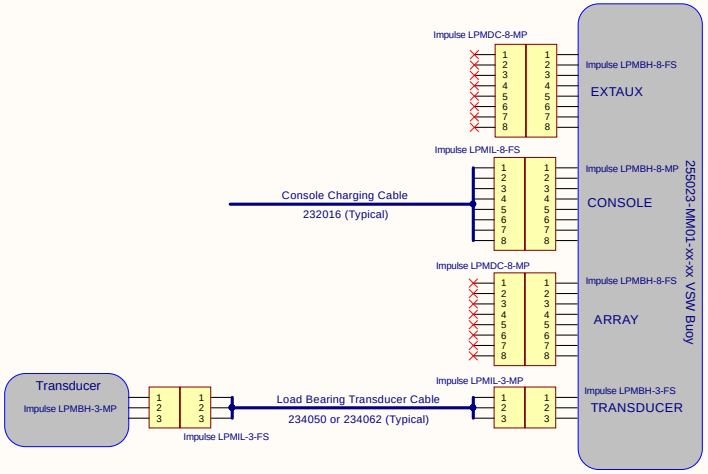
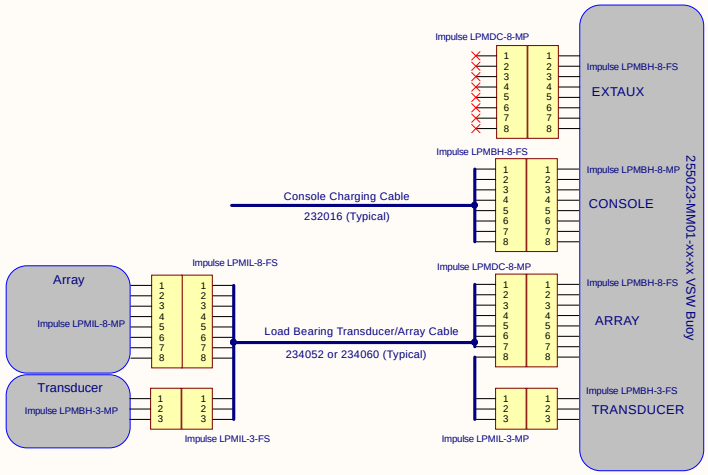
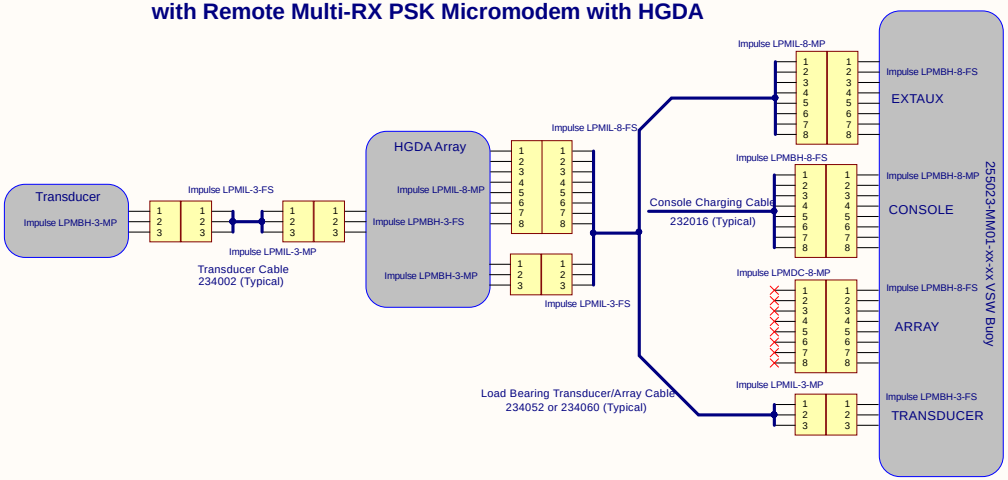
Example: Single or Dual, Single-RX PSK Micromodem (MM01 Option)



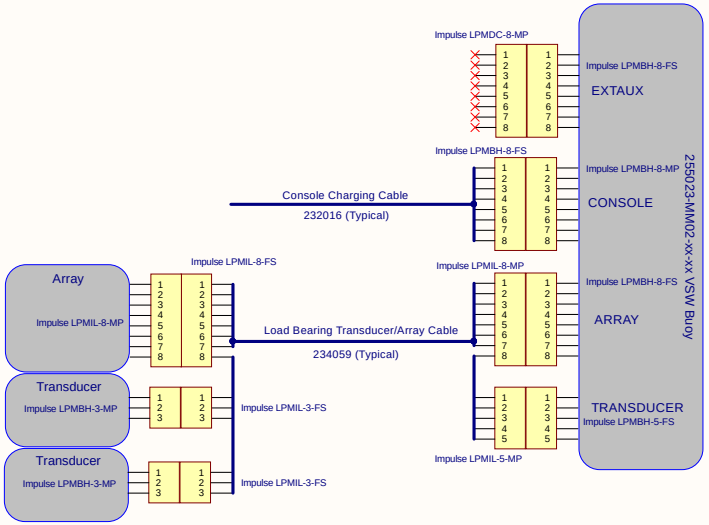
Example: Single or Dual, Multi-RX PSK Micromodem (MM01 Option)



Example: Single-RX PSK Micromodem Topside (MM01 Option) with Remote Multi-RX PSK Micromodem with HGDA



Example: Dual Simultaneous Multi-RX PSK Micromodems (MM02 Option)



Part Numbering Details:

