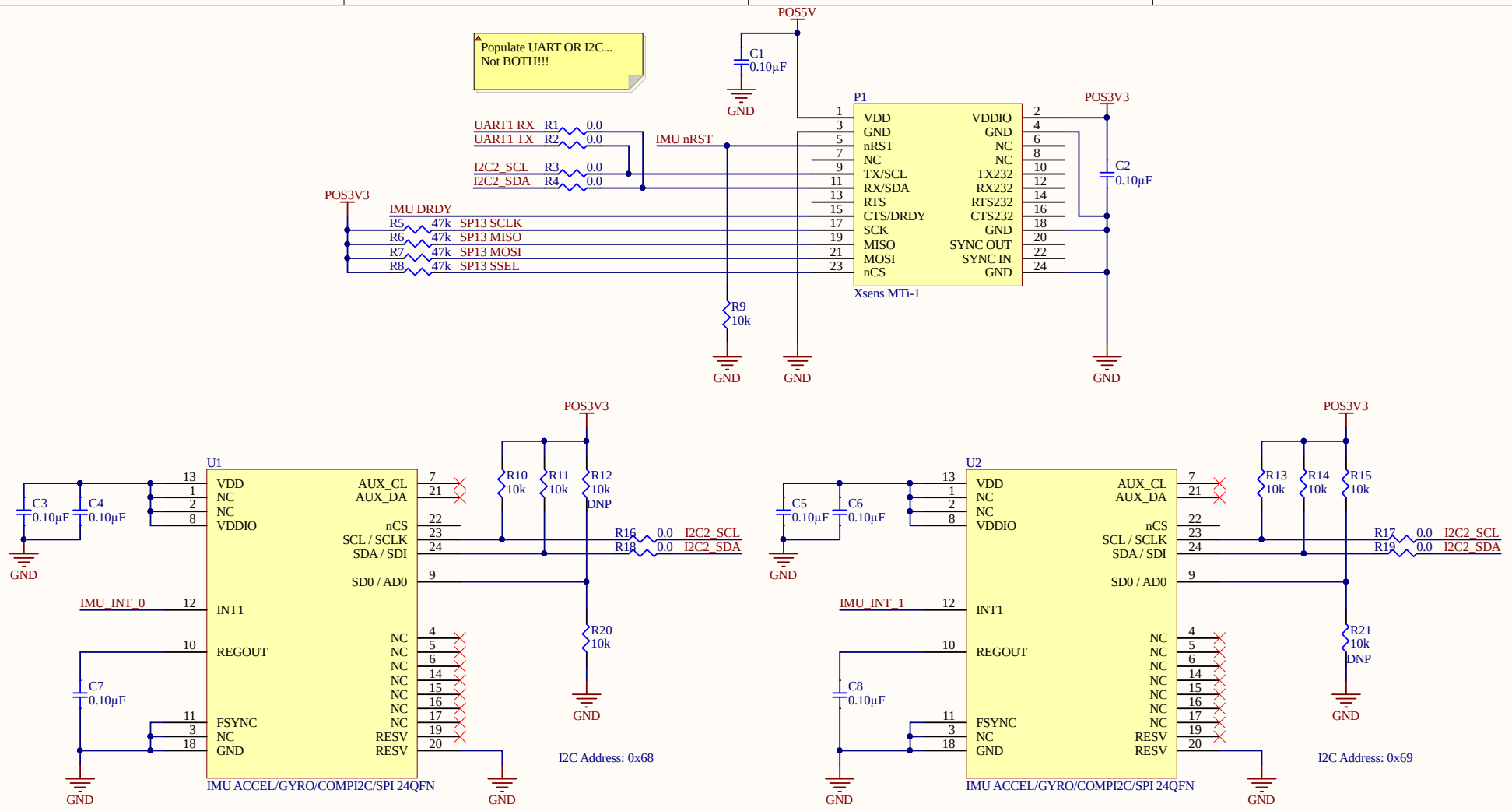
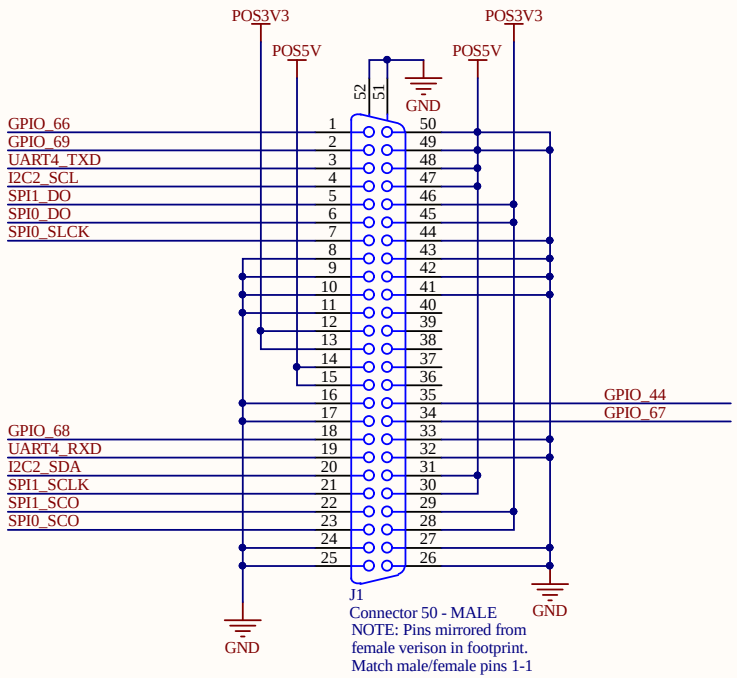
