



User manual

Android field configuration app for CloudWorks data loggers

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Cape Digital

Contents

1. About CloudWorks Configure	4
1.1 Supported loggers	4
1.2 What you need	4
1.3 The screens at a glance.....	5
2. Installing and updating the app.....	6
2.1 Installing from the website.....	6
2.2 Updating	6
3. Connecting to a logger.....	7
3.1 Switch the logger's Bluetooth on	7
3.2 The Scan screen	7
3.3 Connecting.....	8
3.4 Bluetooth password	9
3.5 When a connection fails	9
3.6 Forgetting a paired logger	10
3.7 Disconnecting	11
4. The Status tab.....	12
Logger	12
Connection.....	13
Power.....	13
Datalog and inputs.....	13
Buttons	13
5. The Setup tab.....	14
5.1 Layout	14
5.2 Editing and saving	15
5.3 General	16
5.4 Communications.....	16
5.5 Pulse inputs	16
5.6 4-20mA current loop	17
5.7 Advice after changing the application type.....	18
6. The Tools tab	19
6.1 Logger	19
6.2 Factory default.....	20
6.3 Bluetooth security	21
6.4 Firmware.....	21

6.5 Hardware test	21
6.6 Sensor tests	22
7. Bluetooth security	23
Turning security on	23
Turning security off	23
While connected	23
8. Firmware upgrade	24
8.1 Before you start	24
8.2 Upgrading	25
9. The Comms tab	26
9.1 Reading the log	26
9.2 Command mode and streaming mode	26
9.3 Direct commands	27
9.4 Share and Clear	27
10. Troubleshooting	28
Appendix A. Application types	29
Appendix B. Factory default settings	30
Appendix C. Version history	31

1. About CloudWorks Configure

CloudWorks Configure is the Android app for setting up CloudWorks data loggers in the field. It connects to a logger over Bluetooth, reads the logger's configuration, lets you change it section by section, and provides the engineering tools you need on site: sensor tests, factory defaults, Bluetooth security, a communications view and firmware upgrades.

The app covers everything in the engineering screens of CloudWorks Console except label printing and loop calibration, which remain Console functions. It does not set the logger clock: loggers run on UTC and the CloudWorks server sets the time.

1.1 Supported loggers

The app identifies the logger when it connects and shows only the settings and tools that apply to that model.

Model	Family	Input	Cellular
CDS543	Nimbus	Pulse	NB-IoT
CDS545	Nimbus	Modbus	NB-IoT
CDS546	Nimbus	4-20 mA loop	NB-IoT
CDS555	Nimbus	Dual loop and pulse	NB-IoT
CDS547	Stratus	Modbus	GSM
CDS548	Stratus	4-20 mA loop	GSM
CDS549	Stratus	Pulse	GSM
CDS551	Cirrus	Modbus	GSM
CDS552	Cirrus	4-20 mA loop	GSM
CDS553	Cirrus	Pulse	GSM
CDS554	Cirrus	Dual loop and pulse	GSM

The older Cumulus loggers (CDS538 and CDS541) are recognised but not supported. The app tells you to use CloudWorks Console for them.

1.2 What you need

- **An Android phone** running Android 8.0 or later with Classic Bluetooth. The app has been developed and tested on Samsung phones.
- **Bluetooth on** and permission for the app to find nearby devices, which the app asks for on first use.
- **Internet access** only for installing and updating the app and for the first download of a logger firmware file. Configuring a logger needs no signal at all.
- **Location permission** only if you want the "Use phone location" button on the Setup screen to fill in the logger's position.

1.3 The screens at a glance

Screen	What it is for
Scan	Lists paired and newly found loggers. Tap one to connect. Shows app update notices and connection failures.
Connecting	Shows the steps of the connection and asks for the Bluetooth password when the logger has security on.
Status tab	Read-only overview: identity, firmware, connection, power, datalog and live input readings.
Setup tab	Every configurable setting, grouped in sections, each with its own Save button.
Tools tab	Wakeup, clear datalog, factory defaults, Bluetooth security, firmware upgrade, hardware and sensor tests.
Comms tab	The command traffic with the logger, a direct command line, and the command/streaming toggle.

2. Installing and updating the app

2.1 Installing from the website

The app is not on the Play Store. It is installed from the Cape Digital website, and it updates itself from the same place.

1. **Open the link on the phone.** Cape Digital sends you a link to the current release on cloudworks.systems. Open it in the phone's browser; the APK file downloads.
2. **Open the downloaded file.** Tap the download notification, or open it from the browser's Downloads list.
3. **Allow the install.** The first time, Android asks you to allow installs from this source (the browser). Allow it, then tap Install.
4. **Open CloudWorks Configure.** The splash screen shows for three seconds and the Scan screen opens.

Samsung phones. Samsung phones have an "Auto Blocker" setting that blocks installs from outside the Play Store. If the install is refused, turn Auto Blocker off in Settings, Security and privacy, and try again.

2.2 Updating

Each time it starts, the app checks the website for a newer version. When one exists, a blue card appears at the top of the Scan screen with the version number and a short list of changes.

- **Update** opens the download in the browser. Open the downloaded file and allow the install, exactly as for a first install. Your paired loggers are kept.
- **Later** hides the card until the next time the app starts. A release marked as critical has no Later button.

The installed version and build number are shown at the bottom of the Scan screen.

3. Connecting to a logger

3.1 Switch the logger's Bluetooth on

A logger keeps its Bluetooth off to save battery. Before you connect:

1. Press the button on the face of the logger for one second and release it.
2. The blue LED starts flashing. Bluetooth is now on.
3. You have 90 seconds to connect. If nothing connects in that time, the logger switches Bluetooth off again.
4. To restart the 90 seconds, press the button again to switch Bluetooth off, then once more to switch it on.

Once the app is connected the logger keeps Bluetooth on for as long as the connection lasts.

3.2 The Scan screen

The Scan screen opens after the splash screen. It searches for loggers straight away and keeps searching for about twelve seconds; the refresh icon at the top right starts a new search.

