

| Line | FEATURE DETAIL | INDUSTRIAL | OIL & GAS | HARSH OPERATION |
|------|--|--|--|---|
| 1.0 | Product Image (Harsh Operation Shown) | | | |
| 1.1 | Product Model | M1 GEN2 Auto-Sampler | M1 GEN2 Auto-Sampler | M1 GEN2 Auto-Sampler |
| 1.2 | LogiLube Part Number | L1000520 | L1000521 | L1000522 |
| 1.3 | Build Configuration | Industrial | Oil & Gas | Harsh Operation |
| 1.4 | Typical Applications | Power Generation, Paper Mills, Chemical Plants, Wind Turbines | Natural Gas Compression Engines/ Compressors | Off-Road Equipment, Construction Equipment, Mining Fleets (Haul Trucks, Loaders, Graders, Excavators), Mills (Ball, Rod, SAG) |
| 1.5 | Fluid Sampler Function | Automated / Manual Remote LIVE Fluid Sampling | | |
| 2.0 | ENVIRONMENT | | | |
| 2.1 | Operating Environment | Indoors | Outdoors | Outdoors |
| 2.2 | Ambient Temperature | -40° to 70°C (-40 to 158°F) | | |
| 2.3 | Humidity | 0 to 100% RH | | |
| 2.4 | Fluid Compatability | Hydraulic & Lubricating Oils (Synthetic & Mineral Based), Coolants | | |
| 2.5 | Oil Pressure | Maximum 6.9 bar (100 psi) | | |
| 2.6 | Oil Temperature | -40° to 85°C (-40 to 185°F) | | |
| 2.7 | Vibration | 10-50 Hz: 3mm (displacement), 50-300 Hz: 15g (acceleration) | | |
| 3.0 | GENERAL | | | |
| 3.1 | Construction | 3-Piece Modular Construction | | |
| 3.2 | Material | Machined Solid Billet Aluminum | | |

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| 3.3 | Finish | | Anodize Type II (clear) | |
| 3.4 | Weather Seals | Viton® O-rings | Primary - Viton® O-rings, Secondary - TPU Compression Seal | |
| 3.5 | Humidity Control | | WL Gore PolyVent® Waterproof Vent, Conformal Coating on PCB | |
| 3.6 | Environmental Rating (hardware body) | IP67 | IP68, IP69 (direct water blast) | |
| 3.7 | Max. Fluid Inlet Pressure | 6.9 bar (100 psi), External Pressure Regulation provided by Customer | | |
| 3.8 | Flow Rate | 1.0 liter per minute (0.28 US gallons per minute) at 4.1 bar (60 psi), Restricted by Cartridge Valve | | |
| 3.9 | Flow Direction | Bi-directional | | |
| 3.10 | Warranty Security | Tamper-Proof WARRANTY VOID Metalized Adhesive Seal, Tamper-Proof Indicator Seal Paste on Fasteners | | |
| 4.0 | PRINTED CIRCUIT BOARD ASSEMBLY | | | |
| 4.1 | PCBA Generation | GEN2 (October 2021) | | |
| 4.2 | PCBA Identifier | Blue Colored PCB | | |
| 4.3 | PCBA Logilube P/N | L1001510-2 | | |
| 4.4 | PCBA Build Configuration (Connectors) | | | |
| 4.5 | Connector A | Power (GND/NC/VIN+) | | |
| 4.6 | Connector B | SOL (Solenoid Valve) (SOL+/SOL-) | | |
| 4.7 | Connector C | Temp (Fluid Temperature) (SDA/GND/SCL/+3.3V) | | |
| 4.8 | Connector D | Not Applicable | | |
| 4.9 | Connector E | Not Applicable | | |
| 4.10 | Connector F | Pressure (Fluid Pressure) (NC/GND/0-5V In/+5V) | | |
| 4.11 | Connector G | Not Applicable | | |
| 4.12 | Connector H | Not Applicable | | |
| 4.13 | Connector I | Not Applicable | | |
| 4.14 | Connector J | Not Applicable | | |
| 4.15 | Connector K | Not Applicable | | |
| 5.0 | USER CONTROL PANEL | | | |
| 5.1 | User Control Panel Image | | | |