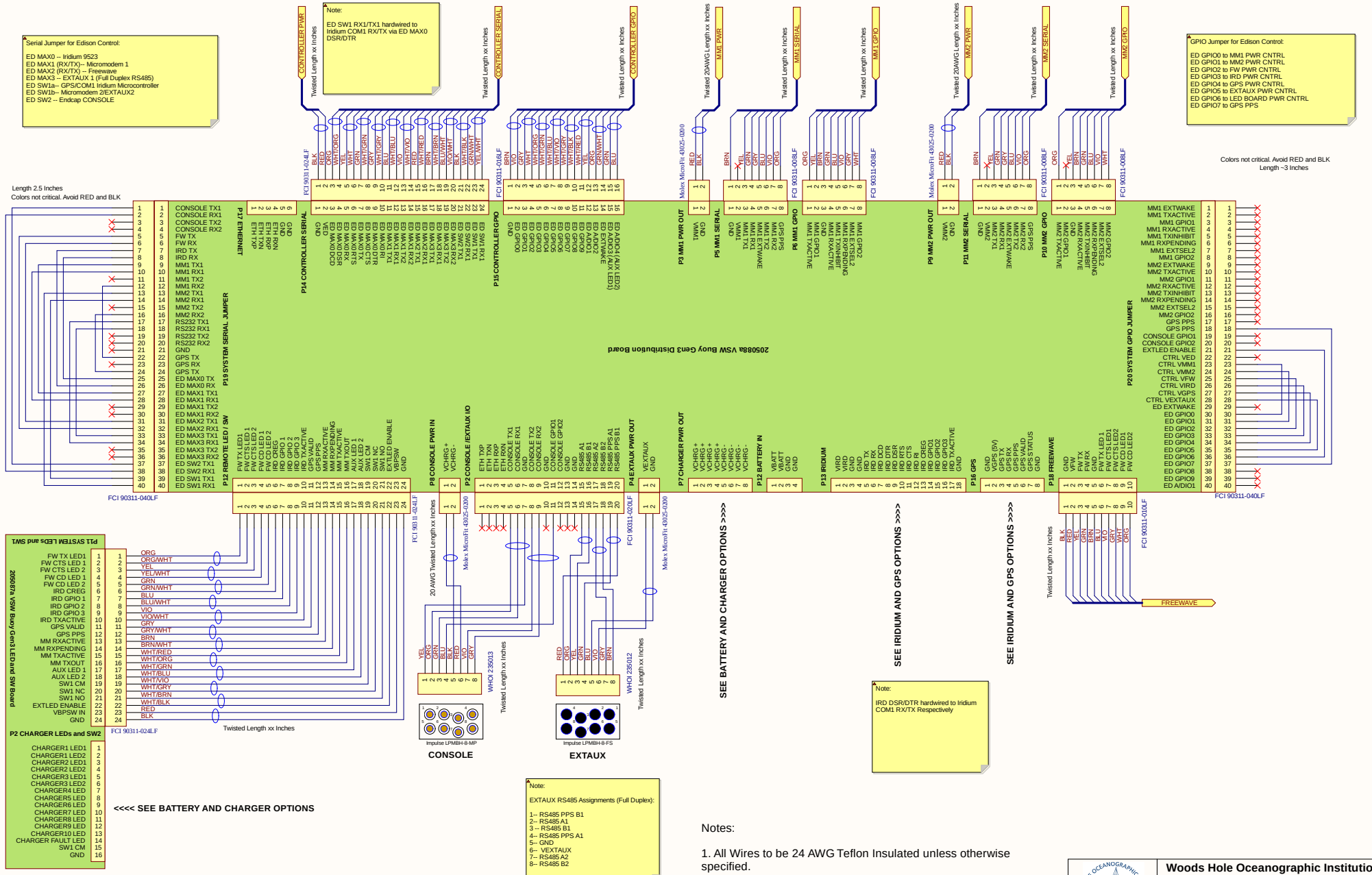
255023-MMxx-RFxx-BCxx

MMxx -- Micromodem Configuration Options
RFxx -- RF Radio Configuration Options
BCxx -- Battery and Charger Configuration Options

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title: Hybrid Modem Buoy Connection Overview

Cage Code: 88846
Drawn By: Tyler Johnson
Date Drawn: 2019-01-24
Drawing Number: 255023-SCH
Rev: A
Sheet 1 of 12



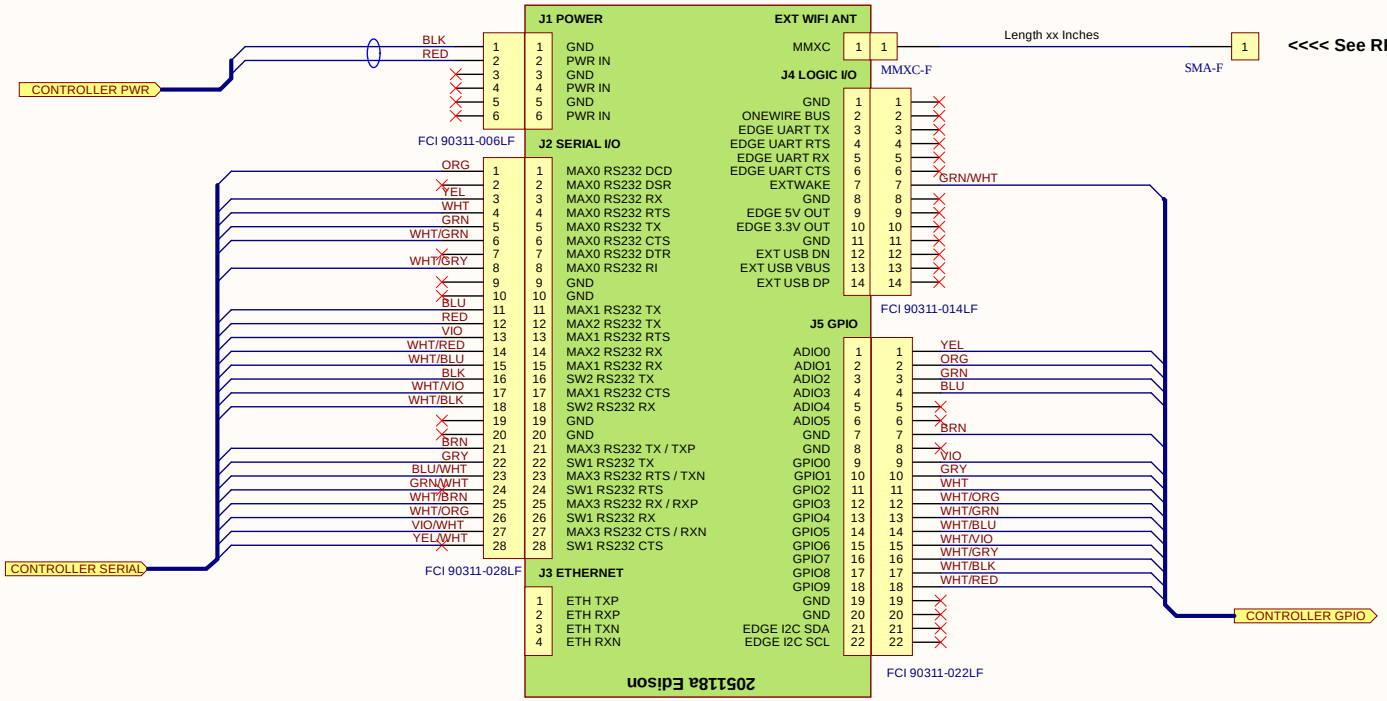
Notes:

1. All Wires to be 24 AWG Teflon Insulated unless otherwise specified.
2. For FCI connectors use FCI pins and the Molex Milligrid pinout.
3. Wiring to be neatly routed and secured using chassis PEMS.
4. Group all wires as indicated on schematic and/or sample.
5. All internal hardware to be stainless steel.
6. All screws are to be socket head cap screws.
7. Loctite 242 to be used on all metal to metal threaded hardware.
8. Loctite 245 to be used on all metal to plastic threaded hardware.

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title: Hybrid Modem Buoy Distribution

Cage Code: 88846
Drawn By: Tyler Johnson
Date Drawn: 2019-01-24
Drawing Number: 255023-SCH
Rev: A
Sheet 2 of 12



Notes:

1. All Wires to be 24 AWG Teflon Insulated unless otherwise specified.
2. For FCI connectors use FCI pins and the Molex Milligrid pinout.
3. Wiring to be neatly routed and secured using chassis PEMS.
4. Group all wires as indicated on schematic and/or sample.
5. All internal hardware to be stainless steel.
6. All screws are to be socket head cap screws.
7. Loctite 242 to be used on all metal to metal threaded hardware.
8. Loctite 245 to be used on all metal to plastic threaded hardware.

