

Wireless Data Logger

User Guide

Wireless Data Logger
DatScan People Counter System
Revision 2.0



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1.2	February 2018	Modified copyright, used with firmware version 1.03
2.0	May 2018	Reformatted and updated specifications

Introduction

About This User Guide

This document provides assistance with the installation and operation of the QTech Wireless Data Logger (WDL). The WDL is a component of the QTech DatScan People Counter System.

Other documents that should be read in conjunction with this document include:

- DatScan Analyser User Guide
- DatScan EP3 data Manager User Guide

Additional help may be found at www.qtech.co.nz, where application notes can be obtained to provide guidance for specific configuration scenarios, detailing the configuration workflow steps.

This version of the guide incorporates a system description, installation instructions and technical specification summary.

Product overview

Datscan is a dedicated and fully integrated wireless people counting & Data Logging system. The system is the perfect solution for all people counting applications such as public facility usage and trend analysis. The Datscan system is in use around New Zealand providing public toilet usage data for service provision analysis.

The WDL comprises a wall mounted enclosure fitted with a PIR sensor to capture people movements and an internal, battery-operated data logger, fitted with a wireless short-range radio module.



Figure 1: WDL in rugged enclosure (antenna version not shown)

Features

- Compact multi-channel battery operated data logger.
- 4 Digital Inputs and 4 Analogue inputs.
- Integrated Real Time Clock for event timestamps
- 1 Mb memory storing approximately 16,000 time-stamped event records.
- Data retrieval formats suitable for desktop spreadsheet or enterprise database use.
- 900 MHz Short range radio up to approximately 50m for local network communications and data retrieval from the WDL.
- No radio operating license or subscription costs.
- Low power Data logger module powered by 2 x AA cell batteries providing approximately 6 months of continuous use.
- PIR (Passive Infra-Red) movement sensor Module powered by 4 x D cell batteries providing approximately 1 year of continuous operation.
- Vandal resistant stainless steel enclosure with stainless steel fixings

- No fixed wiring and minimal installation & running costs

Systems Overview

A DatScan system can be configured in a number of ways including:

- Fully automated data monitoring and data retrieval via cellular or wireless LAN to an enterprise software and database system
- Autonomous data capture and logging using QTech Data Loggers with manual data retrieval using a wireless handheld device (EP3 data manager). Manual data imports function to desktop spreadsheet or database software.

DatScan Analyser is a desktop PC application that is used for managing and reporting on the data that is obtained from the QTech Data Loggers.

For automated operation the data is retrieved to a DATAHost base station. Your data logger needs to be equipped with a cellular modem or LAN bridge connection for this option. DATAHost is a real time data collection service (based on the QTech DATRAN real-time telemetry engine) that manages the communications and storage of data from QTech DATScan People Counters.

For manual operation, data is transferred to an EP3 Data Manager and then must be imported from those devices to a database or spreadsheet for analysis. For this mode of operation, the Data Logger will be equipped with a 2.4GHz radio module (Q54 model) or a 900 MHz radio module (Wireless Data Logger - WDL).

The Data Loggers are installed and the collected data is periodically retrieved wirelessly to the EP3 & stored on SD card. The data can then be exported from the EP3 Data Manager in CSV format for processing or analysed & graphed directly with the DATScan Analyser software or by reporting tools such as Microsoft SQL Server reporting Services for enterprise databasing operations.

