1 PRODUCT INTRODUCTION

1.1 GENERAL DESCRIPTION

The OPSU/BBU (ONT Power Supply Unit/Battery Back-up Unit) consists of a dedicated AC to 48V DC power supply and a battery backup unit. The OPUS/BBU is designed to be mounted inside a customer premise to provide battery back-up power for the ONT.

Alarm outputs are available on the BBU for the ONT to monitor the status of the BBU. The OPSU/BBU indicates its status to the resident with LEDs and buzzer alarm.

Figure 1: Battery Back-Up Unit and ONT Power Supply
2 IMPORTANT SAFETY NOTES

- ONLY qualified personnel should service this equipment.
- SAVE THESE INSTRUCTIONS - This manual contains important instructions for our OPSU/BBU that should be followed during installation and maintenance.
- Verify line voltage requirements and the supplied line voltage prior to installation.
- Verify branch circuit breaker or fuse on the service feed is correct for the equipment being installed.
- Batteries contain hazardous currents and may present a burn hazard if damaged or shorted.
- The following precautions should be observed when working on the unit:
  1. Remove watches, rings, or other metal objects.
  2. Wear protective clothing and eye protection when working with batteries and installing this equipment.
  3. Always carry a water supply to wash eyes and/or skin if exposed to battery electrolyte.
  4. Use tools with insulated handles.
  5. Examine the packing container for damage. Notify the carrier immediately if damage is present.
  6. Do not disassemble the unit.
  7. Do not operate near water or excessive humidity.
  8. Keep liquid and foreign objects from getting inside the unit.
  9. Do not operate close to gas or fire.
  10. Do not operate if the unit is leaking liquid or if any liquid residue is present.
- This Class B digital apparatus complies with Canadian ICES-003.
(Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada)

2.1 Electrical Warnings

- Servicing this equipment may require working with protective covers removed and utility power connected. Use extreme caution during these procedures.
- Check that the power cord(s), plug(s), and outlets are in good condition.
- No user serviceable components other than the battery are present in the OPSU/BBU.

2.2 Battery Warnings

- Worn-out or damaged batteries are considered environmentally unsafe. Always recycle used batteries or dispose of the batteries in accordance with all federal, state and local regulations.
- Any gel or liquid emissions from a valve-regulated lead-acid (VRLA) battery contain sulfuric acid, which is harmful to the skin and eyes. Emissions are electrically conductive and corrosive.
- Batteries produce explosive gases. Keep all open flames and sparks away from batteries.
- Batteries contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Battery post terminals and related accessories contain lead and lead compounds. Wash hands after handling (California Proposition 65).
- Wear protective clothing and eye protection whenever installing, maintaining, servicing, or replacing batteries.
- If any battery emission contacts the skin immediately and thoroughly wash with water. Follow approved chemical exposure procedures.
- Neutralize any spilled battery emission with the special solution contained in an approved spill kit or with a solution of one pound Bicarbonate of soda to one gallon of water. Report chemical spills and seek medical attention if necessary.
- Always replace batteries with new batteries of an identical type and rating.
- Never use uninsulated tools or other conductive materials when installing, maintaining, servicing or replacing batteries.
- A battery showing signs of cracking, leaking, or swelling should be replaced immediately with a battery of identical type and rating.
3 INSTALLATION

3.1 Prior to Installation

Installation of the unit must be performed by skilled technicians and electricians familiar with electrical equipment. Do not allow unqualified personnel to handle, install, or operate the equipment. The installation must comply with both the requirements of the National Electrical Code (ANSI/NFPA 70, latest issue), and local codes.

3.2 Mechanical Installation

Install this unit in a sheltered location away from direct contact with water and rain.

3.3 Mounting Orientation

Locate a stud within the wall the unit is mounted and screw 2, #10-24 pan head screws 2.5" apart into the stud, leaving ½” of the shaft of the screw exposed below the screw head. Mount the unit onto the screws and tighten the screw firmly to prevent the unit from sliding after mounting. Ensure that the door has sufficient space to open.

1. Unit must be installed with battery removed.

2. Place the unit against the wall, and using the keyholes (located on rear of enclosure) as a template, drill pilot holes for two 10-24 pan head screws.

3. Insert screws into each hole, leaving approximately 1/2" of screw protruding from wall. Align keyholes with screws, and slide unit into place. Tighten screws firmly.

4. Connect the battery wires to the battery terminals. Verify that red wire is connected to positive terminal, and black wire is connected to negative terminal.

Figure 2: Rear View
5. Connect the battery cable jack to the BBU.

6. Carefully insert battery into unit while pushing the tabs outwards. Do not pinch battery wires. Close front panel.

![Battery Removal Instructions](image1)

Figure 3: Battery Replacement and Installation Instructions

7. Install the BBU alarm and output power connections (see section 3.5 for more details).

8. Install AC power cord (see section 3.7 for more details).

3.4 Power Wiring Notes

The OPSU/BBU has no electrically conductive parts exposed to the user and so needs no safety grounding. The absence of a ground electrode on the AC plug is deliberate and can be used with either a grounded or older ungrounded style of AC receptacle.

