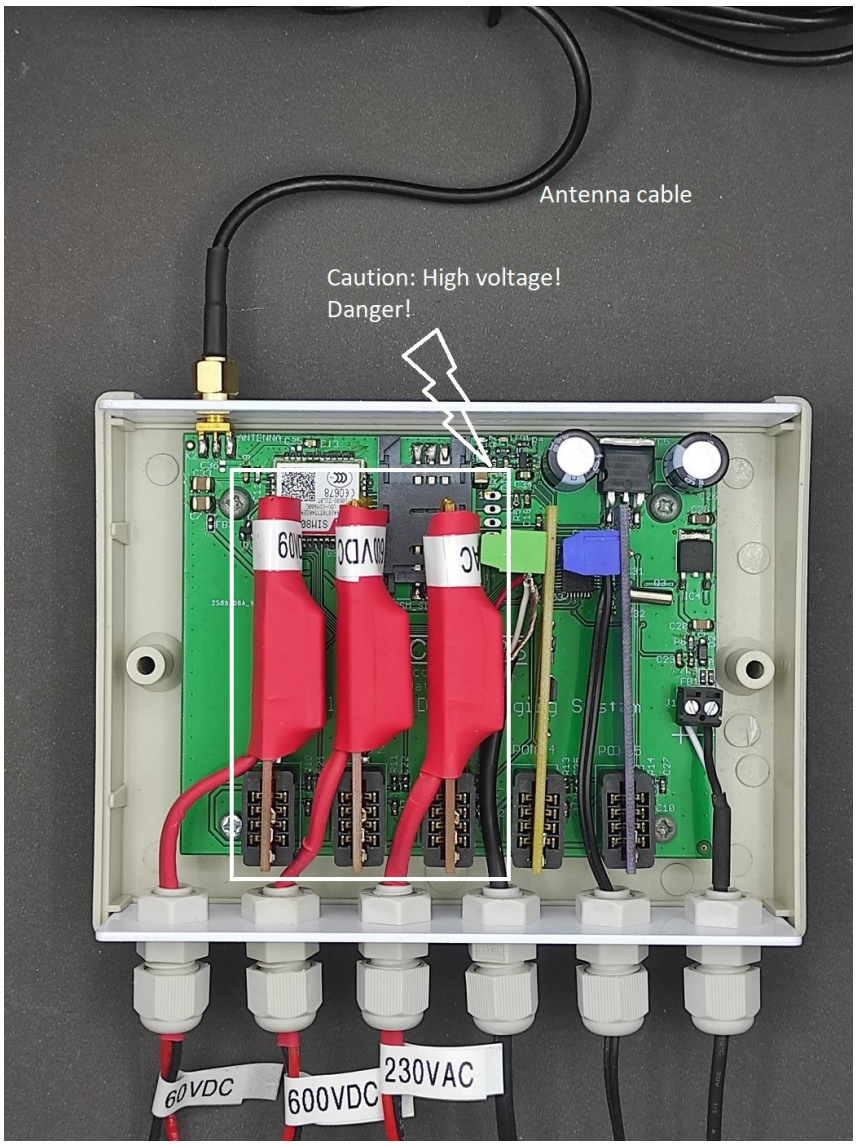
Installation Manual
Datav8 Solar/Inverter Monitoring System

Introduction

This manual explains how to connect your Datav8 Solar/Inverter Monitoring System. All installation work must be carried out by personnel who are correctly qualified to work with the high voltages and currents utilized in these systems. Further, all installation work must comply with local wiring regulations.

Do not attempt to remove the red protective sleeves on the high voltage modules as this will expose potentially lethal voltages.



Connecting Battery Input

The battery input is labeled “60VDC” and can be used to monitor battery voltages up to 60V DC. Typically this would be a 12V, 24V or 48V battery, either lead type or lithium based.
Connect the black wire to the negative of the battery supply via a fuse, after the main battery fuse.
Connect the red wire via a fuse to the positive battery supply after the main battery fuse. See below for a connection diagram.
The fuse should be rated for 5A or lower, minimum 100VDC and must have a rupture capacity of 25kA. Please note that an AC circuit breaker is not suitable for this application. A ceramic 10*38 fuse in an insulated fuse holder is ideal.