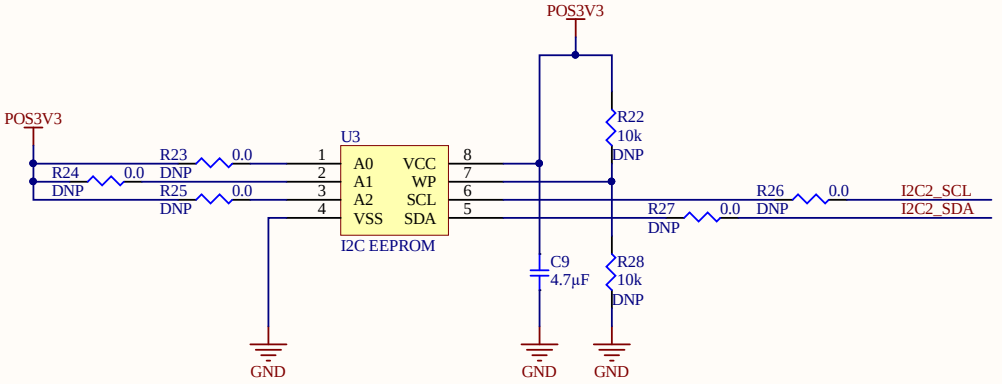
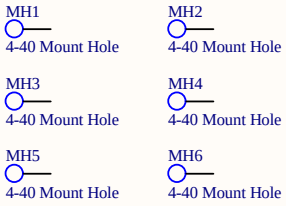

