



CDS553 Cirrus Pulse Logger User Manual

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1 CDS553 CIRRUS PULSE LOGGER

1.1 Introduction

The Cirrus Pulse logger is a robust, sophisticated LTE/4G GSM logger/controller with a wide range of input capabilities, making it ideal for a large number of measurement applications.

Communication to your own server and database can be achieved via the internet or a private APN. The software running on these servers is supplied free of charge. The Cirrus Pulse Logger has been designed to allow for easy installation and setup without the need for a complicated server infrastructure. Setup and management software (CloudWorks) is also supplied free of charge to allow clients to manage their own networks and data. There are no monthly charges for collecting and hosting data as the client can provide this service themselves.



1.2 Features

- Uses GPRS/EDGE/LTE/4G technology. 4G has become essential as many cellular network providers around the world will soon no longer be supporting older GPRS/3G technologies, rendering these legacy dataloggers obsolete. This has already started happening in many countries around the world.
- Bluetooth interface setup and manual data collection can be achieved through the Bluetooth interface negating the need for cables that invariable fail during continuous use.
- Optional external power operation with battery failover.
- Uses standard off-the-shelf alkaline batteries. This logger uses 3x standard D Cell alkaline batteries that can last in
 excess of 5 years under normal usage. Many other loggers use lithium batteries that are expensive and difficult to
 obtain. Other problems involving lithium batteries are the restrictions when shipping using airfreight. All lithium
 batteries need to be shipped as hazardous cargo that is becoming increasingly difficult to achieve as many airlines
 are no longer allowing these batteries on their aircraft.
- 2 x Pulse input ports Pulse inputs are used on metering devices that supply a pulse output for a measured amount of product.

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- ECO interface for connecting to GWF meters..
- Large onboard non-volatile memory This logger can record in excess of 14400 datalog records (application dependent).
- Logging intervals from 1 minute to 1 month. Information is internally logged, time and date stamped and transmitted at programmable intervals.
- Remote programming of all setup parameters via GPRS link or SMS.
- Ideal for leak detection, alarming to prevent water loss.
- Onboard Bluetooth can stream diagnostic information about signal strength, network status etc.
- Touch sensitive button and LED's for manual wakeup to server and diagnostic purposes etc.

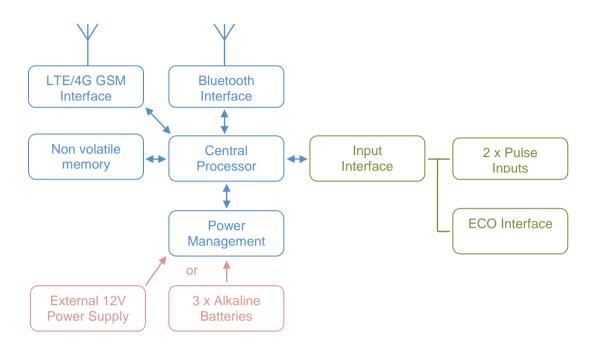
1.3 Specifications

- GPRS/EDGE/ LTE/4G Modem Technology
- LTE-FDD B1/B3/B5/B7/B8/B20/B28
- LTE-TDD B38/B40/B41
- GSM 850MHz/900MHz/1800MHz/1900MHz
- Bluetooth interface
- Powered by battery or external 12V supply
- Option of external power with battery failover and sleep
- All management software supplied free
- Standard Alkaline Batteries 3 x D cells (5+ years)
- 2 x Pulse inputs
- ECO interface for connecting to GWF electronic meters
- Up to 14400 record datalog memory (application dependent)
- Full SMS driven command set
- Logging intervals 1 minute to 1 month
- Rugged housing with seal eye
- Touch sensitive button and LED Diagnostics
- Configuration and diagnostics through Bluetooth interface
- Fully configurable remotely
- Stream data in real-time when powered by external supply
- Size 185mm x 130mm x 55mm (including cable glands)
- Housing Protection Class : IP68 Max 1.2m, 30 days
- Environment : -20°C to 80°C humidity = 90% non condensing. Check battery specifications for low power systems
- Uses a Micro SIM card

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1.4 Architecture



1.5 Power Modes

The Cirrus Pulse Logger can operate in one of two power configurations.

- Mains powered in this mode the logger can be continuously connected to the server allowing for the streaming of live data.
- Battery powered The Cirrus Pulse logger uses standard 'D' Cell alkaline batteries that will last several years depending on the operation. In this mode, the logger will 'wakeup' (adjustable normally 6 hourly) and upload its recorded data to a remote database.
- External 12V (8-15V) 2A supply in this mode the logger can be continuously connected to the server allowing for the streaming of live data. Batteries can be fitted and the logger will automatically switch to battery mode should the power fail.



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1.6 LED and button functions

On the front of the logger, there are 2 LED's and a touch sensitive 'SELECT' button. Internally on the reverse side of the lid is the Bluetooth reset button.