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| 5.2 | LED Status Lights | | | |
| 5.3 | | POWER | GREEN | |
| 5.4 | Wireless (Bluetooth®) Transmit | | BLUE | |
| 5.5 | | ALARM | RED Flashing | |
| 5.6 | | BOTTLE FULL | RED Flashing | |
| 5.7 | | READY | GREEN | |
| 5.8 | | RESET | RED Flashing | |
| 5.9 | Buttons | | | |
| 5.10 | | MANUAL FILL | Membrane Switch, Stainless Steel Snap Dome (400 gram tactile force) | |
| 5.11 | | RESET | Membrane Switch, Stainless Steel Snap Dome (2,250 gram tactile force) | |
| 5.12 | Security Lock-Out | Button Disabling Feature via Wireless Mobile App (iOS iPad) at Admin Permission Level | | |
| 6.0 | ELECTRICAL INTERFACE | | | |
| 6.1 | Input Power Supply | 9 to 36 VDC, Nominal 24 VDC | | |
| 6.2 | Current Draw | 100 mA (Nominal), 1.0A (Maximum) During Valve Actuation | | |
| 6.3 | Power Consumption | 2.4W (Nominal), 24W (During Valve Actuation) | | |
| 6.4 | Current Protection | | 3.0 A In-line ATO Blade Fuse (Internal) | |
| 6.5 | Power Source | External (Application Specific) | | |
| 7.0 | COMMUNICATIONS | | | |
| 7.1 | Wired | Not Applicable | | |
| 7.2 | Wireless | Bluetooth® 5.1, Single Mode 2.4GHz Rubberized Whip Antenna, Max. 19.0 dB Signal | | |
| 8.0 | CONNECTORS (External) | | | |
| 8.1 | Wireless Antenna (Bluetooth®) | SMA, Reverse Polarity Male, Right Angle, IP67, Gold-plated Brass | | |
| 8.2 | Power IN (24 VDC) | M8X1 3-pole, IP67, Nickel Plated Brass | LEMO 1M Series, 5-pole, IP68, Anodized Aluminum, Ratcheting Closure | |
| 8.3 | Data OUT | Not Applicable | | |
| 8.4 | External 3rd Party Sensor Connectors | Not Applicable | | |
| 9.0 | PRODUCT LABELING | | | |
| 9.1 | Fluid Type / Source | | Optional Accessory - Fluid ID Band (Nylon PA12) on Bottle Cover (Ex. ENGINE RH) | |
| 9.2 | Banlaw Fluid Color Code | Optional - Ceramic Coated Fluid ID Band, Banlaw Color Code | | |
| 9.3 | Sample Point Location | | Optional - Custom QR code Label | |
| 9.4 | Hardware Serial No. | Laser Etched on Manifold (Permanent) | | |
| 9.5 | Agency Certifications | Printed Label, Weather Resistant | | |
| 10.0 | PERFORMANCE | | | |
| 10.1 | Embedded Edge Processor | 4-Core ARM Processor | | |