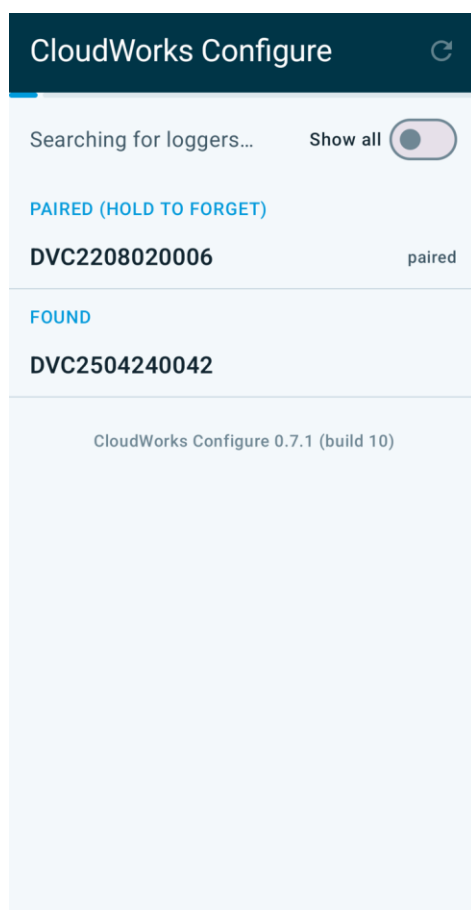


Figure 1. Scan screen with a paired logger and a newly found one

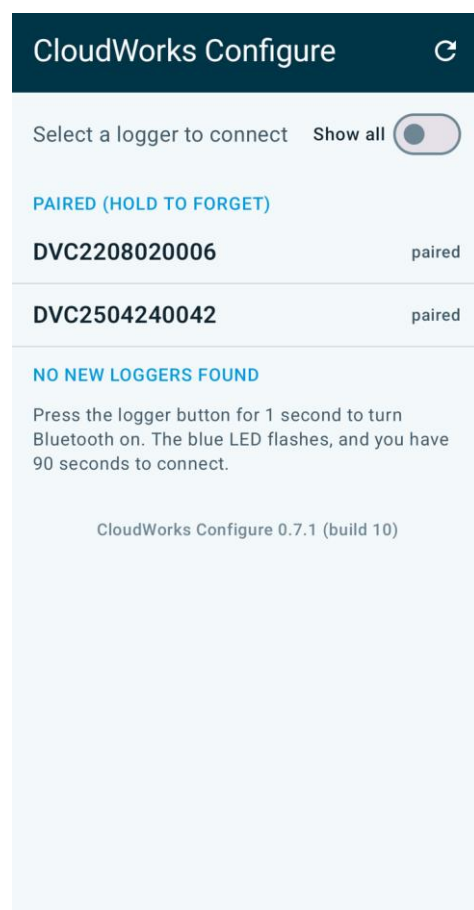


Figure 2. Nothing new found: the hint reminds you how to switch Bluetooth on

- **Paired** lists loggers this phone has connected to before. Tap one to connect. Hold one to forget it (section 3.6).

- **Found** lists loggers that are switched on nearby and not yet paired. Tap one to connect; the phone pairs with it first.
- **Show all** widens the list to every Bluetooth device in range. Use it only if a logger with an unusual Bluetooth name does not appear. Loggers normally appear as DVC followed by their device code.

If the phone's Bluetooth is off, or the app has not been given permission to find nearby devices, the screen shows a single button to fix that.

3.3 Connecting

Tap the logger. The Connecting screen lists the steps as they happen.

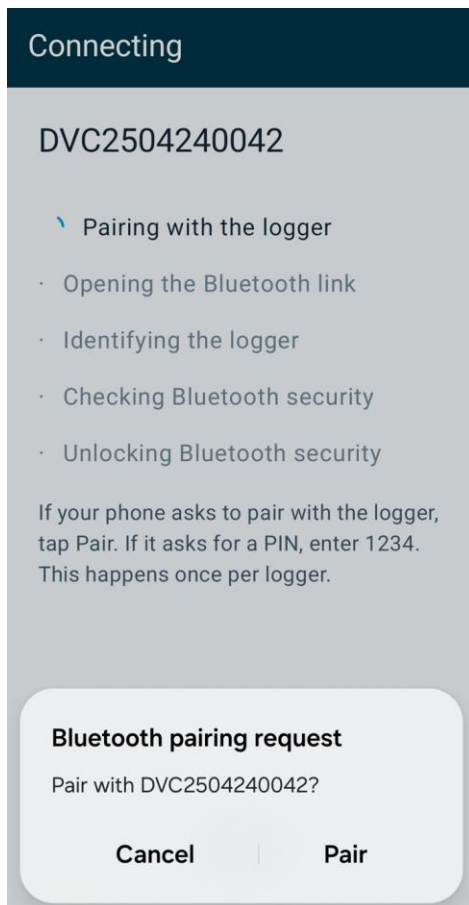


Figure 3. Connecting: the phone asks to pair on the first connection



Figure 4. Connected: the setup is read automatically, with progress under the tabs

1. **Pairing with the logger.** On the first connection to a logger the phone shows a "Bluetooth pairing request". Tap Pair. If the phone asks for a PIN, enter 1234. This happens once per logger.
2. **Opening the Bluetooth link.** Usually a second or two.
3. **Identifying the logger.** The app asks the logger for its type. This can take up to 15 seconds if the logger has just been switched on.
4. **Checking Bluetooth security.** If the logger has security on, the app asks for the password (section 3.4).
5. **Unlocking Bluetooth security.** Only shown when security is on.

When the connection is made the logger screen opens on the Status tab and the app reads the whole setup from the logger. A progress bar under the tabs shows which item is being read. You can look at the Status tab while this runs; the Setup tab shows its fields when the read finishes.

Command mode. Connecting puts the logger into command mode, in which it accepts commands. The screen stays on while you are connected.

3.4 Bluetooth password

A logger with Bluetooth security on asks for its password during the connection. The dialog reads: "This logger has Bluetooth security on. Enter the password to continue."

- Type the password. Show lets you check what you typed.
- Unlock sends it to the logger. Cancel abandons the connection.
- The password is kept in the phone's memory only for that connection. It is not stored on the phone, so you enter it each time you connect.
- A wrong password ends the connection with the message "Bluetooth password incorrect. Connect again and re-enter it."

Turning security on or off is done from the Tools tab (section 7).

3.5 When a connection fails

If the connection cannot be made, or the Bluetooth link drops while you are working, the app returns to the Scan screen with a red card explaining what happened.

- **Reconnect** tries the same logger again. Any edits you had not yet saved are kept if the reconnection succeeds.
- **Dismiss** removes the card.

The card repeats the Bluetooth hint, because the most common cause in the field is the logger's 90 seconds running out before the connection was made.

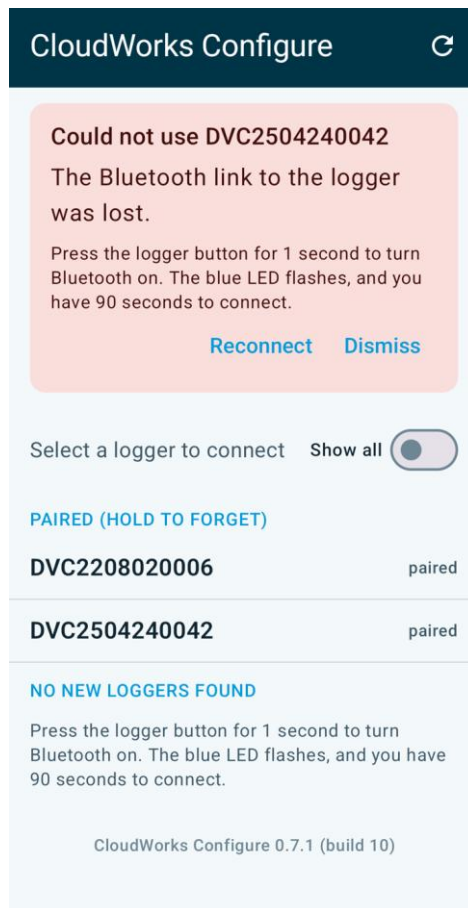


Figure 5. The failure card after the Bluetooth link was lost

Message	Meaning and what to do
Unable to open the Bluetooth link. Check the logger is powered and in range, then try again.	The phone could not open a connection. Switch the logger's Bluetooth on again and stay within a few metres.
Connection error. Please power cycle the logger and try again.	The link opened but the logger did not answer within 15 seconds. Power cycle the logger.
The Bluetooth link to the logger was lost.	The link dropped during the session, for example the logger was switched off or moved out of range. Reconnect.
This logger has Bluetooth security on and needs its password to connect.	The password prompt was cancelled or left blank.
Bluetooth password incorrect. Connect again and re-enter it.	The logger rejected the password.
CDS5xx is an obsolete Cumulus logger. Use CloudWorks Console to configure it.	The app does not support this model.
Unknown device type. Please update CloudWorks Configure.	The logger reported a type this version of the app does not know.

