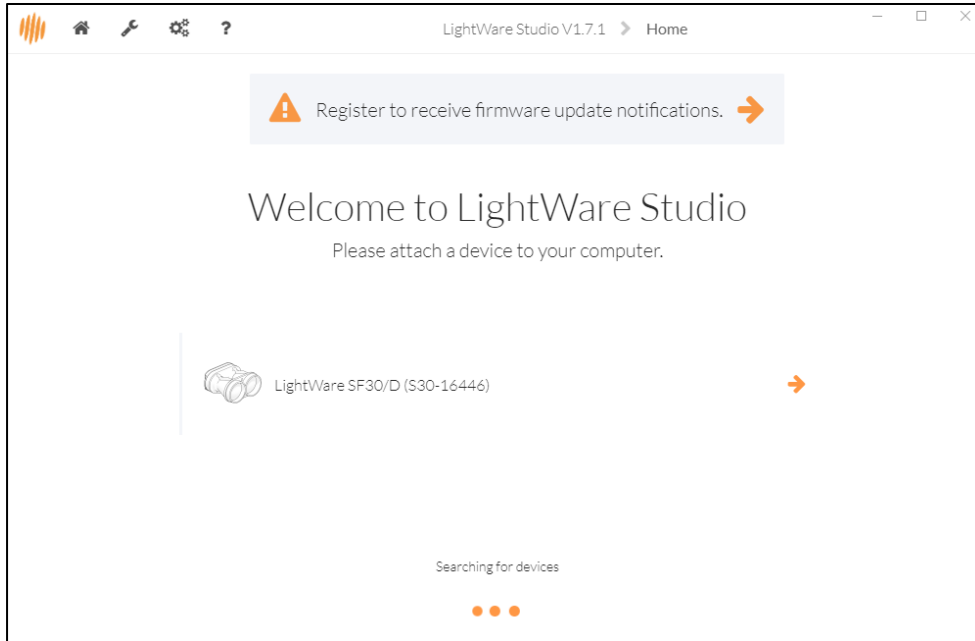


SF30/D Pixhawk Cube Connection guideline

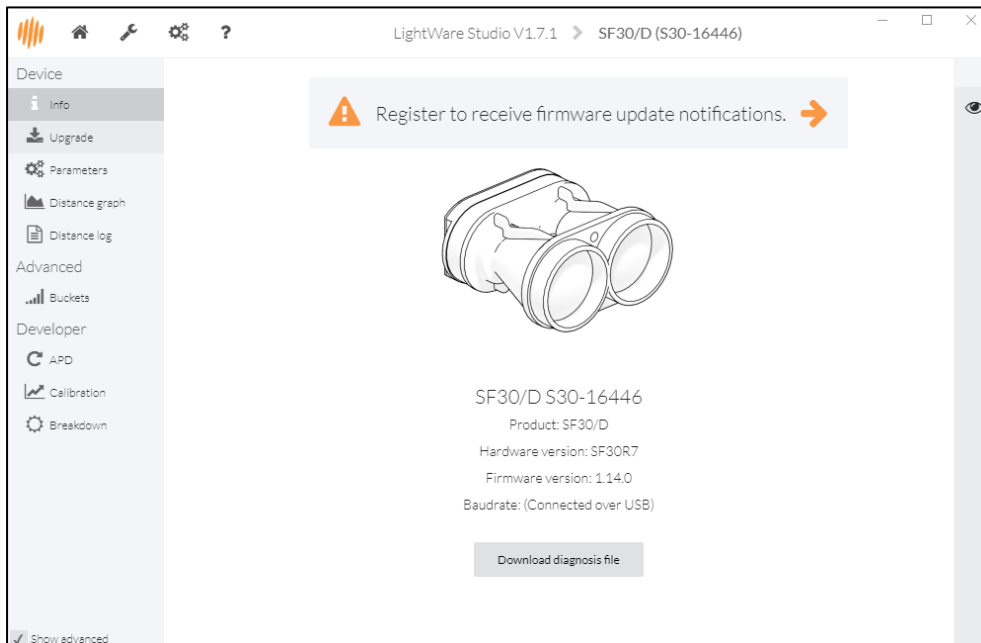
Serial connectivity Guide

Configuring the Device through LightWare Studio

Connect your SF30/D to your computer using the USB to Micro USB that is supplied in the box with your unit. Open LightWare Studio.



Click on the Com Port that appears.



