

# FOOBARENGINEERING CANANA

CANANA Board User Guide

Analogue and digital sensor input, LED drive output,  
General purpose board interfaced using CAN.

CAN Analogue Board  
[www.FooBarEngineering.com](http://www.FooBarEngineering.com)

## Table of Contents

Introduction .....	2
Hardware .....	2
Specifications .....	2
Electrical Data .....	2
I/O Information .....	2
Communication Ports .....	2
Mechanical Data .....	3
Solder connectors .....	4
Header connectors.....	5
J5 10 pin Samtec SQT-110-01-F-S.....	5
J6 10 pin Samtec SQT-110-01-F-S.....	5
J7 10 pin Samtec SQT-110-01-F-S .....	5
J8 16 pin Samtec SQT-116-01-L-S.....	5
CAN messages.....	6
ANALOG_1 100Hz id:193 dlc:8 Motorola Format.....	6
ANALOG_2 100Hz id:194 dlc:8 Motorola Format.....	6
DIGITAL_1 200Hz id:192 dlc:8 Motorola Format.....	6
LED Control 200Hz id:1841 dlc:8 Motorola Format.....	6
LED Brightness 200Hz id:1839 dlc:8 Motorola Format.....	6
Configuration using USB debug interface.....	7
Installing USB drivers .....	7
Connecting to a WSL.....	8
List of WSL commands .....	10
'?' List all registered functions .....	10
Internal Data Logger .....	11

## Introduction

The FooBarEngineering CAN Analogue interface board (CANANA) is based on the proven WSL range of loggers and designed to interface sensors to the CAN bus.

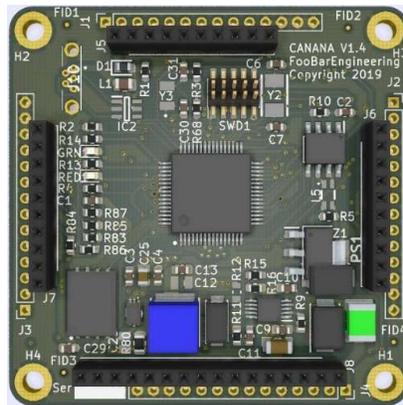
The CANANA allows complicated looms to be reduced in wire count and complexity whilst also providing weight and cost reductions.

The standard CANANA supports 5 analogue inputs, 12 digital switch inputs and there are also 2 opto-isolated relays and 5 LED outputs with brightness control.

The CANANA is fitted with 4 solder blobs to allowing simple switching between the 16 preset CAN identification ranges. These 8 addresses are duplicated once without CAN termination and once with CAN termination (120 ohm).

Further cost options include configurations of the 12 Digital inputs to be used as an additional 12 analogue inputs or wheel speed inputs and an in built logging function based on the WSL range of loggers.

## Hardware



## Specifications

### Electrical Data

Supply Voltage	6.5Vdc to 18Vdc
Supply Protection	Reverse and over voltage
Supply Current	100mA @ 12V
Temperature Range Operating	-30°C to +60°C
Temperature Range Storage	-20°C to +70°C

### I/O Information

1x CAN	1Mbit, 512k, 256k, 128k software selectable, with 120 ohm selectable termination
6x Analogue input	0-5V range @ 100Hz, op amp interfaced input.
12x Analogue Switch Inputs	0-5V range @ 100Hz, with a pull-up resistor.
5x LED/relay drive Outputs	5V Anode supply with a 330Ohm series resistor, PWM controlled for brightness. Optional external supply of up to 50V.
1x 5V Excitation	300ma supply
2x Opto-Isolated Outputs	100ma opto-isolated relay controlled from configurable input.