Populate UART OR I2C...
Not BOTH!!!
POS5V
C1
0.10µF
GND
P1
VDD
GND
nRST
NC
TX/SCL
RX/SDA
RTS
CTS/DRDY
SCK
MISO
MOSI
nCS
VDDIO
GND
NC
NC
TX232
RX232
RTS232
CTS232
GND
SYNC OUT
SYNC IN
GND
Xsens MTi-1
POS3V3
C2
0.10µF
UART1 RX R1 0.0
UART1 TX R2 0.0
I2C2_SCL R3 0.0
I2C2_SDA R4 0.0
IMU nRST
IMU DRDY
R5 47k SP13 SCLK
R6 47k SP13 MISO
R7 47k SP13 MOSI
R8 47k SP13 SSEL
R9
10k
U1
VDD
NC
NC
VDDIO
AUX_CL
AUX_DA
nCS
SCL / SCLK
SDA / SDI
SD0 / AD0
INT1
REGOUT
FSYNC
NC
GND
RESV
RESV
C3
0.10µF
C4
0.10µF
C7
0.10µF
R10
10k
R11
10k
R12
10k
DNP
R16 0.0 I2C2_SCL
R18 0.0 I2C2_SDA
R20
10k
IMU_INT_0
IMU ACCEL/GYRO/COMPI2C/SPI 24QFN
I2C Address: 0x68
U2
C5
0.10µF
C6
0.10µF
C8
0.10µF
R13
10k
R14
10k
R15
10k
R17 0.0 I2C2_SCL
R19 0.0 I2C2_SDA
R21
10k
DNP
IMU_INT_1
IMU ACCEL/GYRO/COMPI2C/SPI 24QFN
I2C Address: 0x69
Programmable Interrupt Source:
DMP InterruptWake On Motion Interrupt
PLL RDY Interrupt
I2C Master Input
Raw Data Ready Interrupt
FIFO Overflow Interrupt
FIFO Watermark Interrupt
Title nav_io.schdoc
Size: A4
Number: 1
Revision: A
Date: 11/15/2018
Time: 11:11:42 PM
Sheet 1 of 2
File: C:\Users\Ryan Castle\Documents\git_repos\podiv-altium\src\prj\sch\lv_io_accel.SchDoc
Badgerloop
133 Engineering Research Building
Madison, WI 53715
BADGER LOOP