Connecting Solar Input

The battery input is labeled “600VDC” and can be used to monitor the voltage from a string of solar panels, provided that the open-circuit voltage (Voc) of the solar string does not exceed 600V.
Connect the black wire to the negative of the solar string, after the protection fuse.
Connect the red wire via a fuse to the positive end of the solar string after the protection fuse. See below for a connection diagram.
The fuse must be of type gPV and have a maximum rating of 5A. Please note that an AC circuit breaker is not suitable for this application. A ceramic 10*38 fuse in an insulated fuse holder is ideal.

Connecting 230VAC Input

The mains voltage input is labeled “230VAC” and can be used to monitor AC voltages up to 230V. This could be either feeding into the inverter, in which case you will have a log of the utility power network voltage, or after the inverter in which case you will have a log of the voltage being supplied to your inverter-fed appliances.
If the logger is wired directly into the distribution board then it must have a means of isolating it. A two pole 5A miniature circuit breaker (MCB) is ideal.

Connect the black wire to the AC neutral and the red wire to the AC live via the isolator. See below for a connection diagram.

Installing the Current Sensor

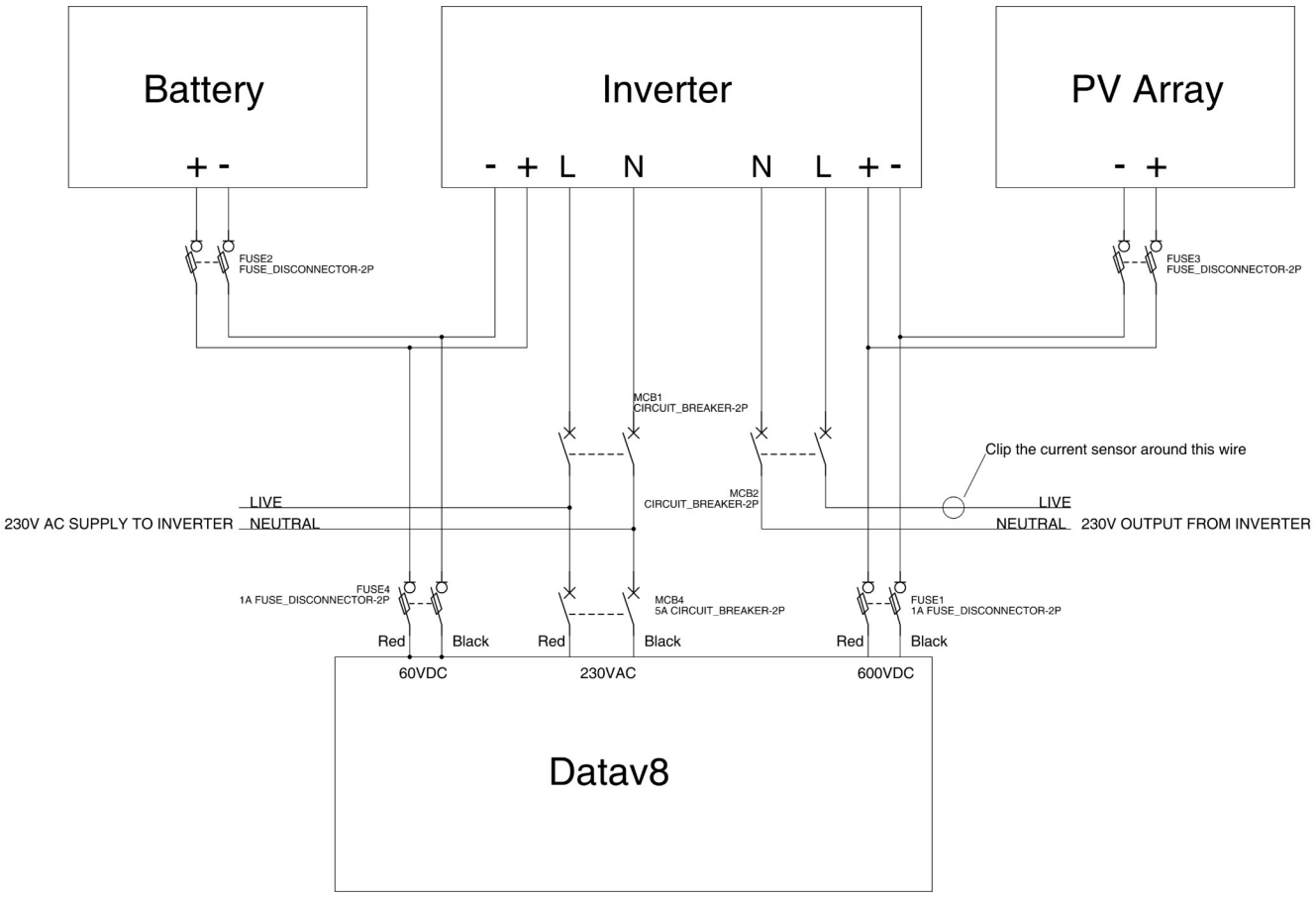
The current sensor is used to measure how much current is being used. It is clipped around an insulated live wire as illustrated in the example connection diagram. It must only go around the live wire, not the entire mains cable, the neutral wire must not pass through the sensor. The sensor can measure up to 50A and can only measure AC current. This allows loads of up to 11.5kVA to be monitored. If you measure voltage and current and multiply the together the amount of power can be determined.
Example: The mains voltage is 230V, the measured current is 10A. The total load=230*10=2300VA=2.3kVA.
This can be used to determine if the inverter is too heavily loaded or it could be used in the run-up to installation to determine what size inverter is needed.