3.6 Forgetting a paired logger

Hold a logger in the Paired list to forget it. Forgetting unpairs the phone from the logger; the next connection will ask you to pair again. Use it when a logger has been re-paired elsewhere or when the list is cluttered with loggers you no longer visit.

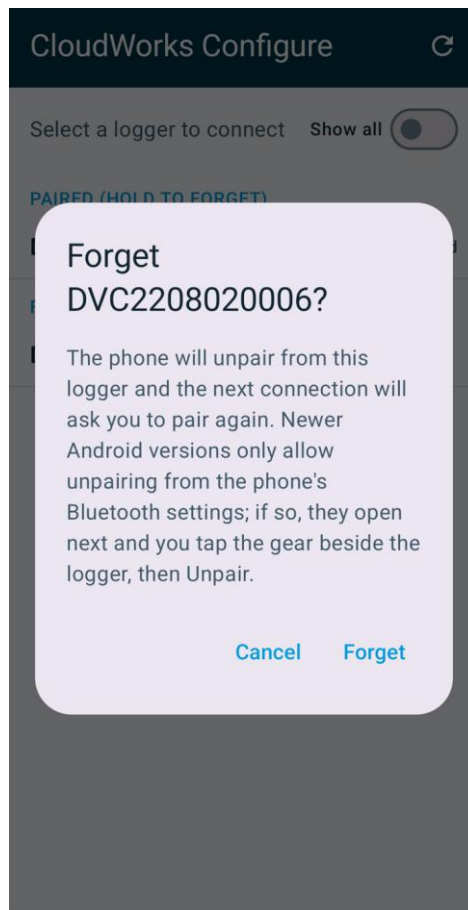


Figure 6. Forget a paired logger

Newer Android versions only allow unpairing from the phone's own Bluetooth settings. When that is the case the app opens those settings for you: tap the gear beside the logger, then Unpair, and return to the app.

3.7 Disconnecting

Tap Disconnect at the top right of the logger screen, or use the phone's Back gesture. Unsaved edits are lost when you disconnect on purpose, so save each section first (section 5.2).

4. The Status tab

The Status tab is a read-only summary of the logger. It is filled in by the setup read that runs after connecting.

CDS551 Cirrus Modbus		Disconnect	
Status	Setup	Tools	Comms
LOGGER			
Device type	CDS551 Cirrus Modbus		
Device code	2504240042		
Serial number	2504240042		
Firmware	3.1		
Application	046 - TSONIC T3-1 Sandwich Meter		
Description	Fuel Sensor Test		
CONNECTION			
Signal strength	0%		
Local IP	0.0.0.0		
Logger clock (UTC)	01/01/2018 00:45:06		
Next wakeup	every 360 min		

Figure 7. Status: logger and connection

CDS551 Cirrus Modbus

Disconnect

Status

Setup

Tools

Comms

POWER

Source

Battery

Configured mode

Battery

Voltage

4.28 V

Battery

98%

DATALOG

Records

3 / 10000

Datalog period

every 5 min

INPUTS

Loop current

0.00 mA

Loop reading

0.000 mA

Loop alarm

None

Refresh inputs

Re-read setup

Figure 8. Status: power, datalog and inputs

Logger

Row	Meaning
Device type	The model, as reported by the logger.
Device code	The logger's unique code, allocated at the factory. Also its Bluetooth name (DVC...).
Serial number	Normally the same as the device code.
Firmware	The firmware version running on the logger. The Tools tab compares this with the published version.
Application	The application type number and name (section 5.3).
Description	The free-text description set on the Setup tab.

Connection

Row	Meaning
Signal strength	Cellular signal at the last connection to the server, as a percentage. 0% when the logger has not connected since power up.
Local IP	The address the network gave the logger on its last connection, or none.
Logger clock (UTC)	The logger's clock. It is set by the CloudWorks server when the logger connects, never by the app. A date in 2018 means the logger has not yet connected since power up.
Next wakeup	How often the logger connects to the server, from the Setup tab.

Power

Row	Meaning
Source	Whether the logger is currently running on battery or on external power.
Configured mode	The power source setting on the Setup tab.
Voltage	Battery voltage.
Battery	Battery voltage as a percentage of its working range. Shown only on battery power. The firmware upgrade needs this at 40% or more.

Datalog and inputs

Row	Meaning
Records	Readings stored in the logger and the maximum it can hold.
Datalog period	Minutes between stored readings.
Pulse reading	The totaliser value of each pulse input in its units.
Loop current, reading, alarm	The 4-20 mA input: the measured current, the reading it converts to, and whether a high or low alarm is active.
Digital input, Output	State of the digital lines where the logger has them.

Buttons

- **Refresh inputs** re-reads the live values: signal, clock, records, power and the input readings. Use it after changing a sensor or when watching a loop current.
- **Re-read setup** reads the entire configuration from the logger again, the same as the read that runs on connection. Any unsaved edits on the Setup tab are dropped.

5. The Setup tab

5.1 Layout

The Setup tab holds every configurable setting in cards, one per section. Which sections appear depends on the logger's input hardware.

Section	Shown for
General	All loggers
Communications	All loggers; the fields differ between NB-IoT and GSM models
Pulse inputs and ECO interface	Pulse loggers (CDS543, CDS549, CDS553)
4-20mA current loop	Loop and Modbus loggers (CDS545, CDS546, CDS547, CDS548, CDS551, CDS552)
Pulse input, 4-20mA current loop 1 and 2	Dual loop loggers (CDS554, CDS555)

The screenshot shows the 'Setup' tab selected for a 'CDS551 Cirrus Modbus' logger. The 'General' section is active, displaying several input fields with hints below them: 'Database code' (demo), 'Database link', 'Description' (Fuel Sensor Test), 'Application type' (046 - TSONIC T3-1 Sandwich Meter), 'Position latitude' (-33.863027), and 'Position longitude' (18.523659). A 'Re-read setup from logger' button is at the top. The 'Status', 'Tools', and 'Comms' tabs are visible but not selected.