1.6.1 LED functions

Blue LED - Bluetooth status

- Flashing indicates the Bluetooth is ready to receive an incoming connection
- Solid light indicates and active connection

Red LED - Logger status

- Solid Logger is in Command Mode (normally accompanied by an active Bluetooth connection)
- Fast flash Logger is currently initiating a connection to the server
- Slow Flash Connection has been established to the server

1.6.2 Pushbutton Functions

SELECT touch button - Please note, this button is touch sensitive in order to maintain the waterproof status of the housing.

- Single short push will toggle the Bluetooth radio on and off.
- A push of more than 3 seconds will result in the logger establishing a connection to the server and uploading its datalog.

BLUETOOTH RESET button - This button is used to reset the Bluetooth interface in the event of a lost password or generally configuration loss.

The Bluetooth interface of this logger can be configured to have a access password which will limit external access to only those issued the password. Should this password get lost, the logger can be opened and the Bluetooth interface reset to disable the security. It is advisable to then connect to the logger again and setup a new password. This is explained later in this document.

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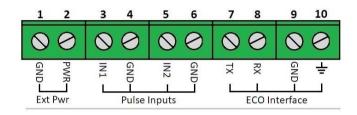


In order to reset the Bluetooth interface, with the housing open, please follow the below procedure.

- Remove all power from the logger remember to remove the batteries if external power is present.
- Press and hold the Bluetooth reset button.
- Power up the logger again while holding the button. Bluetooth LED will be on confirming the button has been pressed.
- Once the Red Status LED comes on again, the button can be released.
- This will now reset the Bluetooth interface.

1.7 Connections

Connections are available on a series of 10 terminal connectors.



These connections are as follows:

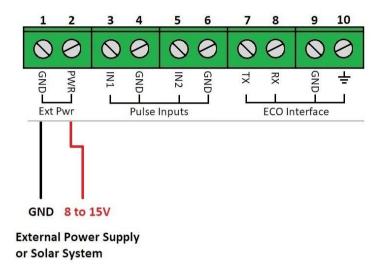
- 1. External Power Supply / Solar system ground (optional)
- 2. External 12V Power Supply / Solar system (optional)
- 3. 24V 30mA max power generator output (used for powering a current loop device)
- 4. Ground for the 24V generator
- 5. Isolated negative connection for 4-20mA isolated loop input
- 6. Isolated positive connection for 4-20mA isolated loop input
- 7. ECO Transmit line
- 8. ECO Receiveline
- 9. ECO ground connection
- 10. System earth used for transient voltage suppression

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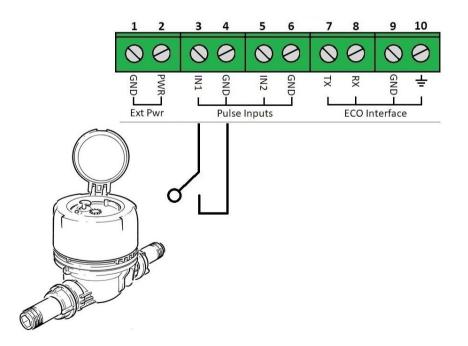
1.8 External Power Supply / Solar System Connection

The CDS553 Cirrus Pulse logger can be powered entirely from an external 12V (8-15V) 2A power supply or solar power source. Using a solar power source and also populating the logger with alkaline batteries means that the logger can be put into dual mode. In this mode, while there is solar power available, the logger will remain online with the server. Should the solar power fail, the logger will automatically switch to 'battery' mode until the solar power source is restored. This is ideal for remote applications where there is no mains power available and streaming data is required.



1.9 Using the pulse inputs

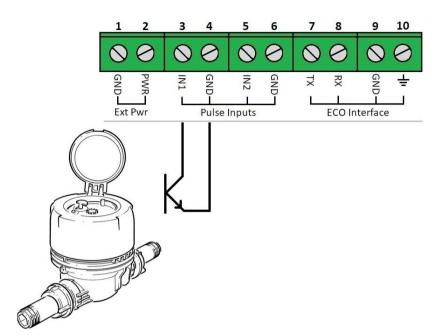
Onboard the Cirrus Pulse logger are 2 pulse inputs. Pulse inputs are used by metering type devices (eg water or energy meter) to measure consumption.



Example configuration of water meter with a volt free switch (e.g. reedswitch)

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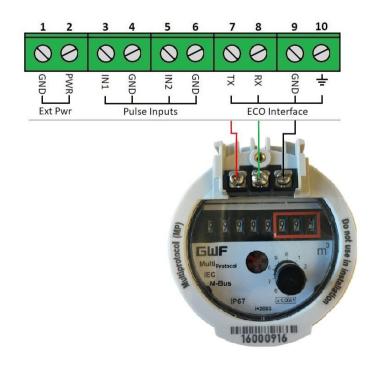




Example configuration of water meter with electronic interface. Please note the polarity of the interface. Ground connection to pin 4 (or 6 for Input 2).

1.10 Using the ECO interface

The onboard ECO interface is primarily used to support the GWF range of water meters with these interfaces installed. The interface provides power to the meter, as well as reading back the data string from the meter.

