Database Manual

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1   Database Architecture

Management of the databases is handled by the **CloudWorks Server** software module. **CloudWorks Server** supports a multiple database architecture, meaning that it will extract data from the remote devices and insert the relevant data into a possible multiple series of databases.

The **CloudWorks Server** software will automatically populate the database that is associated with a specific device. Each database and device has a Vendor Code assigned to it. Data is matched between these systems using that code. This code is also used to separate communications between different vendors, preventing the cross accessing of devices by unauthorised users.

CloudWorks uses MySQL as a database management system. **MySQL Server** can be installed from the following location MySQL Server install.

Please remember to write down the selected root access password when setting up MySQL Server. Losing this password may make it impossible to get access to your database in the future.

Databases are normally present on the same server as the **CloudWorks Server** software but can be hosted on any other server networked in some way to the **CloudWorks Server** machine.

In order for it to be easier to navigate the devices in the field, the database has been divided into 3 different levels. At the top most level are the zones. Zones could be geographical areas such as cities/countries or non-geographical entities such as clients etc. Within a zone there are sites. A site would be an installation within a zone, such as a building or basically a sub section of a zone. Contained in a site are all the devices associated with that site. For example a remote pump station with three loggers would have those three loggers listed within that site.
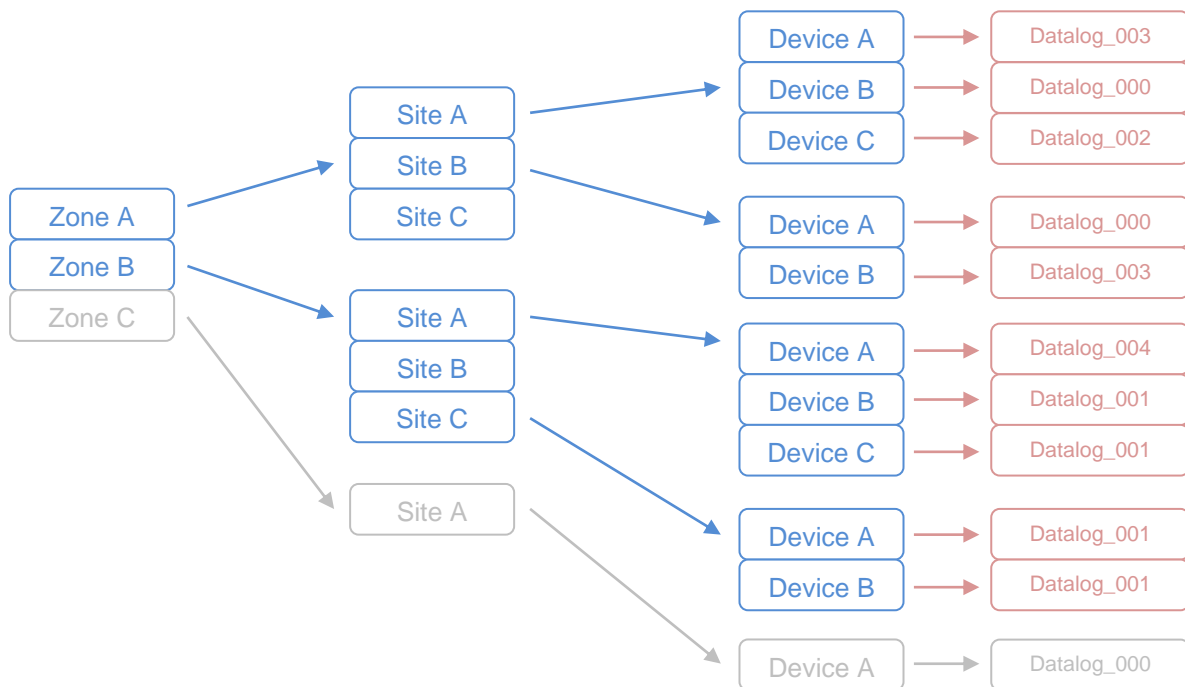
MySQL Database Architecture

Each device in the database contains information regarding its configuration data as well as last read status information. The last read status information is data that is read from the device at the time of the connection. Also linked to each device is a datalog which data collected by the device on regular time intervals.
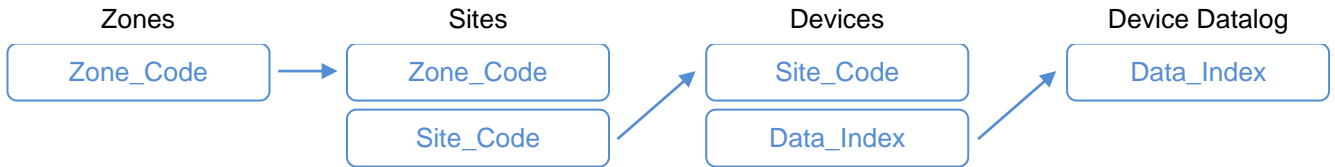
This datalog data is inserted into a series of datalog tables at the time of download. Because the applications vary on these devices, and the data is different for each application, a different datalog table is created for each application. Applications on CloudWorks devices are assigned a number and are selected during the set up of the device.