Using the Temperature Sensor

The logger has a temperature sensor probe which can be used for monitoring the system to ensure that it is not running too hot. Inverters and batteries are often installed in hot garages and when the inverter is carrying a big load it might overheat. Place the temperature sensor on the hottest safe part of the inverter that is accessible.

An alternative use for the temperature sensor is to monitor a fridge or freezer to make sure spoilage of food isn’t happening during power failure. In this case insert the temperature sensor into the cold storage area.
If needed the wires on the temperature sensor can be extended up to 20m with a similar flex wire.

Example Connection Diagram

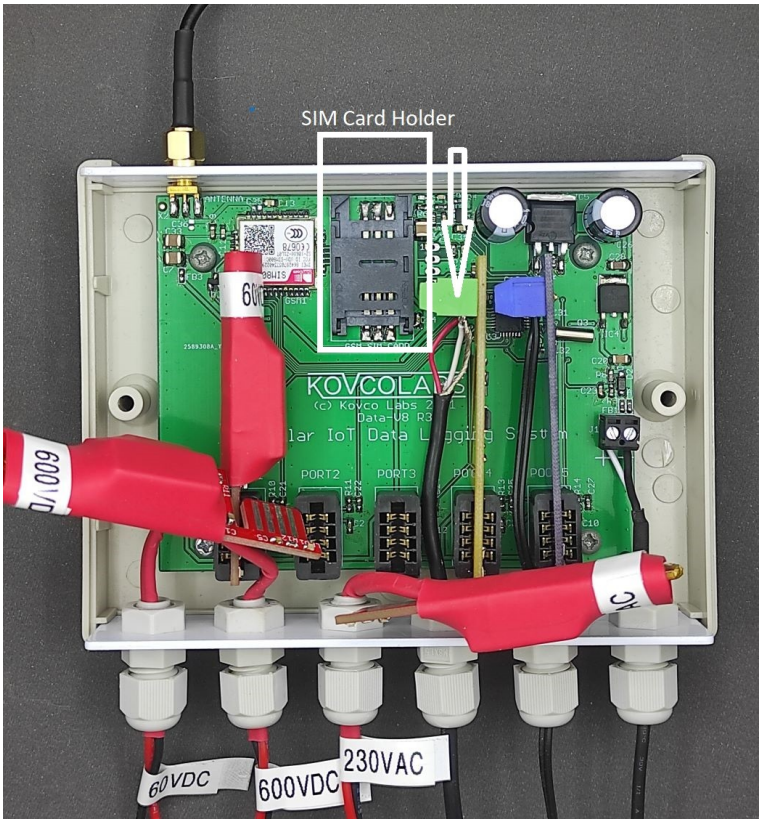


Inserting SIM Card

Before starting you will need a SIM card with sufficient airtime. The logger uses approximately 30MB/month. Prepaid or contract options are available from all the cellular providers. Ensure that the network used has coverage in the logger's final location. It is suggested that you record the phone number of the SIM card before inserting it. This will allow you to recharge airtime without having to remove the SIM card.

In order to access the SIM card slot remove two input modules as shown by pulling them gently upward, as illustrated below.

Gently slide the SIM card slot cover towards the cable entry side. Lift the cover upwards and insert the SIM card into the grooves in the cover. Put the cover down and latch it closed by sliding it upward.