Figure 9. Setup: the General section

The screenshot shows the 'Setup' tab selected for a 'CDS551 Cirrus Modbus' logger. The 'Communications' section is active, displaying input fields for: 'APN name' (internet), 'APN username', 'APN password', 'SIM PIN code', 'Server name or IP' (cloudworks.systems), and 'Server port' (13000). A text area at the top is labeled 'Up to 220 characters'. The 'Status', 'Tools', and 'Comms' tabs are visible but not selected.

Figure 10. Setup: the Communications section

Under each field a short hint explains the value. Fields that do not apply in the current state are greyed out, for example the alarm points while the alarm switch is off.

5.2 Editing and saving

The screenshot shows the 'Setup' tab of the CDS551 Cirrus Modbus interface. The 'Database code' field contains 'demo'. The 'Database link' field is empty. The 'Description' field contains 'Fuel Sensor TestX' and is highlighted with a blue border, indicating it has been changed but not saved. Below the fields is a standard QWERTY keyboard with a 'Done' button in the bottom right corner.

Figure 11. A changed field is marked until it is saved

The screenshot shows the 'Setup' tab of the CDS551 Cirrus Modbus interface. The 'Database code' field is empty. The 'Database link' field contains 'Up to 220 characters'. The 'Description' field is empty. Below the fields are 'Discard' and 'Save' buttons. The 'Communications' section is visible, with fields for 'APN name' (containing 'internet'), 'APN username', 'APN password', 'SIM PIN code', and 'Server name or IP' (containing 'cloudworks.systems').

Figure 12. Save and Discard appear at the end of a section with changes

1. Change any field. The field shows "Changed, not yet saved" and the section's Save and Discard buttons appear.
2. Save writes every changed field in that section to the logger, one command each, in the same order Console uses. A field that the logger refuses shows the reason under it; the others are still saved.
3. Discard drops the unsaved changes in that section.
4. Re-read setup from logger, at the top of the tab, reloads everything from the logger and drops all unsaved changes.

One Save per section. Each section is saved on its own. Changing fields in two sections means pressing Save twice, once in each.

If the Bluetooth link drops while you have unsaved changes, the failure card on the Scan screen says how many are kept. Reconnect to the same logger and they are still there to be saved.

5.3 General

Field	Meaning
Database code	Links the logger to a database on the CloudWorks server. Up to 10 characters. (The logger itself still calls this the vendor code.)
Description	Free text describing the site or installation, up to 50 characters. Shown on the Status tab and on the server.
Application type	What the logger is measuring and how. The list only offers the types this model supports. See section 5.7 for the advice that can follow a change, and Appendix A for the full list.
Position latitude and longitude	Decimal degrees; south and west are negative. "Use phone location" fills both from the phone's GPS to six decimal places. The first use asks for location permission.
Wakeup period	Minutes between the logger's connections to the server.
Datalog period	Minutes between stored readings.
Power source	External 12V power (streaming), Battery, or Both. Leaving external power switches off a 24V generator that was set to On, because that setting needs external power.
User configuration data	Free text passed to the server with the logger's data, up to 220 characters.

5.4 Communications

Field	Meaning
APN name, username, password	The mobile network's access point settings from the SIM provider.
SIM PIN code	Only if the SIM has a PIN.
Server name or IP, Server port	Where the logger sends its data. Normally cloudworks.systems and the port Cape Digital gives you.
NB-IoT bands	Nimbus loggers only. 0 means all bands.
NB-IoT scrambling algorithm	Nimbus loggers only. On or off as required by the network.
Primary and secondary DNS	GSM loggers only. Usually 8.8.8.8 and 8.8.4.4. If either is blank after the setup read, the app offers once per connection to set the Google addresses.
SMS service centre	GSM loggers only.
Data roaming	Allow the logger to use a roaming network.
Modem diagnostics	Extra modem information in the logger's streaming output.

5.5 Pulse inputs

Pulse loggers have two inputs; dual loop loggers have one. Each input has three fields.

Field	Meaning
Weight	Units per pulse, for example 1 for a meter that gives one pulse per kilolitre. Must be more than 0.
Units	The unit name, up to 10 characters.
Reading	The current totaliser value in those units. Enter the meter's reading to bring the logger into line with the meter. Changing the weight keeps the displayed reading the same by rewriting the count.
ECO timeout and holdoff	Pulse loggers only. Timing for the ECO encoder interface, in seconds (1 to 15 and 1 to 8).

5.6 4-20mA current loop

The screenshot shows the 'Setup' tab of the CDS551 Cirrus Modbus interface. At the top, there's a header with 'CDS551 Cirrus Modbus' and a 'Disconnect' button. Below the header are four tabs: 'Status', 'Setup' (selected), 'Tools', and 'Comms'. The main content area is divided into sections for 'High alarm' and 'Low alarm'. The 'High alarm' section has a toggle switch that is currently off, a text input for 'High alarm point', and another text input for 'High hysteresis' with a note 'Alarm clears below this reading'. The 'Low alarm' section has a toggle switch that is currently on, a text input for 'Low alarm point', and another text input for 'Low hysteresis'.

Figure 13. Loop range and alarms

The screenshot shows the 'Setup' tab of the CDS551 Cirrus Modbus interface. At the top, there's a header with 'CDS551 Cirrus Modbus' and a 'Disconnect' button. Below the header are four tabs: 'Status', 'Setup' (selected), 'Tools', and 'Comms'. The main content area has a text input for 'Low alarm point', a text input for 'Low hysteresis' with a note 'Alarm clears above this reading', and a section for '24V power generator'. This section has four radio button options: 'Off', 'On (needs external 12V power)', 'Loop: Power a loop device', and 'Modbus: Power a Modbus device' (which is selected). Below this is a text input for 'Pulse delay' with the value '2' and a note 'Seconds the generator runs before the reading is taken'.

Figure 14. 24V power generator and pulse delay

Field	Meaning
Reading at 4 mA, Reading at 20 mA	The engineering values at the two ends of the loop, in the units below. They must differ.
Loop units	The unit name, up to 10 characters.
High alarm, High alarm point, High hysteresis	Switch the high alarm on to enter the reading at which it trips and the lower reading at which it clears. Switching it on fills in 20 mA and 18 mA equivalents to start from.
Low alarm, Low alarm point, Low hysteresis	The same for the low alarm; switching it on fills in the 4 mA and 6 mA equivalents.
24V power generator	Off; On (needs external 12V power); Loop: power a loop device; or Modbus: power a Modbus device. Dual loop loggers offer Pulse: power the sensor for each reading. On is only available when the power source is external 12V.
Pulse delay	Seconds the generator runs before the reading is taken, 0 to 10. Not used when the generator is Off or On.

Alarm points are entered in engineering units and converted to milliamps for the logger. If an alarm point falls outside the loop range it is clamped to the range when saved. Changing the loop range re-saves any alarm that is switched on, so the alarm stays at the same reading.

5.7 Advice after changing the application type

On the Modbus and loop loggers (CDS545, CDS551, CDS546 and CDS552) some application types need matching generator, loop or datalog settings. After you save an application type the app checks those settings and, when they need changing, shows an "Application type advice" dialog with Apply and Not now. Apply writes the settings straight to the logger.

