SWiM
Installation
Diagrams
Definitions:

Cap: Screw on cover for a port

Terminator: Cap with internal 75 ohm resistor for terminating ports electrically.

Inside:

SWiM Module Port 2 out – The attached terminator must be used if the port is not in use.

Single Port Power Passing Splitters – All unused ports must be terminated

SWiM Power inserters – The IRD port must be terminated if not used as part of the installation

Outside: All outside ports require weather protection.

Weather protection comprises of a closing method and a weather seal

Port in Use: F connector with a weather seal. The connector must be torqued to 30in/lbs

SWiM Switch port 2 out – The attached terminator must be used with a weather seal if the port is not in use.

All other outside unused ports: Require a cap with a weather seal

Using terminators or caps where not intended will result in service quality issues which may not be apparent at the time of install.

Examples:

Terminating Port (only used on a 3x4 off air input port)

SWiM Switch (comes with its own terminator cap)

To make a weather cap – simply remove the center stinger of a terminator cap using a pair of side cutters

Weather Sealed Port

“The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.”
To promote a better understanding of dB losses and dBm power within a DIRECTV installation, charts such as what is listed below are provided on each of the installation diagrams contained in this material.

These charts will show a single path dB loss, a single path is defined as a single cable run from the ODU to a receivers tuner.

All cable runs are based off of a maximum distance of 150ft.

Relative dBm values are listed on each diagram at the ODU. dBm levels seen will vary and are based off of geographic location as well as proper peaking of the ODU.

As a rule dBm readings at the receivers tuner input should not exceed -60 dBm.

Example: Path 1 has 6 F-connectors, 2 F-81 barrels and 150 feet of RG-6 cable, and 1 SWS 4 splitter, the maximum frequency used is 1178MHz (1 HD DVR). The result is 26.5 dB of loss in the RG-6 cable run.

Let’s say that we have -30 dBm of power at the ODU, subtract 26.5 dB (for cable run loss) – anticipated result is -56.5 dB at the receivers tuner input.

<table>
<thead>
<tr>
<th>Component</th>
<th>QTY</th>
<th>dB Loss Per</th>
<th>Net Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-Connectors</td>
<td>6</td>
<td>0.5</td>
<td>3</td>
</tr>
<tr>
<td>F-81 Barrels</td>
<td>2</td>
<td>1.0</td>
<td>2</td>
</tr>
<tr>
<td>SWiM SWS 4</td>
<td>1</td>
<td>11.0</td>
<td>11</td>
</tr>
<tr>
<td>Feet of Cable</td>
<td>150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Highest Frequency used (see chart)</td>
<td>1178MHz</td>
<td>7.01</td>
<td>10.5</td>
</tr>
</tbody>
</table>

Path # Total Loss = 26.5

ODU dBm = -30

Net dBm at receiver = -56.5
For illustration purposes only

<table>
<thead>
<tr>
<th>8 Channel SWM</th>
<th>Frequency</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel 1</td>
<td>1076MHz</td>
<td>Program Content</td>
</tr>
<tr>
<td>Channel 2</td>
<td>1178MHz</td>
<td>Program Content</td>
</tr>
<tr>
<td>Channel 3</td>
<td>1280MHz</td>
<td>Program Content</td>
</tr>
<tr>
<td>Channel 4</td>
<td>1382MHz</td>
<td>Program Content</td>
</tr>
<tr>
<td>Channel 5</td>
<td>1484MHz</td>
<td>Program Content</td>
</tr>
<tr>
<td>Channel 6</td>
<td>1586MHz</td>
<td>Program Content</td>
</tr>
<tr>
<td>Channel 7</td>
<td>1688MHz</td>
<td>Program Content</td>
</tr>
<tr>
<td>Channel 8</td>
<td>1790MHz</td>
<td>Program Content</td>
</tr>
</tbody>
</table>

Programming Guide Data is modulated to each IRD / Tuner connected using the 974MHz frequency range. This could present itself as additional SWiM channel on the IRD’s signal screen.

See Slide 23 of the SWiM LNB & SWiM Module power point for more information regarding SWiM Channels.

### SWiM Channel vs Programming Channel

The following is only an example, actual SWiM channel assignments are unknown to the user or to the technician.

#### Channel Assignment Examples

- **IRD 1**, Tuner 1 – is assigned SWiM Channel 1
- **IRD 1**, Tuner 2 – is assigned SWiM Channel 2
- **IRD 2**, Tuner 1 – is assigned SWiM Channel 3

#### Programming Selections Example

- **IRD 1**, Tuner 1 requests programming channel 201 (DIRECTV Basics), the SWiM LNB takes orbital location 101° transponder 20 and modulates the programming onto **SWiM channel 1**
- **IRD 1**, Tuner 2 requests programming channel 294 (Discovery Kids), the SWiM LNB takes orbital location 101° transponder 4 and modulates the programming onto **SWiM channel 2**
- **IRD 2**, Tuner requests programming channel 285 (Discovery Times), the SWiM LNB takes orbital location 101° transponder 18 and modulates the programming onto **SWiM channel 3**
SWiM Integrated LNB Installation
KaKu - HD DVR SWiM compatible IRD
- Single tuner SWiM compatible IRD
- 4 way single port DC power passing splitter rated from 2-2150MHz
- BBC’s are not required in this scenario

