ROMDAS Guidelines: Customizing A System & Common Configurations
Providers of Innovative Technology for Measuring and Managing Roads.

Designing A ROMDAS System

ROMDAS® (Road Measurement Data Acquisition System) has been developed by Data Collection Ltd. (DCL) as a comprehensive, low cost and modular system for collecting asset and pavement information. The flexible design, which allows for installation on almost any local vehicle, has seen ROMDAS implemented in over 60 countries. Whether a private consultant, government department or research institution, ROMDAS offers great reliability, flexibility and ease of use for anyone who needs to quickly and accurately collect asset data.

TIPS FOR DESIGNING A ROMDAS SYSTEM

Thanks to the modular design ROMDAS can be easily configured to suit the specific needs of users. To ensure you select modules that best suit your needs, consider the following questions;

1) What type of data do I need to collect?
   e.g. Roughness, Rutting, Cracking, RoW Video, Assets, Road Geometry etc...

2) What type of roads do I need to survey?
   e.g. Good Highways, Unpaved/Rough or a mixture of both

3) What is my approximate budget?

Knowing the answers to these questions will help determine the most appropriate modules. If you are still unsure which modules would best suit your needs simply email us the answers to the above questions and we can recommend a suitable configuration.

HOW TO USE THIS GUIDE

Step 1) Select A Central System
   Select either a full ROMDAS or a MiniROMDAS system. The miniROMDAS is a streamline system that uses a handheld data logger and is only compatible with the Bump Integrator to collect Roughness (IRI) data. All other modules must be used with a full ROMDAS system.

Step 2) Select Add-On Modules
   Choose a combination of modules and software that include the features and data outputs you need.

Step 3) Select Optional Post-Processing Software
   Additional post-processing software is optional, however ROMDAS offers several post-processing packages which can greatly enhance the data collected.

Step 4) Email Us Your Configuration & Receive A Quote
   Send the list of components to sales@romdas.com and receive a quotation.

ROMDAS CAN BE USED FOR...

- Project or network level road surveying,
- Roughness surveys,
- Transverse profile/rutting surveys,
- Macro-texture (MPD),
- Visual condition or event rating,
- Automatic crack and surface defect detection,
- Location referencing (spatial GPS/GNSS data or linear LRP data),
- Video logging surveys (right of way, 360 and pavement view),
- Mobile mapping of roadside assets & inventory,
- Road geometry surveys,
- Travel time and congestion surveys,
- iRAP road safety surveys.

COMMON CONFIGURATIONS

For those new to high-speed road surveying, we have compiled some common configurations to help start the process. These configurations can be further customized depending on the needs of the user.

- Entry Level Roughness & GPS
- 'Any Condition' Roughness
- Consultant Friendly System
- Cost Effective Network Survey System
- State-Of-The-Art Network Survey System
- Dedicated Mobile Mapping System
- Dedicated IRAP Survey System

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A central system is required for all vehicle mounted survey systems. The ROMDAS system is the more comprehensive option as it is compatible with all ROMDAS modules. Whereas the MiniROMDAS is a streamline option compatible with only GPS and Bump Integrator. The MiniROMDAS is very cost effective and ideal for users needing to collect road roughness but may only have limited budgets. For customers who want to utilize other modules and collect a wider variety of data (e.g. rutting, geometry, video logging, cracking etc…), then they must select the full ROMDAS system option.

The MiniROMDAS can upgrade to a full ROMDAS system at any time in the future.