Application type	What Apply sets
036 BGT Soil Sensor	Generator to Modbus power with a 7 second delay; datalog period to 60 minutes.
037 Sensecap Soil Sensor	Generator to Modbus power with a 0.5 second delay.
041 Aquas Pressure Sensor	Generator to Modbus power with a 2 second delay. The dialog also reminds you that the logger must have been modified to output 5 V on the generator.
042 Cathodic Protection	The ± 9.5 V to 4-20 mA converter (CDS564) settings: generator Loop with 0.3 s delay, range -9.5 to 9.5 V, high alarm at -0.85 V and low alarm at -1.2 V, hysteresis equal to each alarm.
044, 045, 046 (MPM426W, Promag W800, TSONIC T3-1)	Generator to Modbus power with a 0.5 second delay.
040 Pulse Status + Loop (loop loggers)	Datalog period to 1 minute.

6. The Tools tab

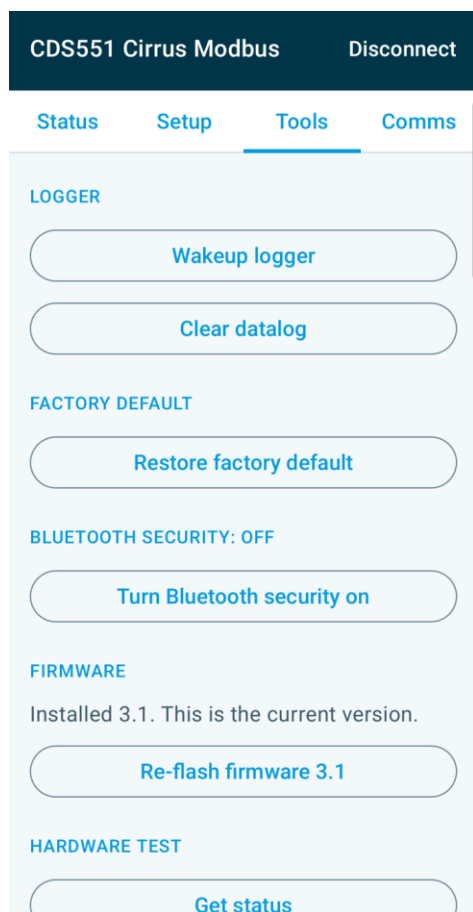


Figure 15. Tools: logger, factory default, security and firmware

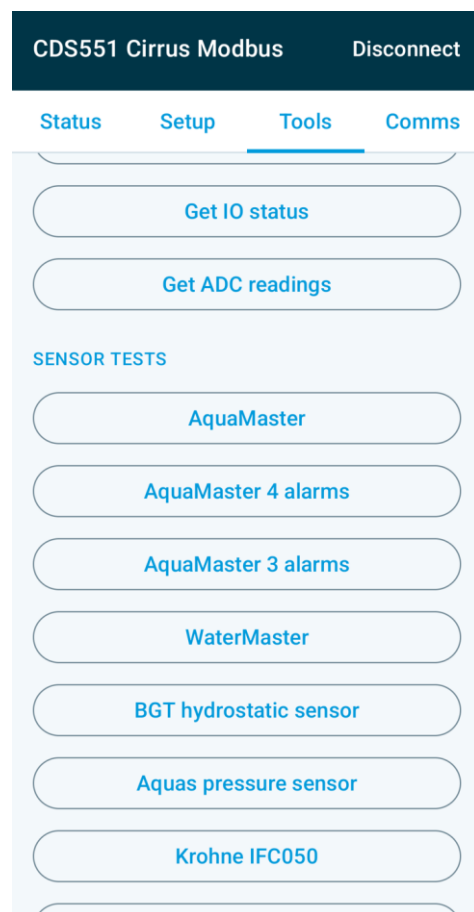


Figure 16. Tools: hardware and sensor tests

Every tool that changes the logger asks you to confirm first. Results open in a box over the screen; tap Close to dismiss it.

6.1 Logger

- **Wakeup logger** makes the logger connect to the server now instead of waiting for its next wakeup. Use it after commissioning to see the site appear on the server.
- **Clear datalog** deletes every reading stored in the logger. Readings already sent to the server are not affected. The record count on the Status tab drops to zero.

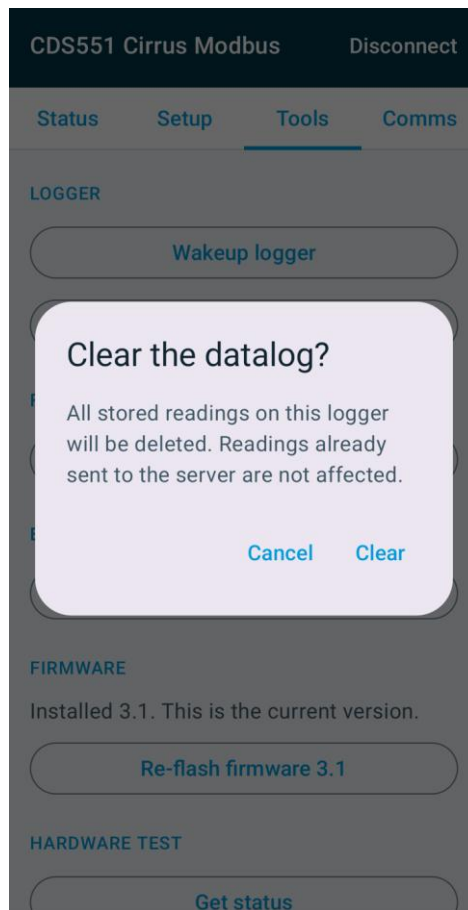


Figure 17. Clear datalog asks for confirmation

6.2 Factory default

Restore factory default writes the standard settings for this model to the logger and then re-reads the setup. The device code and serial number are kept. If the logger has no device code yet, the app allocates one from the date and a daily counter first.

Stratus loggers have two scripts instead: Basic powered device and Basic battery device, which differ in the power source and generator settings.

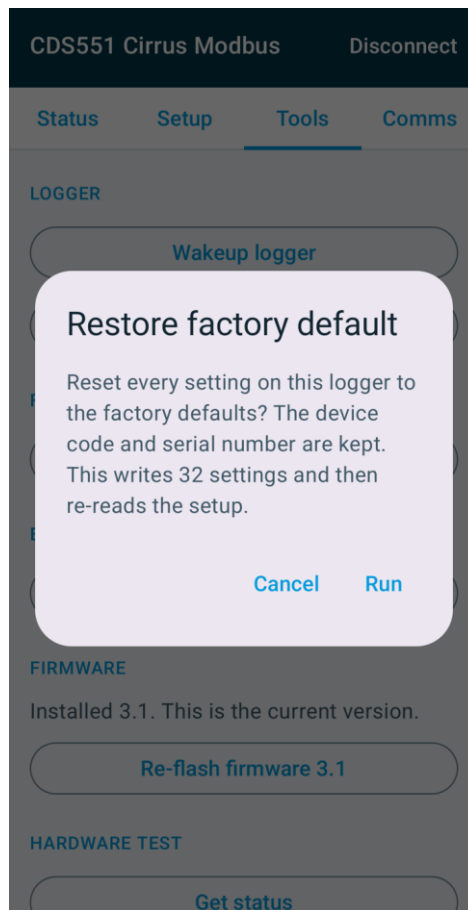


Figure 18. Restore factory default

6.3 Bluetooth security

See section 7.