Internal Wall Plates
External Wall

Terminator on unused ports

Weather Seal Identifier

Black Ground Wire
Indicates # 17ga
CCS Bond

Green Bonding
Wire Indicates # 10ga Solid Copper

S-Video
Video
Phone
Satellite In Ports

Component QTY dB Loss Per Net Loss
F-Connectors 6 0.5 3
F-81 Barrels 2 1.0 2
SWiM SWS 4 1 11.0 11
Feet of Cable 150

Highest Frequency used (see chart) 1178MHz 7.01 10.5
Path # 1 Total Loss = 26.5
ODU dBm = -30
Net dBm at receiver -56.5

Component QT Y dB Loss Per Net Loss
F - Connectors 6 0.5 3
F-81 Barrels 2 1.0 2
SWiM SWS 4 1 11.0 11
Feet of Cable 150

Highest Frequency used (see chart) 1178MHz 7.01 10.5
Path # 1 Total Loss = 26.5
ODU dBm = -30
Net dBm at receiver -56.5

Component QT Y dB Loss Per Net Loss
F - Connectors 6 0.5 3
F-81 Barrels 2 1.0 2
SWiM SWS 4 1 11.0 11
Feet of Cable 150

Highest Frequency used (see chart) 1178MHz 7.01 10.5
Path # 1 Total Loss = 26.5
ODU dBm = -30
Net dBm at receiver -56.5

Component QT Y dB Loss Per Net Loss
F - Connectors 6 0.5 3
F-81 Barrels 2 1.0 2
SWiM SWS 4 1 11.0 11
Feet of Cable 150

Highest Frequency used (see chart) 1178MHz 7.01 10.5
Path # 1 Total Loss = 26.5
ODU dBm = -30
Net dBm at receiver -56.5
SWiM Integrated LNB Installation
KaKu - HD DVR SWiM compatible IRD
Single tuner SWiM compatible IRD
4 way single port DC power passing splitter rated from 2-2150MHz
BBC’s are not required in this scenario

Internal Wall Plates

Terminator on unused ports

Out to TV
Satellite In Ports

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

2
HD DVR
S-Video
120V

Internal Wall Plates

Terminator on unused ports

All Outdoor F Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Black Ground Wire Indicates # 17ga CCS Bond

Green Bonding Wire Indicates # 10ga Solid Copper

Weather Seal Identifier

All Bonding Grounding Diagrams illustrates only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal bonding regulations within the area he or she is working. A DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal bonding regulations within the area he or she is working.
SWIM Integrated LNB Installation
Kaku:
- HD DVR SWIM compatible IRD
- Single tuner SWIM compatible IRD
- Off-Air HD Antenna
- 4 way single port DC power passing splitter rated from 2-2150MHz
- BBC’s are not required in this scenario

Internal Wall Plates

External Wall

Weather Seal Identifier

Green Bonding Wire Indicates # 10ga Solid Copper

Black Ground Wire Indicates # 17ga CCS Bond

Terminator on unused ports

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

Weather Seal Identifier

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Terminator on unused ports

Service Panel

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.

Internal Wall Plates

Terminator on unused ports

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

Weather Seal Identifier

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Terminator on unused ports

Service Panel

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.

Internal Wall Plates

Terminator on unused ports

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

Weather Seal Identifier

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Terminator on unused ports

Service Panel

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.

Internal Wall Plates

Terminator on unused ports

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

Weather Seal Identifier

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Terminator on unused ports

Service Panel

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.

Internal Wall Plates

Terminator on unused ports

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

Weather Seal Identifier

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Terminator on unused ports

Service Panel

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.

Internal Wall Plates

Terminator on unused ports

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

Weather Seal Identifier

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Terminator on unused ports

Service Panel

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.
SWiM Integrated LNB Installation
KaKu -
HD DVR SWiM compatible IRD
AM21 Off-Air Tuner
Off-Air HD Antenna
Single tuner SWiM compatible IRD
4 way single port DC power passing splitter rated from 2-2150MHz
BBC’s are not required in this scenario

Internal Wall Plates

External Wall

Terminator on unused ports

Black Ground Wire Indicates # 17ga CCS Bond

Green Bonding Wire Indicates # 10ga Solid Copper

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply
**SWiM 5 Channel Switch Installation**

**KaKu - 95°**
- Single tuner SWiM compatible IRD
- HD DVR SWiM compatible IRD
- 4 way single port DC power passing splitter rated from 2-2150MHz
- BBC’s are not required in this scenario

**Internal Wall Plates**
- Black or Blue Ground Wire Indicates # 17ga CCS Bond
- Green Bonding Wire Indicates # 10ga Solid Copper

**External Wall**
- Weather Seal identifier

*The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.*

**SWM IRD**
- Satellite In Ports
- Phone Out to TV
- Off Air In
- Video
- S-Video
- 120V

**Legacy**
- SWM-1
- SWM-2

**SWM1/PWR**
- SWM
- 1
- 2

**5 Channel SWiM**
- 18v
- 99°/101°
- 13v
- 99°/101°
- 18v/22KHz
- 13v/22KHz

**Distance between the Power Inserter and the SWiM switch can not exceed 150 ft**

**Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply**

**Terminator**

**Bonding**

**Service Panel**

**Version 5 March 2009**
**SWIM 5 Channel Switch Installation**

KaKu - 95° - 72.5°

Single tuner SWiM compatible IRD
HD DVR SWiM compatible
IRD

BBC’s are not required in this scenario

**Internal Wall Plates**

**External Wall**

Black or Blue Ground Wire Indicates # 17ga CCS Bond

Green Bonding Wire Indicates # 10ga Solid Copper

**Weather Seal identifier**

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state, and federal grounding regulations within the area he or she is working.