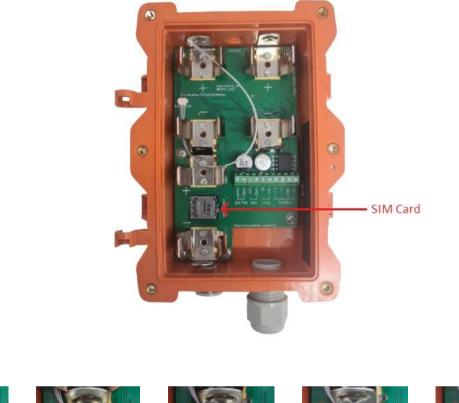


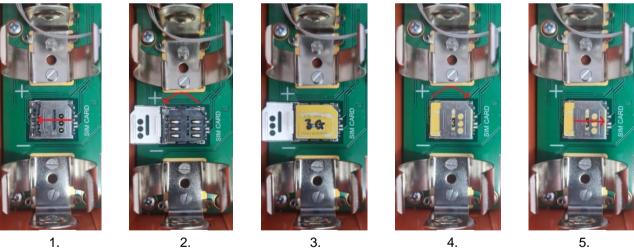
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1.11 Sim card and battery installation

The CDS553 Cirrus logger uses a MicroSIM and is installed as follows.





- 1. Slide the cover plate backwards to unlock.
- 2. Flip the cover plate up to expose the connections.
- 3. Place the sim card with the connections facing downwards. Please note the position of the notch.
- 4. Flip the cover plate down again to cover the sim card.
- 5. Slide the cover plate forward again to lock into the base.

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Battery Installation

1.12 Installation considerations

The CDS553 Cirrus Pulse logger is environmentally rated to IP68 - max1.2m. In order to achieve this, it is critical that any cables entering the logger are properly sealed by the IP68 gland. This gland is designed to only have one cable exiting the logger and not multiple ones. Multiple cables will prevent the gland from achieving a proper seal.



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2 LOGGER SETUP

This logger can be configured using 3 different methods:-

- 1. Through the local Bluetooth interface.
- 2. Remotely when a logger is powered and is currently online.
- 3. Via a scripting method for battery operated loggers that sleep most of the time.

2.1 Setup via Bluetooth Configure

The CDS553 Cirrus Pulse logger has an onboard Bluetooth interface which allows for the device configuration to be done locally. There are two different places in the software to activate the Bluetooth connection. The first option is from the log in screen at start up.

Username Password	Change Password Cancel Login
₽Ţ Database Setup	Device Setup

The purpose of having it here is to allow the user to access the Bluetooth setup option without needing to connect to the server and authenticating. This is useful in instances where there is no internet connection available in the field.

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Cloudworks

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The second option is on the Zone screen by pressing the 'Device Setup' button.

	Refresh Database	e Sys	tem Users Da	atabase Control	((ရာ)) Comms Status	System Set	up Layout Co	ontrol E		evice Setup	Add Zone	Select Zone	Delete Zone	Cancel	Save Save	
_								Zone Deta	ils	\sim						
t Zor	ne											Zone Informatio	n			
lo.	Zone Code	Alarm	Description	Contact Name	Address 1	Address 2	Address 3	Address 4	Country	P/Code	Telephone	Zone Code				
1	TEST_ZONE		ABB Stonehouse	Steve Dickson	Oldends Lane	Stonehouse	Gloucesterhire		United Kingdom	GL103TA +	441453826661	Description				
												Contact Nam	e			
												Address				
												Country				
												Country				
												Postal Code Telephone				
												Fax				
												Cellular				
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Activating this function will launch the Bluetooth Server which will search for the available remote devices in the immediate vicinity.

		luet		ĥ
No.	Device Code	Friendly Name	Address	
Searc	h All Bluetooth	Cancel	Refresh	Connect

Once the search has been completed, a list of all the available devices will be displayed. Should the device you are looking for, not appear in the list, press the 'Refresh' button to start the search again. Please remember the Bluetooth interface needs to be activated before it will be found by the Bluetooth Server. This is normally done by giving the SELECT pushbutton a short press and releasing. The blue LED will flash to indicate that the interface is active and waiting for a connection.

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No. Device Code Friendly Name Address 1 2012040007 DVC2012040007 049162A6AFD0		00100	t a device and hit 'C	Connect'
1 2012040007 DVC2012040007 049162A6AFD0	No.	Device Code	Friendly Name	Address
	1	2012040007	DVC2012040007	049162A6AFD0

To make a connection, select the device from the list and press the 'Connect' button. Alternatively, double clicking on the device in the list will initiate a connection immediately.

Once the Bluetooth connection has been established, Cloudworks will automatically activate the correct configuration screen needed for each device type. This device will immediately be placed into Command Mode and the current setup data retrieved and displayed on the right hand screen.

