

# IMQS: WATER DEMAND MANAGEMENT MODULE

Web-based Water Demand and Conservation Management Tool



## WATER DEMAND MANAGEMENT

*The IMQS Water Demand Management (WDM) Module is a web-based application that leverages important engineering and treasury data to offer a comprehensive and in-depth understanding of municipal water infrastructure use, demand and supply.*

IMQS's integrated software solves a variety of WDM problems by equipping the right people with the right information at the right time to inform strategic operational and financial planning. The module centralises and geographically presents data acquired from specialist engineering software, such as GLS Consulting's SWIFT system, for users to acquire practical information to inform decision-making and planning. Information is presented in a number of categories on a geographically linked user interface accessible on both desktop and mobile devices. The module offers customisable views on water demand and supply, unaccounted for water as well as statistical reports. Users are able to customise a range of settings, so that analyses can be performed of any treasury database and reports can be delivered in a variety of ways that are relevant to different municipal roles.

With IMQS, users can better identify outliers, or potentially malfunctioning assets, such as:

- Faulty meters
- Administrative errors
- Large water consumers
- Irregular spikes or dips in consumption
- Zone Leakage Indexes

Strategic reporting, such as non-revenue, unaccounted-for water, is performed on a zone basis, with the results of the related analyses directly transferred into IMQS. Account-level reporting is facilitated by the integration of treasury data sets within IMQS. The history of actions, such as water shortages or workflow summons, are shown either for individual consumers or on a ward-level. Actions or workflows are compared to payment

## WHO WE ARE

IMQS builds specialised, GIS-centric software for the Infrastructure Asset Management market. This means that we are committed to conceptualising and constructing solutions for real-world problems that impact the lives of people, at all levels and from all communities, on a daily basis. It is our business to think of innovative ways to enhance the value of your organisation's physical assets, while you focus on the work that matters – delivering key services to your valued customers. IMQS's software is currently enabling effective decision-making, service delivery and customer satisfaction in over 100 government and private organisations in South Africa and the internationally.

## WDM MODULE

- George Local Municipality
- Mobombela Local Municipality
- Merafong Local Municipality
- Mogalakwena Local Municipality
- Rustenburg Local Municipality
- Saldanha Bay Local Municipality
- Stellenbosch Local Municipality
- Witzenburg Local Municipality

## TECH BENEFITS

- Cloud-based
- Seamless deployment
- Fast and Secure
- Customizable
- User-friendly
- Mobile

## IMQS IN NUMBERS

- **143 534 km** combined length of water pipes
- **3 892 086** lines of code used to program our software and counting

responses in order to collect outstanding debt in the most cost effective manner. With the right information users are able to conduct analyses that inform comprehensive operating scenarios.

The IMQS Water Demand Management Module is a comprehensive solution to achieving greater success in water demand management. It integrates and centralises engineering and financial data for better decision-making and planning across all municipal departments involved.

## TECHNOLOGY

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IMQS is a web-based enterprise application software that enables effective infrastructure lifecycle asset management. The software consists of collection of web-services and components that are supported by specialised tools and frameworks. The core platform provides an extensive set of generic functionalities that together make the implementation of infrastructure management products possible. Due to its high level of configurability and ability to combine componentised sets of functionality, IMQS offers a highly flexible framework that is able to produce tailored made solutions. Users primarily interact with the IMQS service through a browser-based front-end, which is additionally supported by tablet-based apps.

Interfaces for the enterprise software follow REST principles, both internally and externally. All constituent services have a published API as their primary interface. These interfaces are the foundation on which the browser-based front-end is built. Standard protocols, like HTTP with JSON payloads, however, make it effortless for third parties to consume them for integration purposes. Authentication and authorization services enable security on the interface level.

IMQS's Version 8 stack runs on enterprise operating systems, including Linux (with Docker containerisation) and Microsoft Windows Server. Database technologies include Microsoft SQL Server and PostgreSQL, which are both tried and tested in high-demand environments.

A dedicated DevOps team manages the challenging and unique environment of on-site deployments from a central point. IMQS DevOps makes use of in-house developed, fit-for-purpose tools to manage client-specific data and configuration. The IMQS operations team attends to monitoring server health and service performance by using state-of-the-art monitoring software. This enables fast detection and pro-active response to developing issues in the production environment.