- **SWM**
  - 5 Channel SWiM
  - 18v
  - 13v
  - 18v/22KHz
  - 13v/22KHz
  - Flex Port 1
  - Flex Port 2
  - Legacy 1
  - Legacy 2
  - SWM1/PWR
  - SWM 2
  - SWM-1 Satellite In
  - SWM-1 Off Air In

- **Video**
  - Out to TV
  - Off Air In
  - S-Video

- **Phone**
  - Out to TV
  - Off Air In

- **120V**
  - S-Video

- **Weather Cap on Unused Ports**

- **37°**

- **33°**

- **Service Panel**

- **Bonding**

- **Version 5 March 2009**

- **All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s**

- **Distance between the Power Inserter and the SWIM switch can not exceed 150 ft.**

- **Weather Seal identifier**

- **Distance between the Power Inserter and the SWIM switch can not exceed 150 ft.**
SWiM 5 Channel Switch Installation

KaKu

- Single tuner SWiM compatible IRD
- HD DVR SWiM compatible IRD
- 4 way single port DC power passing splitter rated from 2-2150MHz
- BBC’s are not required in this scenario

Internal Wall Plates

- Black Ground Wire Indicates # 17ga CCS Bond
- Green Bonding Wire Indicates # 10ga Solid Copper

Terminator

Weather Seal identifier

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

All outdoor F-connectors must be tightened to no less than 30 inch lbs to include LNB’s

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.
SWiM 5 Channel Switch Installation
KaKu - HD DVR SWiM compatible IRD
R-15 DVR IRD using SWiM Legacy ports
4 way single port DC power passing
splitter rated from 2-2150MHz
BBC’s are not required in this scenario

Internal Wall Plates

External Wall

Service Panel

Black Ground Wire
Indicates # 17ga
CCS Bond

Green Bonding Wire Indicates # 10ga Solid Copper

Terminator

Weather Seal Identifier

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet local requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area they are working.

All Video F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Terminator on unused ports

SWM-1

Terminator

SWM

SWM1/PWR

PWR

Terminator

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply
**SWiM 5 Channel Switch Installation**

- KaKu - 95°
- HD DVR SWiM compatible IRD
- R-15 DVR IRD using SWiM Legacy ports
- 4 way single port DC power passing splitter rated from 2-2150MHz
- BBC’s are not required in this scenario

---

**Black Ground Wire Indicates # 17ga CCS Bond**

---

**Green Bonding Wire Indicates # 10ga Solid Copper**

---

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.

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**Distance between the Power Inserter and the SWiM switch can not exceed 150 ft**

---

**Terminator**

---

**External Wall**

---

**Internal Wall Plates**

---

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply.

---

Version 5 March 2009
SWM 8 Channel Switch Installation

KaKu - 95° - 72.5°
Single tuner SWM compatible IRD
HD DVR SWM compatible IRD
4 way single port DC power passing splitter rated from 2-2150MHz
BBC’s are not required in this scenario

Internal Wall Plates

External Wall

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply

Black or Blue Ground
Wire Indicates # 17ga CCS Bond

Green Bonding
Wire Indicates # 10ga Solid Copper

Terminator

Service Panel

Weather Seal Identifier

Terminator on unused ports

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB's.

Distance between the Power Inserter and the SWM switch can not exceed 150 ft

Weather Cap on Unused Ports

Terminator on unused ports
SWiM 8 Channel Switch Installation
KaKu - 95°
Single tuner SWiM compatible IRD
HD DVR SWiM compatible IRD
4 way single port DC power passing splitter rated from 2-2150MHz

BBC’s are not required in this scenario

Black or Blue Ground Wire
Indicates # 17ga CCS Bond

Green Bonding Wire
Indicates # 10ga Solid Copper

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.

Internal Wall Plates

Terminators

Weather Seal identifier

Weather Cap on Unused Ports

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply.
SWiM 8 Channel Switch Installation

KaKu - 95° - 72.5°
Single tuner SWiM compatible IRD
HD DVR SWiM compatible IRD
BBC’s are not required in this scenario

Internal Wall Plates

External Wall

Black or Blue Ground Wire
Indicates # 17ga CCS Bond

Green Bonding Wire
Indicates # 10ga Solid Copper

Weather Cap on Unused Ports

Weather Seal identifier

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB's

Bonding

“The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.”
**SWiM 8 Channel Switch Installation**

**KaKu**
Single tuner SWiM compatible IRD
HD DVR SWiM compatible IRD
4 way single port DC power passing
splitter rated from 2-2150MHz
BBC's are not required in this scenario

**Internal Wall Plates**

**External Wall**

**Black Ground Wire** Indicates # 17ga CCS Bond

**Green Bonding Wire** Indicates # 10ga Solid Copper

---

**Terminator**

---

**Weather Cap on Unused Ports**

---

**Service Panel**

---

**Weather Seal identifier**

---

**Distance between the Power Inserter and the SWiM switch can not exceed 150 ft**

---

**All f-connectors must be tightened to no less than 30 inch lbs to include LNBFs**

---

**Terminator on unused ports**

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**Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply**
SWM 8 Channel Switch Installation
KaKu - HD DVR SWM compatible IRD
R-15 DVR IRD using SWM Legacy ports
4-way single port DC power passing splitter rated from 2-2150MHz
BBC’s are not required in this scenario

Internal Wall Plates

External Wall

SWM-1

SWM-2

SWM 1/PWR

Terminator on unused ports

Terminator

Service Panel

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.

