Matrix® 3
Fluid Management Systems

Automated, Wireless Oil Dispense Tracking and Bulk Tank Monitoring
Dispense meters, software, and wireless devices capture dispense history and monitor petroleum and synthetic oil products and anti-freeze mixture inventory levels.

Features and Benefits
• Wireless transmission and reception of meter and tank level information make it simple to track your entire facility’s activities
• Customize to fit your business—three product platforms (Basic, Professional, and Premier) to fit any size facility
• Multi-level security to protect your assets
• Precise measurement and control of fluids ensures profits and eliminates out of stock issues for critical inventory
• ADP and Reynolds & Reynolds interfaces provide secure, reliable, data transfer between the Matrix database and the dealership management software

Typical Applications
• Auto dealerships
• Heavy-duty fleet service
• Off-road maintenance shops
• Industrial in-plant lubrication

Typical Fluids Handled
• Petroleum- and synthetic-based oils
• Anti-freeze

Matrix Application Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Basic</th>
<th>Professional</th>
<th>Premier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Number of Transceivers</td>
<td>1</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Maximum Number of Meters</td>
<td>30</td>
<td>100</td>
<td>300</td>
</tr>
<tr>
<td>Maximum Number of Tank Monitors</td>
<td>0</td>
<td>12</td>
<td>300</td>
</tr>
<tr>
<td>Client PC Networking</td>
<td>0</td>
<td>6</td>
<td>300</td>
</tr>
<tr>
<td>Number of users</td>
<td>250</td>
<td>500</td>
<td>1000</td>
</tr>
<tr>
<td>Track Dispense by Work Order</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Track Dispense by Technician</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Track Dispense by Vehicle Number</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Tank Level Email</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Third Party Interface Capable</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ADP® Certified Interface</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Reynolds® Certified Interface</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

No fluid limitations with any Matrix Platform

FOR SALE TO AUTHORIZED DISTRIBUTORS ONLY
Matrix® 3
Fluid Management Systems

Software System Operating Requirements
Matrix software can be configured as a stand-alone PC or networked to multiple PC’s. This software is not compatible with Apple® Computers, and is not available for the Apple® Operating system. The PC requirements for the Matrix Server and Matrix Client or shop PC’s are noted below.

Server PC Hardware Requirements
• Windows® XP Professional or Vista® operating system
• Pentium® 4 or better processor
• Processor speed of 3.0 GHz or better
• RAM memory of 1 GB or better
• CD-RW or DVD/RW drive
• Serial port configuration for (1) RS422 and (1) USB connection

PC Clients
• Windows® XP Professional or Vista® operating system
• Pentium® 4 or better processor
• Processor speed of 2.0 GHz or better
• RAM memory of 1 GB or better

Software Instruction Manuals
Basic .............................................................................. 313104
Professional ........................................................................ 313106
Premier .......................................................................... 313108
ADP ................................................................................. 313112
Reynolds & Reynolds .......................................................... 313114

RF Communication (Meters, Transceivers, Tank Level Monitors, Pump Air Control)

<table>
<thead>
<tr>
<th>Description</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Communication</td>
<td>2.4 GHz Direct Sequence Spread Spectrum</td>
</tr>
<tr>
<td>RF Communication Range</td>
<td>Unobstructed: 300 to 500 ft (91 to 152 m); Obstructed: 250 to 300 ft (76 to 91 m)</td>
</tr>
<tr>
<td>RF Temperature Range</td>
<td>−40°F to 185°F (−40°C to 85°C)</td>
</tr>
<tr>
<td>Approvals</td>
<td>FCC, Industry Canada (IC), C-Tick, CE</td>
</tr>
</tbody>
</table>

Ordering Information

**System Software**
- 256634 Premier Software CD (includes 3rd party interface)
- 256635 Professional Software CD
- 256636 Basic Software CD
- 256637 Premier Software with ADP Interface
- 256638 Premier Software with Reynolds & Reynolds Interface

**Transceiver and Connection Hardware**
- 257464 Transceiver with Universal Power Adapter (CE)
- 255731 USB/RS422 Converter
- 15T999 15 ft USB Cable
- 15T998 3 ft USB Cable
- 119572 RS422 Bulk Wire (1000 ft roll)

Transceiver and Connection Hardware Technical Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>1.0 lb (454 grams)</td>
</tr>
<tr>
<td>Power Supply</td>
<td>100 – 240 V, 50/60 Hz to 12 VDC plug-in transformer</td>
</tr>
<tr>
<td>Instruction Manual</td>
<td>313008</td>
</tr>
</tbody>
</table>
**Matrix® 3**
Fluid Management Systems