Positioning the Antenna

The antenna must be positioned where it will get a good cellular phone signal. It should be placed on a non-metallic surface and can be secured by means of the double sided-tape backing.

Powering the Logger Up

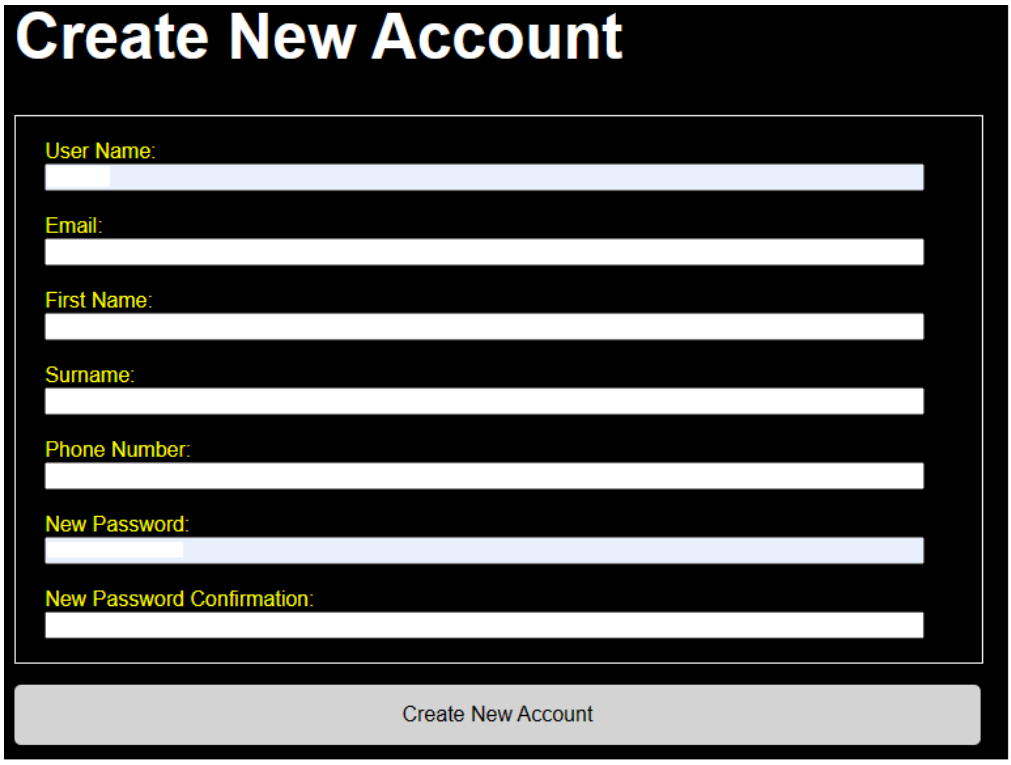
Ensure that the lid of the logger is secured in place before turning on any of the inputs or the power supply. At no stage should you open the logger with any inputs connected to a live power supply.
Plug the power supply in to the mains supply on the backed-up side of the inverter. The end panel light should illuminate red indicating that the logger is powering up.

After a few minutes the light on the end panel should change to blue. At this point the logger is logging data and this should be visible on the dashboard when you add the logger.

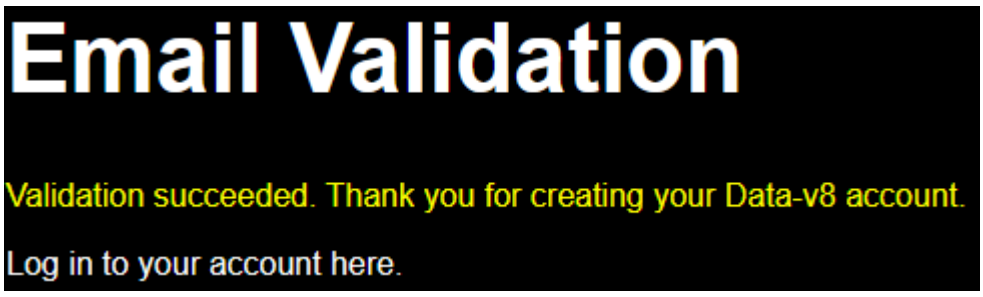
Setting Up a User Log In

Navigate your web browser to https://www.datav8.com and you will see a link to create a new user account. Click on that.