### Features

<table>
<thead>
<tr>
<th>Features</th>
<th>ROMDAS System</th>
<th>MiniROMDAS</th>
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<tr>
<td><strong>General</strong></td>
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<tr>
<td>Includes power supplies, hardware interfaces, data collection and processing software.</td>
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<td>✓</td>
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<tr>
<td>Survey computer</td>
<td>Laptop or PC (Windows)</td>
<td>Hand-held Pocket PC</td>
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<tr>
<td>Upgradable with additional modules at any time</td>
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<td>Real-time status display of all modules during surveys,</td>
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<td>User Defined Event &amp; Condition Rating (Keycoding)</td>
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<td>Predefine survey definitions</td>
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<td>Data compatible with HDM4 and other commonly used Pavement Management Systems (PMS)</td>
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<td>Data compatible with ArcGIS &amp; other common GIS mapping software</td>
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<td>Bump Integrator</td>
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<td>Laser Profiler (Roughness &amp; Macrotexture)</td>
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<td>Laser Crack Measurement System (LCMS)</td>
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<td>(Linear &amp; Spatial)</td>
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<td>Reference GPS to other data sets*</td>
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* When connected to a GPS receiver
** When connected to a DGPS receiver and signal
## Features

### ROMDAS Modules

<table>
<thead>
<tr>
<th>Features</th>
<th>High Resolution DMI</th>
<th>Bump Integrator</th>
<th>Laser Profilometer (SPL)</th>
<th>LCMS (Laser Crack Measurement System)</th>
<th>Transverse Profiler Logger</th>
<th>ROMDAS Geometry Unit</th>
<th>ROW Cameras</th>
<th>Mobile Mapping Software</th>
<th>Pavement View Cameras</th>
<th>360 Degree Camera With Video Logging &amp; Mobile Mapping</th>
<th>360 Degree Imagery</th>
<th>360 Degree Imagery</th>
<th>Compatible With Mobile Mapping Software</th>
<th>Standard AVI or JPEG Output</th>
<th>Customizable Image Overlay</th>
<th>User Defined Trigger Distance</th>
<th>Location Referencing</th>
<th>Other</th>
<th>Where Equipment Is Installed</th>
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*When connected to a GPS receiver
**Upgrade available
***Cracking, Potholes and other pavement defects
## Providers of Innovative Technology for Measuring and Managing Roads.

### Step 3

**Select Post-Processing Software**

<table>
<thead>
<tr>
<th>FEATURES</th>
<th>ROMDAS POST PROCESSING SOFTWARE</th>
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<tbody>
<tr>
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<td>DataView</td>
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<tr>
<td><strong>DATA MANAGEMENT</strong></td>
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<td>Integrate Multiple Survey Files into a Single Database</td>
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<td>Rubber Banding Survey Length</td>
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<td><strong>VIDEO RATING</strong></td>
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<tr>
<td>Extract Visible Assets &amp; Condition Data Directly From Videos</td>
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<tr>
<td>Record Measurements From Images</td>
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<td>Simply Image Calibration (can be performed post-survey)</td>
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<td><strong>GIS MAPPING</strong></td>
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<tr>
<td>Create GIS Map Layers of Survey Data</td>
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<tr>
<td>Exportable to 3rd Party GIS Software, Inc. Shape Files (ESRI/ARCGIS), Mapinfo, KML (Google Earth)</td>
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<td>Import Existing Road &amp; Asset GIS Layers</td>
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<td><strong>DATA PRESENTATION/QC</strong></td>
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<tr>
<td>Synchronized Viewing of All Survey Data (inc. videos, GIS Maps and Charts)</td>
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<td>Custom Graphing of Survey Data (exportable as JPEGs)</td>
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<td>Export Custom Reports</td>
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<td><strong>iRAP CODING</strong></td>
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<td>Accredited Software for iRAP Coding</td>
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<td><strong>MOBILE MAPPING</strong></td>
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<td>Calculate Accurate GPS Coordinates of Assets Directly From Videos</td>
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<tr>
<td>360 Degree Immersive Viewing (Similar to Google Street View)</td>
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<td>Stitch Multiple Images and Export</td>
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<tr>
<td>Dynamically Edit GIS Layers Overlaid Onto Videos</td>
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<tr>
<td>Licensing Options</td>
<td>Single Seat &amp; Enterprise Options Available</td>
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</table>

### Step 4

**Send Us Your Configuration & Receive A Quote**

Once you know which products you want for your survey system. Email us at sales@romdas.com to receive a quote. If you're still unsure which products would be suit your needs please feel welcome to email us for some advice. Our staff are always happy to help.