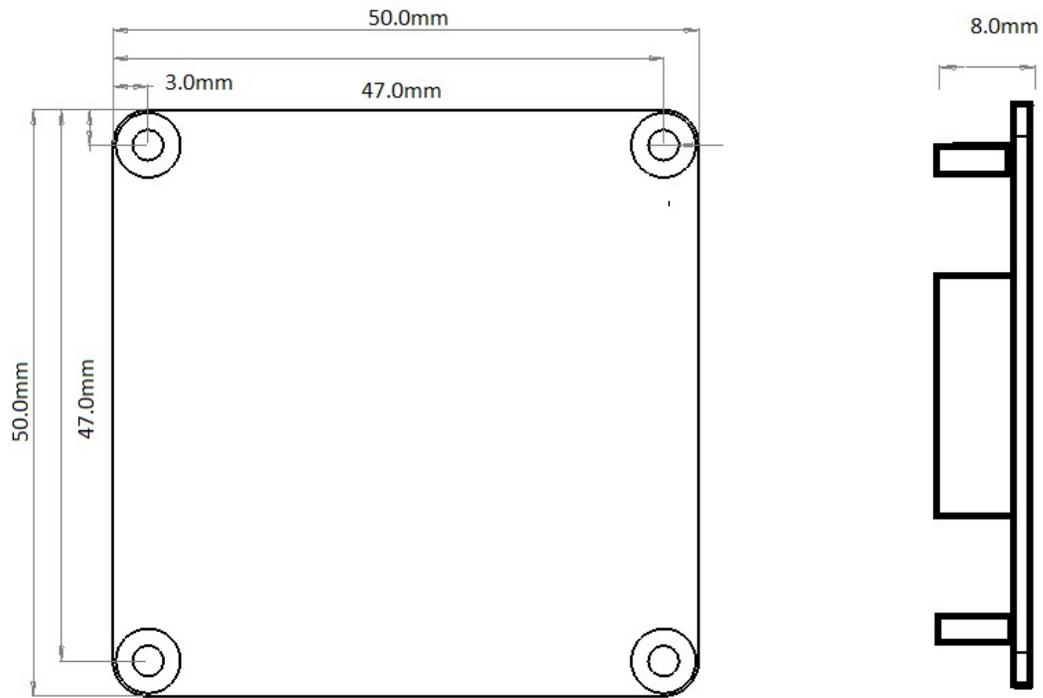
### Communication Ports

1x USB (Debug use only) RS232 terminal for setup and in use testing/ offloading of data.

## Mechanical Data

CAD model of the board available on request.

Size (without mating connectors) 50 x 50 x 13.00 mm  
2.3mm diameter holes



Weight 11 grams

## Solder connectors

### J1

1	+5V supply
2	+5V supply
3	Switch Input 8
4	Switch Input 9
5	Switch Input 10
6	Switch Input 1
7	Switch Input 2
8	Switch Input 3
9	Switch Input 11
10	Switch Input 12
11	Gnd Ground
12	Gnd Ground
13	Gnd Ground
14	Gnd Ground

### J2

1	+5V supply
2	+5V supply
3	LED1 LED 1 output driver
4	LED2 LED 2 output driver
5	LED3 LED 3 output driver
6	LED4 LED 4 output driver
7	LED5 LED 5 output driver
8	OUT-I1 Opto-isolator 1 input voltage
9	OUT-O1 Opto-isolator 1 output voltage
10	OUT-I2 Opto-isolator 2 input voltage
11	OUT-O2 Opto-isolator 2 output voltage
12	Gnd Ground
13	Gnd Ground
14	Gnd Ground

### J3

1	Switch Input 4
2	Switch Input 5
3	Switch Input 6
4	Switch Input 7
5	Analogue input 1
6	Analogue input 2
7	Analogue input 3
8	Analogue input 4
9	Analogue input 5
10	Gnd Ground
13	Gnd Ground
14	Gnd Ground

### J4

1	VEXT +12V input
2	VHSD optional LED supply (leave disconnected)
3	BATT optional battery supply (leave disconnected)
4	NC
5	Gnd Ground
6	NC
7	Optional Analogue input 6
8	CANH
9	CANL
10	CANH
11	CANL
12	Gnd Ground
13	Gnd Ground
14	Gnd Ground

## Header connectors

### J5 10 pin Samtec SQT-110-01-F-S

1	+5V supply
2	Switch Input 8
3	Switch Input 9
4	Switch Input 10
5	Switch Input 1
6	Switch Input 2
7	Switch Input 3
8	Switch Input 11
9	Switch Input 12
10	Gnd Ground

### J6 10 pin Samtec SQT-110-01-F-S

1	LED1 LED 1 output driver
2	LED2 LED 2 output driver
3	LED3 LED 3 output driver
4	LED4 LED 4 output driver
5	LED5 LED 5 output driver
6	OUT-I1 Opto-isolator 1 input voltage
7	OUT-O1 Opto-isolator 1 output voltage
8	OUT-I2 Opto-isolator 2 input voltage
9	OUT-O2 Opto-isolator 2 output voltage
10	GND OV