III CDS553 Engineering			⇔ – ⊡ ×
Image: Symplectic constraint of the symplecticonstraint of the symplectic constraint of the symplectic constr	Sleep Default Setup Scripts Ha	rdware Test Setup Bluetooth Upgrade Firmware Custo	00고 년권: m Firmware
	CDS553 Cirrus Pulse Programme	r	
Communications	General Details	General Setup	Engineering
[PORT=13000]	Device Code 2107070001	Vendor Code demo	Max Startup Time 60 seconds
[GET APN USERNAME] [USERNAME=]	Firmware Version 1.0	Description Cirrus Pulse Logger	Comms Timeout 60 seconds
[GET APN FASSWORD] [PASSWORD=]	Serial Number 2107070001	Application Type 007 - Pulse Only	Heartbeat Time 10 seconds
[GET PINCODE]	Signal Strength 74%	Latitude 0	Power Threshold 4.75 Volts
[PINCODE=] [GET_FRIMARY_DNS]	Local IP 100.125.221.64	Longitude 0	ECO Timeout 5 seconds
[IP=] [GET SECONDARY DNS]	Datalog Size 0 / 14400		ECO Holdoff 7 seconds
[IP=] [GET SMS SERVICE CENTRE]	Current Clock 13 Jul 2021 10:42:41	Communications Setup	Power Mode O Mains
[TEL NUMBER=] [GET DATALOG PERIOD]	Battery Status 100%	APN Name internet	Power Mode O Mains
[PERIOD=5]	Current Power Battery	APN Usemame	O Dual
[GET WAKEUF PERIOD] [PERIOD=360]		APN Password	Modem Diag
[GET MAX STARIUP TIME] [TIME=60]		Server Name/IP cloudworks.systems	
[GET COMMS TIMEOUT] [TIME=60]		Server Port 13000	0.011
[GET POWER THRESHOLD] [VOLTAGE=4.75]		Primary DNS	
[GET CONFIGURATION DATA]	I/O Parameters	Secondary DNS	
[DATA=] [GET POWER MODE]	Pulse 1 Reading 1234	SMS Serv. Centre	
[MODE=BATTERY] [GET MODEM DIAGNOSTICS]	Pulse 1 Weight 1	Pin Code	
[STATE=OFF] [GET ECO TIMEOUT]	Pulse 1 Units kl	Allow Data Roaming	
[TIME=5]	Pulse 2 Reading 0		
[GET ECO HOLDOFF] [TIME=7]	Pulse 2 Weight 1	Datalog / Wakeup Setup	
[GET ROAMING] [STATE=OFF]	Pulse 2 Units kl	Wakeup Period 360 minutes	
[GET IO STATUS] [FULSE1 COUNTER=1234] [FULSE1 WEIGHT=1] [FULSE1 UNITS=k1] [FULSE2 COUNTER=0] [FULSE2 WEIGHT=1] [FULSE2 UNITS=k1] [VOLTAGE=4.69]		Datalog Period 5 minutes	
v			
Direct Command	User Configuration Data (max 220 bytes)		

🔫 13 Jul 2021 - 12:42:47

Data update commands are sent to the device only after the parameter setup field has been left. What this means is that while adjusting a parameter in its input box, no commands are sent to the logger. Once you have completed entering the field and leave it for the next function, only then will the command be sent.

Datalogging functions are suspended while a logger is in Command Mode. At any point, with the logger in Command Mode, the settings can be reread by pressing the 'Get Current Setup' button in the top menu.

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VENDOR CODE SITE CODE	
DEVICE CODE	: 1801260262
UTC TIME	: 26/04/2018 12:50:28
NEXT DATALOG	: 26/04/2018 12:55:00
DATALOG SIZE	: 00000
	: CONNECTING TO SERVER
SIGNAL LEVEL	: 67%
COMMAND MODE	
Direct Commar	nd
26 Apr 2018 - 1	4:50:26

To switch between the Diagnostic Mode and Command Mode, simply press the 'Command/Connect' button. Switching from the Diagnostic Mode to Command Mode can take several seconds depending on what the logger is currently executing. Command Mode is shown with the [COMMAND MODE] text in the communications block. All commands and responses will be displayed in the 'Communications' block. This information can be cleared by right clicking in this box and selecting the 'Clear Screen' option.

The logger must be in 'Command Mode' before any of the settings changes or other instructions are accepted. Sending a command in Diagnostic Mode will cause the logger to switch to Command Mode but that last instruction will fail.

General Details	
Device Code	1908200001
Firmware Version	1.0
Serial Number	1908200001
Signal Strength	48%
Local IP	10.170.113.87
Datalog Size	0 / 14400
Current Clock	14 Feb 2020 14:52:01
Battery Status	
Current Power	Mains

The information on this screen is ordered in various groups. The 'General Details' box holds information that is not alterable and is general information about the logger. This information consists of the following data:

Information	Notes
Device Code	The Device Code assigned to this particular logger. All communications are initiated by addressing this code. This code is unique to all loggers and is assigned at the time of manufacture.
Firmware Version	Firmware version of the software loaded on the logger
Serial Number	Serial number of this logger - assigned in the factory.
Signal Strength	Signal strength of the last GSM communications, expressed as a percentage.

