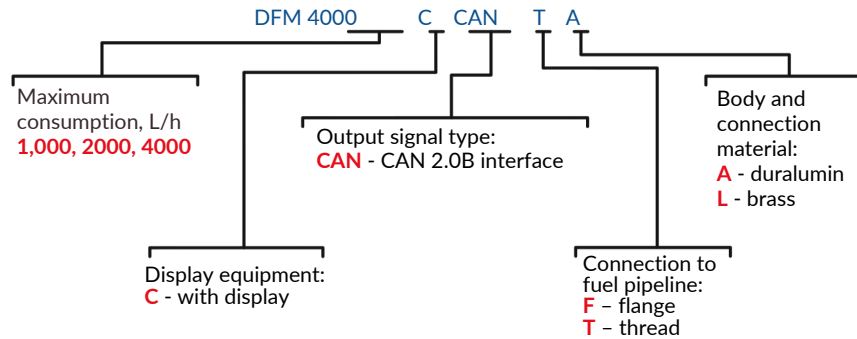
Service DFM Marine software





DFM SPECIFICATIONS

MODEL LINE UP DESIGNATIONS



Parameter	DFM Marine 1000	DFM Marine 2000	DFM Marine 4000
Measuring fuel consumption	0.02 to 4 m ³ /hour		
Inaccuracy rate	±0.5*		
Maximum pressure (flange connection)	25 bar		
Maximum pressure (thread connection)	16 bar		
Nominal pressure	2 bar		
External connection thread type	G3/4-A	G1-A	G1 1/4-A
Thread sizes for hose fittings or adaptors	3/4" BSPP	1" BSPP	1-1/4" BSPP
Flange holes distance	65 mm	75 mm	85 mm
Weight	1.9	3.4	4.4
Supply voltage range	from 10 to 45 V		
Current consumption at 12 V, not more than	50 mA		
Current consumption at 12 V, not more than	25 mA		
Ambient operation temperature range	from -20 to +60°C		
Vibration resistance	Max. acceleration to 100 m/s ² in the frequency range from 5 to 250 Hz		
Resistance to aggressive environments	Oil and petrol resistance		
Electromagnetic compatibility	<ul style="list-style-type: none"> • ESD Protection, severity level II; • Electromagnetic interference protection, severity level IV. 		
Ingress protection rating	IP54		



*Differential/summarization measurement mode, inaccuracy is not higher than ±1.0 % (depending on the proportion of fuel consumption in chamber of each flow meter used).

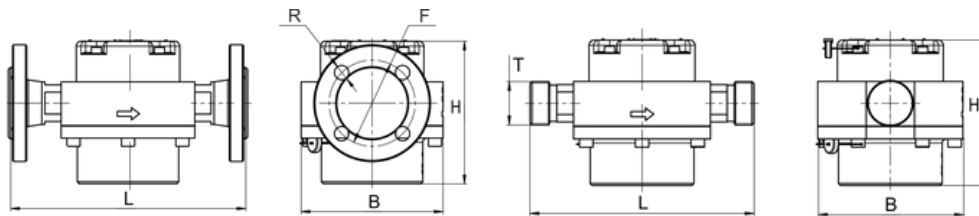




DFM SPECIFICATIONS

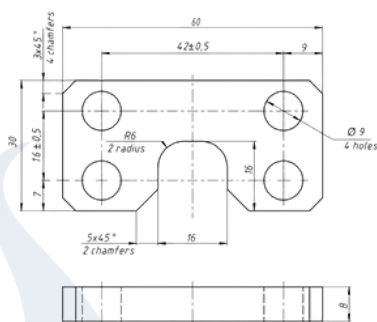
Dimensions

Model	Type of connection	L, inch	F, mm	R, mm	L, mm	B, mm	H, mm
DFM Marine 1000	thread	G3/4	-	-	172	102	117
	flange	-	Ø65	Ø14 (4 hole)	200		
DFM Marine 2000	thread	G1	-	-	194	120	123
	flange	-	Ø75	Ø14 (4 hole)	214		
DFM Marine 4000	thread	G1 1/4	-	-	216	140	141
	flange	-	Ø85	Ø14 (4 hole)	232		