### J7 10 pin Samtec SQT-110-01-F-S

1	Switch input 4
2	Switch input 5
3	Switch input 6
4	Switch input 7
5	Analogue input 1
6	Analogue input 2
7	Analogue input 3
8	Analogue input 4
9	Analogue input 5
10	GND OV

### J8 16 pin Samtec SQT-116-01-L-S

1	VEXT +12V input
2	BATT optional battery supply for RTC(leave disconnected)
3	NC
4	GND OV
5	NC
6	NC
7	CANH CANH
8	CANL CANL
9	GND OV
10	NC (leave disconnected)
11	NC (leave disconnected)
12	NC (leave disconnected)
13	ISP0(leave disconnected)
14	ISP1(leave disconnected)
15	Reset(leave disconnected)
16	GND OV

## CAN messages

The CAN protocol is user configurable via a small csv setup file,By default the unit produces 3 messages, and receives 2 a DBC for the standard messages is available on request.

### ANALOG\_1 100Hz id:193 dlc:8 Motorola Format

Channel	startbit	Length	factor	unit
Analogue1	32	16	0.001	V
Analogue2	16	16	0.001	V
Analogue3	0	16	0.001	V

### ANALOG\_2 100Hz id:194 dlc:8 Motorola Format

Channel	startbit	Length	factor	unit
Analogue4	32	16	0.001	V
Analogue5	16	16	0.001	V

### DIGITAL\_1 200Hz id:192 dlc:8 Motorola Format

Channel	startbit	Length	factor	unit
Sw01	0	1	1	bool
Sw02	1	1	1	bool
Sw03	2	1	1	bool
Sw04	3	1	1	bool
Sw05	4	1	1	bool
Sw06	5	1	1	bool
Sw07	6	1	1	bool
Sw08	7	1	1	bool
Sw09	8	1	1	bool
Sw10	9	1	1	bool
Sw11	10	1	1	bool
Sw12	11	1	1	bool
Box Voltage	24	8	0.1	V
Box Temp	16	8	1	DegC

The unit will receive by default 2 messages to control the led outputs.

### LED Control 200Hz id:1841 dlc:8 Motorola Format

Channel	startbit	Length	factor	unit
LED1	56	1	1	bool
LED2	57	1	1	bool
LED3	58	1	1	bool
LED4	59	1	1	bool
LED5	60	1	1	bool

### LED Brightness 200Hz id:1839 dlc:8 Motorola Format

Channel	startbit	Length	factor	unit
Brightness	56	5	1	Brightness level
Day/Night	63	1	1	Day night

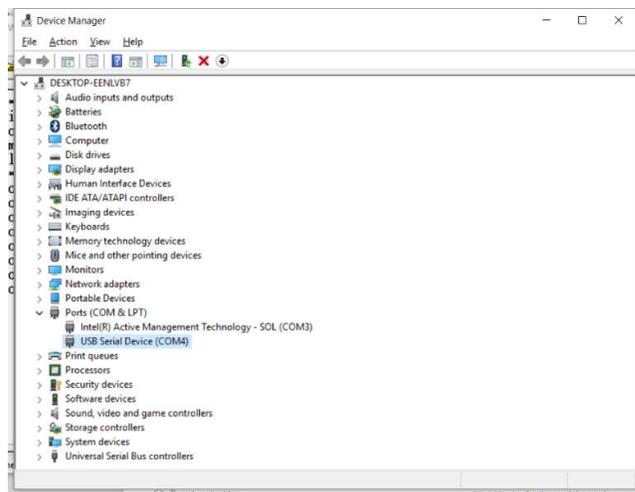
## Configuration using USB debug interface

Connection to the WSL is done through Hyperterminal and a USB serial port connection. If you have not connected to a WSL before, you will need to install the correct USB drivers.

### Installing USB drivers

The correct USB drivers are contained within the folder `lpcopen_examples_windows_usb_drivers_v1.20`. The drivers are located in the Hyperterminal folder on the USB flash drive.

Connect the WSL to the computer via a USB cable, switch the WSL on via the switch on the top of the unit. The computer might make the sound that a new USB device has been connected, don't worry if it doesn't we have to hand install the drivers.