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Local IP	Local IP address assigned by the GSM network. This data is important when using a static
	IP system to ensure that the correct IP has been assigned to the logger.
Datalog Size	Number of records in the datalog/maximum number possible for the selected application type.
Current Clock	Current Date/Time on the logger. This is automatically set by the server to be UTC time. The logger does need to have connected to the server for the time to have been updated.
Battery Status	Battery status for loggers that are powered by battery, expressed as a percentage. It is important to note that this will be the battery status read while the logger is under larger than normal load (Bluetooth communications active). It would normally indicate lower than the recorded battery status in the datalog (which is read while the logger is essentially idle).
Current Power	An indicator as to how this logger is being powered. Normally the same as the power mode but can vary for systems on Dual Power mode. For loggers in a dual power mode, this parameter will display the current power status of the logger. Battery or Mains.

I/O Parameters	
Pulse 1 Reading	2875
Pulse 1 Weight	1
Pulse 1 Units	kl
Pulse 2 Reading	0
Pulse 2 Weight	1
Pulse 2 Units	kl

The 'I/O Parameter' block is the data used to setup the I/O functions of the logger. This is the place where you would be able to synchronise the volume readings for Pulse input 1 and 2.

When entering the new Totaliser readings (the Pulse Readings), the pulse weights are automatically calculated and processed in the setting of the Pulse count on the logger.

Pulse weights refer to the volume of measurement for each pulse on the input. This volume is as a ratio of the measurement unit. For instance, if measuring cubic metres (Pulse Units=m3) and each pulse represents 100 litres, then the pulse weight would be 0.1 - however if measuring in litres (Pulse Units=litres) and each pulse is still 100 litres, then the pulse weight would be 100. The Pulse Reading, Pulse Weight and Pulse Units can all be entered in the 'I/O Parameter' box.

Next are the 'General Setup' parameters. These are parameters that are used for the general descriptions and applications of the logger.

General Setup	
Vendor Code	demo
Description	Cirrus Pulse Logger
Application Type	007 - Pulse Only ~
Latitude	0
Longitude	0

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Very important here is the 'Vendor Code'. The Cloudworks System supports multiple databases. What this means is that the server will automatically populate the database that is associated with a specific logger. Each database and logger 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 loggers by unauthorised users. The Vendor Code is assigned to the relevant subsystem by the administrator during the creation of the database on the server.

The description is a simple string of data that is stored by the logger and used to identify that logger in simple terms. Here, it is best to use wording that might explain something about where this logger has been applied.

Application types are explained in detail earlier in this document. To select an application type, simply click the dropdown arrow on the right of the entry field and select the application type you wish to apply.

Since this logger has no onboard GPS, co-ordinates are recorded in the latitude and longitude fields which will be sent through to the database during a reload device configuration event.

Communications Setup		
APN Name	internet	
APN Username		
APN Password		
Server Name/IP	cloudworks.systems	
Server Port	13000	
Primary DNS		
Secondary DNS		
SMS Serv. Centre		
Pin Code		
	Allow Data Roaming	

When using a simcard to connect to a GSM network, there are a couple of parameters that your GSM service provider will need from you in order to connect to their network. These are sometimes not necessary as the card will automatically connect but most will require them. The parameters are the APN Name, Username and Password.

Networks generally require you to enter the APN Name but the Username and Password are not necessary. These details are obtained directly from your GSM service provider and most are published on their websites.

Cloudworks devices are also designed to allow for the connection to custom private APN's for purposes of security. Entering the APN details here will result in the device connecting to your private network. These networks normally issue a static IP address which will be shown in the 'Local IP' field in the 'General Details' box.

All Cloudworks devices connect to a server with a static IP or domain name. They usually use UDP/IP protocols and connect, by default, on port 13000. If you are running your own server, the Server Name or IP address as well as Server Port number need to be entered here. Just a note, it is always better to rather use the IP address than the domain name. This will mean that the logger will not have to execute a domain name lookup before connecting to your server.

Cloudworks loggers support the use of simcard pin codes. How this works is - should a simcard have a pincode activated, it will request the pincode when the modem powers up and starts connecting to the network. If the pincode field here is populated, the logger will offer this code to the network, allowing it to connect. Failure of the pincode will cause the logger to abort the connection attempt and shutdown.

With regards to Domain Name Servers (DNS), most service providers will use their own predetermined DNS servers so these entries are normally left blank. However, should you require your own DNS servers, you can capture their Names/IP addresses in the Primary and Secondary DNS fields.

Similarly, SMS Service Centre number is normally not required as your network will default this value. This can be customised using the 'SMS Serv. Centre' field.

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If you are using a foreign simcard on a network, the logger will need to be told that it is allowed to use data roaming. Without that, the logger will shutdown communications if it detects a roaming data connection. This can be done by ticking the option box.