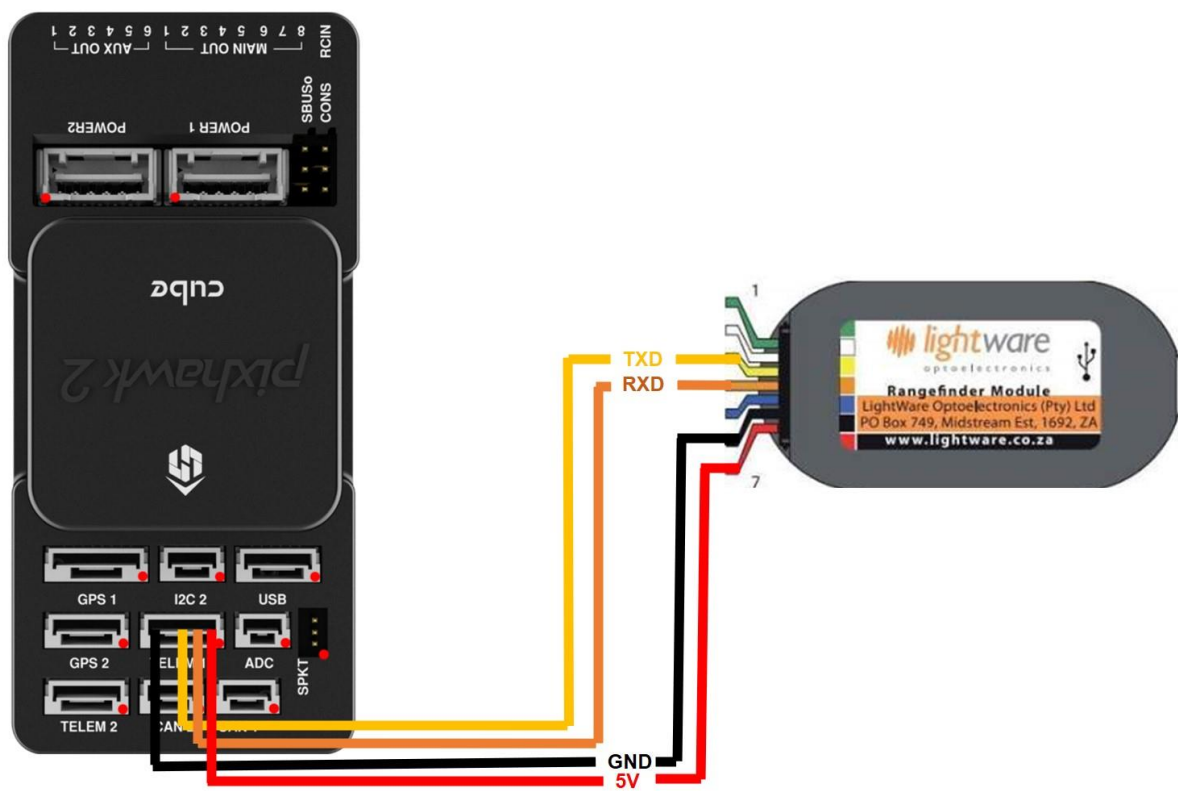
Here you can view all the relevant information related to your SF30/D, such as the unit's Serial number, hardware, and firmware revision. By Clicking on the Parameters Tab you can now adjust your unit before connecting it to your Pixhawk. Below is a table with a description of the parameters, please take note and adjust the highlighted entries.

Communication	Serial port baud rate	Must match the baud rate you set on the Pixhawk
	I2C Address	Configurable
Measurement	Exposure Time	<p>Controls the duration of a single measurement. The is used to adjust the update rate of the unit. The unit uses filtering on the slowest 3 update rates:</p> <ul style="list-style-type: none"> • 39 readings per second • 78 readings per second • 156 readings per second <p>These update rates are useful when the device is used as an Altimeter. Higher update rates can be used if the device will be used as a collision avoidance LiDAR</p>
	Return Mode	<p>First Return – Useful for foliage canopy detection as well as collision avoidance (The closest target detected by the laser)</p> <p>Last Return – Useful if the device is used behind a glass dome protection/ terrain underneath foliage/distance through rain, light mist or fog</p>
	Lost signal Confirmations	This is the number of lost signals the unit will receive before returning an out-of-range output.
Analog	Analog output rate	Controls the output rate of the analogue port (limited by exposure time)
	Analog range	The value in meters that 0V to 2.048V represents. The value inserted represents the max range value that corresponds to 2.048V
Alarms	Alarm activation distance	The distance in meters at which the alarm is activated. (0.5 to 254m)
	Alarm hysteresis	The dead band around the alarm activation distance in meters (0.06 to 50m)
	Alarm Latch	If latching is enabled and the alarm is triggered, then the alarm output will remain active until manually released.
Legacy data output	Output type (legacy)	<ol style="list-style-type: none"> 1. Distance over USB 2. Distance and strength over USB 3. Distance over serial 4. Analogue voltage over USB 5. Full communication mode
	USB port output rate(legacy)	Controls the output rate of the USB port. Configurable but limited to exposure time