Black Ground Wire Indicates # 17ga CCS Bond

Green Bonding Wire Indicates # 10ga Solid Copper

All added F-Connectors must be tightened to no less than 30 inch lbs to include LNB's

Distance between the Power Inserter and the SWM switch can not exceed 150 ft

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB's

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply
SWiM 8 Channel Switch Installation
KaKu - 95°
HD DVR SWiM compatible IRD
R-15 DVR IRD using SWiM Legacy ports
4 way single port DC power passing
splitter rated from 2-2150MHz
BBC’s are not required in this scenario

Internal Wall Plates

External Wall

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply

Black or Blue Ground Wire
Indicates # 17ga CCS Bond

Green Bonding Wire
Indicates # 10ga Solid Copper

Terminator

Weather Cap on unused ports

Weather Cap on unused ports

Weather Cap on unused ports

Weather Cap on unused ports

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

SWM
IRD

Satellite In Ports

Phone

Out to TV
Off Air In

Video
Video
Video

S-Video

120V

S-Video

120V

S-Video

Terminator on unused ports

Terminator on unused ports

Terminator on unused ports

Terminator on unused ports

SWM-1
8 Channel SWiM

18v
Sat 99°/101°

13v
Sat 99°/101°

18v/22KHz
13v/22KHz

Flex Port

Flex Port

Legacy

Legacy

SWM1/PWR

SWM 2

Sat 103°/110°/119°

95° LNB

Terminator on unused ports

Terminator on unused ports

Terminator on unused ports

Terminator on unused ports

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB's

Weather Seal identifier

Version 5 March 2009
**SWiM 8 Channel Switch Installation**
- KaKu - HD DVR SWiM compatible IRD
- R-15 DVR IRD using SWiM Legacy ports
- 4 way single port DC power passing
- splitter rated from 2-2150MHz
- BBC’s are not required in this scenario
- Off-Air HD Antenna

---

**Service Panel**

**Phone**

**Out to TV Off Air In**

**Video**

**S-Video**

**120V**

---

**Black Ground Wire**

**Indicates # 17ga CCS Bond**

---

**Green Bonding Wire Indicates # 10ga Solid Copper**

---

**Weather Cap on Unused Ports**

---

**Terminator**

---

**External Wall**

---

**Internal Wall Plates**

---

**Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply**

---

**Terminator on unused ports**

---

**The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal bonding regulations within the area he or she is working.**
SWiM 8 Channel Switch Installation
KaKu
Single tuner SWiM compatible IRD
HD DVR SWiM compatible IRD
4 way single port DC power passing splitter rated from 2-2150MHz
BBC’s are not required in this scenario

Internal Wall Plates

External Wall

Weather Seal identifier

Green Bonding Wire Indicates # 10ga Solid Copper

Terminator

Service Panel

Black Ground Wire Indicates # 17ga CCS Bond

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNBs

Weather Cap on Unused Ports

Terminator on unused ports

Splitters can be installed exterior of the residence, however port termination and weather sealing rules still apply

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

Terminator on unused ports

Terminator

The following grounding diagrams illustrate only a few examples of ways to bond a DIRECTV system and may not meet bonding requirements in every municipality within the United States. It is the responsibility of the installer/technician performing the installation to know and follow all local, state and federal grounding regulations within the area he or she is working.
SWiM 8 Channel Switch Installation
KaKu - 95° - 72.5°
4 Port Legacy Multiswitch
Single tuner SWiM compatible IRD
HD DVR SWiM compatible IRD
R-15 DVR IRDs
BBC’s are not required in this scenario

Due to size of this drawing the below items are not shown, all installations must include these items:
- Switch Drip / Service Loops
- Wall Plates
- Exterior Wall penetrations / Drip Loops
- Black or Blue Ground Wire Indicates # 17ga
- CCS Bonding Wire
- Green Bonding Wire Indicates # 10ga Solid Copper

Weather Seal Identifier

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB's

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

Terminate unused Ports
SWM 8 Channel Switch Installation
KaKu - 90° - 72.5°
Port Expander
Single tuner SWiM compatible IRD
HD DVR SWiM compatible IRD
R-15 DVR IRDs
BBC’s are not required for receivers connected to the SWiM 1 & SWiM 2 ports
BBC’s are required on IRD’s connected to the 6x8 Multiswitch
Due to size of this drawing the below items are not shown, all installations must include these items
Switch Drip / Service Loops
Wall Plates
Exterior Wall penetrations / Drip Loops

Switch Drip / Service Loops
Wall Plates
Exterior Wall penetrations / Drip Loops

Black or Blue Ground Wire Indicates # 17ga
CCS Bond
Green Bonding Wire Indicates # 10ga Solid Copper

Weather Seal identifier
Weather Cap on Unused Ports

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

To Additional Receivers
HD receivers require a BBC to be connected

Weather Cap on Unused Ports

To Additional Receivers
HD receivers require a BBC to be connected
Service Panel

Dual SWiM 5 Channel Switch Installation
KaKu - 95° - 72.5°
Port Expander
Single tuner SWiM compatible IRD
HD DVR SWiM compatible IRD
R-15 DVR IRD
BBC’s are not required for receivers connected to the SWiM 1 & SWiM 2 ports