Datalog / Wakeup Setup			
Wakeup Period	2	minutes	
Datalog Period	5	minutes	

For the datalogger setup, the Wakeup Period refers to the time a logger remains asleep before waking and connecting to the server to upload its data. The Datalog Period is the time between each recorded datalog entry.

Datalog timings are calculated forward from midnight of the day on which they are set. What this means is that if the datalog period is set to 5 minutes for instance, the next log time will be calculated as 5 minute intervals starting from midnight. This means that each entry would appear on the 5 minute interval of an hour.

Wakeup timings are calculated forward from the moment a logger goes back to sleep and not from the midnight point.

-User Configuratio	n Data (max 220 bytes)		

Stored locally on each logger is a 220 byte 'User Configuration Data' scratchpad area. This information is eventually carried back into the database and can be used for numerous functions. An example would be the storage of meter serial numbers on a water metering application etc. This area could also contain a complex code that would perhaps give the backend software more information as to how the data from this logger needs to be handled. For example, it could contain a code which has the meter serial number plus other digits indicating whether it is a bulk or zonal meter.

Also, if there are multiple meters attached it could contain multiple serial numbers separated by a comma for instance. Any data that is useful could be stored here.

Engineering		
Max Startup Time	60	seconds
Comms Timeout	60	seconds
Heartbeat Time	10	seconds
Power Threshold	3.2	Volts
ECO Timeout	5	seconds
ECO Holdoff	7	seconds
Power Mode	Mair	ıs
	⊖ Batt	ery
	⊖ Dua	I
Modem Diag	● Off	
	\bigcirc On	

The 'Engineering' box contains parameters involved with the setup of onboard functions of the logger. The are several communications monitoring parameters that are set to ensure that the communications to the logger are functional and stable.

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Battery operated loggers will wake up, connect to the server and upload their data. Should this fail, it would be a large drain on the battery of the logger to continually try and connect. For this reason, the logger has a single chance to wake up and establish a connection. If that fails, it will return to sleep and a only reconnect at the next wakeup period. At the start of a wake up, the 'Max Start Time' timer will be started. Should the connection to the server take longer than this preset time, the connection will be aborted and the logger will be put back to sleep. For powered loggers, the modem will be powered down and the process to connect will be restarted from scratch until a connection is established.

There are two other timers that ensure the communications are functioning correctly. First is the 'Comms Timeout'. When a logger communicates with the server, there is continuous communications between the two. Should this stall for a period longer than this timeout value (in seconds), the logger will abort the connection and go back to sleep (battery) or reestablish a connection (powered).

The second is the 'Heartbeat Time'. This is for powered loggers only. The server will continuously ping the logger at the interval set by this timer. The logger will respond to the ping and the two will remain in communications. Should the logger not receive two heartbeat pings in a row, it will assume there has been a failure in the communications and abort the connection and go back to sleep (battery) or re-establish a connection (powered).

This logger can operate in one of three power configurations.

Mode	Notes
Mains	In this mode the logger will be continuously connected to the server allowing for the streaming of real time data.
Battery	In this mode, the logger will 'wakeup' (normally 6 hourly) and upload its recorded data to a remote database and then go to sleep.
Dual	External 12V supply + Battery. In this mode the logger will automatically switch to battery mode should the power fail.

Each power mode can be selected from the items under 'Power Mode'. When a logger is in Dual Mode, the voltage point at which the logger will switch from Mains to Battery mode is defined by the 'Power Threshold' voltage. This should only under special circumstances be adjusted from 3.2V.

The Nimbus Pulse logger has an onboard ECO interface for the connection to GWF water meters. There are two parameters associated with this type of interface. The first is the 'ECO Timeout' which is the maximum length of time the interface may wait for the meter to deliver data once activated. And secondly, the 'ECO Holdoff' which is the minimum amount of time allowed between activating the ECO interface and reading the meter. Both these parameters are in seconds.

And lastly, an advanced function showing the modem diagnostics can be switched on or off. What this will do is stream all the modem commands to the diagnostic screen for analysis. This is really only for advanced troubleshooting and should be kept off by default.

On the top of this page are several tool bar options. Briefly their functions are as follows:-

Function	Notes
Bluetooth Connect/Disconnect	Connecting and disconnecting to the Bluetooth interface can be done multiple times from this screen.
Command/Connect	Used to switch between the Command Mode and the Connected to server Mode with streaming diagnostics. In battery mode the logger might simply go to sleep rather than connect to the server.
Get Current Setup	When in Command Mode, pressing this button will get the software to go and read all the configuration data from the logger and display it on the right