△ Terminal: FCI 10044403-101LF Female

△ Terminal: Molex MicroFit 43030 Female

△ Terminal: Molex MillGrid 50294 Female

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title: Hybrid Modem Buoy
Edison Controller

Cage Code: 88846

Drawn By: Tyler Johnson

Date Drawn: 2019-01-24

Drawing Number: **255023-SCH**

Rev: **A**

Sheet 3 of 12

Micromodem Board Stack #1 W/ Off Board Magnetics
- Install on chassis with 205088 Distribution Board and 205118 Edison Controller

Micromodem Board Stack #2 (Typically 10kHz or 25kHz)
- Install on chassis with Freewave and/or 205102 Iridium

201005 Micromodem v2.0

J5: GND, VIN (5VDC-36VDC), GND, VIN (5VDC-36VDC), nc, nc

J4: GND, 3.3V OUT, COM3 Logic TX, I2C SCL, COM3 Logic RX, I2C SDA, COM3 Logic #RTS, GPIO1, COM3 Logic #CTS, GPIO2, AUX ADC+, AUX ADC-

J3: GND, GND, COM1 RS232 TX, COM2 RS232 TX, COM1 RS232 RX, COM2 RS232 RX, COM1 RS232 #RTS, COM4 RS232/RS485 #RTS / TX+, COM1 RS232 #CTS, COM4 RS232/RS485 TX / TX-, EXTPPS, COM4 RS232/RS485 RX / RX+, EXTWAKE, COM4 RS232/RS485 #CTS / RX-, TXTRIGGER, GND

J1: TXACTIVE, GPIO3, GND, RXACTIVE, TXINHIBIT, RXPENDING, GPIO4, GPIO5, VPOWERAMP OUT, AGND, VPREAMP OUT, ANALOG TX OUT, ANALOG RX IN+, ANALOG RX IN-

FCI 90311-016LF

BRN, YEL, BLU, GRN, VIO, ORG, GRY

Twisted Length xx Inches

MM1 SERIAL

FCI 90311-014LF

ORG, YEL, BRN, GRN, BLU, VIO, GRY, WHT

Twisted Length xx Inches

MM1 GPIO

MM2 SERIAL

Twisted Length xx Inches

MM2 GPIO

203004 c6713 Coprocessor

J2: Vin (5V - 20V), DSP TX, DSP RX, TXINHIBIT, GND, GND, TXACTIVE, RXACTIVE

FCI 90311-008LF

RED, BLK

Length 6 Inches

203001c Multi-Channel Analog

J2 - Hydrophone In

GND, GND, Ain1 +, Ain1 -, Ain2 +, Ain2 -, Ain3+, Ain3 -, Ain4+, Ain4 -, Ain5 +, Ain5 -, Ain6 +, Ain6 -, Ain7+, Ain7 -, Ain8+, Ain8 -, Vvm, Vvm, GND, GND

Vin (10.5V to 18V), GND, Sig1, GND, Sig2, GND, Sig3, GND, Sig4, GND, nc, nc, nc, nc, nc, nc, nc, nc, Vbatt, Vvm, GND, GND

RED, BLK, RED, ORG, YEL, GRN, BLU, VIO, GRY, BRN

Length 5.5 Inches

Molex MilliGrid 51110-2251

J1 - Power and Signal Out

Molex MiniFit 0039012040

WHOI 231021-SCH

ARRAY

Impulse LPMBH-8-FS

Twisted Length xx Inches

RED, ORG, YEL, GRN, BLU, VIO, GRY, BRN

WHOI 235012 LPMBH-8-FS

Requries modification to front end of preamp to disable current mode resistors.

Solder Splice and Shrink

Twisted Length 2.5 Inches

205074 AMCC-100 Interface

TXF PRI A, TXF VH, GND, OUT -, TXF PRI B, TXF VH, GND, OUT +

Bi TXF, Ls, Rs

202009 Micromodem Power Amp

J3: VOUT (12.5V), GND, VOUT (12.5V), GND, VOUT (12.5V), GND, VPS EXT SW, VPS EXT SW 1

J1: GND, GND, EXT RX, GND, EXT TX, GND, EXT TX ENABLE, GND, EXT RX ENABLE, GND, EXT VH1 PWR1, nc, EXT VH1 PWR2, nc, nc, VCC (3.3V)

FCI 90311-008LF

J2: VIN (9V-48V), GND

Molex MicroFit 43025-0200

MM1 PWR

Twisted Length XX Inches 20AWG

TRANSDUCER

Impulse LPMBH-3-FS

BLK, GRY, YEL

WHOI 235014 LPMBH-3-FS

Length 8.25 Inches

Molex MicroFit 43645-0400

J5: XDUCER +, nc, SHIELD, XDUCER -

J6: VH, GATE A, GATE B, GND, VH, PRIMARY A, PRIMARY B, GND

WHOI 231023-12in-12in

Molex MiniFit 0039012080

J7: OUT +, OUT -, GND, GND

Molex MiniFit 0039012040

202006 Micromodem Power Amp

J3: VOUT (10.5V), GND, VOUT (10.5V), GND, VOUT (10.5V), GND, VPS EXT SW, VPS EXT SW 1

J1: GND, GND, EXT RX, GND, EXT TX, GND, EXT TX ENABLE, GND, EXT RX ENABLE, GND, EXT VH1 PWR1, nc, EXT VH1 PWR2, nc, nc, VCC (3.3V)

J2: VIN (10.5V-48V), GND

J5: XDUCER +, nc, SHIELD, XDUCER -

MM2 PWR

Twisted Length XX Inches 20AWG

Twisted Length XX Inches

Molex MicroFit 43640-0400

Connect to MM1 Power Amp J5 Mate to Endcap >>>>

Terminal: FCI 10044403-101LF Female

Terminal: Molex MicroFit 43030 Female

Terminal: Molex MicroFit 43031 Male

Terminal: Molex MillGrid 50294 Female

255023-MM01-x-x

MM01: Micromodem Option (Standard)

- (1) or (2) Micromodems can be installed in the buoy but only one can be utilized during deployment due to 3-pin connector.
- Only (1) Micromodem can be physically connected to endcap connector and a single remote transducer at at time.
- Manual pre-deployment configuration required.

Notes:

1. All Wires to be 24 AWG Teflon Insulated unless otherwise specified.
2. For FCI connectors use FCI pins and the Molex Milligrid pinout.
3. Wiring to be neatly routed and secured using chassis PEMS.
4. Group all wires as indicated on schematic and/or sample.
5. All internal hardware to be stainless steel.
6. All screws are to be socket head cap screws.
7. Loctite 242 to be used on all metal to metal threaded hardware.
8. Loctite 245 to be used on all metal to plastic threaded hardware.

