

KOOKABERRY QUICK MANUAL

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WHAT IS THE KOOKABERRY?

The Kookaberry is an easy-to-use digital device (a microcontroller) designed in Australia to engage both students and teachers at the basic data level of our digital world.

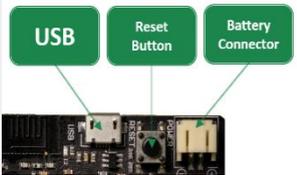
Its primary purpose is to enrich lessons across many Key Learning Areas of the curriculum such as Geography, Personal Health, Mathematics, Science & Technology; and it can be used in practical learning projects as diverse as weather stations, art installations, mathematical games, physical fitness, and musical experimentation.

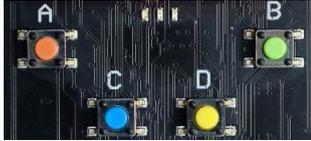
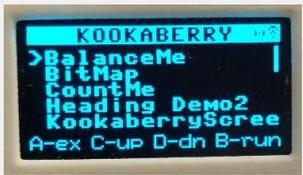
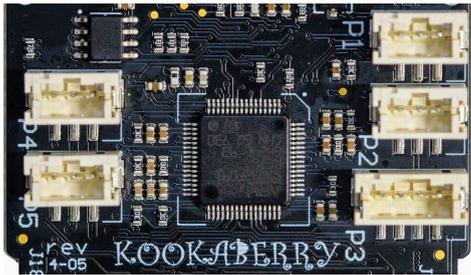
The Kookaberry is slightly larger than a credit card, and stands alone as a single, easy to use, device for measuring, monitoring, communicating and displaying data; storing the results for later graphing and analysis; and transforming data through algorithms (i.e. coding) to control processes and external devices.

The Kookaberry uses pre-coded applications with plug-and-play sensors and other peripherals to measure and log data such as temperature, humidity, and soil moisture over time; as well as control external elements such as speakers, lights, relays, servos, fans or water pumps.

GETTING STARTED

Learn how to switch on and find your way around the Kookaberry

Step	Description	Resource
1	If an AustSTEM handle is available, push the Kookaberry into it with the screen facing forward, ie with the battery hole at the back. Insert the battery into the vertical hole if being held in the hand, and into the horizontal hole if being stood on a flat surface	
2	Connect the 5 Volt USB Lithium-Ion battery to the USB connector. A green LED should illuminate on the back of the Kookaberry indicating that the Kookaberry is now switched ON. If a blue LED is pulsing slowly then the battery voltage is too low and the Kookaberry will soon become inoperative. In such a case the battery should be replaced with another one that is fully charged. The Kookaberry can also be powered directly from a USB charger or a battery box plugged into the battery connector.	 

Step	Description	Resource
3	<p>Start the Kookaberry's Menu app by holding down the green B button, tapping the reset button on the back and then releasing the green B Button.</p> <p>This activates the Menu screen on the display.</p> <p>The Menu shows a list of the MicroPython apps that are stored in the Kookaberry's USB memory stick.</p>	
4	<p>Select the Kookaberry app that you wish to run by navigating up or down by pressing the C or D buttons respectively. The cursor (>) on the left will move up or down the display and the list on the display will scroll up or down in response.</p> <p>Press the B button to run the app.</p>	
5	<p>Read the prompts on the screen for the correct connectors for the peripherals and connect them to the relevant connectors (P1 to P5) on the back of the Kookaberry.</p> <p>It is best to make such connections and disconnections when the Kookaberry is OFF as connecting them whilst it is ON sometimes causes it to reset and turn OFF.</p> <p>If this happens, simply write down the correct connections, plug the peripherals into the correct connectors and turn it on again</p>	
6	<p>The display and buttons will then be controlled by the app that was run until it exits and returns to the Menu app.</p> <p>In general, the A button is used as the exit button, both from the Menu app and most apps provided by the AustSTEM Foundation.</p> <p>It is best to consult the documentation for the app being run to learn how to operate it.</p>	

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USING THE KOOKABERRY

The Kookaberry has been designed to enhance the teaching of all subjects in the absence of both the internet and WiFi.

All the translation of software programmes written in its native MicroPython language takes place within the Kookaberry board, and access to external servers over the internet, or separate programmes running on a connected computer, is no longer required.

The inclusion of a USB memory on the board means that programmes written in the MicroPython language can be stored as drag-and-drop applications (or apps) that run as soon as they are called up via the menu on the on-board display.

The USB memory is also used to store data logged during many measurement applications. The data is stored in an Excel CSV format which can be easily transferred to a teacher's computer for analysis and display.