Search for device manager, click on the Ports, find the port that has a question mark. Right click, Update driver. Browse for the driver folder located on the USB flash driver, the x64 folder if your computer is a 64 bit machine.

The computer should then install the correct drivers for the WSL, and give the port a specific number – such as COM4.

## Connecting to a WSL

Double click the Hyperterminal Icon a connection name dialogue will come up, call the connection WSL, click okay.



A new dialogue will then appear which is the Connect To. Change the Connect Using: drop down to the COM port that was installed as the USB driver. The quickest way is just to use the down arrow on the keyboard.

Once the correct COM port is selected hit enter.

The COM port properties dialogue will pop up. Don't change anything, just hit enter. This will connect the computer to the WSL.

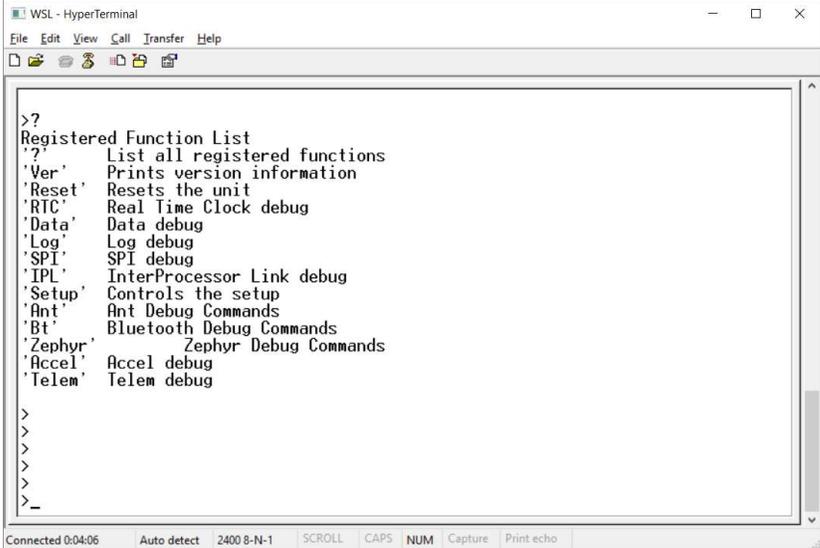
```
WSL - HyperTerminal
File Edit View Call Transfer Help
*****
Wireless Sensor Logger 2 Base
FooBarEngineering Ltd
Email:support@foobarengineering.co.uk
All rights reserved Copyright 2015
*****
Mon Jul 04 13:30:59 2016
Loading setup for AntMezz :OK
Loading setup for Ant :OK
Loading setup for BlueTooth :OK
Loading setup for Zephyr :OK
Loading setup for Telemetry :OK
Loading setup for Beacon :OK
Loading setup for Logger :1 not found :OK
>_
Connected 0:00:12 Auto detect 2400 8-N-1 SCROLL CAPS NUM Capture Print echo
```

The following dialogue should come up showing that you are communicating to the WSL. At this point you can now program the WSL, watch incoming information, look at the details of the configuration.

## List of WSL commands

'?' List all registered functions

You can view all the available commands on the WSL by typing a ?, pressing enter, from the command prompt.



```
WSL - HyperTerminal
File Edit View Call Transfer Help
Registered Function List
'?      List all registered functions
'Ver'   Prints version information
'Reset' Resets the unit
'RTC'   Real Time Clock debug
'Data'  Data debug
'Log'   Log debug
'SPI'   SPI debug
'IPL'   InterProcessor Link debug
'Setup' Controls the setup
'Ant'   Ant Debug Commands
'Bt'    Bluetooth Debug Commands
'Zephyr' Zephyr Debug Commands
'Accel' Accel debug
'Telem' Telem debug

>
>
>
>
>
>
>_
```

Here is a list of the basic commands:

'Ver' Prints version information.

'Reset'- Resets the unit.

'Ana' view the ADC channels, esc to exit

'Pwm' view the current pwm duty for the led drives

'Canana' view channels being received for the canana functionality.

'Can' view the CAN bus status and data.