The datalog table that is populated for each application type uses the following naming convention:

 'datalog_xxx' where xxx is the application number.

Data fields within each of these tables will vary depending on the application.

In terms of the primary keys, the database is indexed as follows:-

Zones	Sites	Devices	Device Datalog
Zone_Code	Zone_Code	Site_Code	Data_Index
	Site_Code	Data_Index	

2   Connecting to the Database

Connections to a MySQL database are done through a TCP/IP connection that normally defaults to port 3306. This port number can be changed on the MySQL Database Server and all the related CloudWorks software. Changing the port number can provide as certain amount of extra security.

Database Usernames and Passwords are the same as those provided by your system administrator in the creating of the database using **CloudWorks Server**.

Your system administrator can provide a entirely separate user profile to the database by means of any external database management software.

3   Database Tables

Below is a brief description of the tables within the database and their related functions. All the fields within the CloudWorks database are commented to give details as to their content.

3.1   System Details Table

The system_details table contains the very important Vendor Code and database version number. This Vendor Code is the code which will associate all the remote devices with this particular database. The database version number is used for the tracking of the upgrades to the database as new systems and applications become available.

3.2   System Users Table

System Users Table contains all the relevant information regarding the Users of the CloudWorks system.

3.3   Zones Table

The zones table holds information regarding each zone.

3.4   Sites Table

The sites table holds information regarding each zone. Each site is indexed back to the zones table with the zone_code key. The listed time zones are as follows:

Available Time Zones
UTC-12:00) Dateline Standard Time
(UTC-11:00) UTC-11
(UTC-10:00) Aleutian Standard Time
(UTC-10:00) Hawaiian Standard Time
(UTC-09:30) Marquesas Standard Time
(UTC-09:00) Alaskan Standard Time
(UTC-09:00) UTC-09
(UTC-08:00) Pacific Standard Time (Mexico)
(UTC-08:00) UTC-08
(UTC-08:00) Pacific Standard Time
(UTC-07:00) US Mountain Standard Time
(UTC-07:00) Mountain Standard Time (Mexico)
(UTC-07:00) Mountain Standard Time
(UTC-06:00) Central America Standard Time
(UTC-06:00) Central Standard Time
(UTC-06:00) Easter Island Standard Time
(UTC-06:00) Central Standard Time (Mexico)
(UTC-06:00) Canada Central Standard Time
(UTC-05:00) SA Pacific Standard Time
(UTC-05:00) Eastern Standard Time (Mexico)
(UTC-05:00) Eastern Standard Time
(UTC-05:00) Haiti Standard Time
(UTC-05:00) Cuba Standard Time
(UTC-05:00) US Eastern Standard Time
(UTC-05:00) Turks And Caicos Standard Time
(UTC-04:00) Paraguay Standard Time
(UTC-04:00) Atlantic Standard Time
(UTC-04:00) Venezuela Standard Time
(UTC-04:00) Central Brazilian Standard Time
(UTC-04:00) SA Western Standard Time