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title:
Hybrid Modem Buoy
Micromodems: MM01 Option
Single or Dual Band

Cage Code: 88846

Drawn By: Tyler Johnson

Date Drawn: 2019-01-24

Drawing Number: **255023-SCH**

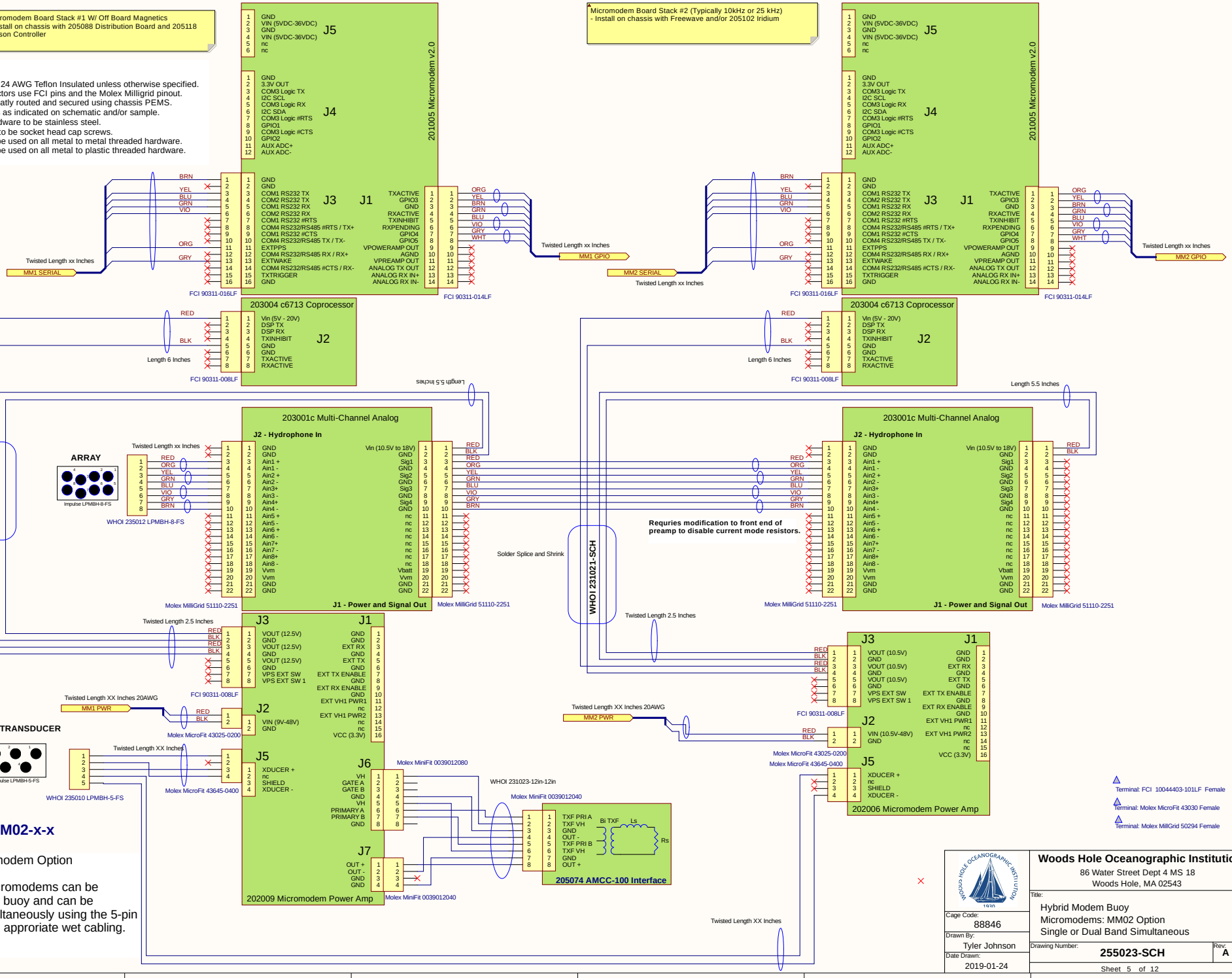
Rev: **A**

Micromodem Board Stack #1 W/ Off Board Magnetics
- Install on chassis with 205088 Distribution Board and 205118 Edison Controller

Micromodem Board Stack #2 (Typically 10kHz or 25 kHz)
- Install on chassis with Freewave and/or 205102 Iridium

Notes:

1. All Wires to be 24 AWG Teflon Insulated unless otherwise specified.
2. For FCI connectors use FCI pins and the Molex Milligrid pinout.
3. Wiring to be neatly routed and secured using chassis PEMS.
4. Group all wires as indicated on schematic and/or sample.
5. All internal hardware to be stainless steel.
6. All screws are to be socket head cap screws.
7. Loctite 242 to be used on all metal to metal threaded hardware.
8. Loctite 245 to be used on all metal to plastic threaded hardware.



255023-MM02-x-x

MM02: Micromodem Option

- (1) or (2) Micromodems can be installed in the buoy and can be operated simultaneously using the 5-pin connector and approriate wet cabling.

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title:
Hybrid Modem Buoy
Micromodems: MM02 Option
Single or Dual Band Simultaneous

Cage Code: 88846
Drawn By: Tyler Johnson
Date Drawn: 2019-01-24
Drawing Number: 255023-SCH
Rev: A
Sheet 5 of 12

Micromodem Board Stack #1 W/ Off Board Magnetics
- Install on chassis with 205088 Distribution Board and 205118 Edison Controller

Micromodem Board Stack #2 W/ Off Board Magnetics
- Install on chassis with Freewave and/or 205102 Iridium

201005 Micromodem v2.0

J5: GND, VIN (5VDC-36VDC), GND, VIN (5VDC-36VDC), nc, nc

J4: GND, 3.3V OUT, COM3 Logic TX, I2C SCL, COM3 Logic RX, I2C SDA, COM3 Logic #RTS, GPIO1, COM3 Logic #CTS, GPIO2, AUX ADC+, AUX ADC-

J3: GND, GND, COM1 RS232 TX, COM2 RS232 TX, COM1 RS232 RX, COM2 RS232 RX, COM1 RS232 #RTS, COM4 RS232/RS485 #RTS / TX+, COM1 RS232 #CTS, COM4 RS232/RS485 TX / TX-, EXTPPS, COM4 RS232/RS485 RX / RX+, EXTWAKE, COM4 RS232/RS485 #CTS / RX-, TXTRIGGER, GND

J1: TXACTIVE, GPIO3, GND, RXACTIVE, TXINHIBIT, RXPENDING, GPIO4, GPIO5, VPOWERAMP OUT, AGND, VPREAMP OUT, ANALOG TX OUT, ANALOG RX IN+, ANALOG RX IN-

MM1 SERIAL — Twisted Length xx Inches — FCI 90311-016LF
MM1 GPIO — Twisted Length xx Inches — FCI 90311-014LF
MM2 SERIAL — Twisted Length xx Inches — FCI 90311-016LF
MM2 GPIO — Twisted Length xx Inches — FCI 90311-014LF

203004 c6713 Coprocessor

J2: Vin (5V - 20V), DSP TX, DSP RX, TXINHIBIT, GND, GND, TXACTIVE, RXACTIVE

RED, BLK — Length 6 Inches — FCI 90311-008LF

203001c Multi-Channel Analog

J2 - Hydrophone In: GND, GND, Ain1 +, Ain1 -, Ain2 +, Ain2 -, Ain3+, Ain3 -, Ain4+, Ain4 -, Ain5 +, Ain5 -, Ain6 +, Ain6 -, Ain7+, Ain7 -, Ain8+, Ain8 -, Vvm, Vvm, GND, GND

Vin (10.5V to 18V), GND, Sig1, GND, Sig2, GND, Sig3, GND, Sig4, GND, nc, nc, nc, nc, nc, nc, Vbatt, Vvm, GND, GND

J1 - Power and Signal Out

Length 5.5 Inches — Molex MilliGrid 51110-2251 — Molex MiniFit 0039012040

WHOI 231021-SCH

ARRAY — Impulse LPMBH-8-FS — WHOI 235012 LPMBH-8-FS

Twisted Length xx Inches

RED, ORG, YEL, GRN, BLU, VIO, GRY, BRN

Requries modification to front end of preamp to disable current mode resistors.