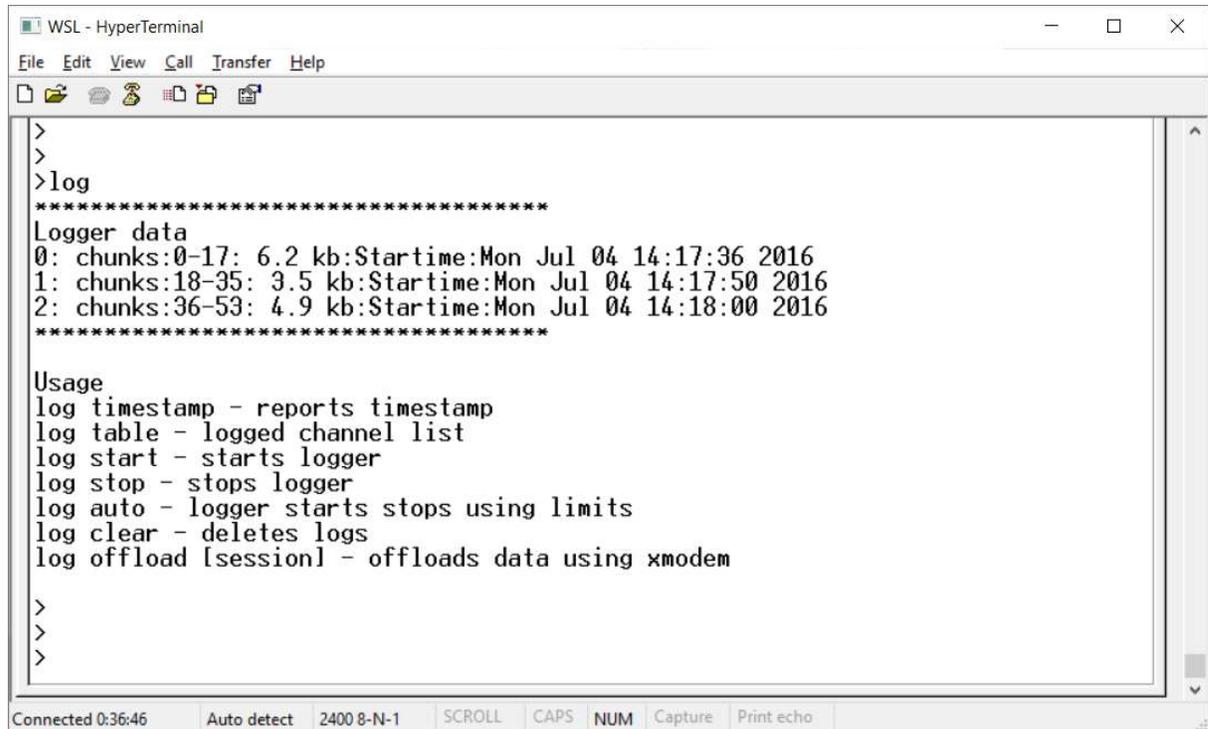
'Log' internal data logger.

'Setup' used to load setup files to the unit.

## Internal Data Logger

The Canana is capable of logging data internally (Cost Option) and offloading a tab delimited text file that can be used with many viewers.

The Log command gives access to the all the Log functions such as offloading data files from the box.

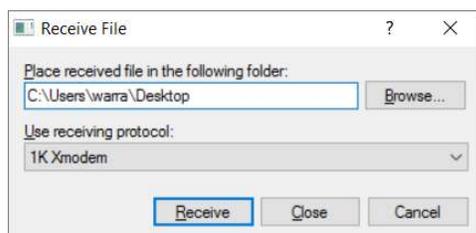


If the WSL has recorded data then the logs are listed under logger data. To offload the data use the command

log offload [session] – the session number being the number of the left hand side under Logger data. An example would be – log offload 1, press enter and you will then follow the procedure to complete a data offload. If you don’ designate an effort to offload then the last recorded data set is offloaded.

When you type log offload 1, you will be prompted to Retrieve log data using 1K modem. From the HyperTerminal menu select Transfer, Receive File...

A dialogue will open..select the folder where you want the data to download to and select 1K modem for the receiving protocol, press enter or Receive



A second dialogue will open which is where you set the file name. We have been using a file name definition of date\_rider\_effort.txt.

An example file name would be 20160704\_PC\_01.TXT

The transfer might time out because you have a limited time to set the information in the two dialogues. If it times out, just repeat the previous two steps, it remembers the first dialogue information so the second time through should be quicker, thus enabling the download.

Once complete a confirmation is printed on the screen.