Due to size of this drawing the below items are not shown, all installations must include these items:
- Switch Drip / Service Loops
- Wall Plates
- Exterior Wall penetrations / Drip Loops

All DirectV Connections must be isolated to no less than 18 in. to include LNB’s

Black or Blue Ground Wire Indicates #17ga CCS Bonding

Green Bonding Wire Indicates #10ga Solid Copper

Satellite In Ports
Out to TV
Phone
Off Air In
S-Video
Out to TV
Phone
Off Air In
S-Video

Weather Cap on Unused Ports

Weather Seal Identifier

All Outdoor F-Connectors must be tightened to no less than 30 inch lbs to include LNB’s

Distance between the Power Inserter and the SWiM switch can not exceed 150 ft

Termination of unused Ports

To Additional SWiM compatible Receivers

HD DVR
S-Video

SWM Connections
Multiswitch Connections
ODU Connections

To Additional SWiM compatible Receivers

Version 5 March 2009
The SWiM LNB requires additional steps to be performed during the peaking process.

An ASL (Alignment Signal Locator) is required to be used during the peaking process to ensure that the 101° and 119° satellites are located and peaked for maximum signal strength.

The SWM integrated LNB is connected to the ASL (SWiM IN port). This connection then allows the 101° and 119° satellite locations to be split into separate unique signals as seen below.

The BirDog, Supper Buddy, Acutrac Pro 22 and Acutrac III meter have been tested and verified to work with the ASL.

If an ASL is not available then a single port power passing two way splitter (rated @ 2MHz - 2150MHz) can ONLY be used with the BirDog and Super Buddy meters.

Note: The SWiM Integrated LNB output port must be connected to the input port of the Splitter

The following pages describe the proper peaking procedures using both methods. These procedures do not exclude or eliminate the need to dither the KaKu dish.

Peaking must be performed using the SWiM LNB
**Super Buddy Meter**

**ASL Peaking**

**SWiM Integrated LNB Peaking:**

Note: Use instructions in the Meter Setup section for peaking of the SWiM-ODU

**DO NOT CONNECT ANY IRD to the SWiM Integrated LNB BEFORE OR DURING THE PEAKING PROCESS**

1) Be sure the mast is plumb and the foot plate is secure to an approved mounting surface.

2) Obtain the azimuth, elevation and tilt settings from the DIRECTV receiver or the Super Buddy zip code screen.

3) Preset the antenna tilt and elevation to the settings obtained.

4) Apply power to the SWiM LNB using the power inserter as the diagram outlines. *(When power is applied, and before any receivers are connected, the SWiM Integrated LNB will enter a diagnostic mode that is required for the alignment procedure.)*

5) Connect the Super Buddy to the 101 port of the ASL unit. Press the LNB button once to select LNB1 and the 101 West satellite. The Super Buddy will tune to a SWiM Integrated LNB 101 west channel.

6) Adjust the antenna’s azimuth to obtain a signal lock and peak the signal level on your left bar graph. If you cannot obtain a lock, just peak the signal level and try to obtain the lock in the next step.

7) Now adjust the elevation to obtain the peak signal level and a signal lock.

8) At this point, you should be ROUGHLY aligned to 101 West. The SWiM Integrated LNB is not compatible with the Super Buddy’s satellite ID feature, but the signal lock status indicates that you are pointed at 101.

Note: Use the LNB button on the main screen to turn on LNB 1 (101° west) or LNB 2 (119° west) during the peaking process.

You can now follow the KaKu dithering process as outlined in the KaKu Dithering procedures

Note: You will have to disconnect the cable from the 101° port on the ASL and connect to the 119° port on the ASL during the tilt adjustment step of the dithering process

Software updates can be found at the following link  
http://www.appliedin.com/sbdowmen

Use the Flash Update Program from Applied Instruments to obtain the proper software

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**System Setup**

- **SERVICE**
  - DIRECTV
- **System**
  - SWM-LNB
- **LNB MODEL**
  - (SL3s or SL5s)
- **SWITCH TYPE**
  - Manual
Super Buddy Meter
Splitter Peaking

SWiM Integrated LNB Peaking:
Note: Use instructions in the Meter Setup section for peaking of the SWiM-ODU

DO NOT CONNECT ANY IRD to the SWiM Integrated LNB BEFORE OR DURING THE PEAKING PROCESS

1) Be sure the mast is plumb and the foot plate is secure to an approved mounting surface.

2) Obtain the azimuth, elevation and tilt settings from the DIRECTV receiver or the Super Buddy zip code screen.

3) Preset the antenna tilt and elevation to the settings obtained.

4) Apply power to the SWiM Integrated LNB using the power inserter as the diagram outlines. (When power is applied, and before any receivers are connected, the SWiM Integrated LNB will enter a diagnostic mode that is required for the alignment procedure.)

5) Connect the Super Buddy to the 2nd port of the splitter. Press the LNB button once to select LNB1 and the 101 West satellite. The Super Buddy will tune to a SWiM Integrated LNB 101 west channel.

6) Adjust the antenna’s azimuth to obtain a signal lock and peak the signal level on your left bar graph. If you cannot obtain a lock, just peak the signal level and try to obtain the lock in the next step.