Solder Splice and Shrink

Twisted Length 2.5 Inches

202009 Micromodem Power Amp

J3: VOUT (12.5V), GND, VOUT (12.5V), GND, VOUT (12.5V), GND, VPS EXT SW, VPS EXT SW 1

J1: GND, GND, EXT RX, GND, EXT TX, GND, EXT TX ENABLE, GND, EXT RX ENABLE, GND, EXT VH1 PWR1, nc, EXT VH1 PWR2, nc, nc, VCC (3.3V)

J2: VIN (9V-48V), GND

J5: XDUCER +, nc, SHIELD, XDUCER -

J6: VH, GATE A, GATE B, GND, VH, PRIMARY A, PRIMARY B, GND

J7: OUT +, OUT -, GND, GND

FCI 90311-008LF — Molex MiniFit 0039012040

205074 AMCC-100 Interface

TXF PRI A, TXF VH, GND, OUT -, TXF PRI B, TXF VH, GND, OUT +

Bi TXF, Ls, Rs

TRANSDUCER — Impulse LPMBH-3-FS — WHOI 235014 LPMBH-3-FS

MM1 PWR — Twisted Length XX Inches 20AWG — Molex MicroFit 43025-0200

Length 8.25 Inches — Molex MicroFit 43645-0400

MM2 PWR — Twisted Length XX Inches 20AWG — Molex MicroFit 43025-0200

Molex MicroFit 43640-0400 — Molex MicroFit 43645-0400

WHOI 231023-12in-12in

Connect to MM1 Power Amp J5 Mate to Endcap >>>>

Molex MiniFit 0039012080

Terminal: FCI 10044403-101LF Female
Terminal: Molex MicroFit 43030 Female
Terminal: Molex MicroFit 43031 Male
Terminal: Molex MillGrid 50294 Female

255023-MM01-x-x

MM03: Micromodem Option

- (1) or (2) Micromodems with off board magnetics can be installed in the buoy but only one can be utilized during deployment due to 3-pin connector.
- Only (1) Micromodem can be physically connected to endcap connector and a single remote transducer at at time.
- Manual pre-deployment configuration required.

Notes:

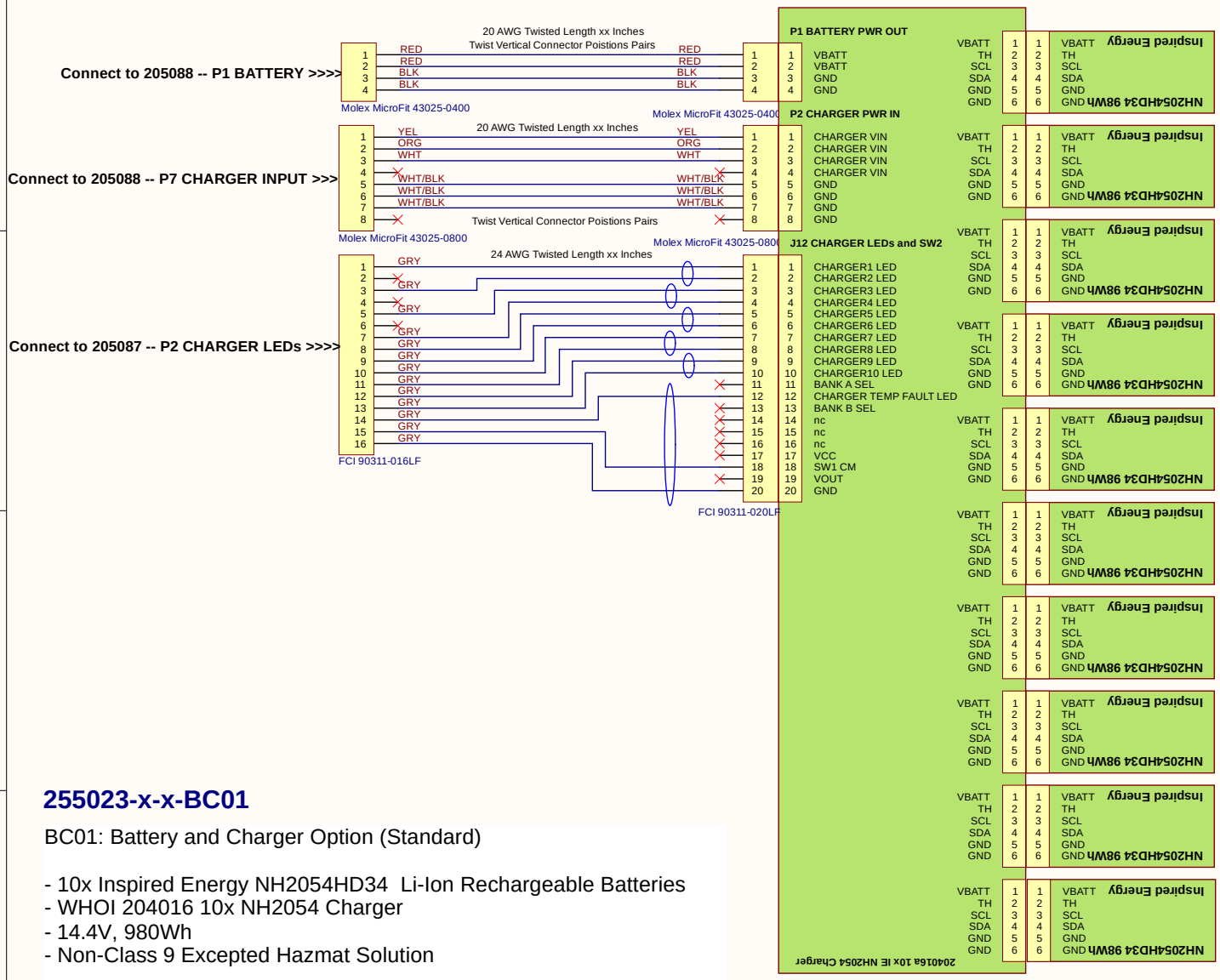
1. All Wires to be 24 AWG Teflon Insulated unless otherwise specified.
2. For FCI connectors use FCI pins and the Molex Milligrid pinout.
3. Wiring to be neatly routed and secured using chassis PEMS.
4. Group all wires as indicated on schematic and/or sample.
5. All internal hardware to be stainless steel.
6. All screws are to be socket head cap screws.
7. Loctite 242 to be used on all metal to metal threaded hardware.
8. Loctite 245 to be used on all metal to plastic threaded hardware.