(UTC-04:00) Pacific SA Standard Time
(UTC-03:30) Newfoundland Standard Time
(UTC-03:00) Tocantins Standard Time
(UTC-03:00) E. South America Standard Time
(UTC-03:00) SA Eastern Standard Time
(UTC-03:00) Argentina Standard Time
(UTC-03:00) Greenland Standard Time
(UTC-03:00) Montevideo Standard Time
(UTC-03:00) Magallanes Standard Time
(UTC-03:00) Saint Pierre Standard Time
(UTC-03:00) Bahia Standard Time
(UTC-02:00) UTC-02
(UTC-02:00) Mid-Atlantic Standard Time
(UTC-01:00) Azores Standard Time
(UTC-01:00) Cape Verde Standard Time
(UTC) UTC
(UTC+00:00) Morocco Standard Time
(UTC+00:00) GMT Standard Time
(UTC+00:00) Greenwich Standard Time
(UTC+01:00) W. Europe Standard Time
(UTC+01:00) Central Europe Standard Time
(UTC+01:00) Romance Standard Time
(UTC+01:00) Sao Tome Standard Time
(UTC+01:00) Central European Standard Time
(UTC+01:00) W. Central Africa Standard Time
(UTC+02:00) Jordan Standard Time
(UTC+02:00) GTB Standard Time
(UTC+02:00) Middle East Standard Time
(UTC+02:00) Egypt Standard Time
(UTC+02:00) E. Europe Standard Time
(UTC+02:00) Syria Standard Time
(UTC+02:00) West Bank Standard Time
(UTC+02:00) South Africa Standard Time
(UTC+02:00) FLE Standard Time
(UTC+02:00) Israel Standard Time
(UTC+02:00) Kaliningrad Standard Time
(UTC+02:00) Sudan Standard Time
(UTC+02:00) Libya Standard Time
(UTC+02:00) Namibia Standard Time
(UTC+03:00) Arabic Standard Time
(UTC+03:00) Turkey Standard Time
(UTC+03:00) Arab Standard Time
(UTC+03:00) Belarus Standard Time
(UTC+03:00) Russian Standard Time
(UTC+03:00) E. Africa Standard Time
(UTC+03:30) Iran Standard Time
(UTC+04:00) Arabian Standard Time
(UTC+04:00) Astrakhan Standard Time
(UTC+04:00) Azerbaijan Standard Time
(UTC+04:00) Russia Time Zone 3
(UTC+04:00) Mauritius Standard Time
(UTC+04:00) Saratov Standard Time
(UTC+04:00) Georgian Standard Time
(UTC+04:00) Caucasus Standard Time
(UTC+04:30) Afghanistan Standard Time
(UTC+05:00) West Asia Standard Time

(UTC+05:00) Ekaterinburg Standard Time
(UTC+05:00) Pakistan Standard Time
(UTC+05:30) India Standard Time
(UTC+05:30) Sri Lanka Standard Time
(UTC+05:45) Nepal Standard Time
(UTC+06:00) Central Asia Standard Time
(UTC+06:00) Bangladesh Standard Time
(UTC+06:00) Omsk Standard Time
(UTC+06:30) Myanmar Standard Time
(UTC+07:00) SE Asia Standard Time
(UTC+07:00) Altai Standard Time
(UTC+07:00) W. Mongolia Standard Time
(UTC+07:00) North Asia Standard Time
(UTC+07:00) N. Central Asia Standard Time
(UTC+07:00) Tomsk Standard Time
(UTC+08:00) China Standard Time
(UTC+08:00) North Asia East Standard Time
(UTC+08:00) Singapore Standard Time
(UTC+08:00) W. Australia Standard Time
(UTC+08:00) Taipei Standard Time
(UTC+08:00) Ulaanbaatar Standard Time
(UTC+08:30) North Korea Standard Time
(UTC+08:45) Aus Central W. Standard Time
(UTC+09:00) Transbaikal Standard Time
(UTC+09:00) Tokyo Standard Time
(UTC+09:00) Korea Standard Time
(UTC+09:00) Yakutsk Standard Time
(UTC+09:30) Cen. Australia Standard Time
(UTC+09:30) AUS Central Standard Time
(UTC+10:00) E. Australia Standard Time
(UTC+10:00) AUS Eastern Standard Time
(UTC+10:00) West Pacific Standard Time
(UTC+10:00) Tasmania Standard Time
(UTC+10:00) Vladivostok Standard Time
(UTC+10:30) Lord Howe Standard Time
(UTC+11:00) Bougainville Standard Time
(UTC+11:00) Russia Time Zone 10
(UTC+11:00) Magadan Standard Time
(UTC+11:00) Norfolk Standard Time
(UTC+11:00) Sakhalin Standard Time
(UTC+11:00) Central Pacific Standard Time
(UTC+12:00) Russia Time Zone 11
(UTC+12:00) New Zealand Standard Time
(UTC+12:00) UTC+12
(UTC+12:00) Fiji Standard Time
(UTC+12:00) Kamchatka Standard Time
(UTC+12:45) Chatham Islands Standard Time
(UTC+13:00) UTC+13
(UTC+13:00) Tonga Standard Time
(UTC+13:00) Samoa Standard Time
(UTC+14:00) Line Islands Standard Time

3.5   Device Table

Although the device table is common to all the applications, it is populated slightly differently depending on the application type chosen for the specific device.

3.6   Datalog Tables

Each application type has a associated with it an application number. When datalog data is extracted from the remote device, it is populated into a datalog table with the corresponding application number. The naming convention is a follows:-

datalog_xxx where xxx is the application number

3.7   Offline Scripts Table

The offline_scripts table contains all the script commands that will be executed when a device wakes up and connects to the server. This includes the completed commands and their responses.