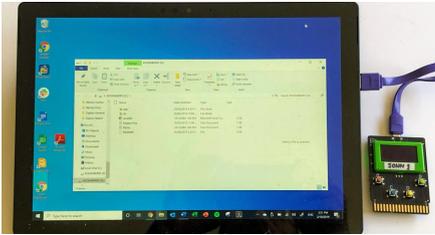
Kookaberries can also transfer data between themselves using their in-built Bluetooth low power radio transceivers in broadcast mode. This means that data collected on individual Kookaberries can be transmitted to a teacher's Kookaberry running a special listening app. The teacher can then transfer this data to their computer as an Excel CSV file.

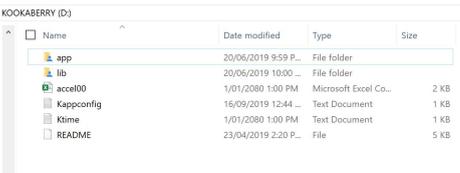
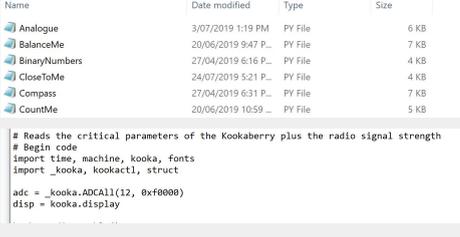
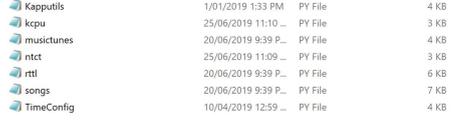
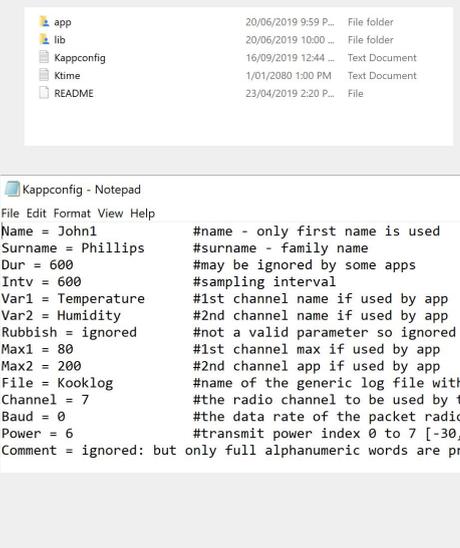
All the Kookaberry's software functionality can be accessed through viewing and editing the files in the USB memory except for the Teachers' Window and real-time editing of the native MicroPython via the KookaIDE. This is done within the USB memory using the computer's file location application (File Explorer on Windows computers).

Loading the KookaIDE and accessing the Teachers' Window is covered in Annexes A and B

ACCESSING AND USING THE USB MEMORY

The Kookaberry stores its apps and measured data in a USB memory on the board.

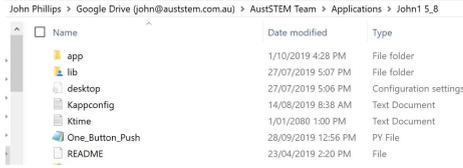
Step	Description	Resource
1	<p>Your Kookaberry has a number of applications preloaded into its USB memory. To view and access them, unplug the USB connector from the battery and plug it into your computer.</p> <p>The contents of the USB memory should then automatically open and appear on your screen as a drive named KOOKABERRY(D).</p> <p>The letter designating the drive (in this case D) will vary according to how many drives are installed on your computer.</p> <p>If the drive does not automatically appear go the File Explorer window and navigate to the drive named KOOKABERRY.</p>	