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	hand side of the screen.
Clear Datalog	When in Command Mode, pressing this button will send a command to clear the onboard datalog.
Wakeup	Forces the logger to wake up and connect to the server. This will also force a battery logger to connect to the server.
Sleep	Applies only to battery loggers and will force the logger to sleep rather than connect to the server.
Default Setup Scripts	Dropdown menu giving to options for factory default settings of either battery or powered loggers.
Hardware Test	Dropdown menu to activate various hardware tests. Selecting these options will send the appropriate command to the logger and display the result in the diagnostic screen.
Setup Bluetooth	Bluetooth interfaces are set to default 'Friendly Names' that include the current Device Code for the logger. This makes it easier to select the correct device when connecting to a Bluetooth interface. Should the Device Code not appear on the list of devices when connecting to the Bluetooth interface (legacy devices), then pressing this button will reset the interface and correct the naming system. This function can also be used to reset the Bluetooth interface to its factory default.
	The Bluetooth interface may be setup with or without access via password. The password used is the Bluetooth Password setup under the General Setup option in CloudWorks. As long as the logger's requested password and the system Bluetooth Password are the same, the connection will be established.
Upgrade Firmware	The onboard firmware can be upgraded through the Bluetooth interface. The process is explained in further detail below.

Upgrading firmware on the logger can be done through the Bluetooth interface. Newer versions of the software for each type of device is embedded into the Cloudworks software so will not need an internet connection to collect the data.

When in Command Mode, press the 'Upgrade Firmware' button. The first thing the software will do is to determine the current firmware version on the logger and see if there is an upgrade available. Should the firmware be up to date, you will be prompted as such and given an option to re-flash the firmware. Re-flashing can happen if your last upgrade failed and you would like to try again.

Before continuing, the following prompt will flash on the screen.

CloudWo	ırks	×
	Warning: Please do not interrupt this process A failure of the upgrade may result in the device having to be returned to the manufacturer for recovery. Continue?	
	Yes No	

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Please do not at any stage interrupt the process while the firmware is downloading as this may leave the logger inoperable and necessitate that it get sent back to the manufacturer for recovery.

Selecting 'Yes' will start the upgrade process. The diagnostic screen will display the progress of the upgrade.

ommunications	
Firmware Upgrade Module	
Building Flash Memory	
Connected - Bootstrap version 1	
Programming and verifying	
31% complete	

Once the upgrade is complete, the following message will be displayed.

Firmware U	Jpgrade Module -			
Building Flas	Memory			
Connected - Bo	otstrap version	1		
Programming and	nd verifying			
Jpgrade comple	ete.			
Bluetooth Dis	connected			
lease power (cycle the device	to contin	ue	

Please power cycle the logger and then reconnect the Bluetooth interface if you wish to carry out further configurations.

A note about power cycling a logger - when a logger is in battery mode and asleep, disconnecting the battery will not cycle the device. A battery logger in sleep mode can remain powered for up to 5 minutes before the onboard capacitors discharge enough for the device to reset. To speed this process up, press the pushbutton for more than 3 seconds forcing the device to try and connect to the server and therefore draining the capacitors.

Should the upgrade fail for some reason, please power cycle the logger, reconnect the Bluetooth, go into Command Mode and try again.

If the upgrade process fails to start, try the following recovery.

- 1. Connect with the Bluetooth interface and switch the logger to Mains Mode (if battery logger).
- 2. Disconnect the Bluetooth and power cycle the logger properly.
- 3. Re-connect the Bluetooth and retry the upgrade process.
- 4. Disconnect Bluetooth and power cycle the logger properly.
- 5. Re-connect the Bluetooth and switch the logger back into Battery mode (if battery logger).

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2.2 CDS553 Cirrus Pulse Logger Setup via Remote Configure

Once the remote connection has been established, Cloudworks will automatically download the current setup data and display it on the screen. This data can be refreshed at any time by pressing the 'Refresh' button in the top menu.

neral Details		General Setup		Engineering		
)evice Code	2107070001	Vendor Code	demo	Max Startup Time	60 :	second
irmware Version	1.0	Description	Cirrus Pulse Logger	Comms Timeout	60 :	second
erial Number	2107070001	Application Type	007 - Pulse Only	Heartbeat Time	10 :	second
ignal Strength	80%	Latitude	0	Power Threshold	4.75	Volts
ocal IP	100.73.216.210	Longitude	0	ECO Timeout	5 8	second
)atalog Size	0			ECO Holdoff	7 :	second
Current Clock	13 Jul 2021 11:08:05	Communications Set	up	Power Mode	Mains	
attery Status		APN Name	internet		⊖ Battery	y .
Current Power	Mains	APN Username]	◯ Dual	
		APN Password]		
		Server Name/IP	cloudworks.systems			
		Server Port	13000			
		Primary DNS				
_		Secondary DNS				
Parameters		SMS Serv. Centre				
ulse1 Reading	0	Pin Code				
ulse1 Weight	1		Allow Data Roaming			
ulse 1 Units	kl					
ulse 2 Reading	0	Datalog / Wakeup S	etup			
ulse 2 Weight	1	Wakeup Period	360 minutes			
Pulse 2 Units	kl	Datalog Period	5 minutes			

As you can see the parameters are the same as when you configure via the Bluetooth setup option. Again, data update commands are sent to the device only after the parameter setup field has been left. What this means is that while adjusting a parameter in its input box, no commands are sent to the logger. Once you have completed entering the field and leave it for the next function, only then will the command be sent.