## Matrix Meter and Accessories

### Matrix Electronic Meter with Extension, 5 gpm or Less

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>256282</td>
<td>1/2 in npt(f) swivel, rigid extension and standard automatic non-drip quick-close nozzle for oil</td>
</tr>
<tr>
<td>256482</td>
<td>1/2 in npt(f) swivel, flexible extension and standard automatic non-drip quick-close nozzle for oil</td>
</tr>
<tr>
<td>256483</td>
<td>1/2 in npt(f) swivel, gear lube extension and standard quick-close nozzle</td>
</tr>
<tr>
<td>256484</td>
<td>1/2 in npt(f) swivel, rigid extension and standard quick-close nozzle for anti-freeze</td>
</tr>
<tr>
<td>256485</td>
<td>1/2 in npt(f) swivel, flexible extension and standard quick-close nozzle for anti-freeze</td>
</tr>
</tbody>
</table>

### Matrix Electronic Meter with Extension, 14 gpm or Less

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>256486</td>
<td>1/2 in npt(f) swivel, rigid extension, high flow, quick-close nozzle for oil</td>
</tr>
<tr>
<td>256487</td>
<td>1/2 in npt(f) swivel, flexible extension, high flow, quick-close nozzle for oil</td>
</tr>
<tr>
<td>257120</td>
<td>1/2 in npt(f) swivel, gear lube extension and standard quick-close nozzle for oil</td>
</tr>
<tr>
<td>256488</td>
<td>1/2 in npt(f) swivel, flexible extension, high flow, quick-close nozzle for anti-freeze</td>
</tr>
<tr>
<td>256489</td>
<td>1/2 in npt(f) swivel, rigid extension, high flow, quick-close nozzle for anti-freeze</td>
</tr>
</tbody>
</table>

### Swivel Covers

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15T366</td>
<td>Black swivel cover (standard color with meter)</td>
</tr>
<tr>
<td>15T367</td>
<td>Red swivel cover</td>
</tr>
<tr>
<td>15T368</td>
<td>Blue swivel cover</td>
</tr>
<tr>
<td>15T369</td>
<td>Green swivel cover</td>
</tr>
<tr>
<td>15T370</td>
<td>Yellow swivel cover</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15B750</td>
<td>16 gallon and 55 gallon meter mounting bracket</td>
</tr>
<tr>
<td>249440</td>
<td>Console bracket</td>
</tr>
<tr>
<td>257539</td>
<td>Matrix meter for oil bar (swivel and extension removed)</td>
</tr>
<tr>
<td>256719</td>
<td>Oil bar console–complete cabinet without piping and meters</td>
</tr>
<tr>
<td>255370</td>
<td>Oil bar kit (fittings, nozzles, and piping)</td>
</tr>
<tr>
<td>257556</td>
<td>Retro fit kit–mount Matrix meter in 222107 console</td>
</tr>
</tbody>
</table>

### Filter Kits for Matrix Meters

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>255885</td>
<td>Filter kit includes (10) filters/strainers (15M308), (10) spacers (15M309) and (10) O-rings (155332)</td>
</tr>
</tbody>
</table>

## Technical Specifications

- **Flow Range**: 0.1 to 14 gpm (0.4 to 53 lpm)
- **Maximum Working Pressure**: 1500 psi (103.4 bar)
- **Operating Fluid Pressure Range**: 100 – 1500 psi (7–103 bar, 0.7–10.3)
- **Weight**: 6.07 lbs (2.75 kg)
- **Units of Measurement**: Programmable in pints, quarts, gallons, or liters
- **Inlet**: 3/4 in–14 npt or 1/2 in–14 npt
- **Outlet**: 3/4 in–16 straight thread O-ring Boss
- **Maximum Totalizer**: 999,999 gallons or liters
- **Maximum Recorded Dispense**: 999.9 Units
- **Battery**: 4 AA alkaline or 4 AA lithium
- **Battery Life**: Preset Models–six months, manual models–one year
- **Storage Temperature Range**: -40–158º F (-40-70º C)
- **Operating Temperature Range**: 4–158º F (-20-70º C)
- **Wetted Parts**: Stainless steel, pp, tf/e, cr, nn, cr
- **Fluid Compatibility**: Petroleum- and synthetic-based oils and anti-freeze mixtures (not compatible with fuel and windshield washer fluid)
- **Meter Pressure Loss**: 180 psi (12 bar) @ 14 gpm (53 lpm)
- **Accuracy**: ± 0.5%
- **Repeatability**: ±0.15%
- **Dimension w/o Extension**: 13 in L x 3.75 in W x 5.75 in H (33 cm x 9.5 cm x 14.6 cm)