You will be directed to a page where you can enter your details. Please note the privacy policy, we commit to not spamming you or sharing your personal details. Passwords are stored in encrypted form and we can not see them.



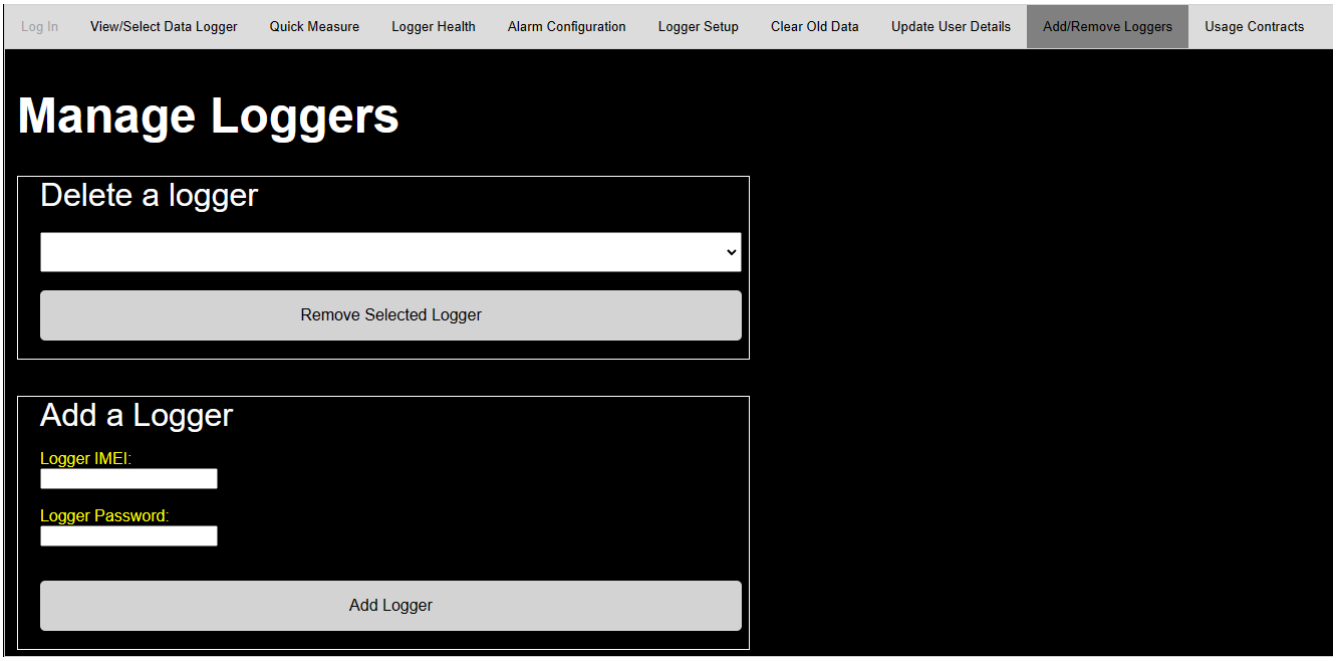
Once you create an account you will receive an email asking you to validate your email account. The email will originate from “Data-v8 validations <admin@datav8.com>” and will contain a link that must be clicked within 24 hours in order to validate that we have your correct email address.
Clicking the link will take you to this page:



From here you can click the “Log in” link and you’ll be taken to the login page. Use your username or email or phone number together with your password to log in.

Adding Your Logger to Your Account

Click on the “Add/Remove Loggers” tab and you will see this screen.



Under “Add a Logger” enter the logger’s unique IMEI and factory-allocated password. These are supplied on a piece of paper with your logger. Keep a record of these so that you can add the logger to other users’ accounts if you so wish. Click the “Add Logger” button

You can add as many loggers as you want to your account in this way.

Click on “Logger Setup” to name loggers and channels. This is useful when you have multiple loggers. The channel setups are pre-configured so you will not need to change them unless you change plug-in modules. Please remember to click the “Save Logger Setup” button at the bottom of the page to save your changes.

Click on “Alarm Configuration” to set automated email alerts. Alarm conditions can be set so that if a channel value exceeds a threshold for a specified amount of time emails can be sent to a list of recipients.