	Serial port output rate (legacy)	Controls the output rate of the serial port. Configurable but limited to exposure time
Extra	Synchronisation output	Enables synchronisation output
	Sensitivity offset	Adjusts the sensitivity of the receiver (-30 000 to 0)

Pixhawk Cube Serial Connection guide

For this, please set the device to **“Legacy data output-> Output type (legacy) -> Full communication mode”** For a serial connection you can use any spare UART. Connect the RX line of the UART to the TX line of the Lidar, and the TX line of the UART to the RX line of the Lidar. Also connect the GND and 5V lines. You do not need flow control pins. *The diagram below shows how to connect to TELEM1.*



ArduPilot Parameters

Serial/UART Parameters

SERIAL1_PROTOCOL	9 (LIDAR)
SERIAL1_BAUD	115 (115200) (dependant on what you configured the device to earlier)
RNG_MAX_CM	16500 SF30/D. Distance in cm that the rangefinder can reliably read in cm.
RNG_MIN_CM	5

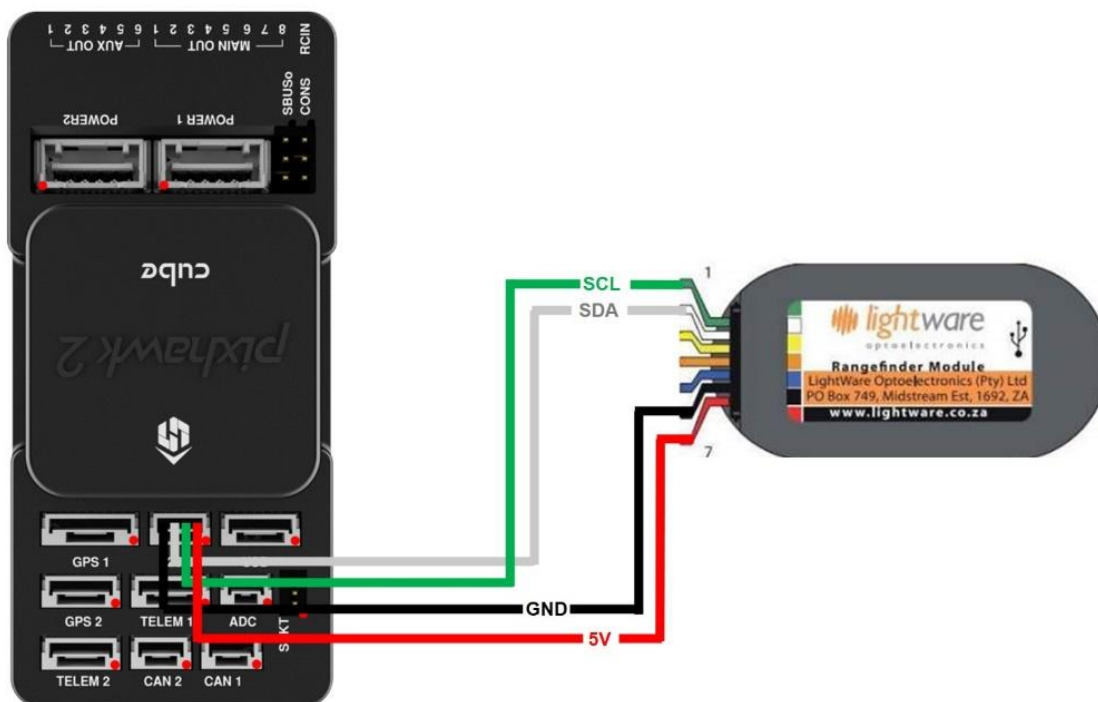
RNGFND1_GNDCLEAR	10 (Distance of Lidar to ground in cm when vehicle is on the ground)
RNGFND_SCALING	1 Serial/UART
RNGFND_TYPE	8 Serial

SF30/D I2C Connection guide

For this, please set the device to “**Legacy data output-> Output type (legacy) -> Full communication mode**”. This will allow for the green and white cables, which in other modes are the alarm and synchronisation pins to become the SCL and SDA lines respectively:



Pixhawk Cube I2C Connection guide



ArduPilot Parameters

I2C Parameters

RNGFND_ADDR	102 decimal - Default
RNG_MAX_CM	16500 SF30/D. Distance in cm that the rangefinder can reliably read in cm. (this is limited to 16500 due to the way Ardupilot interfaces with the device)
RNG_MIN_CM	5

RNGFND1_GNDCLEAR	10 (Distance of Lidar to ground in cm when vehicle is on the ground)
RNGFND_SCALING	1 I2C
RNGFND_TYPE	7 LightWare I2C