1. Tested in 10W oil at 70º F. Flow rates vary with fluid pressure, temperature, viscosity, inlet fitting and nozzle type.
2. At 2.5 gpm (9.5 lpm) @ 70º F (21º C) with 10 wt. oil and 1 gal (3.8 l) dispensed. May require re-calibration. Out-of-box accuracy ±1.25%.
3. Average shop use with alkaline batteries (included); 30-35% longer life with lithium AA
Matrix® 3
Fluid Management Systems

Tank Level Monitor
Choose one TLM for each bulk fluid tank. Tank readings are automatic for used or new oil and anti-freeze products.

<table>
<thead>
<tr>
<th>Tank Level Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>256285</td>
</tr>
</tbody>
</table>

Technical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultrasonic Tank Depth Measurement Range</td>
<td>0 – 30 ft. (0-9 m) (Not recommended for use with pressurized tanks)</td>
</tr>
<tr>
<td>Fluid Level Measurement Accuracy*</td>
<td>± 0.5%</td>
</tr>
<tr>
<td>Weight</td>
<td>2.34lb (1.06 kg)</td>
</tr>
<tr>
<td>RF Operating Temperature Range</td>
<td>-40° F - 185° F (-40° C - 85° C)</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>-40° F - 185° F (-40° C - 85° C)</td>
</tr>
<tr>
<td>Ambient temperature range**</td>
<td>-22° F - 122° F (-30° C - 50° C)</td>
</tr>
<tr>
<td>Batteries</td>
<td>(2) 9 VDC Alkaline only</td>
</tr>
<tr>
<td>Vertical Tanks</td>
<td>Maximum volume: 999,999 gallons or liters, maximum height: 30 ft (360 in.)</td>
</tr>
<tr>
<td>Cylindrical Tanks</td>
<td>Maximum volume: 999,999 gallons or liters, maximum diameter: 30 ft (360 in.)</td>
</tr>
<tr>
<td>Approvals</td>
<td>FCC, Industry Canada (IC), C-Tick, CE</td>
</tr>
<tr>
<td>Instruction Manual</td>
<td>312964</td>
</tr>
</tbody>
</table>

Note: Do NOT use the Matrix Tank Level Monitor with gasoline, diesel fuel, or other flammable liquids, and materials with an auto ignition temperature below 419º F (215º C)

Pump Air Control

One PAC required for each air pump. For safety and increased security, the PAC is a must have to maximize your fluid management system. Designed to supply air to the pump only when Matrix authorizes the dispense.

<table>
<thead>
<tr>
<th>Pump Air Control (PAC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>247435</td>
</tr>
<tr>
<td>247436</td>
</tr>
</tbody>
</table>

Technical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Pressure Range</td>
<td>23-145 psi (1.7 - 10 bar)</td>
</tr>
<tr>
<td>Maximum Air Flow</td>
<td>247436 - 23 SCFM (0.7m³/min), 247436 - 93 SCFM (2.6m³/min)</td>
</tr>
<tr>
<td>Power Supply</td>
<td>120-240 VAC line voltage, 24VDC solenoid</td>
</tr>
<tr>
<td>Output Power</td>
<td>10mW - 100mW</td>
</tr>
<tr>
<td>AMPS</td>
<td>1A</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Operating Temperature Range*</td>
<td>32° F - 122° F (0° C - 50° C)</td>
</tr>
<tr>
<td>Enclosure Type</td>
<td>NEMA Type 3</td>
</tr>
<tr>
<td>Weight</td>
<td>247435 - 2.8 lbs (1.27 kg), 247436 - 3.4 lbs (1.5 kg)</td>
</tr>
<tr>
<td>Instruction Manual</td>
<td>312417</td>
</tr>
</tbody>
</table>

* The difference in air temperature between the inside and outside of the tank may affect the accuracy of fluid levels. Display will not function below 32° F (0° C).