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title: Hybrid Modem Buoy
Micromodems: MM03 Option
Dual Off Board Magnetics

Cage Code: 88846
Drawn By: Tyler Johnson
Date Drawn: 2019-01-24

Drawing Number: 255023-SCH
Rev: A



255023-x-x-BC01

BC01: Battery and Charger Option (Standard)

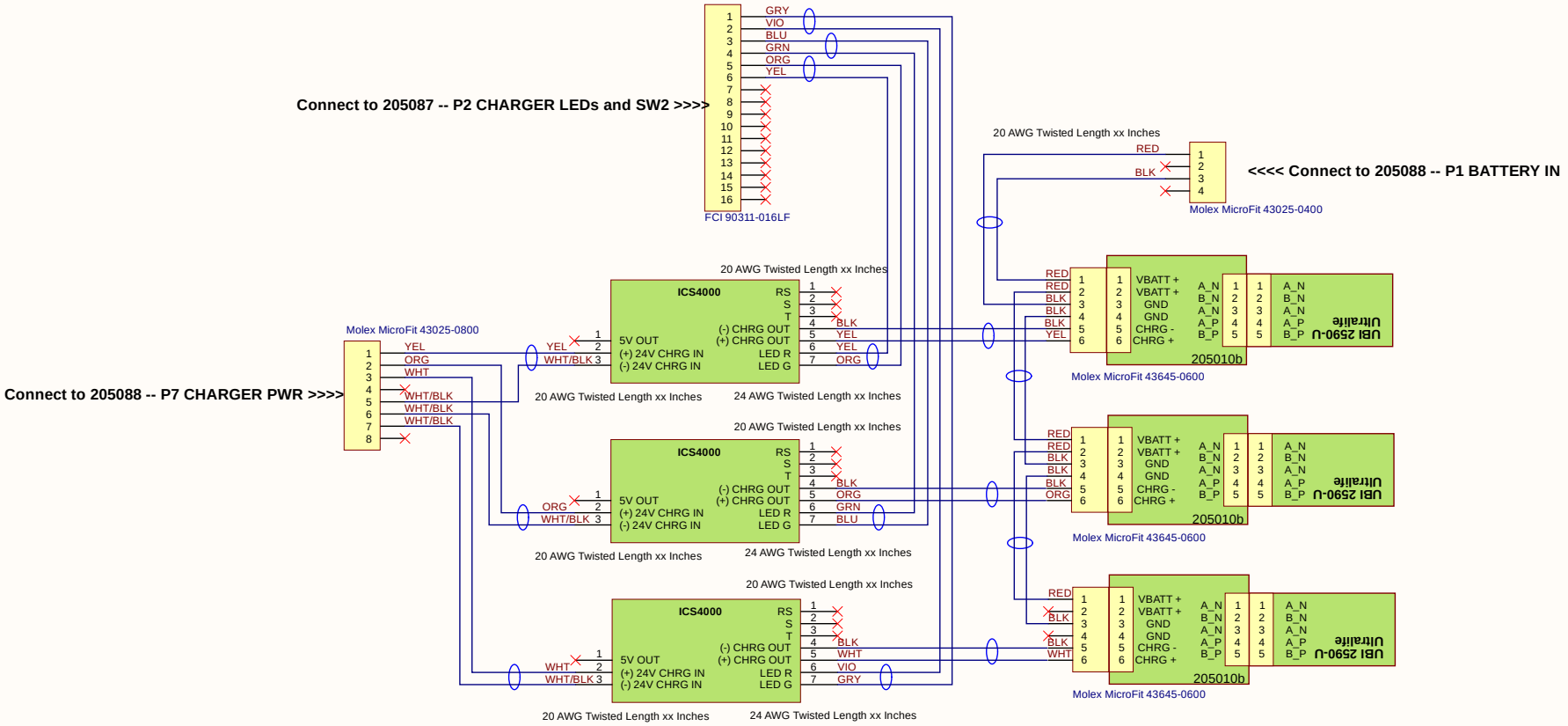
- 10x Inspired Energy NH2054HD34 Li-Ion Rechargeable Batteries
- WHOI 204016 10x NH2054 Charger
- 14.4V, 980Wh
- Non-Class 9 Excepted Hazmat Solution

Cage Code:	88846
Drawn By:	Tyler Johnson
Date Drawn:	2019-01-24

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title:
Hybrid Modem Buoy
Batteries and Chargers: Option BC01
Inspired Energy Batteries and Charger

Drawing Number: **255023-SCH** Rev: **A**



255023-x-x-BC02

BC02: Battery and Charger Option

- 3x UBI-2590U Li-Ion Rechargeable Batteries
- 3x UBI ICS-4000 Battery Chargers
- 14.4V, 12.0Ah, 518Wh
- Class 9 Excepted Hazmat

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title:
Hybrid Modem Buoy
Batteries and Chargers: Option BC02
UBI-2590 Batteries and ICS4000 Chargers

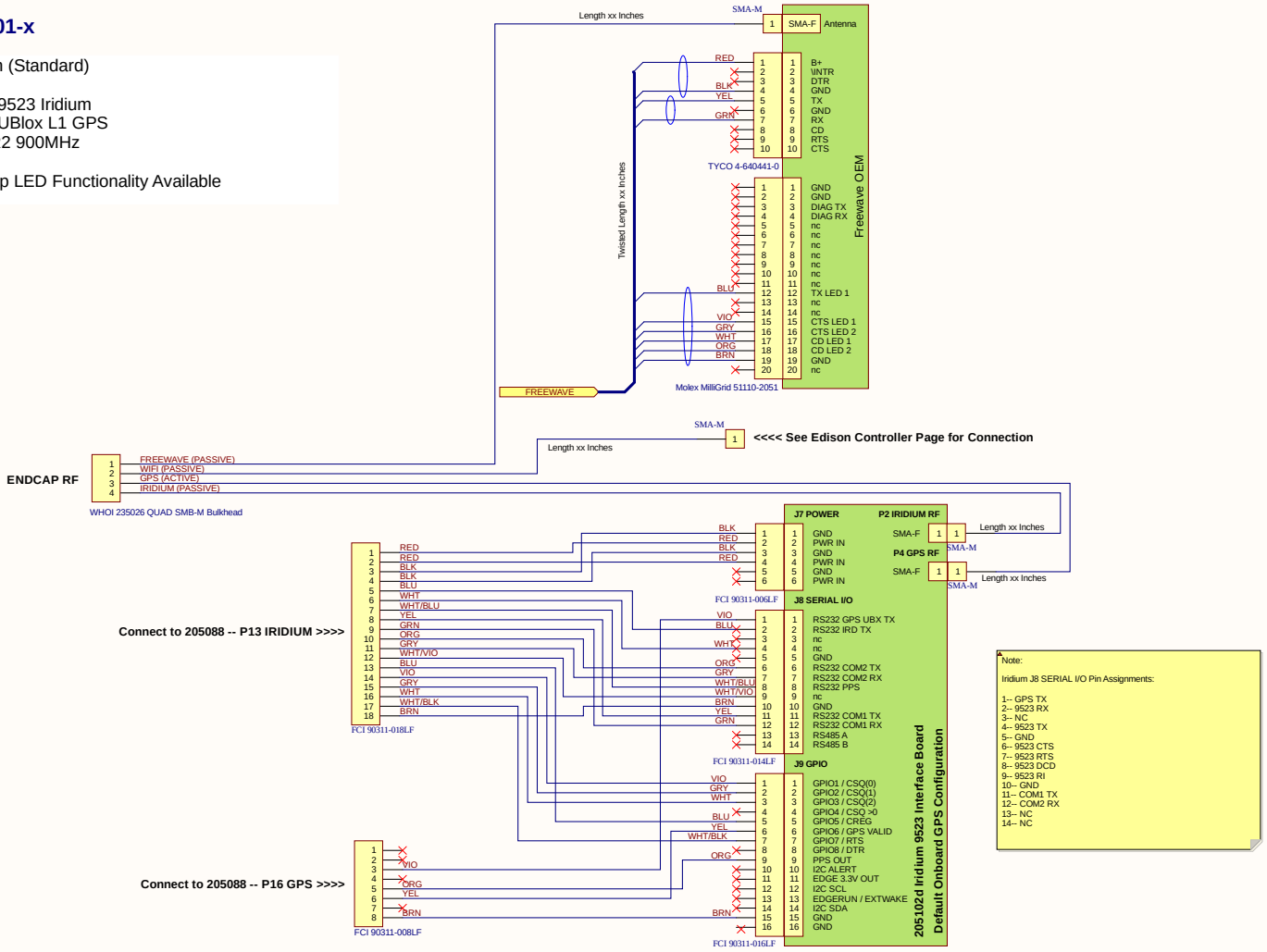
Cage Code: 88846
Drawn By: Tyler Johnson
Date Drawn: 2019-01-24
Drawing Number: 255023-SCH
Rev: A
Sheet 8 of 12