6.4 Firmware

See section 8.

6.5 Hardware test

- **Get status** shows the logger's status block: database, site and device codes, application code, firmware version, APN, IP address and port, heart rate, signal, clock, record count and power source.
- **Get IO status** shows the raw input readings: pulse counters, weights and units, loop current, range and alarm state, digital input and output, and battery voltage.
- **Get ADC readings** shows the analogue-to-digital converter channels. Not offered on pulse loggers.

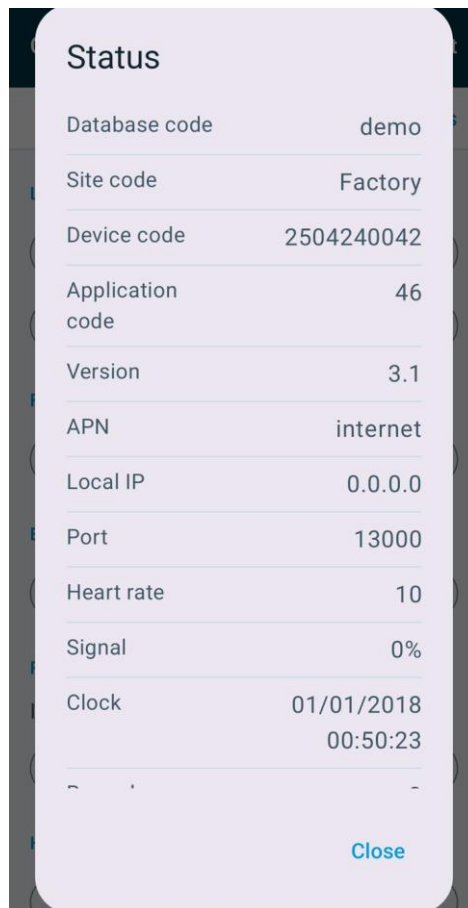


Figure 19. Get status result

6.6 Sensor tests

Sensor tests read the connected meter or sensor through the logger and decode the reply, so you can prove the wiring and the sensor before leaving site. Each test uses the settings the sensor needs (Modbus address, speed and registers) and shows the decoded values, for example flow rate, totalisers and alarms. The list depends on the logger model.

Test	Available on
AquaMaster, WaterMaster, BGT hydrostatic sensor, Krohne IFC050, Krohne IFC070	All Modbus loggers (CDS545, CDS547, CDS551)
AquaMaster 4 alarms, AquaMaster 3 alarms, Aquas pressure sensor, Rosemount 8750W, GWF Namur interface, GWF SCR push, BGT soil sensor, Sensecap soil sensor, Siemens MAG8000, Q&T W803, Microsensor MPM426W, Promag W800, TSONIC T3-1 sandwich meter	Nimbus and Cirrus Modbus loggers (CDS545, CDS551)
Promag W800: set scan registers	CDS545 and CDS551. Writes the meter's scan register list; asks for confirmation because it changes the meter.
GWF ECO encoder push, GWF Sonico push	Pulse loggers (CDS543, CDS549, CDS553)

A test that fails shows the reason in red. "No reply" usually means the sensor is not powered or the Modbus wiring or address is wrong. For sensors powered by the logger, the test switches the generator on for the sensor's delay before reading.

7. Bluetooth security

A logger can require a password before it accepts Bluetooth commands. The Tools tab shows whether security is on or off and offers the opposite action.

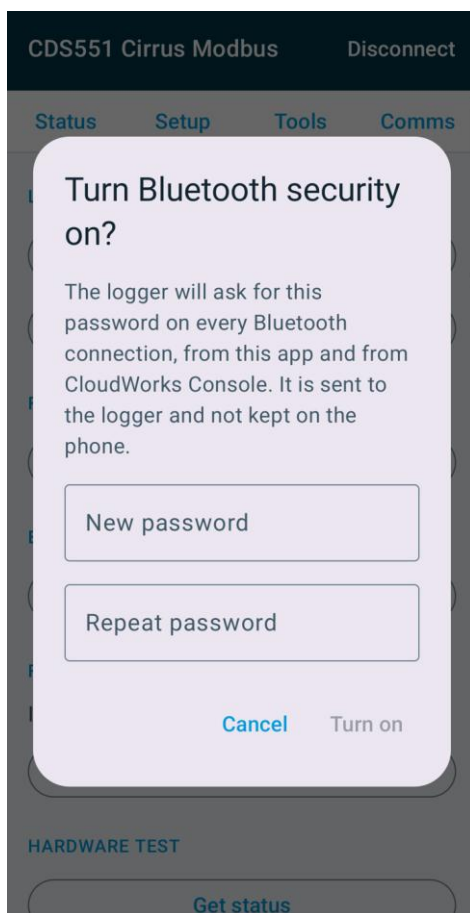


Figure 20. Turning Bluetooth security on

Turning security on

1. Tap Turn Bluetooth security on.
2. Enter the new password twice. Turn on stays disabled until both match.
3. Tap Turn on. The password is written to the logger and security is enabled.

From then on every connection to this logger, from this app and from CloudWorks Console, asks for the password. The app does not keep the password on the phone. Keep a record of it: a logger whose password is lost has to be recovered by Cape Digital.

Turning security off

Tap Turn Bluetooth security off and confirm. The logger clears its password and connects without one.

While connected

If a secured logger drops back into command mode during a session, for example after streaming mode, it reports [COMMAND MODE][SECURE] and the app re-sends the password automatically.

8. Firmware upgrade

Logger firmware is published on the Cape Digital website. After each setup read the app fetches the published list, compares the version for this logger model with the version the logger reported, and shows the result under Firmware on the Tools tab.

Firmware line	Meaning
Installed x.y. Version y.z is available.	An upgrade is offered. A dialog also tells you this as soon as the check completes.
Installed x.y. This is the current version.	Up to date. Re-flash lets you write the same version again if a logger is misbehaving.
Installed x.y. The published version is y.z, so this logger is newer than the list.	Nothing to do.
No firmware is published for CDS5xx.	Nothing to do.
The firmware list could not be fetched.	The phone has no internet. Tap Check again when it does. Firmware files already downloaded stay on the phone.

8.1 Before you start

- The logger battery must be at 40% or more, and the phone battery at 40% or more. The app checks both and refuses to start otherwise.
- The phone must have had internet at some point since the firmware was published, so the file could be downloaded. Once downloaded it is kept on the phone.
- Stay within a few metres of the logger and do not leave the app until it finishes. The transfer takes one to two minutes.

Warning. An interrupted upgrade can leave the logger unable to run. If that happens, power cycle the logger and try the upgrade once more. If it fails a second time the logger must be returned to the manufacturer for recovery.