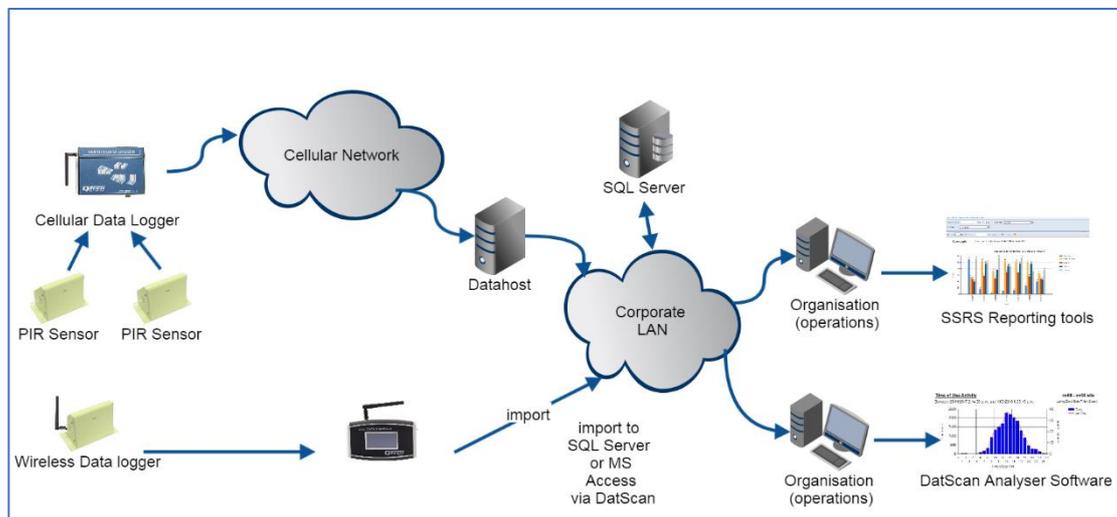


Figure 2: Typical System Configurations

Getting started

This section describes procedures for readying the product for use.

System and Equipment Requirements

The following tools and equipment are used for installation and commissioning and maintenance of the product.

- Fixings: ceiling mount - 6 x 4.8mm (3/16" Diam.) blind rivet (6.4 mm, 1/4" Grip), and rivet gun
- Fixings: wall mount – size to fit 6 x M6 panel hole (fixings not supplied)
- Batteries: 2 x "AA" Lithium (data logger module), 4 x "D" cell alkaline (for the PIR module)
- 2.5 mm hex Allen key (for enclosure entry, battery replacement)
- EP3 Data Manager for verification of operation
- SD Card for Data Transfer
-

Installation

The Data Logger enclosure is of a robust stainless-steel construction made from 1.5mm stainless steel with a 3mm mounting plate, weighing approximately 1.8 kg. This enclosure has been designed to minimise vandalism and present a difficult enclosure for access. This unit is not deemed to be waterproof and care should be taken if it is mounted in areas where high pressure water cleaners are used.

The unit has a self-contained PIR for monitoring movement (foot traffic / people counting), mounting is important to deliver the best results.

The unit is battery powered, the Wireless Data Logger module is powered by two AA pen light batteries. The PIR is powered by four D size batteries. Please note that the batteries supplied by QTech are high capacity and have been provided specifically for the purpose, using lesser capacity batteries may not deliver the same lifetime performance. Similarly, changing only one of the two batteries at a time may result in reduced performance. i.e., when changing any battery, it is good practice to replace all batteries at the same time.

When used for counting foot traffic, mounting the Wireless Data Logger, is best, either above the entrance way or in a place where the entry and exit is narrow and restricts the traffic through the catchment area of the PIR.

The PIR has a purposely refined narrow band of operation when mounted at 2100 mm above the floor (typical standard door height) the area of operation for the PIR sensor is approximately 1200mm wide by 400mm deep.

The PIR sensor is mounted so that it is angled so when it is mounted flat against the wall the sensors operational area is below and in front of the unit as shown in the figure below.

Remove the battery isolation tabs from the battery holder prior to first use.

Remove the protective tape over the PIR before first use.

Wall Mount

The enclosure should be mounted on a flat surface in a vertical position, this seats the enclosure so that the natural angle of enclosure, where the PIR is positioned, angles upwards (see Figure 3: PIR Operation Footprint). The enclosure has six fixing holes through the base plate. Should it be more

appropriate to mount the enclosure from the ceiling then an overhead fixing plate is optionally available (see Figure 5: Ceiling Mount Bracket).

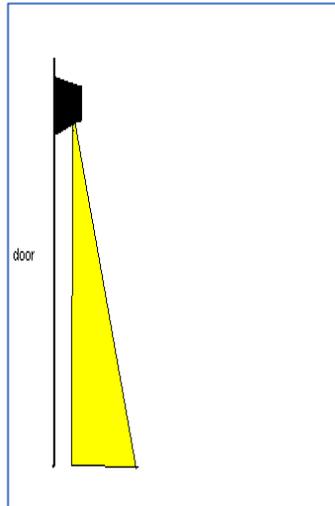


Figure 3: PIR Operation Footprint



Figure 4: Base Plate Layout

Ceiling Mount

A bracket is available (optional) for mounting the unit from the ceiling is more appropriate for the location. This bracket is supplied with six 4.8mm pop rivets which may be used to secure the bracket to the WDL enclosure. Pop rivets are supplied as this will prevent the opportunity for vandalism where some enterprising individual may unbolt the units if they were secured by nuts and bolts.



Figure 5: Ceiling Mount Bracket



Figure 6: WDL fitting to Ceiling Bracket, rivet placement

OPERATION

Each WDL unit is pre-configured in the factory with:

- A Customer Name – the organisation operating the device
- A site number – uniquely identifying the WDL, this is also printed on the unit
- The Radio Channel - allocated by QTech

Units are sold with an EP3 data manager, supplied with an SD Card which can be preconfigured in the factory with customer and site information preloaded.