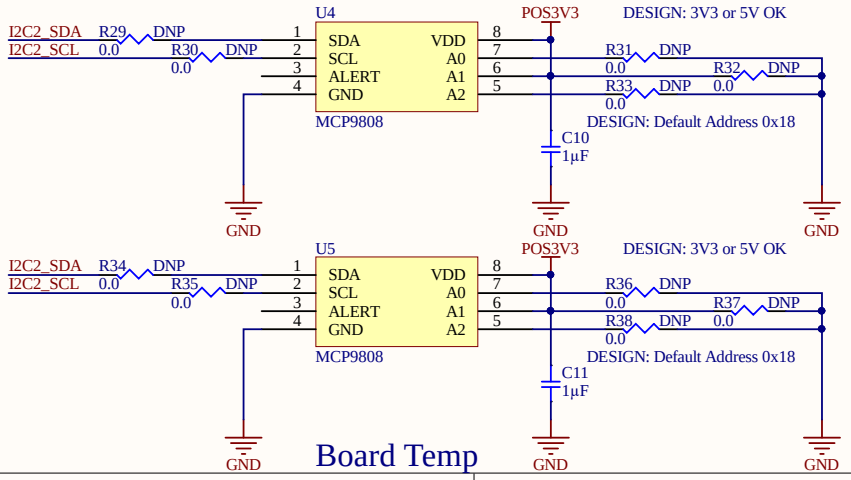
Main Connector



I2C EEPROM



MECHANICAL

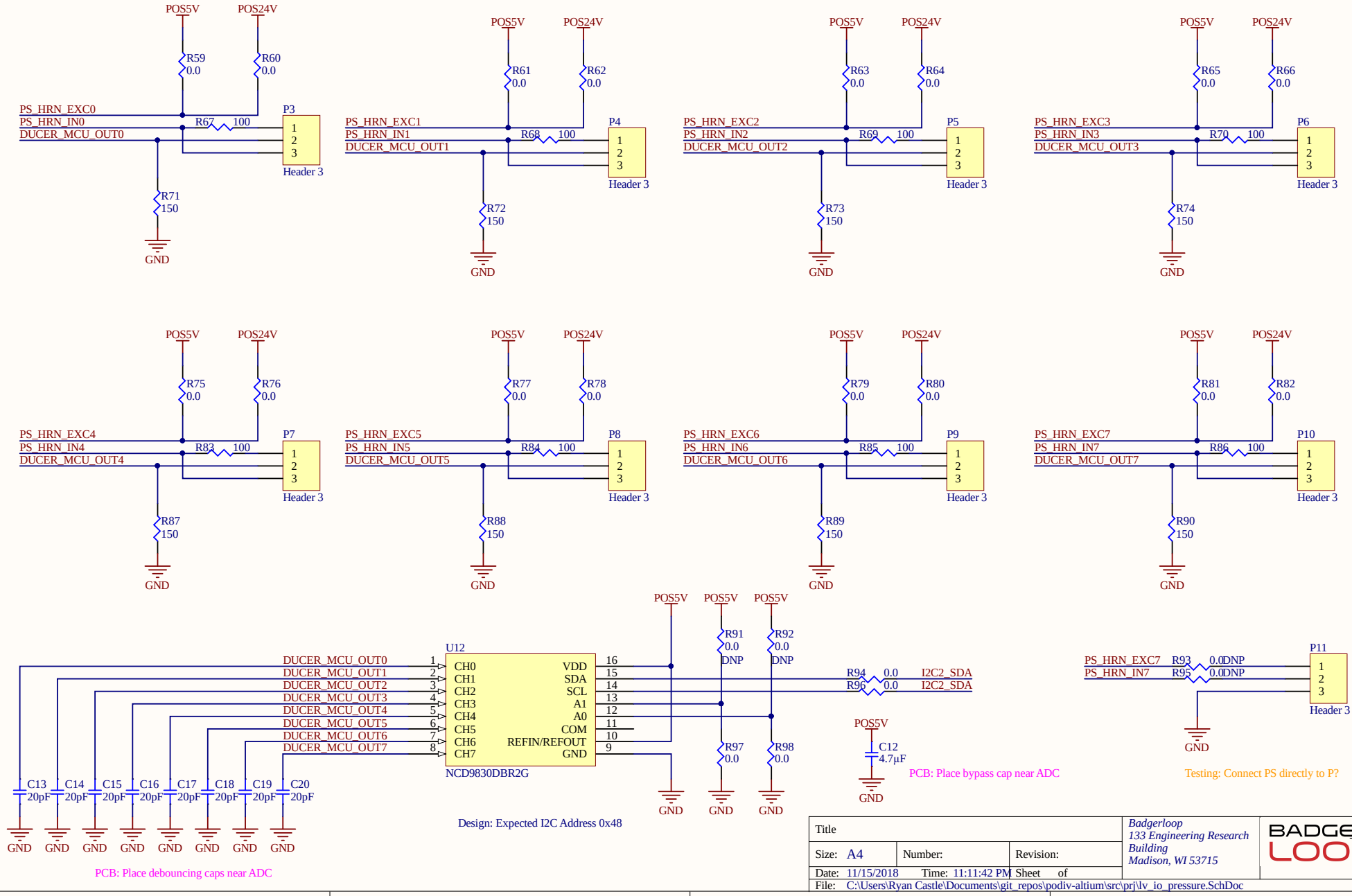


Board Temp

Title	***nav_main_connector.schdoc***		*Badgerloop* *133 Engineering Research Building* *Madison, WI 53715*
Size: A4	Number: 1	Revision: A	
Date: 11/15/2018	Time: 11:11:42 PM	Sheet 2 of 2	
File: C:\Users\Ryan Castle\Documents\git_repos\podiv-altium\src\prj\sch\lv_io_main_connector.SchDoc			

Title			
Size: A4	Number:	Revision:	
Date: 11/15/2018	Time: 11:11:42 PM	Sheet of	
File: C:\Users\Ryan Castle\Documents\git_repos\podiv-altium\src\prj\sch\lv_io_harness.SchDoc			