## KEY FEATURES

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### GEOGRAPHIC INFORMATION SYSTEMS



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The GIS functionality implemented in the IMQS Water Module shows the water network infrastructure overlaid on a spatial map in order to visualize the complete water infrastructure of an area defined by municipal boundaries. The water infrastructure is made up of various layers, which includes pipes, water sources, valves, etc. Each layer is broken down into more detail and categorized according to a legend. Consumption patterns are categorised according to actual or theoretical consumption.

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### OPERATING SCENARIOS



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In IMQS a scenario represents a specific spatial view of data. The WDM Module offers its user:

- Theoretical Scenarios - including categories such as “fully occupied” or “land use only”
  - Actual Consumption Scenarios
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## KEY FEATURES (continued)

### THEMES



In IMQS, themes provide a user with the ability to display data spatially in the form of shapes, symbols and colours. A theme comprises multiple layers, where each layer contains data of the same type like water pipes, valves or water sources. Each layer in turn uses one field within the dataset. This means that values contained in the field are grouped into ranges and each range is then reflected as a specific colour on the GIS Map. The data is then displayed as a point, line or polygon on a map, where the colour and symbol is defined by the theme.

### BESPOKE REPORTING



The reporting system is based on standard engineering reports that can be viewed on the IMQS built-in reporting platform. The reporting platform includes standard reporting tools such as filtering on a report or global level, but also more advanced capabilities that produce more complex reports, which include graphs.

### COMPREHENSIVE DATA GRIDS



Comprehensive Data Grids display data on a GIS Map in a list format. Users are able to find a range of features - like property category or consumption by land-use type - based on simple or more complex joint-filtering criteria.

The screenshot displays the IMQS web application interface. At the top, there is a navigation bar with 'HOME', 'WATER DEMAND Stands (General)', and 'MAP Stand Suburb Category'. A search bar is present with the text 'Click to begin search'. The main area shows a GIS map of a residential area with a selected stand highlighted in red. The interface includes a navigation menu on the left and a detailed panel on the right for 'Water Meters'. The 'Water Meters' panel shows the following data:

Water Meters	
000000000060354144	
General	
Meter ID	000000000060354144
Water Reading	
Jan 2015 Jul 2015 Jan 2016 Jul 2016 Jan 2017 Jul 2017	
Serial Number	000000000060354144
Metered Flow (kL/d)	0.03
Metered Flow (kL/yr)	10
Readings	
Adjustment Code	0
1 Month Ratio	1
3 Month Ratio	1
Days since last reading (days)	12
Last Consumption	0.03
Last Measurement	16765
Last Measurement Date	April 24, 2017
Last Measurement Code	01::01   BF: RF: 1.00000
Total Flow through the meter (kL)	64.000
Period of Constant Consumption (months)	157
Route Number	1515401B

Image: Water Meter Details for Selected Stand

## KEY FEATURES (CONTINUED)

### TELEMETRY



The Telemetry system implemented in IMQS provides its user with a spatial view of the operational status of their water network. Data is gathered from sensors across the water network and converted into information that can be displayed spatially on a GIS Map. Each cluster of sensors is represented by a symbol on the map and can provide its user intelligence to inform monitoring and decision-making.

### WATER DEMAND GRAPHS



The IMQS WDM Module offers its user the value of information on water consumption and asset performance in the form of generic graphs:

- Faulty meters
- Administrative errors
- Large water consumers
- Irregular spikes or dips in consumption
- Zonal Leakage Index

## CONCLUSION

The IMQS WDM Module empowers municipalities to make better decisions about water demand and supply within their boundaries. The module enables a proactive approach to demand management and conservation. As a WDM tool, the software offers a more realistic geographic view representation of consumption, which in turn enables the enforcement of stricter demand management measures as well as more effective revenue enhancement strategies. In so doing, this software package helps municipalities achieve greater customer accountability, ensures a fair distribution of water, as well as supports planning and the better use of public funds. The geographic visualisation of information makes IMQS a key node in the WDM decision-making process. While IMQS maintains its own powerful GIS system, the module integrates effortlessly with other GIS ERP systems, such as ESRI. This offers users the freedom to work on their preferred GIS platform without having to waste time by switching between systems.

## CONTACT

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