Step	Description	Resource
2	<p>The USB memory has three parts</p> <ul style="list-style-type: none"> ● app folder which contains all the applications coded in the MicroPython language ● lib folder which contains programmes used regularly by apps such as music tunes ● the root directory which just means that these files are not in specific folders. 	
3	<p>The MicroPython files in the app folder are very small text files with the suffix .py. These are the files which appear as apps in the same order on the Kookaberry's menu screen. An example of the code which reads important internal parameters (K Vitals) is shown to the right</p>	 <pre># Reads the critical parameters of the Kookaberry plus the radio signal strength # Begin code import time, machine, kooka, fonts import _kooka, kookact1, struct adc = _kooka.ADCAll(12, 0xf0000) disp = kooka.display</pre>
4	<p>The files in the lib folder are also small .py text files. As well as musictunes, it contains the programmes for allowing data logging files to show real as opposed to elapsed time</p>	
5	<p>The most important file in the root directory is the Kappconfig text file. Open it by double clicking on it. This file is where app programmes look to find specific data such as the Kookaberry's name (top line), or the sampling interval (4th line) for data logging which, in the instance shown is 600 secs (ie, every 10 mins). All the parameters in this file can be edited and changes saved by clicking on File and then Save in the drop down menu. If the Kookaberry is still connected, any saved changes will automatically load onto the Kookaberry Try changing the name to something else. Surname is optional.</p>	 <pre>Name = John1 #name - only first name is used Surname = Phillips #surname - family name Dur = 600 #may be ignored by some apps Intv = 600 #sampling interval Var1 = Temperature #1st channel name if used by app Var2 = Humidity #2nd channel name if used by app Rubbish = ignored #not a valid parameter so ignored Max1 = 80 #1st channel max if used by app Max2 = 200 #2nd channel app if used by app File = Kooklog #name of the generic log file with Channel = 7 #the radio channel to be used by tf Baud = 0 #the data rate of the packet radio Power = 6 #transmit power index 0 to 7 [-30, Comment = ignored: but only full alphanumeric words are prc</pre>

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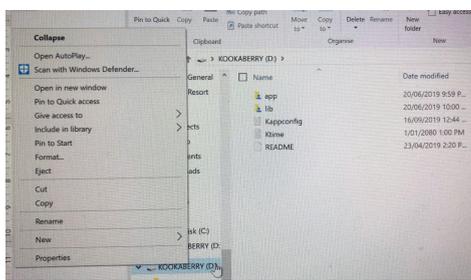
BACKING UP AND ADDING NEW APP FILES

It is good practice to backup all the folders and files that come with your Kookaberry to a separate location within your PC

Step	Description	Resource
1	<p>Backup all the contents of the Kookaberry's USB drive in a location on a computer (preferably with cloud backup such as OneDrive)</p> <p>Any new or updated files should also be backed up to this location.</p>	
2	<p>New and updated apps for the Kookaberry can be either</p> <ul style="list-style-type: none"> • downloaded directly from a distant location such as the Kookaberry website into the app folder if a Kookaberry is connected, or • dragged and dropped from another location on your PC if they were downloaded without the Kookaberry connected <p>When the Kookaberry is connected to your PC after new or updated apps have been added to its app folder, a blue LED will light on the back of Kookaberry indicating that these files are being loaded into the Kookaberry's USB memory.</p> <p>When the Kookaberry is removed and power reconnected, they will appear in the menu on the screen ready to run.</p>	

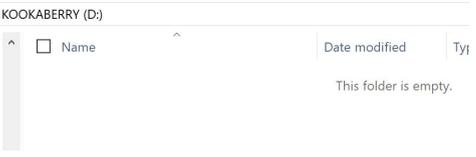
REPAIRING THE USB MEMORY

What to do in the rare case of problems with running apps or menu screen errors

Step	Description	Resource
1	<p>If the USB memory on a Kookaberry becomes corrupted for some reason (ie, the menu screen starts looking strange) then the drive should be formatted (ie cleaned out completely), and the folders and files copied and pasted back from the backup location</p> <p>To format the Kookaberry drive, right click on the drive name in the file Explorer menu and click on Format</p>	
2	<p>A small window will appear when Format is clicked. Click Start.</p> <p>A warning will now appear that formatting will erase ALL data on the disk. As this is what we are setting out to do - click on OK</p>	



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Step	Description	Resource
3	<p>The formatting will proceed and a popup window will advise that the operation has been completed. Close the Format window.</p> <p>The KOOKABERRY (D) drive will now be empty</p>	
4	<p>Copy all the original files, plus all new or updated ones from the backed up location on your computer and paste them into the empty KOOKABERRY drive.</p> <p>The Kookaberry will now work as well as it when you took it out of its original box</p>	
5	<p>Corruption of the USB memory - which is very rare - generally occurs because the USB memory connection to the computer is interrupted or pulled out when data is being transferred.</p> <p>This can be avoided by either closing the KOOKABERRY drive before disconnecting, or checking that it is OK to eject the USB memory by clicking the little USB memory icon at the right of Taskbar at the bottom of your Windows computer.</p> <p>The former is easier.....</p>	

