Hardware connection

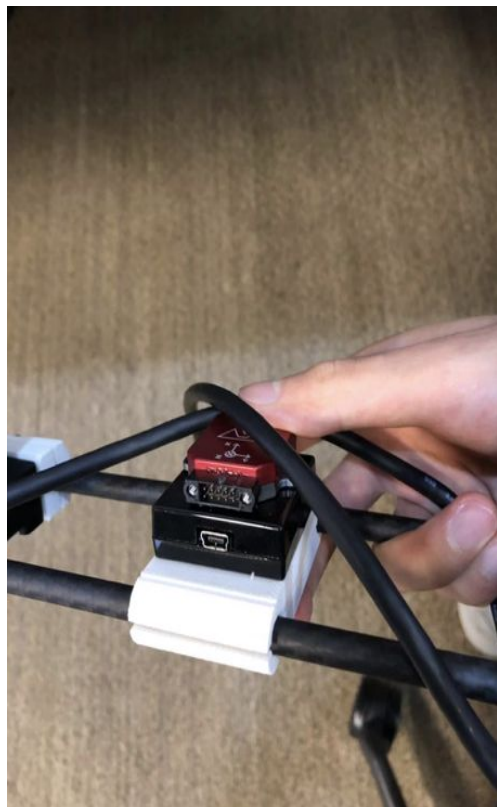# Roadmap

> 1) connect sync out and sync in from VN 100 to GPIO 3 of pointgrey camera

> 2) write a publisher from VN driver to publish out a msg whenever the sync in count changes

> 3) write a subscriber from pointgrey camera to subscribe to this msg and use that timestamp as the timestamp for the images

> 4) we only acquire images after we have received the msg from VN driver to ensure that we do not tag the wrong time stamp to the images

Wiring overview

- Need to connect imu sync out to GPIO 3 in cameras, and sync out to sync in to record the trigger time

- Original cable for vn 100 does not provide access to sync out pin

- We have to taylor-make the cables

  - NUC and imu: usb to vn 100 connector

  - NUC and cameras: usb cables

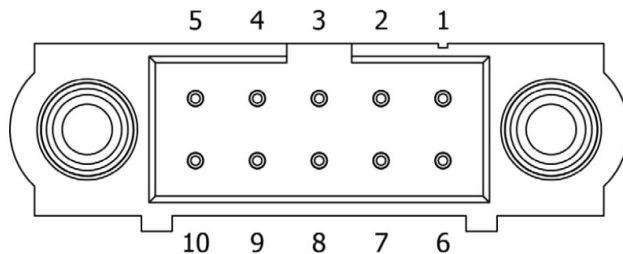 - Imu and cameras: syncout to GPIO

What we have

IMU

2.2 VN-100 Rugged Electrical

VN-100 Rugged Pin Assignments

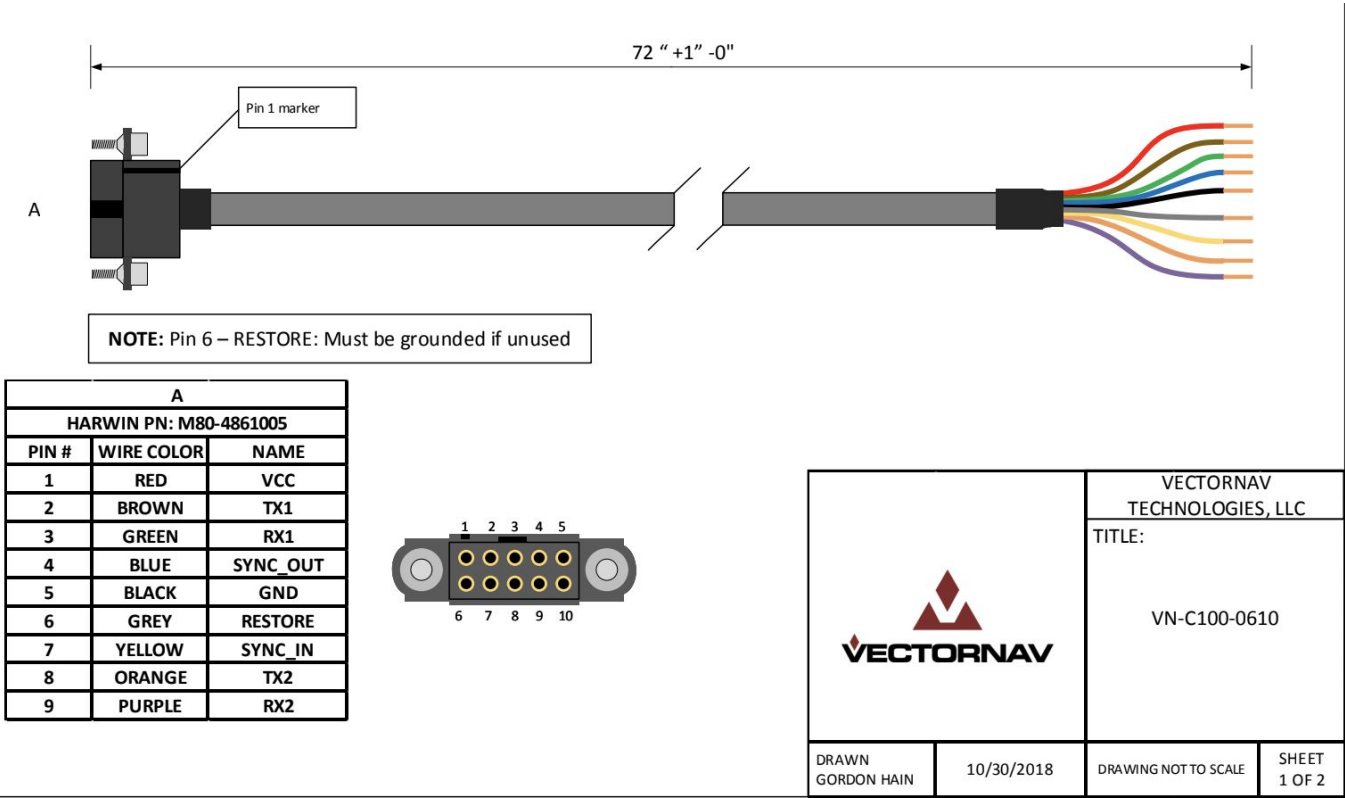| Pin	Pin Name	Description
1	VCC	+4.5V to +5.5V
2	TX1	RS-232 voltage levels data output from the sensor. (Serial UART #1)
3	RX1	RS-232 voltage levels data input to the sensor. (Serial UART #1)
4	SYNC_OUT	Output signal used for synchronization purposes. Software configurable to pulse when ADC, IMU, or attitude measurements are available.
5	GND	Ground
6	TARE/RESTORE	Input signal used to zero the attitude of the sensor. If high at reset, the device will restore to factory default state. Internally held low with 10k resistor.
7	SYNC_IN	Input signal for synchronization purposes. Software configurable to either synchronize the measurements or the output with an external device.
8	TX2_TTL	Serial UART #2 data output from the device at TTL voltage level (3V).
9	RX2_TTL	Serial UART #2 data into the device at TTL voltage level (3V).
10	RESV	This pin should be left unconnected.