Tank Accessories

CleanLine Filter Assemblies

<table>
<thead>
<tr>
<th>CleanLine Filter Assemblies</th>
</tr>
</thead>
<tbody>
<tr>
<td>248421</td>
</tr>
<tr>
<td>248418</td>
</tr>
<tr>
<td>248419</td>
</tr>
<tr>
<td>248417</td>
</tr>
</tbody>
</table>

Replacement Filters

<table>
<thead>
<tr>
<th>Replacement Filters</th>
</tr>
</thead>
<tbody>
<tr>
<td>150702</td>
</tr>
<tr>
<td>119278</td>
</tr>
</tbody>
</table>
Horizon™
Fluid Management System

Features and Benefits
- Allows multiple technicians to dispense simultaneously
- Easily configured and expandable for any facility
- Increases technician productivity
- Password-protected to prevent unauthorized dispensing
- Tracks inventory levels and alerts operators to low inventory conditions to minimize out-of-stock situations

Typical Applications
- Bulk-dispensing to multiple service bays
- Automotive dealerships
- Heavy-duty dealerships
- Fleet service facilities

Typical Fluids Handled
- Petroleum- and synthetic-based oils
- Anti-freeze

Technical Specifications

System Specifications
- Control Modules on a System (1 Master only, plus 39 Slaves) .......... 40 maximum
- Keypads on a System (1 keypad per Control Module) .................... 40 maximum
- Solenoids on a System (40 Control Modules, 6 ports each) .......... 240 maximum
- Meters on a System (40 Control Modules, 6 ports each) ............ 240 maximum
- Fluids on a System ...........................................................................10 maximum
- Dispense Areas (reel banks)..............................................................99 maximum
- Operator Names / PIN Numbers ....................................................100 maximum
- Dispense Records Stored.................................................................668 maximum
- Simultaneous Dispenses (same and/or different fluids): .......... 12 maximum
- Jobs Waiting in Queue ......................................................................12 maximum
- Printer per System OR Attached Computer per System ..............1 maximum
- (either must be connected to Master Control Module)
- Accuracy of System .................................................................±0.6%

Control Module Ports
- Solenoid Ports (air or fluid) per Control Module ......................... 6
- Pulse Meter Ports per Control Module .......................................... 6
- Port for Keypad per Control Module ...............................................
- Port for Printer or Computer per Master Control Module ...............

Voltage Input
- 90-120 Volts AC, 50/60 Hz, single phase, 2 amps maximum draw
- 208-240 Volts AC, 50/60 Hz, single phase, 1 amp maximum draw

Operating Temperature Range.........................................................40 - 140º F (4 - 60º C) ambient

Pre-set or Free-flow Options
- Maximum Preset or Free-Flow Dispense......................................999.9 units
- Minimum Preset Dispense.............................................................. 0.5 units

Units of Measure
- Dispense .........................liters, quarts, gallons or pints (configurable for each fluid)
- Inventory ......................liters or gallons (dependent upon dispense units chosen)

Maximum Cable Lengths
- From Keypad to Control Module ..................................................50 ft (15.3 m)
- From Solenoid to Control Module ..................................................50 ft (15.3 m)
- From Pulse Meter to Control Module ............................................50 ft (15.3 m)
- From Printer/Computer to Master Control Module ....................50 ft (15.3 m)
- From one end of the Control Module Network to the other end (daisy-chained) .......
- ...................................................................................................2000 ft (610 m)

Reference Data
- Instruction Manual ........................................................................ 308607
Ordering Information

Control Module drives air and fluid solenoids, and counts pulses from meters. On-board memory contains a map of available system resources, and a power supply that supports both 120 and 240 Volt AC operation. Combine one Master Control Module with up to 39 Slave Control Modules per system.

- 238624 Master Control Module (one per system)
- 238625 Slave Control Module (up to 39 per system)

Keypads: Basic, Enhanced and Administrative

- 113551 Basic Keypad for navigating through the Horizon’s menus
- 113553 Administrative Keypad is needed to set up and make changes to the system parameters
- 191368 Keypad Wall-Mounting Bracket

Air Solenoids open and close the air supply to the fluid pump air motor. Each solenoid can be up to 50 ft (15.3 m) from a Control Module. Up to 6 solenoids (air or fluid) can be connected to each Control Module.

- 215407 For pumps requiring normal air flow (Mini Fire-Ball 225, 3:1 and Fire-Ball 300, 5:1)
- 512926 For pumps requiring higher air flow (Fire-Ball 425, 6:1 and 3:1)

Fluid Solenoids start and stop the fluid dispense cycles. These must be placed at each dispense point for each fluid being dispensed. Each fluid solenoid can be up to 50 ft (15.3 m) from a control module. Up to 6 solenoids (either air or fluid) can be connected to each control module. The low-flow model is available in a kit with a ready light which alerts the operator when the job is ready to dispense.