Should the instruction fail to send or not be acknowledged by the logger, you will get a prompt alerting you to the failed command. This parameter change should be attempted again.

Apart from that, functions are the same as the Bluetooth Setup with the exception of three buttons on the top tool bar. The 'Reset Device' button is self explanatory and will initiate a reset of the logger. This would really only be used if there has been some really unexplained behaviour linked to the loggers operation.

If you make changes to the connection parameters (i.e. APN details or Server details), you can force the logger to disconnect from the server and reconnect using the new connection parameters by pressing the 'Hangup' button. This will

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cause the connection to re-establish. Bear in mind, if these parameters have changed, the logger may re-connect to a completely different server so will go offline here preventing you from making any further changes.

The 'Remote Configure' screen has one further tool available in its arsenal, and that is the 'Send Test SMS' function. The purpose of this function is to not only test the SMS system, but also to determine the telephone number assigned to that simcard (if the card supports SMS's). Using this function is as simple as pressing the button and entering the destination telephone number in the provided input box - and pressing ENTER.

The logger will then send an SMS to that number. The message should read, 'Hello from Cirrus Pulse Logger CDS553 - Device Code xxxxxxxxx'. The receiving number can then be used to send sms commands to that logger.

If you have made changes to configuration data and the logger is present in the database, please remember to trigger a 'Reload Device Config' function to allow the server to update the database correctly.

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2.3 CDS553 Cirrus Pulse Logger Setup via Offline Script Configure

Once activated, the correct blank Scripting Editor screen will be displayed, ready for the capture of the settings that need to be altered.

Construint Pulse Scripting Editor General Details General Setup Device Code 2107070001 FW Version 1 Uo Parameters Description Pulse 1 Reading Application Type Pulse 1 Weight Communications Setup Pulse 2 Reading Communications Setup Pulse 2 Weight APN Name Pulse 2 Weight APN Name Pulse 2 Units Server Name/IP Server Port Primary DNS Datalog / Wakeup Setup Secondary DNS Datalog / Wakeup Setup Secondary DNS		Layout Configuration	Script Data	
Wakeup Penod minutes SMS Serv. Centre Datalog Period minutes Pin Code Data Roaming O 0ff O n	Device Code 2107070001 F/W Version 1 I/O Parameters 1 Pulse1 Reading 1 Pulse1 Weight 1 Pulse1 Units 1 Pulse 2 Reading 1 Pulse 2 Weight 1 Pulse 2 Weight 1 Pulse 2 Weight 1 Pulse 2 Units 1 Functions Clear Datalog Datalog / Wakeup Setup minutes Datalog Period minutes	General Setup Vendor Code Description Application Type Latitude Longitude Communications Setup APN Name APN Vsemame APN Vsemame Server Name/IP Primary DNS Secondary DNS Secondary DNS SMS Serv. Centre Pin Code	Engineering Max Startup Time seconds Comms Timeout seconds Heartbeat Time seconds Power Threshold Volts ECO Timeout seconds ECO Holdoff seconds Power Mode Mains Battery	No. Command 1 [SET DESCRIPTION][DESCRIPTION=Combination Pulse M 2 [SET WAKEUP PERIOD][PERIOD=60] 3 [SET APPLICATION CODE][CODE=8] 4 [SET ROAMING][STATE=OFF]

Since the device is offline the only parameters available are the Device Code and Firmware Version which are picked up from the communications register.

As you can see the parameters are the same as when you configure via the Bluetooth setup option with one or two minor exceptions explained later.

All the parameter fields are empty at this point. To create a script, simply enter the new values for the parameters you wish to change in the correct fields. The script will only be generated for the parameters that have been altered in this form. Should you wish to restart your parameter changes, you can press the 'Clear Configuration' button in the top tool bar to reset all the fields.

When generating a script for your new parameters, you have an option of adding to the current script or replacing the script with only your new one. To do this, press the 'Create Script' dropdown button on the top tool bar and select the option you require.

On the right of the screen is a table of the current script that appears in the database with the status of each command tabled. This would include older scripts that are still present in the database. Each command has associated with it a status - either Pending or Complete.

lo.	Command	Response	Status
1	[SET GENERATOR MODE][MODE=OFF]	[OK]	Complete
2	[SET DESCRIPTION][DESCRIPTION=Cape Digital]	[OK]	Complete
3	[SET GENERATOR MODE][MODE=ON]		Pending

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Pending commands are those that still need to be executed. Listed also is the response to each command for diagnostic purposes. You can read back the current script to determine its status at any point by pressing the 'Read Script' button. 'Clear Script' would delete the script from the database.

All the other functions should be familiar with the exception of the 'Clear Datalog' and 'Send Test SMS' functions. Since these cannot be a button on the screen, they are captured as selectable options.

If you have made changes to configuration data and the logger is present in the database, please remember to trigger a 'Reload Device Config' function to allow the server to update the database correctly.

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