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| 10.2 | Battery Back Up | 6 Months of Real-Time-Clock Function (2X Safety Factor), Primary Lithium Coin Cell, Permanent | | |
| 10.3 | Firmware (Proprietary) | Ver. 2.0.7 (or greater), OTA Upgradeable via SmartOil-M Mobile App (iOS iPad) with Support+Data Subscription | | |
| 10.4 | Data Storage (Internal) | SRAM, EPROM, Non-Volatile Memory (2.5 Years of 30-sec Measurement Interval Data Log) | | |
| 10.5 | Embedded Fluid Property Software Tables | Application Specific, Upgraded via SmartOil-M Mobile App (iOS iPad) | | |
| 11.0 | FLUID SAMPLING | | | |
| 11.1 | Sampling Modes | MANUAL, AUTONOMOUS (Machine Time or Calendar), Configurable via SmartOil-M Mobile App (iOS iPad) | | |
| 11.2 | Sample Interval | Configurable via SmartOil-M Mobile App (iOS iPad) | | |
| 11.3 | Sample Interval Range | Configurable to 9999 hours via SmartOil-M Mobile App (iOS iPad) | | |
| 11.4 | Sample Bottle Station(s) - Qty | One (1) | | |
| 11.5 | Sample Bottle Neck Finish (thread pitch) | 38x400 | | |
| 11.6 | Sample Bottle Fill Volume | Industry Standard Bottle - 125 ml, Up To 500 ml (Optional), Configurable via SmartOil-M Mobile App (iOS iPad) | | |
| 11.7 | Sample Bottle(s) | Provided by Customer (fluid analysis lab) | | |
| 12.0 | BOTTLE COVER | | | |
| 12.1 | Standard | Anodized Aluminum w/ Lanyard, 125 ml Sample Bottle | | |
| 12.2 | Optional | Anodized Aluminum, w/ Lanyard, 100 ml to 125 ml Sample Bottle, Universal, Spring Loaded, Locking (ALS Compatible) | | |
| 12.3 | Optional | Nylon 12, w/ Lanyard, 100 ml to 125 ml Sample Bottle, Universal, Spring Loaded, Locking (ALS Compatible) | | |
| 13.0 | FLUIDS | | | |
| 13.1 | Permissible Fluids | Hydraulic & Lubricating Oils (Synthetic & Mineral Based), Coolants | | |
| 13.2 | Fluid Viscosity Range | 1-320 cSt | | |
| 13.3 | Fluid Flow Path | Configurable: Side-to-Side, Rear-to-Rear, Side-to-Rear, Rear-to-Side; 4 Fluid Inlet/Outlet Port Options | | |
| 14.0 | FLUID SAMPLING EVENT CONTROL | | | |
| 14.1 | MANUAL Sample - Local | via User Control Panel | via User Control Panel, Option - Remove User Control Panel for 100% Wireless | |
| 14.2 | MANUAL Sample - Wired | Not Applicable | | |
| 14.3 | MANUAL Sample - Wireless | via SmartOil-M Mobile App (iOS iPad) | | |
| 15.0 | DATA CAPTURE | | | |
| 15.1 | Internal Sensors | 30-sec interval, timestamp, .csv file format | | |
| 15.2 | Error Events | timestamp, .csv file format | | |
| 15.3 | Sample Event History | Reset, Manual/Automated, timestamp, .csv file format | | |
| 16.0 | SENSORS (Internal) | | | |
| 16.1 | Fluid Properties | | | |
| 16.2 | | Fluid Temperature | Measurement Range -40° to 125°C (-40 to 257°F), Accuracy +/- 2°C (3.6°F) | |
| 16.3 | | Fluid Pressure | Measurement Range 0-6.7 bars (0-100 psi) | |
| 16.4 | Printed Circuit Board Assembly | | | |

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| 16.5 | Surface Temperature | Measurement Range -40° to 125°C (-40 to 257°F), Accuracy +/- 0.3°C (0.54°F) | | |
| 16.6 | Humidity | 0-100% Relative Humidity (+/-2% RH) | | |
| 16.7 | Vibration | 10-50 Hz: 3mm (displacement), 50-300 Hz: 15g (acceleration) | | |
| 17.0 | MECHANICAL INTERFACE | | | |
| 17.1 | Weight | 3.6 kg (8.0 lbs) | | |
| 17.2 | Dimensions | 267 mm (10.5 in) H X 121 mm (4.8 in) D | | |
| 17.3 | Mounting | Optional Accessory - Stainless Steel Bracket | | |
| 17.4 | Fluid Port Fitting Type | Female 1/4-19 BSPP (ISO 6149) | | |
| 18.0 | ACCESSORIES | | | |
| 18.1 | Cable Assemblies | | | |
| 18.2 | Power Supply (24 VDC) | M8X1, 3-Pole, Nickel Plated Brass, IP67 Molded Connector, 24AWG, Shield Wire, 1M | LEMO 1M Series, 5-pole, Anodized Machined Aluminum, Ratcheting Closure, IP68 Connector, 20AWG Shielded Copper Wire, 1M | |
| 18.3 | Data OUT | Not Applicable | | |
| 18.4 | External 3rd Party Sensor(s) | Not Applicable | | |
| 19.0 | AGENCY CERTIFICATIONS | | | |
| 19.1 | UL | Yes | | |
| 19.2 | CE | Yes | | |
| 19.3 | EMC (EMI, RF emissions) | FCC Part 15 Class B, EMC (EN 550011, EN 301 489, EN 61000), Australia RCM | | |
| 19.4 | RoHS 3 | Compliant | | |
| 19.5 | Hazardous Operation (O&G applications) | | | |
| 19.6 | NEC Class 1, Div 2 (Groups A, B, C, D) | | Pending | |
| 19.7 | ATEX | | Pending | |
| 20.0 | INTELLECTUAL PROPERTY PROTECTION | | | |
| 20.1 | Patents (issued) | USA | | |
| 20.2 | Patents (pending) | PTC, Australia | | |
| 20.3 | Trademarks (registered) | USA and International | | |
| 20.4 | Service Marks | USA and International | | |