- 215487 Low-flow: supports 3 gpm (11.4 lpm)
- 512927 Higher-flow: supports up to 6 gpm (22.7 lpm)
- 514150 Anti-Freeze Solenoid
- 218588 Low-flow Solenoid with Ready Light Kit
- 238996 Ready Light Kit (only; less the solenoid)

Pulse Meters measure fluid flow to dispense points and send a train of pulses back to the Control Modules which are counted to determine how much fluid has been dispensed. If there are multiple meters for a single fluid, check valves (111620) should be placed in series with each meter to prevent “cross talk” and oscillations. Pulse Meters can be used for either U.S. or metric units.

- 238618 For oils, gear lube, automatic transmission fluid
- 215474 For anti-freeze
- 111620 Check Valve, 1/2 in

Thermal Relief Kits

- 235998 600 psi (41 bar)
- 102527 Thermal Relief Valve, 900 psi (62 bar)
- 237893 900 psi (62 bar)
- 240429 1600 psi (110 bar)

System Printer prints job tickets after each dispense is complete, plus has save function for later analysis

- 113774 Printer
- 514037 Printer paper, 1 roll

Keypad or Printer Cables

- 191393 25 Ft (7.6 M) cable with connectors
- 191394 Cable with connectors. 50 Ft (15.3 M)

Control Module Network

- 113559 500 Ft (152.5 M) bulk cable
- 113560 1000 Ft (305 m) bulk cable

Pulse Meter Cable

- 113555 Length: 500 ft (152.5 m)
- 113556 Length: 1000 ft (305 m)

Solenoids Cable

- 113557 Length: 500 ft (152.5 m)
- 113558 Length: 1000 ft (305 m)

Computer Cable with Connectors

- 192873 Computer I/O 25 ft (7.6 m)
- 192874 Computer I/O 50 ft (15.3 m)
Fluid Commander™
Fluid Management System

Features and Benefits
- Provides increased accuracy over mechanical counters
- PIN code prevents unauthorized dispensing
- Dispense totals tracked by location
- Easy to read display
- Accurate controlled dispense with parts room authorization

Typical Applications
- Parts room authorized dispensing for inventory control
- Automotive dealerships
- Heavy-duty dealerships
- Fleet service facilities

Typical Fluids Handled
- Petroleum- and synthetic-based oils
- Anti-freeze

Technical Specifications
- Maximum Number of Fluids: 1 or 2
- Dispense Stations/Bays: 6 or 12
- Air Solenoids Required: 1 (per pump)
- Fluid Solenoids Required: 1 (per fluid dispense station)
- Electrical Requirements: 120 V, 60 Hz, .25 amps
- Weight: 4 lb, 5 oz. (8.0 kg)
- Wiring Requirements: 90V; 2-wire
- Distance/Gauge: 200 ft (61 m) = 18 gauge, 201 to 500 ft (61 m to 152 m) = 16 gauge, 501 ft (152 m) or more = 14 gauge

Easy to Use
1. Service technician enters the service bay number, type of product, and amount to be dispensed, then activates the dispense button.
2. A “ready” light (located on the hose reel or dispense bar of the target service bay) signals when dispensing can begin.
3. As fluid is dispensed, the Fluid Commander tallies the amount dispensed and shuts-off when the pre-set amount is reached. No further dispensing takes place until new dispensing data is entered.

Typical Fluid Commander System Layout

A. Control*
B. Pressure Relief Kit**, 237893, 1-1/2 npt (m x f)
C. Supply Tank
D. Air Shutoff Valve, bleed-type
E. Air Filter
F. Air Solenoid Valve, 215407*
G. Air Regulator, 202156
H. Pump
J. Flexible Hose, 3-6 ft (0.9-1.8 m) long
K. Check Valve, 111620 (required)*
L. Fluid Filter, 223179
M. Pulse Meter, 236763 or 236764
N. Fluid Shutoff Valve, 108458, 1/2"*
P. Fluid Solenoid Valve***, 215487*
Q. Hose Reel
R. Ready Light, 238996***
S. Dispense Valve

*These parts are included with model 232076, 240448, or 241905
**Kit required to protect system from rupture due to thermal expansion of fluid lines. See instruction manual 308403.
***218588 includes 238996 and 215487.
† Required to ensure meter accuracy.