7) Now adjust the elevation to obtain the peak signal level and a signal lock.

8) At this point, you should be ROUGHLY aligned to 101 West. The SWiM Integrated LNB is not compatible with the Super Buddy’s satellite ID feature, but the signal lock status indicates that you are pointed either at 101.

Note: Use the LNB button on the main screen to turn on LNB 1 (101° west) or LNB 2 (119° west) during the peaking process.

You can now follow the KaKu dithering process as outlined in the KaKu Dithering procedures

Software updates can be found at the following link http://www.appliedin.com/sbdownmen

Use the Flash Update Program from Applied Instruments to obtain the proper software

System Setup

SERVICE DIRECTV

System SWiM-LNB

LNB MODEL (SL3s or SL5s)

SWITCH TYPE Manual (the default for the SWiM-LNB)
BirDog Meter
ASL Peaking

SWiM Integrated LNB Peaking:

DO NOT CONNECT ANY IRD to the SWiM Integrated LNB BEFORE OR DURING THE PEAKING PROCESS

1) Be sure the mast is plumb and the foot plate is secure to an approved mounting surface.

2) Obtain the azimuth, elevation and tilt settings from the DIRECTV receiver.

3) Preset the antenna tilt and elevation to the settings obtained.

4) Apply power to the SWiM Integrated LNB using the power inserter as the diagram outlines. *(When power is applied, and before any receivers are connected, the SWiM Integrated LNB will enter a diagnostic mode that is required for the alignment procedure.)*

5) Connect the Birdog meter to the 101 port of the ASL unit. Press the arrow button to select DIRECTV SWM 101

6) Adjust the antenna’s azimuth to obtain a signal lock and peak the signal level on your bar graph. If you cannot obtain a lock, just peak the signal level and try to obtain the lock in the next step.

7) Now adjust the elevation to obtain the peak signal level and a signal lock.

8) At this point, you should be ROUGHLY aligned to 101 West.

You can now follow the KaKu dithering process as outlined in the KaKu Dithering procedures

Note: You will have to disconnect the cable from the 101° port on the ASL and connect to the 119° port on the ASL during the tilt adjustment step of the dithering process

Software updates can be found at the following link http://www.birdog.tv/

Download the following files
DIRECTV SWM 101
DIRECTV SWM 119
DTV Ka/Ku 3g 119 west
DTV Ka/Ku 3g 101 west

Notice
With the BIRDOG meter turned off, press and hold the up arrow button to get to the backend menu.
Press the down arrow, scroll through the Menu until you see the RF option
Change the RF option to Linear by using the right arrow
Press the down arrow, scroll through the Menu until you see the BER option
Change the BER option to ‘Log’ by using the right arrow key
Press the up arrow until you see ‘Exit’ then press the right arrow to turn the meter off

http://www.birdog.tv/
BirDog Meter
Splitter Peaking

SWiM Integrated LNB Peaking:

**DO NOT CONNECT ANY IRD to the SWiM Integrated LNB BEFORE OR DURING THE PEAKING PROCESS**

1) Be sure the mast is plumb and the foot plate is secure to an approved mounting surface.

2) Obtain the azimuth, elevation and tilt settings from the DIRECTV receiver.

3) Preset the antenna tilt and elevation to the settings obtained.

4) Apply power to the SWiM Integrated LNB using the power inserter as the diagram outlines. *(When power is applied, and before any receivers are connected, the SWiM Integrated LNB will enter a diagnostic mode that is required for the alignment procedure.)*

5) Connect the Birdog meter to the 2nd port of the splitter. Press the arrow button to select **DIRECTV SWM 101**

6) Adjust the antenna’s azimuth to obtain a signal lock and peak the signal level on your bar graph. If you cannot obtain a lock, just peak the signal level and try to obtain the lock in the next step.

7) Now adjust the elevation to obtain the peak signal level and a signal lock.

8) At this point, you should be ROUGHLY aligned to 101 West.

You can now follow the KaKu dithering process as outlined in the **KaKu Dithering procedures**

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Software updates can be found at the following link: [http://www.birdog.tv/](http://www.birdog.tv/)

Download the following files:
- DIRECTV SWM 101
- DIRECTV SWM 119
- DTV Ka/Ku 3g 119 west
- DTV Ka/Ku 3g 101 west

**Notice**

With the BIRDIG meter turned off, press and hold the up arrow button to get to the backend menu.

Press the down arrow, scroll through the Menu until you see the RF option.

Change the RF option to Linear by using the right arrow.

Press the down arrow, scroll through the Menu until you see the BER option “

Change the BER option to “Log” by using the right arrow key.

Press the up arrow until you see “Exit” then press the right arrow to turn the meter off.
Accutrac Pro Meter
ASL Peaking

**SWiM Integrated LNB Peaking:**

**DO NOT CONNECT ANY IRD to the SWiM Integrated LNB BEFORE OR DURING THE PEAKING PROCESS**

1) Be sure the mast is plumb and the foot plate is secure to an approved mounting surface.

2) Obtain the azimuth, elevation and tilt settings from the DIRECTV receiver.

3) Preset the antenna tilt and elevation to the settings obtained.

4) Apply power to the SWiM Integrated LNB using the power inserter as the diagram outlines. *(When power is applied, and before any receivers are connected, the SWiM Integrated LNB will enter a diagnostic mode that is required for the alignment procedure.)*

5) Connect the Accutrac Pro meter LNB 1 to the 101 port of the ASL unit. Press the on /menu button.