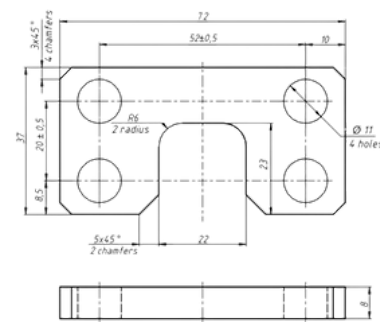


DFM Marine overall dimensions

Mounting Plate



a) for DFM Marine 1000/2000 installation

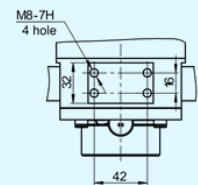


b) for DFM Marine 4000 installation

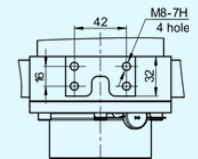
Certifications



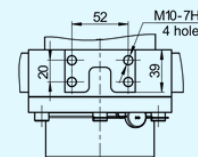
Mounting Holes Placement Scheme



a) for DFM Marine 1000



b) for DFM Marine 2000



c) for DFM Marine 4000





DFM SPECIFICATIONS

Showing and Resetting Data

- Switching between data displays
- Switching on metric/U.S. units system of measurements
- Resetting “Total fuel consumption” resettable Counter



Data on Screen

SCREEN NO.	DISPLAYED DATA	DIGITAL CAPACITY		UNITS	
		Metric System of Measures	American System of Measures	Metric System of Measures	American System of Measures
1	Total Fuel Consumption counter	10E-4	17060	m ³	gal
2	Total Fuel Consumption counter with higher digit capacity	10E-6	34120	m ³	gal
3	Engine Operation Time counter	0.1	51180	h	h
4	Engine Operation Time in Idle Mode counter	0.1	68240	h	h
5	Engine Operation Time in Optimal Mode counter	0.1	85300	h	h
6	Engine Operation Time in Overload Mode counter	0.1	102360	h	h
7	Engine Operation Time in Tampering Mode counter	0.1	25590	h	h
8	Engine Operation Time counter. Resettable	0.1	34120	h	h
9	Total Fuel Consumption counter. Resettable	10E-4	85300	m ³	gal
10	Total Fuel Consumption counter. Tampering Mode	10E-4	102360	m ³	gal
11	Interference Time counter	0.1	136400	h	h
12	Instant Fuel Consumption	10E-2	10E-1	m ³ /h	gal/h
13	Total Differential Fuel Consumption counter	10E-4	10E-2	m ³	gal
14	Total Differential Fuel Consumption	10E-2	10E-1	m ³ /h	gal/h
15	Battery Charge in Percentage of the Maximum	1	1	%	%
16	Temperature in the Measuring Chamber	1	1	C°	F°
17	Firmware Version	-	-	-	-





TELEMATICS SOLUTIONS

CANUp Telematics Gateway

Captures and records extensive machinery operation parameters, ideal for vehicle GPS tracking and remote monitoring.

Data Gathering and Analysis

- Integrates data from additional telematics sensors.
- Scans and parses J1939/71, ISOBUS, J1708, and Modbus RTU messages.

Position Tracking

- Tracks object position using GPS and GLONASS.

Report Generation

- Sends operation reports via 2G, 3G, LTE (4G), or Wi-Fi.



FMSCrocodile Contactless FMS Gateway

Integrates data from multiple automotive buses into the CAN/S6 Telematics Interface, simplifying telematics unit configuration.

Non-Intrusive Reading

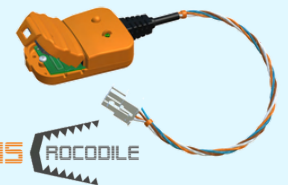
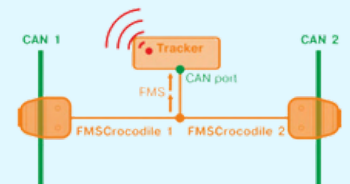
- Reads CAN bus data without electrical contact.

Efficient Messaging

- Sends FMS and Telematics messages via CAN 2.0B (J1939 protocol).
- Combines FMS messages from two CAN buses into one CAN-port.

Simplified Configuration

- Filters out unnecessary data.
- Prevents active requests from telematics unit.
- Uses CANbus data for instant fuel rate.



MasterCAN Display 35

MasterCAN Display 35 visualizes CAN J1939 parameters for vehicle telematics and machinery monitoring.

