1.0 Introduction

The Backup Control Switch (BCS) provides a way to island a Schneider Electric solar or storage solution from the grid. The BCS can be used with Schneider Electric XW inverters. For more information about installing and configuring the XW Pro Inverter with the BCS, see the XW Pro Owner’s Guide (document number 990-91227) and XW Pro Multi-unit Design Guide (document number 990-91373) (go to https://solar.schneider-electric.com/product-xw-pro-na-solar-hybrid-inverter > Downloads > Technical Publications).

1.1 What’s in the Box

IMPORTANT: Inspect the package for damage. If damage is found, contact Schneider Electric customer service.

1.2 Required Tools and Materials

The following materials and tools are not supplied but are required to complete the installation.

- Appropriate PPE
- Calibrated professional digital multimeter
- AC power cables
- Grounding wires
- RS-485 cable
- Auxiliary wires
- Cable conduits and fittings
- 14A (M6) mounting hardware
- Appropriate socket for the mounting hardware
- Adjustable torque wrench
- Power drill set
- Screw driver set (including a #3 Phillips screwdriver)
- 5/16” (8 mm) nut driver
- 3/8” hex key
- Stripper and crimping tool
- Bubble level or spirit level
- High-tension cable tie gun

1.3 Optional Components

For more information, see Wiring the BCS.

- Main AC circuit breaker, as specified
- Non-backup circuit breaker, as specified
- Extension wires for CTs (see WattNode® manual)
- Square D Series B conduit hub for top entry wire routing

Quick Start Guide

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Contact Information

Contact your local Schneider Electric Sales Representative or visit the Schneider Electric website at http://solar.schneider-electric.com/

Important Safety Information

Read and Save These Instructions. Do NOT discard.

This Guide is intended for any qualified personnel who need to install, operate, configure, and troubleshoot the Backup Control Switch. Certain configuration tasks should only be performed by qualified personnel in consultation with your local utility and/or an authorized dealer. Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. Qualified personnel have training, knowledge, and experience in:

- Installing electrical equipment
- Applying applicable installation codes
- Installing and configuring batteries
- Connecting communication devices into a network
- Selecting and using Personal Protective Equipment (PPE)
- Analyzing and reducing the hazards involved in performing electrical work

The following special messages may appear throughout this document or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.
1.4 Features

1. Grid input wiring entry - Option 1
2. Door latch (x2)
3. Knockout for Main AC circuit breaker
4. Lock-out bracket
5. Manual Grid Connection Switch
6. Knockout for non-backup circuit breaker
7. Grid input wiring entry - Option 2 (for 2.5 or 2" conduit fitting)
8. Non-backed up load wiring entry (for 2 or 1.5" conduit fitting)
9. Backed-up load wiring entry (for 2 or 1.5" conduit fitting)
10. AC sense and control signal wiring entry (for 1 or 0.75" conduit fitting)
11. Ground wiring entry (for 0.5" conduit fitting)

1.5 Dimensions

- Width: 7 3/4 in (196 mm)
- Height: 9 1/4 in (235 mm)
- Depth: 2 1/2 in (64 mm)

2.0 Choosing a Location

**WARNING**

IGNITION AND FIRE HAZARD

This equipment is not ignition protected. To prevent fire or explosion, do not install this product in locations that require ignition-protected equipment. This includes any confined space containing lead acid batteries or flammable chemicals such as natural gas (NG), liquid petroleum gas (LPG), or gasoline (Benzine/Petrol).

- Do not install in a confined space with machinery powered by flammable chemicals, or storage tanks, fittings, or other connections between components of fuel or flammable chemical systems.
- Do not install the BCS on a flammable surface. If local codes permit installation on a wood surface, ensure that the wood is flame retardant.
- Do not install the BCS near readily flammable materials such as cloth, paper, straw, or plastic sheathing. Keep flammable materials a minimum distance of 24 in (600 mm) from the top surface and 12 in (30 cm) from either side surface and the front of the Backup Control Switch.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

3.0 Mounting the Backup Control Switch

**CAUTION**

EQUIPMENT DAMAGE AND PERSONAL INJURY

- The BCS weighs approximately 30 lbs (13.6 kg). To prevent personal injury, always use proper lifting techniques during installation.
- The mounting location and anchors must be suitable for the weight of the product. The BCS must be mounted vertically.
- Failure to follow these instructions can result in injury or equipment damage.

1. Remove deadfront and mark the wall Pre-drill
2. Fasten mounting hardware 1/4" lag bolts and sealing washers
3. Place BCS over partially installed bolt
4. Align with mounting holes
5. Using a manual screwdriver, fasten the BCS to the mounting surface using four additional 1/4" (M6) lag bolts and the supplied sealing washers. Do not overtighten.

**NOTE:** Obtain all necessary permits prior to starting the installation. Installations must meet all applicable local and national codes and standards.
5.0 Wiring the BCS

Review Lock-out and Tag-out (LOTO) before working.