For each of the five channels the following settings apply:

Alarm Active: Whether the channel is monitored or not.
Upper limit: If the channel reading is higher than the upper limit continually for more than the “holdoff time” then an alarm is triggered.

Lower limit: If the channel reading is lower than the lower limit continually for more than the “holdoff time” then an alarm is triggered.

Alarm Holdoff: If the channel’s reading is above the upper threshold or below the lower threshold then an alarm condition is detected. In some instances It is desirable to trigger the alarm after thresholds have been exceeded for some specified length of time. An example of this would be a temperature probe placed in a fridge. If no delay is used then opening the door might trigger an alert. Setting the delay to a few minutes will prevent this but still trigger an alert if the door is left standing open. This is often a better approach than raising the thresholds to avoid false alerts.

Channel sends alarm every hour while in alarm condition: This is used for applications where hourly reminders are needed if a channel value is out of bounds.

The overall logger can be monitored in case of failure. This can occur in instances of power failure, loss of cellular network or lack of airtime. This is activated by ticking the “Send Alarm if logger goes offline” checkbox. In such cases the Data-v8 cloud server will notify you if it hasn’t received data from the logger for over an hour.

The list of email addresses to notify is at the bottom of the page. Multiple email addresses may be entered provided that you separate them with a comma.

When you have finished setting up your alarms please click “Save alarm configuration and send test email. This will cause a test email to be sent to the mailing list. Please ensure that all recipients receive it correctly.

Viewing Your Logger Data

The data from your Data-v8 device can be viewed and downloaded by clicking the “View Data Logger” tab. This shows you graphs of the active channels. The relevant logger can be selected from the drop-down box if you have multiple loggers. The time period can be selected either by clicking the time picker boxes or by clicking one of the quick selection buttons just below the logger selection box.

Data can be downloaded to your device in CSV format which can be opened by popular spreadsheets.

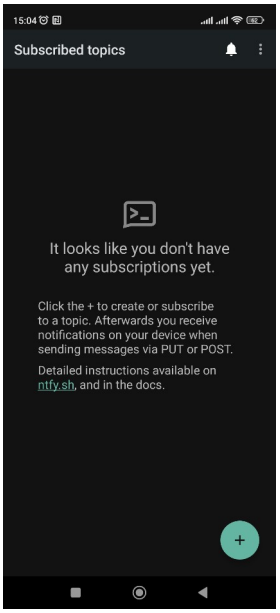
Each graph can be zoomed by dragging with a mouse or by a pinching gesture on a touch screen. Channels can be overlaid on top of each other on the graph at the bottom of the page.

Sometimes it is more convenient to get a few quick measurements from the logger, for example average (mean), minimum, maximum and current values. These can be accessed under the “Quick Measure” tab.

The logger’s system parameters can be seen under the “Logger Health” tab. This allows you to see your logger’s cellular signal strength (typically this should be 15/31 or higher), the logger supply voltage and whether the logger has been online or offline. The logger has three hours worth of onboard memory for when the cellular network is not available. If this is used then samples taken during this time will be uploaded gradually when the network returns and are considered “offline samples”.

10. Mobile App Notifications

Download and install the “ntfy” (Notify) application from the Android Play Store or the Apple App Store.
When you run ntfy for the first time you will see a screen as follows:



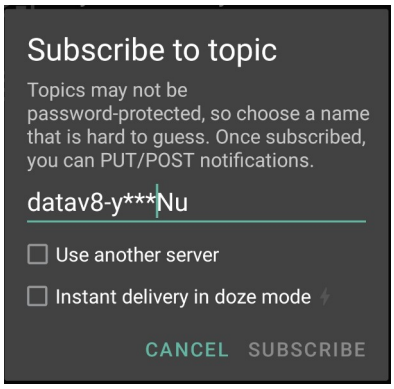
Log in to www.datav8.com with your computer or phone. Under the “View/Select Data Logger” tab choose the logger for which you wish to receive notifications.

Now navigate to the “Alarm Configuration” tab. Near the bottom of the tab you will see the following section:

Mobile App Notifications

To receive free mobile alarm notifications from this logger install the app "ntfy" from the Android Play Store or Apple App Store and subscribe to the following channel: datav8-y[redacted]Nu

Click the “+” button in the bottom right corner of ntfy and enter the information from the datav8 web page into ntfy, you should see this:



Click “Subscribe” and alarms and messages from Datav8 will be sent to your phone. Anybody subscribed to the channel will receive alerts. In order to stop receiving alerts you can unsubscribe from the relevant channel in ntfy.