Badgerloop
133 Engineering Research Building
Madison, WI 53715


POS5V
POS24V
R59 0.0
R60 0.0
PS_HRN_EXC0
PS_HRN_IN0
DUCER_MCU_OUT0
R67 100
P3
Header 3
R71 150
GND
R61 0.0
R62 0.0
PS_HRN_EXC1
PS_HRN_IN1
DUCER_MCU_OUT1
R68 100
P4
Header 3
R72 150
R63 0.0
R64 0.0
PS_HRN_EXC2
PS_HRN_IN2
DUCER_MCU_OUT2
R69 100
P5
Header 3
R73 150
R65 0.0
R66 0.0
PS_HRN_EXC3
PS_HRN_IN3
DUCER_MCU_OUT3
R70 100
P6
Header 3
R74 150
R75 0.0
R76 0.0
PS_HRN_EXC4
PS_HRN_IN4
DUCER_MCU_OUT4
R83 100
P7
Header 3
R87 150
R77 0.0
R78 0.0
PS_HRN_EXC5
PS_HRN_IN5
DUCER_MCU_OUT5
R84 100
P8
Header 3
R88 150
R79 0.0
R80 0.0
PS_HRN_EXC6
PS_HRN_IN6
DUCER_MCU_OUT6
R85 100
P9
Header 3
R89 150
R81 0.0
R82 0.0
PS_HRN_EXC7
PS_HRN_IN7
DUCER_MCU_OUT7
R86 100
P10
Header 3
R90 150
U12
DUCER_MCU_OUT0
DUCER_MCU_OUT1
DUCER_MCU_OUT2
DUCER_MCU_OUT3
DUCER_MCU_OUT4
DUCER_MCU_OUT5
DUCER_MCU_OUT6
DUCER_MCU_OUT7
CH0
CH1
CH2
CH3
CH4
CH5
CH6
CH7
VDD
SDA
SCL
A1
A0
COM
REFIN/REFOUT
GND
NCD9830DBR2G
R91 0.0 DNP
R92 0.0 DNP
R97 0.0
R98 0.0
R94 0.0 I2C2_SDA
R96 0.0 I2C2_SDA
C12 4.7µF
PCB: Place bypass cap near ADC
C13 20pF
C14 20pF
C15 20pF
C16 20pF
C17 20pF
C18 20pF
C19 20pF
C20 20pF
PCB: Place debouncing caps near ADC
Design: Expected I2C Address 0x48
PS_HRN_EXC7
PS_HRN_IN7
R93 0.0DNP
R95 0.0DNP
P11
Header 3
Testing: Connect PS directly to P?
Title
Size: A4
Number:
Revision:
Date: 11/15/2018
Time: 11:11:42 PM
Sheet of
File: C:\Users\Ryan Castle\Documents\git_repos\podiv-altium\src\prj\lv_io_pressure.SchDoc
Badgerloop
133 Engineering Research Building
Madison, WI 53715
BADGER LOOP

Remove R26 and R27 after bringup

P2
3
2
1
RETRO DEBUG

R42 0.0
R43 0.0

GND

POS24V

R39 1k
D2 P13571CT-ND
U6 TPC817
RETRO_SIG5

R44 1k
D4 P13571CT-ND
U7 TPC817
RETRO_SIG4

R47 1k
D6 P13571CT-ND
U8 TPC817
RETRO_SIG3

R50 1k
D8 P13571CT-ND
U9 TPC817
RETRO_SIG2

R53 1k
D10 P13571CT-ND
U10 TPC817
RETRO_SIG1

R56 1k
D12 P13571CT-ND
U11 TPC817
RETRO_SIG0

LED+ LED- C E

POS3V3

RETRO5 R40 10k D1 R41 200 LED GREEN
RETRO4 R45 10k D3 R46 200 LED GREEN
RETRO3 R48 10k D5 R49 200 LED GREEN
RETRO2 R51 10k D7 R52 200 LED GREEN
RETRO1 R54 10k D9 R55 200 LED GREEN
RETRO0 R57 10k D11 R58 200 LED GREEN

RETRO_SIG[0..5]
RETRO[0..5]

BROWN: 24V
BLUE: GND
BLACK: SIG

NOTE: Adjust sensitivity on retroreflector with the sensor's potentiometer

Estimated distance from sensor to tube wall <1 m

During initial brinup, verify orange light on sensor corresponds with PCB LED

Tape Strip Monitoring:
RETROS 0-2

Wheel Speed Monitoring:
RETROS 3-5

QMIC-0N-0A Photoelectric / Retroreflective Sensor

Title		
Size: A4	Number:	Revision:
Date: 11/15/2018	Time: 11:11:42 PM	Sheet of
File: C:\Users\Ryan Castle\Documents\git_repos\podiv-altium\src\prj\sch\lv_io_retro.SchDoc		

Badgerloop
133 Engineering Research Building
Madison, WI 53715

BADGER LOOP