Manufactured by Data Collection Ltd
BC Bentinck Street, New Lynn, Auckland 0600, New Zealand.
Ph.: +64 9 827 7703
www.romdas.com
Email: info@romdas.com
Common Configuration

Entry Level Roughness & GPS

RECOMMENDED FOR:
- Government departments or consultants who have limited budgets and only need to collect roughness (IRI) and GPS data.
- Surveying unpaved, rough or rural roads where laser equipment cannot be used.

KEY BENEFITS:
- Exceptional price for World Bank Class 3 roughness device,
- Scalable by adding new modules as required in the future,
- Proven technology utilized worldwide,
- Easy to use interface,
- Can be installed with minimal time and vehicle modification,
- Use ROMDAS keycoding feature to perform visual condition and asset inspections while surveying,
- All data referenced with chainage and GPS coordinates.

INCLUDES:
- Central ROMDAS system,
- Single or dual Bump Integrators,
- GPS receiver,
- Survey laptop and vehicle mount.

SUGGESTED UPGRADES:
- ROMDAS Z250 Reference Profiler for setting up Bump Integrator calibration sites,
- Right of Way (ROW) video logging camera.
Common Configuration

‘Any Condition’ Roughness

RECOMMENDED FOR:
♦ Users who require high accuracy roughness data, but need to survey a range of very good to very poor pavement conditions.

KEY BENEFITS:
♦ Minimize costly downtime due to weather and environmental conditions by utilizing Bump Integrator data in wet or very rough conditions where lasers are not suited,
♦ Bump Integrators can be rapidly calibrated using the Laser Profilometers,
♦ Complies with widely accepted ASTM and World Bank standards for collecting roughness data,
♦ Scalable by adding new modules as required in the future,
♦ Can be easily installed on locally supplied vehicles,
♦ Use ROMDAS keycoding feature to perform visual condition and asset inspections while surveying,
♦ All data referenced with chainage and GPS coordinates.

INCLUDES:
♦ Central ROMDAS system,
♦ Single or dual Bump Integrators,
♦ Single or dual Laser Profilometers
♦ High Resolution DMI (HRDMI)
♦ GPS receiver,
♦ Survey laptop and vehicle mount.

SUGGESTED UPGRADES:
♦ Upgrade the Laser Profilometers to collection Macrotexture (MPD)
♦ Right of Way (ROW) video logging camera.

Modules Inside Vehicle

Bump Integrators
- Roughness (e.g. IRI)

Survey Laptop

Software Included

ROMDAS Data Acquisition
In vehicle

Laser Profilometers
- High Accuracy Roughness (IRI),
- Longitudinal Profile
- Optional: Macrotecture (MPD)
Common Configuration

Consultant Friendly System

**RECOMMENDED FOR:**
- Consultants or other users who’s requirements vary from project to project and want minimal upfront investment cost.

**KEY BENEFITS:**
- Collects many of the core datasets required for post-construction or network surveys.
- Adjustable camera mounting and DataView software gives users the flexibility of being able to measure visible condition or asset data in the office.
- Complies with widely accepted ASTM and World Bank standards for collecting data.
- Scalable by adding new modules as required in the future.
- Can be easily installed on locally supplied vehicles.
- Use ROMDAS keycoding feature to perform visual condition and asset inspections while surveying.
- All data referenced with chainage and GPS coordinates.

**INCLUDES:**
- Central ROMDAS system,
- Single or dual Bump Integrators,
- Single or dual Laser Profilometers with Macrotexture upgrade,
- Transverse Profile Logger (TPL),
- 1 x Right of Way (ROW) camera,
- High Resolution DMI (HRDMI),
- DGPS receiver,
- Survey laptop and vehicle mount,
- DataView software.