Extending Your Contract

The Data-v8 starter kit comes with one year’s server access which starts when the unit is first configured using the procedure described above (section 3). This allows the system to be tested on-site so that you can see first-hand what the benefits of remote logging are. Should you wish to continue beyond this year then you will need to buy a contract.

The contract allows the Data-v8 to upload data to the server and allows you to view and download data for the past month. You will need to purchase data for the unit yourself. Typically the unit consumes 30MB/month but an allowance of 50MB/month is recommended.

Accessories and Measurement Options

Data-v8 has a large range of options and accessories to ensure that it can measure many physical parameters. Each of the five channels can be adapted to measure different parameters by means of unplugging a measurement module and plugging in a different module depending on what is to be measured. When purchasing new modules you will need to update the “Logger Setup” tab of the device and which channel it will be fitted to so that the online platform can be updated to reflect the new configuration.

If you want...	Then you need:
Low cost NTC temperature probe	NTC temperature probe and NTC measurement module. Stock code: HTE00325: (NTC probe) Stock code: HTE00315: (Measurement module)
A larger NTC probe to smooth out temperature fluctuations such as defrost cycles	NTC temperature probe and NTC measurement module. Stock code: HTE00323 (Large NTC probe) Stock code: HTE00315: (Measurement module)
To use a Pt1000 temperature probe	Pt1000 probe and Pt1000 measurement module. Stock code: DEV0111 (Pt1000 probe) Stock code: HTE0026 (measurement module)
To measure AC single phase current up to 30A	Clip on current transformer, split core 30A and current measurement module Stock code: HTE0034 (transformer) Stock code HTE0027 (measurement module)
To measure AC single phase current up to 50A	Clip on current transformer, split core 50A and current measurement module Stock code: HTE00345 (transformer) Stock code HTE0027 (measurement module)
To measure AC single phase current up to 100A	Clip on current transformer, split core 100A and current measurement module Stock code: HTE0035 (transformer) Stock code HTE0027 (measurement module)
To measure gas or water pressure	Pressure transducer, pressure measurement module and pressure transducer cable. Choose either a 10 bar or a 35 bar sensor. Stock code: SPO9100 (10 bar max pressure sensor) Stock code: SPO9110 (35 bar max pressure sensor) Stock code: SPO9200 (Cable for pressure transducer) Stock code: HTE0030 (measurement module) Stock code: FBB0000 (Adapter to fit threaded garden tap)
To measure DC voltage up to 60V	Low DC voltage measurement board Stock code: HTE00296
To measure DC voltage up to 600V	High DC voltage measurement board Stock code: HTE00297
To measure mains voltage, single phase	Mains voltage measurement board Stock code: HTE00295
To measure relative humidity	RH and ambient temperature probe. The probe uses one channel for RH and one channel for temperature. The temperature measurement channel is optional. One measurement module is needed per used channel Stock code: HTE0028 (RH and ambient probe) Stock code: HTE0033 (measurement module. Use two if both RH and ambient temperature are used)

Troubleshooting

Problem	**Likely Cause**
No lights come on at all	Check that the unit is supplied with 12VDC. The power connector is on the right hand side of the circuit board and positive and negative terminals are marked. The supply must be the right polarity. The unit is reverse-polarity protected.
No data is being logged but one of the lights is on	Check that there is a cellular signal where the unit is installed. There must be signal on the same network as the SIM card fitted in the unit. A smartphone app such as “Network Cell Info Lite” (For Android) is very useful for determining the optimal antenna location. Check that there is airtime or data loaded onto the unit’s SIM card. This can be done by putting the SIM card into a cellphone and following the cellular network provider’s instructions. Please remove power from the unit when removing or replacing the SIM card.
NTC temperature probe is displaying temperatures below -80°C	Probe is open circuit
Customer-supplied temperature probe is displaying incorrect temperature readings	Wrong type of probe is installed. NTC Probes must be 10kohms at 20°C and have a Beta of 3950 Pt1000 boards may only have Pt1000 probes connected.
A different measurement module and sensor type have been fitted to a channel but aren’t reflecting on the graphs	Check that the correct modules are selected under “”Logger Setup” tab
Other technical support needed	Email samuel.ginsberg@kovcolabs.co.za for engineering support