Verifying installation

An EP3 with the site configuration loaded onto the SD Card is required to communicate with the WDL to verify operation.

To verify operation follows these steps:

1. Check that the tape over the PIR and battery tabs has been removed. This will supply power to the logger and power up the PIR.
2. Wait approximately 30s for the PIR to initialize.
3. Walk past the PIR a few times to generate some events
4. Insert the supplied SD Card into the EP3 and power it on
5. Navigate to the WDL site and the EP3 will attempt to communicate with the WDL. If successful the EP3 screen will display the number of event records that have been captured.
6. If necessary synchronize the time on the WDL with the EP3

Note. The WDL captures events for both person present and absent (arriving and departing) at the PIR. It may therefore appear to the installer that twice as many events have occurred as expected.

Note. Please refer to the EP3 Data Manager User Guide for instruction in the operation of the EP3 and communication to the WDL.

Data Retrieval

Please refer to the EP3 Data Manager User Guide for instruction in the operation of the EP3 and communication to the WDL for data retrieval.

Configuration

Note. The EP3 is also used for some configuration functions including:

- Internal clock Date/Time setting

Site Configuration

Customer and Site information including radio settings are configured at the factory. Please contact QTech if the WDL requires reprogramming.

Technical Specifications

Note. Specifications are subject to change without notice.

WDL Specification

Item	Parameter	Specification
General		
	Dimensions	Case: H 135 x W 156 x D 105 mm (excluding mounting plate) Data logger module: approx. 85 x 60 x 15 mm
	Weight	1800 gms
Enclosure		
	Material	Case: 1.5 mm stainless steel Mounting Plate: 3mm stainless steel 200 x 100mm
	Finish	Powder Coated (special order option only)
Environmental		
	Temperature	Operating: 0-65 degrees C Storage 0-65 degrees C
	Humidity	0 -90% non-condensing
	Ingress Protection	IP64
Electrical		
	Power	Data Logger: Input voltage: 3V (2 x 1.5 "AA" alkaline batteries) Current: approx. 400 uA average
		PIR: Input Voltage: 6V (4 x "D" alkaline batteries) Current: approx. 400 uA
	Clock	Internal, battery-backed.
	Storage	1Mb – non-volatile event storage (approx. 16,000 records) 8 KB – non-volatile configuration data
	Inputs	4 x Digital (internally connected to common ground) 4 x Analogue (5V or 10V max input voltage, jumper selectable) (application specific, contact QTech for options)
Radio		
	Regulatory	ISM Band, AS/NZS 4268
	Antenna	Detachable SMA
	Operating Frequency	915 – 928 MHz
	Output power	18 +/- 2 dBm
	Receiver Sensitivity	-121 dBm
	Modulation	GFSK
Sensor		
		Passive Infra-Red (PIR)
	Beam width	1200 mm (max.)
	Beam Depth	400 mm (max)
	Mounting Height	Greater than 2100 mm (recommended)
Communications		
	Data Retrieval	EP3 Data Manager, storage: SD Memory Card
	Configuration	EP2 Programmer (factory use only)

SD Card Specification

The EP3 Data Manager uses an SD card interface for file transfer. The memory card must be formatted as FAT32. Typical memory device specifications are:



- Capacity: 8GB/16GB
- Standard: SDA 2.0
- Dimensions: 24 x 32 x 2.1mm (W x H x D)
- Weight: 2g
- Voltage: 2.7~3.6V
- Performance: Approximate Speed (read): 10~14 (MB/s), (write): 4~5 (MB/s)
- Speed Class: Class 10

Other card specifications may work but the user should verify that the EP3 can read the memory card correctly.

Warning. Performance of SD cards from some manufacturers may vary. If problems occur loading files then try using a class 4 SD card instead.

Warranty

The Wireless Data Logger hardware and software is covered by QTech Limited Warranty Agreement and software End User License Agreement, respectively.

Please refer to the QTech Limited Product Warranty Agreement, which may be downloaded from the QTech website: www.qtech.co.nz

QTech Data Systems Limited does not warrant the suitability of this product for any particular application as the conditions in which it is used are beyond our control. This is notwithstanding warranty of merchantability.

Additional Information and Support

If you have problems try the following:

- Visit the QTech web site for application notes and guides
- Refer to the troubleshooting section if one is present in this document
- Contact the support desk at support@qtech.co.nz
- Phone the support desk, contact details at beginning of this document



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