6) Adjust the antenna’s azimuth to obtain a signal lock and peak the signal level on your bar graph. If you cannot obtain a lock, just peak the signal level and try to obtain the lock in the next step.

7) Now adjust the elevation to obtain the peak signal level and a signal lock.

8) At this point, you should be ROUGHLY aligned to 101 West.

You can now follow the KaKu dithering process as outlined in the **KaKu Dithering procedures**

Note: You will have to disconnect the cable from the 101° port on the ASL and connect to the 119° port on the ASL during the tilt adjustment step of the dithering process.
Digisat III Meter 
ASL Peaking

SWiM Integrated LNB Peaking:

DO NOT CONNECT ANY IRD to the SWiM Integrated LNB BEFORE OR DURING THE PEAKING PROCESS

1) Be sure the mast is plumb and the foot plate is secure to an approved mounting surface.

2) Obtain the azimuth, elevation and tilt settings from the DIRECTV receiver.

3) Preset the antenna tilt and elevation to the settings obtained.

4) Apply power to the SWiM Integrated LNB using the power inserter as the diagram outlines. (When power is applied, and before any receivers are connected, the SWiM Integrated LNB will enter a diagnostic mode that is required for the alignment procedure.)

5) Connect the Digisat meter LNB port to the 101 port of the ASL unit. Press the on /menu button.

6) Adjust the antenna’s azimuth to obtain a signal lock and peak the signal level on your bar graph. If you cannot obtain a lock, just peak the signal level and try to obtain the lock in the next step.

7) Now adjust the elevation to obtain the peak signal level and a signal lock.

8) At this point, you should be ROUGHLY aligned to 101 West.

You can now follow the KaKu dithering process as outlined in the KaKu Dithering procedures

Note: You will have to disconnect the cable from the 101° port on the ASL and connect to the 119° port on the ASL during the tilt adjustment step of the dithering process.
Accutrac III Meter
ASL Peaking

SWiM Integrated LNB Peaking:

**DO NOT CONNECT ANY IRD to the SWiM Integrated LNB BEFORE OR DURING THE PEAKING PROCESS**

1) Be sure the mast is plumb and the foot plate is secure to an approved mounting surface.

2) Obtain the azimuth, elevation and tilt settings from the DIRECTV receiver.

3) Preset the antenna tilt and elevation to the settings obtained.

4) Apply power to the SWiM LNB using the power inserter as the diagram outlines. *(When power is applied, and before any receivers are connected, the SWiM Integrated LNB will enter a diagnostic mode that is required for the alignment procedure.)*

5) Connect the Accutrac III meter LNB port to the 101 port of the ASL unit. Press the power on/off button. Then select the 101 location by using the satellite select button.

You will be viewing the KU bar for signal strength.

6) Adjust the antenna’s azimuth to obtain a signal lock and peak the signal level on your bar graph.

7) Now adjust the elevation to obtain the peak signal level and a signal lock.

8) At this point, you should be ROUGHLY aligned to 101 West.

You can now follow the KaKu dithering process as outlined in the **KaKu Dithering procedures**

Note: You will have to disconnect the cable from the 101° port on the ASL and connect to the 119° port on the ASL during the tilt adjustment step of the dithering process.
Part 1: Course Elevation Adjustment/Fine Tune Tilt

Start Peaking Process

1. With Azimuth, elevation and tilt roughly set according to the customers specific zip code and signal on your signal meter for the 101° west location proceed to step 2.

2. Ensure that the following bolts are loose.
   - Leave Azimuth bolts loose
   - Leave these Elevation bolts loose

3. Align and peak the 101 satellite to the highest signal level possible.

4. Tighten the mast collar bolts. Then using the Azimuth screw turn clockwise and then counterclockwise until the maximum signal is obtained from the 101° location.

5. Using a \(\frac{1}{2}\)" nut driver, coarse align the elevation by turning the elevation screw clockwise and then counterclockwise until the maximum signal is obtained from the 101° location.

6. To fine tune the tilt,
   - if connected to an ASL – connect the 119 port cable to the meter then continue on with the instructions.
   - if connected to a SWiM splitter continue on with the instructions.

   Set the meter to 119 degrees by selecting:
   - **Super Buddy** = LNB 2
   - **Birdog** = DIRECTV SWM 119
   - **Accurac Pro** Specific Setting (LNB 1, 13v w/o 22KHz ).
   - **Accurac III** – Satellite Select
     - Ka @103, Ku @ 119
   - **Digisat III** Specific Setting
     - (13v w/o 22KHz )

7. Slowly rotate the dish (left/right) around the tilt axis to peak the signal to 119°.

8. Tighten the Tilt Lock Nuts.

Go to Part 2: Fine Tune Elevation

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Version 5 March 2009
Part 2: Fine Tune Elevation

(1) If ASL is used, reconnect the 101 port cable back to the meter. Set Meter back to 101° -
   - Super Buddy LNB 1
   - BirdDog DIRECTV SWM 101
   - Accutrac Pro Specific (LNB 1, 13v w/o 22KHz).
   - Accutrac III – Satellite Select
     - Ka @ 99, Ku @ 101
   - Digisat III
     - (13v w/o 22KHz)

(2) Write down the signal level number.

(3) Set the plastic dial to zero (0) by hand.