NOTE: The BCS includes a manual override switch, and an external bypass switch is not required.

5.1 Wiring Overview

The figures below show examples of the BCS wiring with and without the optional main and non-backup circuit breakers.

4.0 Lock-out and Tag-out (LOTO)

De-energize, lock-out and tag-out the BCS from all power sources.

HAZARD OF ELECTRIC SHOCK, EXPLOSION, ARC FLASH, AND FIRE

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Never energize the BCS with the covers removed.
- Always use a properly rated voltage sensing device to confirm all circuits are de-energized.
- The BCS is energized from multiple sources. Before opening the cover identify the power source, de-energize, lock-out and tag out, and wait 5 minutes for circuits to discharge.

Failure to follow these instructions will result in death or serious injury.

For more information about the two configurations above, see System Diagrams on page 7.
5.2 Connecting to Inverter Aux Terminals
The BCS's auxiliary power is supplied by the XW Pro inverter's auxiliary port. For more information, see the XW Pro Installation Guide (document number 990-91228) and XW Pro Multi-unit Design Guide (document number 990-91773).

### XW Pro Network Board AUX Port Connector Terminals and Functions

<table>
<thead>
<tr>
<th>Pin</th>
<th>Reference</th>
<th>Name</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>JU-1</td>
<td>AUX+12V</td>
<td>+12 VDC User Voltage Supply</td>
<td></td>
</tr>
<tr>
<td>JU-2</td>
<td>Not used in multi-unit installations. See the XW Pro Multi-unit Design Guide (document number 990-91773).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JU-3</td>
<td>AUX-COM</td>
<td>Common Ground Reference</td>
<td></td>
</tr>
<tr>
<td>JU-4</td>
<td>EXT_T9_OUT</td>
<td>External Transfer switch: Output signal</td>
<td></td>
</tr>
<tr>
<td>JU-5</td>
<td>EXT_T9_IN</td>
<td>External Transfer switch: Input signal</td>
<td></td>
</tr>
</tbody>
</table>

Connect wires from the BCS's PCB J2 terminals (see Wiring Overview #9) to the master inverter's JU terminals. **Note:** Max. output is 250 mA.

5.3 Option 1: Service Entrance Installation

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, AND FIRE**
- For Service Entrance installations, the supplied bonding screw must be installed.
- Verify that only one neutral-to-ground bond exists in the system. Having more than one neutral-to-ground bond in a system may violate local codes, create a shock or fire hazard, or cause sensitive equipment to malfunction.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

When the BCS is installed as a Service Entrance, a main circuit breaker must be installed in the BCS according to NEC 230 part V1 (230.90). The following **S** 0 circuit breakers are recommended (see the instruction Bulletin for QOM2 Main Circuit Breaker for QO8 Series S_ _ and HOM® Series S_ _ Load Centers (document number 48940-014-05)).

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Current Rating</th>
<th>Voltage Rating</th>
<th>Interrupting Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>QOM2100VH</td>
<td>100 A</td>
<td>120/240 VAC</td>
<td>22 kA</td>
</tr>
<tr>
<td>QOM2125VH</td>
<td>125 A</td>
<td>120/240 VAC</td>
<td>22 kA</td>
</tr>
<tr>
<td>QOM2150VH</td>
<td>150 A</td>
<td>120/240 VAC</td>
<td>22 kA</td>
</tr>
<tr>
<td>QOM2175VH</td>
<td>175 A</td>
<td>120/240 VAC</td>
<td>22 kA</td>
</tr>
<tr>
<td>QOM2200VH</td>
<td>200 A</td>
<td>120/240 VAC</td>
<td>22 kA</td>
</tr>
</tbody>
</table>

5.4 Option 2: Subpanel Backup Installation

**WARNING**

**RISK OF FIRE AND EQUIPMENT DAMAGE**
For Subpanel Backup Installations, DO NOT install the supplied bonding screw. Failure to follow these instructions can result in death, serious injury, or equipment damage.

When the BCS is not connected to the grid service entrance, a main circuit breaker is not required. Use the box lug terminals to connect L1 and L2 in the BCS to a main AC (grid) panel.

1. Connect grid L1/L2 cables (4 AWG to 300 kcmil) to the pre-installed box lugs at L1/L2 busbars.
2. Install the circuit breaker on the DIN rail provided.
3. Remove the knockout from the deadfront panel.
4. Install “Service Disconnect” label (see circuit breaker manual).

5.5 Install an Optional Non-backup Circuit Breaker

A non-backup subpanel can be connected to the BCS by installing an optional non-backup circuit breaker to feed the subpanel.

1. Install the circuit breaker on the DIN rail provided.
2. Install wires from the circuit breaker to the terminals on the L1/L2 busbars (see below).
3. Install L1/L2 and Neutral wires (see Wiring Overview).
4. Remove the knockout from the deadfront panel.
5.6 Power Meter Connections
The BCS comes with the WattNode® Modbus WND-WR-MB power meter.