3.5 Alarm and Output Power Connection

To access the craftsperson interface a standard 216 tool is required.

![Alarm Signal and Output Power Craft Interface](image2)

Figure 4: Alarm Signal and Output Power Craft Interface

Alarm and Output Power connections are made using the supplied insulation displacement connector (IDC). No stripping of wires is required. If a mistake is made and the wire must be reinserted into the
connector, make sure the wire end is trimmed and a clean, non-damaged insulated wire end is inserted into the connector.

3.5.1 ONT Alarm Connections

1. Verify OPSU is disconnected from AC power and that the BBU is not power on or in back-up mode.
2. Connect the power (24AWG wire) cable from the OPSU into the “48VDC” insulation displacement connector (IDC) See Figure 4.
3. Connect the 5 signal wires to the IDC in Figure 4. The connector pins are labeled with their function. Refer to the specific instructions from the ONT supplier to determine what alarms are accepted from the BBU to the ONT.
4. Connect the ONT cable according to ONT manufacturer instructions.

3.6 Alarm Conditions/Action

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Condition</th>
<th>Alarm Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON Battery</td>
<td>Battery being discharged</td>
<td>Open</td>
</tr>
<tr>
<td>Replace Battery</td>
<td>Battery failed self test</td>
<td>Open</td>
</tr>
<tr>
<td>Battery Missing</td>
<td>No battery installed or battery disconnected</td>
<td>Open</td>
</tr>
<tr>
<td>Low Battery</td>
<td>&lt;45% capacity remaining</td>
<td>Open</td>
</tr>
</tbody>
</table>

Table 1: Alarm Action

3.7 AC Wiring Connection

The Power Supply will come with a power cord pre-installed. This power cord is not removable/replaceable from the OPSU. The power supply is mounted after the wall outlet utilizing an 8 foot power cord between the OPSU and the customer provided outlet.

The AC power cord is supplied with a warning label “Telco Equipment – Do Not Remove”. If the label is missing or unreadable do not install the equipment.

![Figure 5: OPSU Plug with Label](image-url)
4 BBU LED INDICATORS, BUZZER ALARM, AND BUTTON OPERATION

4.1 LED INDICATORS

There are four LEDs that are visible from the exterior of the BBU. These four indicators have the following characteristics:

1. System Status: The system status LED will provide an indication that the power supply is in a normal mode of operation. This will be a solid green light if the BBU is in normal operation. This will flash during a fault condition in the BBU.

2. Battery Power: The battery power LED will be a solid green light to indicate that the power supply is operating in battery back-up mode. At the <45% battery capacity point, the LED will flash.

3. Replace Battery: The replace battery status line will provide an indication that the battery has reached the end of its useful life. Intelligent and active testing of the battery in the power supply will make this determination. This LED will be a solid red light when the battery requires replacement or is missing/not connected.

4. Auxiliary Power: The auxiliary power source line indicates that an external power source has been connected to the BBU and has adequate voltage present. The LED will be a solid green light when an auxiliary power is present.

4.2 BBU BUZZER ALARM

1. When input power is removed, there will be a one second long power fail buzzer.

2. This buzzer alarm will beep 4 times per minute in the event that the battery becomes low (which is at the <45% battery capacity point).

2. The buzzer will beep with a difference cadence from (2) above, once every 15 minutes, when the battery should be replaced.

4.3 BUTTONS

1. ALARM SILENCE BUTTON:

   Press and hold the alarm silence button 1-2 seconds to mute alarm for 24hrs. To restore alarm, press and hold again for 3-5 seconds.

2. BATTERY EMERGENCY USE BUTTON:

   Press and hold the battery emergency use button until all 4 LEDS light then release to use reserve battery power or re-start with new battery. If not released and held more than 5 seconds, operation will be disabled. If released after 4 LEDS light, battery operation will remain enabled.

Figure 6: LED Indicator and Push Button Label
### SPECIFICATIONS

<table>
<thead>
<tr>
<th>Dimensions</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Length</td>
<td>11&quot;</td>
</tr>
<tr>
<td>Width</td>
<td>6.9&quot;</td>
</tr>
<tr>
<td>Depth</td>
<td>3.06&quot;</td>
</tr>
<tr>
<td>Weight (net)</td>
<td>1.16kg (excluding battery)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>AC Input</th>
<th>90 to 135 VAC, 50/60 Hz</th>
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<tbody>
<tr>
<td>DC Output</td>
<td>13.3 VDC typical</td>
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<table>
<thead>
<tr>
<th>Environmental</th>
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</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>-20°C to 46°C with solar loading (-4°F to 114°F)</td>
</tr>
<tr>
<td>Humidity</td>
<td>5% to 95%, non-condensing</td>
</tr>
<tr>
<td>To be mounted in sheltered conditions, no liquid exposure</td>
<td></td>
</tr>
</tbody>
</table>

| Auxiliary Power      | 12.5 to 20 VDC |

P/N: 5011349401