(4) Using the nut driver, rotate the fine tune adjustment bolt two (2) full turns “counter
    clockwise.”

Fine tune adjustment bolt

(5) Record the signal level.

(6) Rotate the bolt “clockwise” counting turns as well as the fractions until the same signal
    level is achieved.
    **Note:** This may require 5 to 7 turns.

(7) Divide the number by two (2). **Note:** You can use the division chart below.

(8) Turn the dial, not the screw back to zero.

(9) Rotate the screw “counter clockwise” by the divided amount of turns.

(10) Tighten the Elevation bolts

Go to Part 3: Fine Tune Azimuth

Complete Part 1 before Fine Tuning Elevation
Part 3: Fine Tune Azimuth

(1) Set Meter to 101° -
Super Buddy LNB 1,
BirDog DIRECTV SWM 101
Accutrac Specific
(LNB 1, 13v w/o 22KHz )

Accutrac III – Satellite Select
Ka @99, Ku @ 101

Digisat III Specific
( 13v w/o 22KHz )

(2) Record the signal level

(3) Set the plastic dial to zero (0) by hand.

(4) Using a ½ inch nut driver, rotate the fine tune adjustment bolt 2 full turns “counter clockwise.”

(5) Record the signal level

(6) Rotate the bolt “clockwise” counting turns as well as the fractions until the same signal level is achieved.
Note: This may require 5 to 7 turns.

(7) Divide the number by two (2). Note: You can use the division chart below.

(8) Turn the dial, not the screw back to zero.

(9) Rotate the screw “counter clockwise” by the divided amount of turns.

(10) Tighten down the Azimuth bolts and verify signal via the IRD
(Make sure that the the SWM Integrated LNB screws are installed)

If good signal from the IRD, the Peaking Process is complete

Complete Part 2 before Fine Tuning Azimuth
SWiM Installation Meter Steps

# 1 – Install the SWiM ODU (SWiM Integrated LNB) to a secure stable surface, ensure that the mast is plumb and level

# 2 – Rough peak the SWiM ODU using the Azimuth, Elevation and Tilt obtained using the customers specific zip code coordinates

# 3 – Install an ASL or Single port power passing splitter, Install cabling from the KaKu ODU to an applicable ground block.

# 4 – Continue with cable run to the penetration point of the structure and inside the structure

# 5 – Install a SWiM Splitter

# 6 – Connect all internal cable runs to the SWiM Splitter

# 7 – Connect the cable run from the SWiM Integrated LNB to the SWiM port of the SWiM Power Inserter

# 8 – Connect the SWiM power inserter to an electrical outlet

# 9 – Peak the KaKu ODU using the peaking meter specific steps.

# 9a – Once the peaking and dithering process is complete remove the ASL or the Single port power passing splitter from the SWM Integrated LNB.

# 10 – Connect the SWiM – 1 port of the IRD to the IRD port of the SWiM power inserter

Step # 11 to # 14 is required for SWiM Meter use only with the SWiM-ODU. Skip if you are using a standalone SWiM switch.

# 11 – Connect an IRD to an electrical power outlet. Models (D-12+, R-16+, H-20+, HR-20+) This IRD needs to be SWM enabled, so D12’s and H20’s with certain native NDS software running will need to be force upgraded.

DO NOT UNPLUG SWiM POWER INJECTOR FROM THE SWiM AT ANYTIME PAST THIS STEP WHEN USING THE SWiM INSTALLATION METER.

# 12 – Power on the IRD and complete the guided setup and/or the APG download. Verify that you see video after the APG download. Go to Step # 14. If you cannot get to this point, go to step # 13.

# 13 – Check the IRD cable run, and redo if needed. Repeat step # 12.

# 14 – Remove the IRD from the cable run. *Once you are done with the SWiM meter diagnosis of all the cable runs described in the following steps, plug in the cable to this first IRD. There is no need to redo the setup or reacquire guide.

# 15 – Connect the SWiM meter to any cable run that is connected to the SWiM splitter

# 16 – Press and hold the SWiM meter yellow button for 2 seconds, all LED’s should be lit

# 17 – Refer to Trouble Diagnosis page for test results (SWiM Meter Trouble Shooting Chart Page)

# 18 – Repeat test two times per cable run to verify same results

# 19 – Continue with installation – remember to reconnect any IRD that was disconnected after the registration process

Complete a phone line installation to each IRD. Don’t forget to complete all paper work and complete the customer education portion of the installation.
Danger: if the voltage light is off, an over voltage condition exists. DO NOT connect an IRD to this cable until this is corrected. The SWiM power inserter may be installed incorrectly or another device is supplying voltage to the system.

Trouble Diagnosis for SWiM Meter:

There are several scenarios you will run into when using the SWiM meter.

(Light Error = Led light is not GREEN in color)

1. Voltage Light Error – Check to make sure Power Inserter SWiM power connector and IRD connector are not reversed.
2. LF Light Error + 5 or 8 ch good, problem with inline splitters. Low Pass not good enough.
3. LF Light Good + 5 ch error and 8 ch error, or 5 ch good, 8 ch error, problem with inline splitters. Low Pass characteristics good enough but not rated to 2150MHz for 8 channel SWiM-ODU.
4. LF error + 5 and 8 ch error, bad cable run.
5. LF error + 5 and 8 ch error + Voltage error, check to make sure power inserter is properly powering the SWiM-ODU.