VN-100 Rugged External Connector

IMU

- Digital Interface: Serial TTL, RS-232
- USB to TTL Serial Converter

IMU

72 " +1" -0"

Pin 1 marker

A

NOTE: Pin 6 – RESTORE: Must be grounded if unused

A		
HARWIN PN: M80-4861005		
PIN #	WIRE COLOR	NAME
1	RED	VCC
2	BROWN	TX1
3	GREEN	RX1
4	BLUE	SYNC_OUT
5	BLACK	GND
6	GREY	RESTORE
7	YELLOW	SYNC_IN
8	ORANGE	TX2
9	PURPLE	RX2

1 2 3 4 5

6 7 8 9 10

	VECTORNAV TECHNOLOGIES, LLC	
VECTORNAV	TITLE: VN-C100-0610	
DRAWN GORDON HAIN	10/30/2018	DRAWING NOT TO SCALE	SHEET 1 OF 2

IMU

Can make it 2 inches = 5 cm

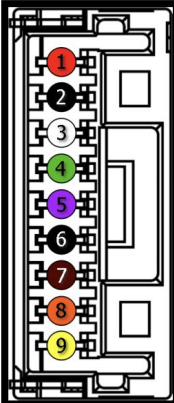| Item	Description	Quantity	Unit Price
VN-C100-0610	VN-100 Rugged Pigtail Cable Custom Length: 2 Inches Lead Time: 2-3 Business Days Shipping Options to San Diego, CA: FedEx Ground (3-4 Days Transit): $10.00 USD FedEx 2Day: $40.00 USD FedEx Priority Overnight: $70.00 USD UPS Ground (3-4 Days Transit): $10.00 USD UPS 2nd Day: $40.00 USD UPS Next Day: $70.00 USD	1	$100.00 USD

IMU

- What should the the cable length?
- From syncout to cameras, need a wire with one head in one side and two heads in another side, buy online or make it on our own?

Camera

Mannual p34 https://www.ptgrey.com/support/downloads/10431/

4.9.4 General Purpose Input/Output (GPIO)

Diagram	Color	Pin	Function	Description
	Red	1	V_{EXT}	Allows the camera to be powered externally 5 - 24 VDC
	Black	2	GND	Ground for Input/Output, V_{EXT}, +3.3 V pins
	White	3	+3.3 V	Power external circuitry fused at 150 mA maximum
	Green	4	GPIO3 / Line3	Input/Output/Tx
	Purple	5	GPIO2 / Line2	Input/Output/Rx
	Black	6	GND	Ground for Input/Output, V_{EXT}, +3.3 V pins
	Brown	7	OPTO_GND	Ground for opto-isolated IO pins
	Orange	8	OPTO_OUT / Line1	Opto-isolated output
	Yellow	9	OPTO_IN / Line0	Opto-isolated input