Parameter Display

- Shows up to 402 parameters from the S6 database, 10,000+ SPNs

Flexible Configuration

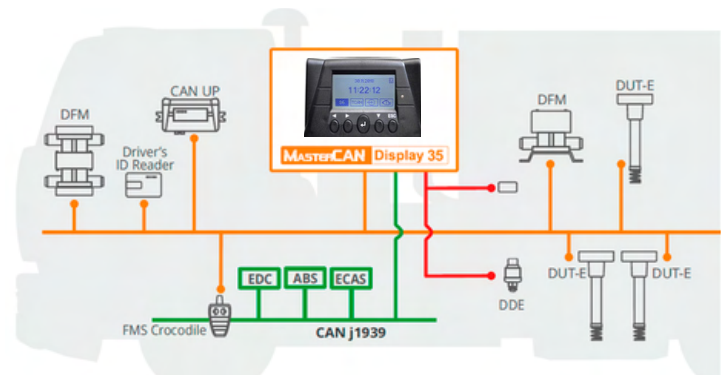
- Add/delete screens, rename parameters, upload custom icons.

Pre-configured Models for Quick Set-up

- "Truck," "Tractor," and "Marine" models.

User Friendly

- No programming or HEX value calculations needed.



IoT Burger Technology, which allows flexible configuring of CAN bus



CAN-based Technology of connecting telematics equipment into a wired network.





TELEMATICS SOLUTIONS

Telematics Solutions Specifications

Specification	CANUp	FMSCrocodile	MasterCAN Display 35
Wired Digital Interface	CAN J1939/S6	CAN (SAE J1939)	CAN J1939/S6
Analog Inputs	Voltage, Frequency, Binary	N/A	2 analog (0.5-10V) / frequency (10-10,000 Hz), adjustable via SK S6
Memory Size for Storing Reports	40,000	N/A	N/A
Autonomous Operation from Built-in Battery	5 hours	N/A	N/A
GNSS Start Time (Hot)	10 seconds	N/	N/A
Power Supply	9-45 Volts	10-45 Volts	9-36 Volts
Max. Current Consumption (12V/24V)	100/50 mA	40 mA	N/A
Ambient Temperature Range	-40°C to +60°C	-40°C to +85°C	-40°C to +85°C
Input Interface	N/A	CAN (SAE J1939)	N/A
Output Interface	N/A	CAN J1939/S6 (FMS/Telematics)	N/A
Weight	0.5 kg	100 g	0.5 kg
Dimensions	10.5 × 8 × 2.5 cm	8 × 3.5 × 1.5 cm	16 × 23 cm
Level of Message Losses	N/A	1%	N/A
Product Type	Telematics Gateway	Data Integration Device	CAN Data Converter
Applications	Vehicle GPS tracking, remote monitoring	Vehicle telematics, fleet management	CANbus data conversion and visualization, J1939 data conversion

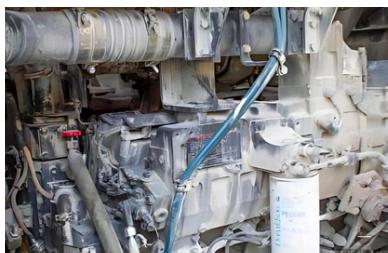




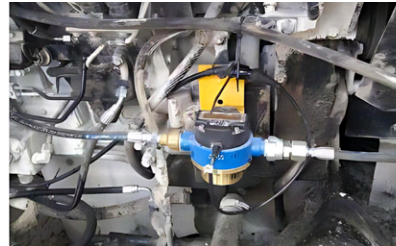
DFM APPLICATIONS

DFM MARINE PC2000

Komatsu PC200 Excavator



Mounting a pair of fuel flow meters on a mining excavator

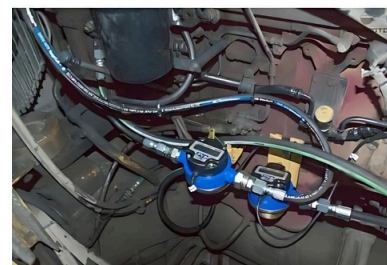


DFM MARINE PC1800 DUAL ENGINE

Komatsu PC1800 Hydraulic Excavator



Fuel supply system of Komatsu PC 1800



Fuel flow meters are installed on rear engine of excavator



Installing fuel flow meters on front engine of Komatsu



Fuel flow meters are installed in Komatsu fuel supply system Komatsu PC1800



Rear engine fuel system rear of Komatsu and installed flow meters





DFM INSTALLATION

Easy Installation and Deployment

1. Find location for mounting and fabricate bracket.
2. Attach female BSPP swivel adaptors to male connectors.
3. Build a new hose that fits neatly and securely.
 - a. Record all hose lengths and fittings to build future kits.



ThermaStart Idle Management System
Eliminate idling and boosting.



EPURA Self-Cleaning Filters
The last air filters you'll ever need.



SkelStart Engine Start Module
Never boost a dead battery again.



FuelActive Floating Fuel Pickups
Up to 5% fuel efficiency.