**SUGGESTED UPGRADES:**
- Add additional ROW cameras for wider or multiple viewing angle (e.g. left, center, right, rear),
- Add a Pavement View camera for more detailed images of surface defects,
- Add mobile mapping software to calculate the GPS position of roadside inventory for detailed GIS mapping.

**Modules Inside Vehicle**
- Bump Integrators
  - Roughness (e.g. IRI)
- Survey Laptop
- Laser Profilometers
  - High Accuracy Roughness (IRI),
  - Longitudinal Profile,
  - Macrotexture(MDS)
- Transverse Profile Logger (TPL)
  - Transverse Profile & Rutting

**Software Included**
- ROMDAS Data Acquisition In Vehicle
- DataView Office Post-Processing
- Right of Way (ROW) Camera
- GPS Antenna
Common Configuration

Cost Effective Network Survey System

RECOMMENDED FOR:
- Consultants or Government departments with limited budgets but are responsible for maintaining large regional or national road networks.

KEY BENEFITS:
- Exceptional price for a complete system capable of outputting the wide range of data needed for managing a modern road network,
- Complies with industry accepted ASTM and other international standards,
- Pavement View camera with DataView’s video rating feature allows users to record and measure visible pavement defects such as cracking and potholes.
- Create detailed GIS maps directly from ROW images using the Mobile Mapping software,
- Can be easily installed on locally supplied vehicles,
- Use ROMDAS keycoding feature to perform visual condition and asset inspections while surveying,
- All data referenced with chainage and GPS coordinates.

INCLUDES:
- Central ROMDAS system,
- Single or dual Laser Profilometers with Macrotexture upgrade,
- Transverse Profile Logger (TPL),
- 3 x Right of Way (ROW) cameras,
- Pavement View camera,
- Road Geometry Module,
- High Resolution DMI (HRDMI),
- DGPS receiver,
- Semi-ruggedized PC and vehicle mount,
- DataView software,
- Mobile Mapping software.

Software Included
- ROMDAS Data Acquisition In-Vehicle
- DataView Office Post-Processing
- Mobile Mapping Office Post-Processing

3 x Right of Way (ROW) Cameras

Pavement View Camera - Defect Imaging

Modules Inside Vehicle
- Road Geometry Module:
  - Cross slope
  - Gradient
  - Radius of Curvature
- Semi-ruggedized Survey Computer
- Laser Profilometers:
  - High Accuracy Roughness (TRI),
  - Longitudinal Profile,
  - Macrotexture (MPP)
- Transverse Profile Logger (TPL):
  - Transverse Profile & Rutting

Manufactured by Data Collection Ltd
BC Bentinck Street, New Lynn, Auckland 0600, New Zealand.
Ph.: +64 9 827 7703
Email: info@romdas.com
www.romdas.com
Common Configuration

State-Of-The-Art Network Survey System

RECOMMENDED FOR:

- Anyone who want the latest technology, highest accuracy and most reliable data for maintaining modern road networks.

KEY BENEFITS:

- Automatically collect cracking, potholes and other pavement defects,
- Utilizes advanced LCMS scanning lasers from world renowned Pavementics/INO and at the best price on the market,
- High resolution 3D profiling allows for the analysis of datasets not possible from traditional vehicle mounted systems,
- Pavement imaging during day or night,
- Lane tracking feature ensure consistent and repeatable profile positioning, overcoming influences like driver wander,
- Easily create detailed GIS maps using the Mobile Mapping software and 360 field of view (FOV) imagery,
- Install on locally supplied vehicles,
- JPEG images with automatically overlaid defects, include custom severity color coding,
- Innovative design allows the whole system to run off the vehicle power supply (i.e. no additional generators required),
- Easier maneuverability with no large bumper mounted devices,
- Use ROMDAS keycoding feature to perform visual condition and asset inspections while surveying,
- All data referenced with chainage and GPS coordinates.