255023-x-RF01-x

RF01: RF Option (Standard)

- WHOI 205102 9523 Iridium
- WHOI 205102 UBlox L1 GPS
- Freewave FGR2 900MHz

Note: Full Endcap LED Functionality Available



Terminal: FCI 10044403-101LF Female

Terminal: Molex MicroFit 43030 Female

Terminal: Molex MillGrid 50294 Female

Notes:

1. All Wires to be 24 AWG Teflon Insulated unless otherwise specified.
2. For FCI connectors use FCI pins and the Molex Milligrid pinout.
3. Wiring to be neatly routed and secured using chassis PEMS.
4. Group all wires as indicated on schematic and/or sample.
5. All internal hardware to be stainless steel.
6. All screws are to be socket head cap screws.
7. Loctite 242 to be used on all metal to metal threaded hardware.
8. Loctite 245 to be used on all metal to plastic threaded hardware.

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title:
Hybrid Modem Buoy
RF Radios: RF01 Option
Iridum and GPS

Cage Code: 88846

Drawn By: Tyler Johnson

Date Drawn: 2019-01-24

Drawing Number: **255023-SCH**

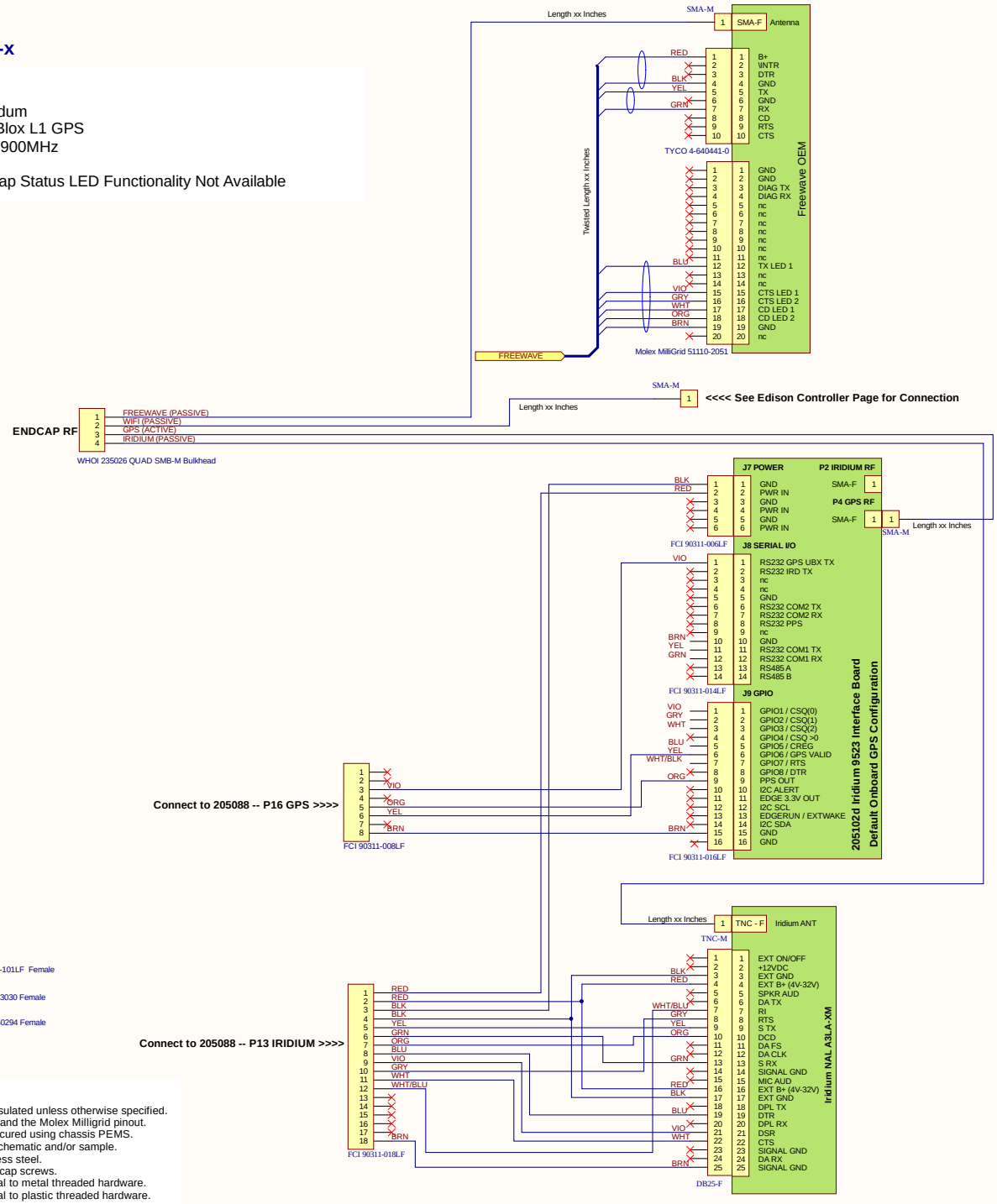
Rev: **A**

255023-x-RF02-x

RF02: RF Option

- NAL A3LA-XM Iridum
- WHOI 205102 UBlox L1 GPS
- Freewave FGR2 900MHz

Note: Iridium Endcap Status LED Functionality Not Available



Notes:

1. All Wires to be 24 AWG Teflon Insulated unless otherwise specified.
2. For FCI connectors use FCI pins and the Molex Milligrid pinout.
3. Wiring to be neatly routed and secured using chassis PEMS.
4. Group all wires as indicated on schematic and/or sample.
5. All internal hardware to be stainless steel.
6. All screws are to be socket head cap screws.
7. Loctite 242 to be used on all metal to metal threaded hardware.
8. Loctite 245 to be used on all metal to plastic threaded hardware.