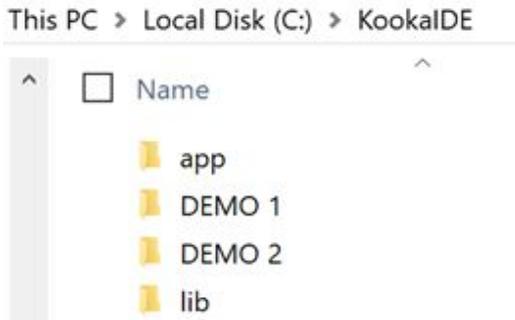
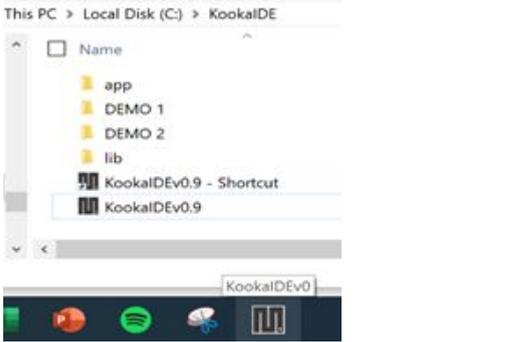


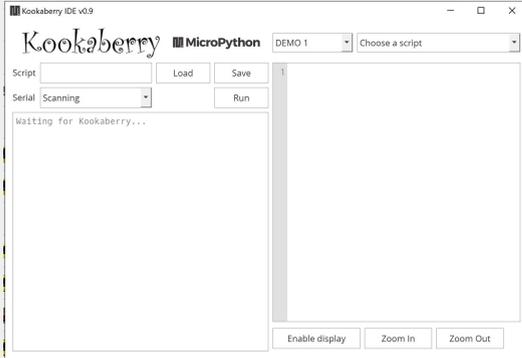
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ANNEX A: LOADING THE KOOKAIDE

The KookaIDE is a programme on a Windows computer which can access, write, edit and run MicroPython programmes on a connected Kookaberry.

The KookaIDE has been designed to run on a computer running Windows. **It is incompatible with Mac computer operating systems**

Step	Description	Resource
1	<p>A suitable folder must first be prepared on a computer running Windows to store the KookaIDE when it is downloaded from a server.</p> <p>This should take the form as shown to the right</p>	
2	<p>Locate the KookaIDE programme in a zipped file at https://github.com/kookaberry/kooka-releases/releases</p>	
3	<p>Download the zipped file to the computer and unzip it to the same location.</p> <p>Create a shortcut and pin it to the taskbar</p>	

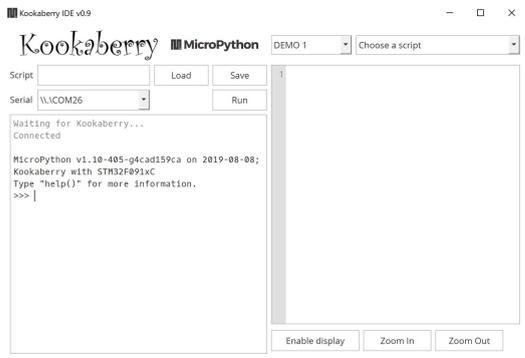
Step	Description	Resource
4	<p>Run the KookaIDE app. (Double click the file).</p> <p>Because it is what is called an executable app – which can cause problems if not from a trusted source – a computer running Windows 10 will probably generate the two warnings to the right.</p> <p>It is safe to run this programme.</p> <p>When the first warning appears, click “more info” and when the second warning appears. click “Run Anyway”</p>	
5	<p>The KookaIDE screen will now be shown as waiting for a Kookaberry to be connected.</p> <p>Features are as follows:</p> <ul style="list-style-type: none"> ● REPL – single line execution of MicroPython code ● Editor for writing of MicroPython programs as well as program editing ● RUN facility – to run a program directly on the Kookaberry ● LOAD - A facility that allows the loading of stored programs into the editor ● SAVE – A facility that allows programs developed or modified in the Editor to be stored (saved). ● TEACHERS WINDOW – A training and teaching facility that allows the Kookaberry display to be mirrored onto the KookaIDE computer via a separate window 	

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ANNEX B: DISPLAYING THE TEACHERS' WINDOW

The Teachers' Window allows the display on the Kookaberry's screen to be mirrored onto the screen of a Windows computer.

The KookaIDE programme has to be installed on the Windows computer being used by the teacher to display its screen on a monitor or smart board.

Step	Description	Resource
4	<p>Check that the KookaIDE programme has been installed (see Annex A).</p> <p>Connect a Kookaberry to a Windows computer and run the KookaIDE programme from the icon in the task bar.</p> <p>A flashing cursor in the left hand window indicates that the Kookaberry is connected</p>	
5	<p>Turn on the Kookaberry (whilst still connected to the computer) and click on Enable display at the bottom left hand corner of the right hand window.</p> <p>The Teachers' Window will appear in a separate window on the computer. This can be mirrored onto a classroom monitor or smart board.</p> <p>The interface is very fast and response is close to real time</p>	