INCLUDES:

- Central ROMDAS system,
- High Resolution DMI (HRDMI),
- DGPS receiver,
- Rack mount computer system,
- LCMS module,
- LCMS Roughness upgrade,
- LCMS Geometry upgrade
- 360 degree camera,
- DataView software,
- Mobile Mapping software.

SUGGESTED UPGRADES:

- None, this is the best you can get!

Software Included

- ROMDAS Data Acquisition
- DataView Office Post-Processing
- Mobile Mapping Office Post-Processing

Modules Inside Vehicle

- Rack Mounted Computer
- 360 Degree Camera
- LCMS
  - Crack (Automatic)
  - Rut Depth
  - Rut Width
  - Rut Cross-Sectional Area
-Macroscale (MS)
- Surface Raveling
- Surface Bleeding
- Pavement detection
- Concrete Joints and Faulting
- Water pooling depth
- Pavement Imagery (3RIG)

Upgrades Included

- Roughness (IR)
- Road Geometry
Common Configuration

Dedicated Mobile Mapping System

**RECOMMENDED FOR:**
- Those who want to record accurate GPS locations and measurements of roadside assets for establishing GIS databases.

**KEY BENEFITS:**
- Extremely time and cost efficient option compared to traditional methods, such as manual field surveys or Lidar systems,
- Full 360 field of view imagery,
- GPS receiver capable of real-time sub-meter GPS accuracy available worldwide,
- Easily create detailed GIS maps using the Mobile Mapping software and 360 field of view (FOV) imagery,
- GIS layers are exportable in commonly used formats (e.g. Shape or KML),
- Secure magnetic road mounting for easy setup,
- Use ROMDAS keycoding feature to perform visual condition and asset inspections while surveying,
- All data referenced with chainage and GPS coordinates.

**INCLUDES:**
- Central ROMDAS system,
- GPS receiver,
- Semi-rugged computer system and vehicle mount,
- 360 degree camera,
- ROMDAS geometry unit,
- DataView software,
- Mobile Mapping software,
- Omnistar VBS subscription (DGPS signal).

**SUGGESTED UPGRADES:**
- Upgrade the GPS receiver and Omnistar subscription for higher accuracy GPS positioning.
- For customers with limited budgets the 360 camera can be replaced with standard ROW cameras,
- Geometry unit can be removed for a lower cost, lower accuracy system.

**Software Included**

ROMDAS Data Acquisition
- In Vehicle

DataView
- Office Post-Processing

Mobile Mapping
- Office Post-Processing

360 Degree Camera

GPS Antenna

**Modules Inside Vehicle**
- Semi-ruggedized Survey Computer
- Road Geometry Module
  - Cross slope
  - Gradient
  - Radius of curvature
- Omnistar VBS subscription (DGPS signal)
Common Configuration

Dedicated iRAP System

RECOMMENDED FOR:
♦ Organizations responsible for road safety and intend to conduct iRAP surveys.

KEY BENEFITS:
♦ ROMDAS is an iRAP accredited system, this helps streamline an organization's certification as iRAP service providers,
♦ DataView offers a user friendly and comprehensive iRAP coding interface, including the ability to export data in compliant formats ready for star rating analysis,
♦ Secure magnetic road mounting for easy setup,
♦ Use ROMDAS keycoding feature to perform visual condition and asset inspections while surveying,
♦ All data referenced with chainage and GPS coordinates.

INCLUDES:
♦ Central ROMDAS system,
♦ GPS receiver,
♦ Semi-rugged computer system and vehicle mount,
♦ 3 x ROW cameras,
♦ ROMDAS Geometry unit,
♦ DataView software with iRAP version upgrade,

SUGGESTED UPGRADES:
♦ Add or subtract additional ROW cameras depending on the iRAP Class required for the project,
♦ Add any of ROMDAS’ pavement condition modules to simultaneous collect iRAP and road maintenance data.