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title:
Hybrid Modem Buoy
RF Radios: RF03 Option
Iridum and GPS

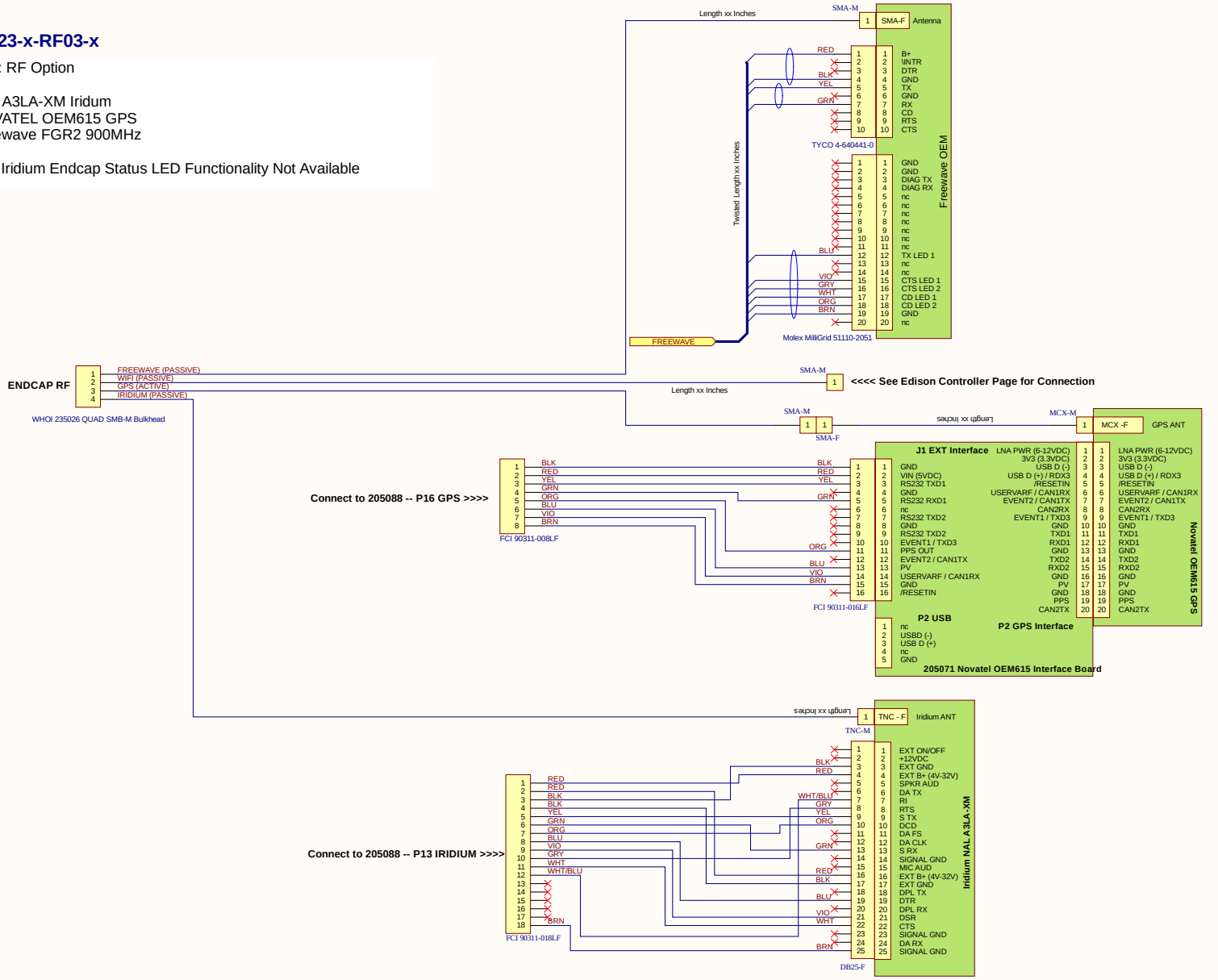
Cage Code: 88846
Drawn By: Tyler Johnson
Date Drawn: 2019-01-24
Drawing Number: 255023-SCH
Rev: A
Sheet 10 of 12

255023-x-RF03-x

RF03: RF Option

- NAL A3LA-XM Iridum
- NOVATEL OEM615 GPS
- Freewave FGR2 900MHz

Note: Iridium Endcap Status LED Functionality Not Available



Terminal: FCI 10044403-101LF Female

Terminal: Molex MicroFit 43030 Female

Terminal: Molex MillGrid 50294 Female

Notes:

1. All Wires to be 24 AWG Teflon Insulated unless otherwise specified.
2. For FCI connectors use FCI pins and the Molex Milligrid pinout.
3. Wiring to be neatly routed and secured using chassis PEMS.
4. Group all wires as indicated on schematic and/or sample.
5. All internal hardware to be stainless steel.
6. All screws are to be socket head cap screws.
7. Loctite 242 to be used on all metal to metal threaded hardware.
8. Loctite 245 to be used on all metal to plastic threaded hardware.

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Cage Code: 88846

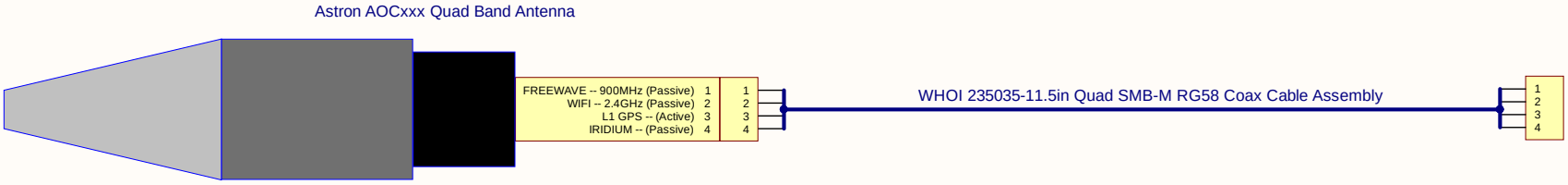
Drawn By: Tyler Johnson

Date Drawn: 2019-01-24

Title:
Hybrid Modem Buoy
RF Radios
Iridum and GPS Options

Drawing Number: 255023-SCH

Rev: A



Cage Code:	88846
Drawn By:	Tyler Johnson
Date Drawn:	2019-01-24

Woods Hole Oceanographic Institution
86 Water Street Dept 4 MS 18
Woods Hole, MA 02543

Title:
Hybrid Modem Buoy
Antennas: Iridium, Freewave, GPS, WiFi

Drawing Number: **255023-SCH** Rev: **A**

Sheet 12 of 12