8.2 Upgrading

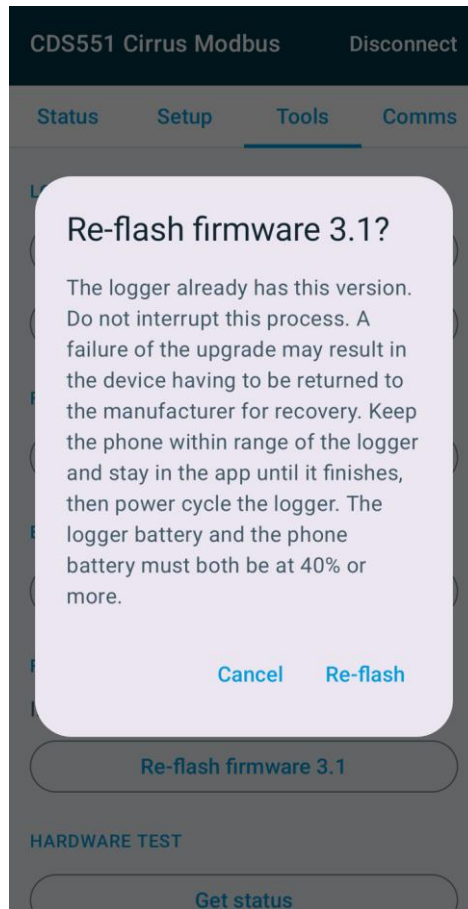


Figure 21. The upgrade confirmation

1. **Tap Upgrade firmware** (or Re-flash firmware) on the Tools tab, or Open Tools on the alert dialog, and confirm.
2. **Checks.** The app checks the phone battery, reads the logger battery, downloads or verifies the firmware file and confirms the installed version. If any check fails a "Firmware upgrade not started" box says why and the logger is untouched.
3. **Transfer.** The logger is handed to its bootstrap loader and the firmware is written in 62 blocks. A progress box shows the block number; a block that does not verify is retried up to three times. Back and Disconnect are blocked while this runs.
4. **Finish.** The app closes the Bluetooth link and returns to the Scan screen with a blue card: "Firmware x.y was written to DVC.... Power cycle the logger, then connect again to check the version."
5. **Power cycle the logger** and connect again. The Status tab shows the new firmware version and the Tools tab reports it as current.

If the transfer fails the Scan screen shows a red card naming the block that failed, with the instruction to power cycle and try once more.

9. The Comms tab

The Comms tab shows the conversation with the logger. It is the place to check what the logger is doing, to send a command by hand, and to collect a log for support.



Figure 22. Comms after a setup read: commands and replies in brackets

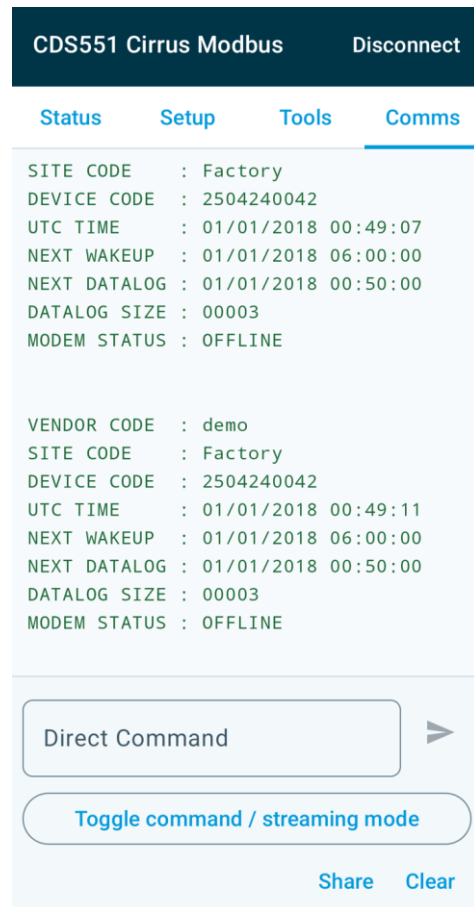


Figure 23. Streaming mode: the logger's own diagnostic output

9.1 Reading the log

- **Blue lines in brackets** are commands the app sent, for example [GET VOLTAGE].
- **Green lines in brackets** are the logger's replies, decoded, for example [VOLTAGE=4.28].
- **Other green lines** are anything the logger sends on its own: the status block it prints when its button is pressed, [COMMAND MODE] when it returns to command mode, and the diagnostic stream in streaming mode. These are shown exactly as received, blank lines included.
- **Grey lines** are notes from the app, such as "Setup read complete". Red lines are errors.

9.2 Command mode and streaming mode

The logger has two modes. In command mode it accepts commands; this is the mode it is put into when the app connects. In streaming mode it prints diagnostic information as it connects to the network and the server, and ignores commands.

Toggle command / streaming mode, under the command line, switches between them. The logger prints [COMMAND MODE] when it returns to command mode.

If commands fail. The app cannot tell which mode the logger is in except by what appears on this screen. If a command fails with the message that the logger may not be in command mode, look here first and toggle back to command mode before trying again.

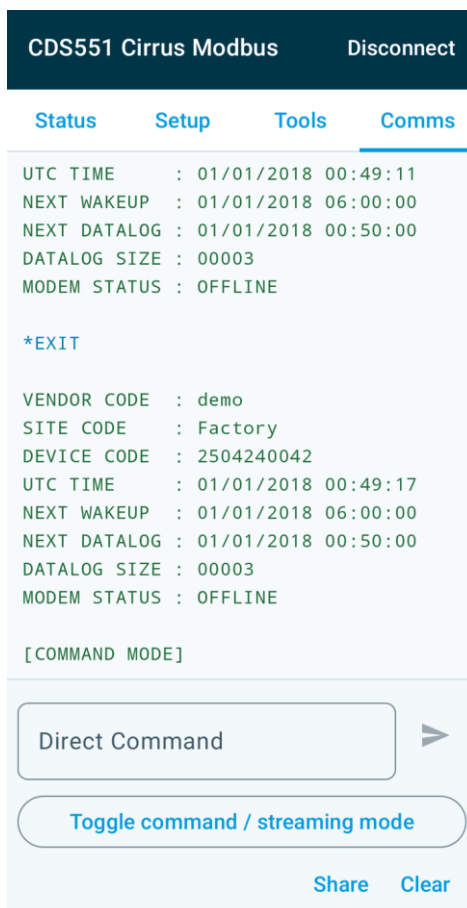


Figure 24. Toggling back: *EXIT is sent and the logger confirms [COMMAND MODE]

9.3 Direct commands

The Direct Command line sends a command you type. Three forms are accepted:

You type	What happens
[GET VOLTAGE]	A Console high-level command in brackets. The app runs it exactly as the matching tool or setup read would, and shows the bracket reply.
*PING	A raw logger command starting with an asterisk. It is sent as typed, without the app's packet numbering, and the raw reply is shown.
GET VOLTAGE	Anything else is sent as a numbered logger command and shown as a [DIRECT COMMAND] with its [RESPONSE].

9.4 Share and Clear

- **Share** sends the whole log as text, with timestamps, through any app on the phone: email, WhatsApp, and so on. Send it to Cape Digital when reporting a problem.
- **Clear** empties the log. It is also cleared when you connect to a different logger.

10. Troubleshooting

Symptom	What to check
The logger does not appear in the Found list	Press the logger button for one second and check the blue LED is flashing. You have 90 seconds. Tap the refresh icon to search again. Try Show all if the logger has an unusual Bluetooth name.
Pairing request never appears, or pairing fails	Forget the logger (hold it in the Paired list, or use the phone's Bluetooth settings) and connect again.
"Connection error. Please power cycle the logger"	The logger did not answer. Power cycle it, switch Bluetooth on again and reconnect.
A tool or a save fails with "The logger may not be in command mode"	Open Comms. If streaming output is scrolling, tap Toggle command / streaming mode and wait for [COMMAND MODE], then try again.
A sensor test reports no reply	Check the sensor's power, wiring, Modbus address and speed. Check the 24V power generator setting and pulse delay on the Setup tab.
Setup read finishes with errors	The Status tab lists what could not be read. Check command mode as above, then use Re-read setup.
The firmware line says the list could not be fetched	The phone has no internet. Connect it and tap Check again.
The firmware upgrade is refused	The box says which check failed: phone battery, logger battery, or the file could not be downloaded or verified.
The firmware upgrade failed part way	Power cycle the logger and try once more. A second failure means the logger must go back to the manufacturer.
Samsung phone refuses to install or update the app	Turn off Auto Blocker in Settings, Security and privacy.
The Use phone location button does nothing	Grant the app location permission when asked, and make sure the phone's location service is on. It can take up to 25 seconds outdoors.

When reporting a problem to Cape Digital, use Share on the Comms tab to send the log of the session together with the logger's device code and the app version shown at the bottom of the Scan screen.

Appendix A. Application types

The number is what the logger stores. Each logger model offers only the types that apply to it.

Type	Name	Offered on
000	Basic Cumulus Function	Not offered by this app
001	Combo Pulse Meter + Pressure	Not offered by this app
002	Fwd/Rev Meter + Pressure	Not offered by this app
003	AquaMaster 3 + Loop	Not offered by this app
004	GWF ECO Encoder + Loop	Not offered by this app
005	AquaMaster 4 + Loop	Not offered by this app
006	GWF Sonico + Loop	Not offered by this app
007	Pulse Only	CDS543, CDS549, CDS553
008	Combo Pulse Meter	CDS543, CDS549, CDS553
009	Fwd/Rev Meter	CDS543, CDS549, CDS553
010	GWF ECO Encoder	CDS543, CDS549, CDS553
011	GWF Sonico	CDS543, CDS549, CDS553
012	Current Loop	CDS545, CDS547, CDS551
013	AquaMaster 3 + Loop	CDS545, CDS547, CDS551
014	AquaMaster 4 + Loop	CDS545, CDS547, CDS551
015	Basic Pulse + Loop	CDS546, CDS548, CDS552
016	Combo Pulse Meter + Pressure	CDS546, CDS548, CDS552
017	Fwd/Rev Meter + Pressure	CDS546, CDS548, CDS552
018	WaterMaster + Loop	Not offered by this app
019	WaterMaster + Loop	CDS545, CDS547, CDS551
020	4-20mA H/S Level Sensor	Not offered by this app
021	4-20mA H/S Level Sensor	CDS545, CDS546, CDS547, CDS548, CDS551, CDS552, CDS554, CDS555
022	BGT H/S Level Sensor	Not offered by this app
023	BGT Modbus H/S Level Sensor	CDS545, CDS547, CDS551
024	GPS Location + Loop	Not offered by this app
025	Krohne IFC050 Meter + Loop	Not offered by this app
026	Krohne IFC050 Meter + Loop	CDS545, CDS547, CDS551
027	Combo Pulse + Aquas Press.	Not offered by this app
028	Rosemount 8750W + Loop	CDS545, CDS551
029	Dual Loop + Pulse	CDS554, CDS555
030	GWF Sonico ECO E2 + Pulse	CDS543, CDS553
031	PRV + Pulse	CDS554, CDS555
032	GWF Namur Interface + Loop	CDS545, CDS551
033	Krohne IFC070 Meter + Loop	CDS545, CDS547, CDS551
034	Aquamaster 4 w/Alarms + Loop	CDS545, CDS551
035	GWF SCR Interface + Loop	CDS545, CDS551
036	BGT Soil Sensor	Not offered by this app
037	Sensecap Soil Sensor	CDS545, CDS551
038	Siemens MAG8000 + Loop	CDS545, CDS551
039	Aquamaster 3 w/Alarms + Loop	CDS545, CDS551
040	Pulse Status + Loop w/Wakeup	CDS546, CDS552
041	Aquas Pressure Sensor	CDS545, CDS551
042	Cathodic Protection	CDS545, CDS546, CDS551, CDS552
043	Q&T Instruments W803	CDS545, CDS551
044	MPM426W Fuel Sensor	CDS545, CDS551
045	E&H Proline Promag W800	CDS545, CDS551
046	TSONIC T3-1 Sandwich Meter	CDS545, CDS551

Appendix B. Factory default settings

Restore factory default writes these values, the same as CloudWorks Console's default script for the model. On Stratus loggers the Basic powered device script sets the power source to external 12V and the generator to On; Basic battery device sets battery and Off.

Setting	Default
Database code, site code, description	Default, Factory, Factory Default
Application type	007 Pulse Only (pulse), 012 Current Loop (Modbus), 015 Basic Pulse + Loop (loop), 029 Dual Loop + Pulse (dual loop)
Position	0, 0
Server (Nimbus)	40.114.246.217, port 13000; APN blank; NB-IoT bands 0; scrambling on
Server (Stratus and Cirrus)	cloudworks.systems, port 13000; APN internet with no username or password; SMS service centre blank
DNS	8.8.8.8 and 8.8.4.4 on Cirrus; blank on Stratus
SIM PIN	Blank
Wakeup period, datalog period	360 minutes, 5 minutes
Power source	Battery (Basic powered device: external 12V)
Data roaming, modem diagnostics	On, off
Pulse inputs	Counter 0, weight 1, units m3; ECO timeout 5 s and holdoff 7 s on pulse loggers
Loop	4 to 20 mA, units mA, alarms off
24V power generator	Off with a 0.1 s pulse delay (On for Basic powered device)
User configuration data	Blank
Engineering values	Maximum startup 60, comms timeout 60, heartbeat 10, power threshold 4.75 V (3.2 V on the CDS543)
Device code, serial number, Bluetooth security	Unchanged

The confirmation dialog states how many settings will be written for the connected model.

Appendix C. Version history

Version	Changes
0.7.1	Firmware upgrade from the Tools tab with an alert when a newer version is published. Comms shows everything the logger sends, with the command/streaming toggle moved there. Bluetooth hint while searching. Warning about command mode on failed commands.
0.6.1	Cathodic protection defaults, 24V power generator wording, logger list shows Bluetooth names only.
0.6.0	First release with in-app update from the website.