Install Current Transformers
Install the two pre-connected CTs inside the BCS to measure Grid current. For installation instructions and guidelines, see:
- Accu-CT® ACTL-0750 Series Split-Core Current Transformer Installation Guide

Notes:
- Point the "SOURCE" arrow on each CT toward residential loads (see System Diagrams). If the CT is mounted backwards, the measured power will be negative. • Avoid extending the CT wires beyond 100 ft (30 m). For more information, see the WattNode Installation guide above.
- Locate the two pre-connected CTs inside the BCS, and install the CTs in one of the following ways:
  a. For Whole Home Backup (Service Entrance) installations, install the CTs over the AC Grid input cables (L1/L2) from the Grid (see Wiring Overview #4).
  b. When the BCS is between the Main AC panel and a subpanel (Subpanel Backup), install the CTs over the AC Grid input cables (L1/L2) between the Grid and the Main AC panel.
- Fasten the CT to each conductor with a cable tie.

Install the RS-485 Cable
For more information, see the WattNode Modbus Electric Power Meter Installation Manual.

**NOTE:** The Modbus X terminal is not active on the power meter.

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5.7 Install AC Voltage Sense Wiring
Using the specifications below, connect the AC voltage sense wires from the BCS to the master inverter's AC2 input terminals (see Wiring Overview #12):

![Diagram of AC Voltage Sense Wiring](image)

**Specifications**
- 14 AWG to 10 AWG
- Copper or aluminum
- Wire strip length: 0.4 in (11 mm)
- Wire's insulation layer

**Torque**
- 2.8 Nm (25 lb-in)

---

5.8 Neutral Connections
These are the required neutral connections (see Wiring Overview):

<table>
<thead>
<tr>
<th>Connection</th>
<th>Qty</th>
<th>Wire Specifications</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid/main panel</td>
<td>1</td>
<td>4 AWG to 300 kcmil</td>
<td>28 Nm (250 lb-in)</td>
</tr>
<tr>
<td>Backed-up load</td>
<td>1-2*</td>
<td>4 AWG to 300 kcmil</td>
<td>28 Nm (250 lb-in)</td>
</tr>
<tr>
<td>Non-backed up load1</td>
<td>1</td>
<td>12 AWG to 1/0 AWG</td>
<td>12-2 to 4 AWG: 0.1 Nm (45 lb-in)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 to 1/0 AWG: 0.5 Nm (50 lb-in)</td>
</tr>
</tbody>
</table>

1 When optional non-backup circuit breaker is installed. *Install one neutral wire per load.

---

5.9 Ground Connections

**WARNING**

**UNGROUNDED EQUIPMENT** Equipment ground terminals must be reliably connected to ground by appropriately sized grounding conductors. All installations must comply with national and local codes. Consult local and national codes for specific grounding and bonding requirements.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Connect ground wires to the ground terminal bar inside the BCS (shown below).

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6.0 Commissioning Checklist

Before powering on the inverter, perform the following inspections:
- All clearances are correct (see Choosing a Location on page 2).
- The BCS is stable and fixed to the wall, per the instructions in this guide.
- There are no objects such as tools or extra screws inside or on top of the BCS.
- The cables are routed through cable glands or conduits and protected against potential mechanical damage. Do not over-tighten the sealing locks, if used.
- The wires are properly and firmly connected.
- There is no damage to the door gasket.

Checklist continues on next page.
7.0 Start-Up Procedure
Before proceeding, make sure that all commissioning steps are complete. The following procedures require access to the InsightLocal web portal.

7.1 Configure External Contactor Settings using InsightLocal

To enable external controller, the XW Pro inverter must be configured following the instructions in the XW Pro Owner’s Guide (document number 990-91227) and XW Pro Multi-unit Design Guide (document number 990-91373).

7.2 Check Voltage (Service Entrance Installations)
1. Verify that all tools are removed and all safety covers/panels on all devices are installed.
2. Verify that the XW Pro inverter is in Standby mode.
3. Verify that the Manual Grid Connection Switch in the BCS is in the "Disconnected from Grid" position.
4. Coordinate with the grid operator to restore grid power to the BCS.
5. In the BCS, close the Main AC circuit breaker.
6. In InsightLocal, confirm the AC2 voltage input of the master inverter:
   - AC2 Voltage: 240 V
   - AC2 L1 Voltage: 120 V
   - AC2 L2 Voltage: 120 V
7. Set the XW Pro inverter to Operating mode. Confirm that the Manual Grid Connection Switch moves to "Connected to Grid". Note: The relay will change state in approximately 40 s with the default inverter to grid transfer time delay.

7.3 Check Voltage (Subpanel Backup Installations)
1. Verify that all tools are removed and all safety covers/panels on all devices are installed.
2. Verify that the XW Pro inverter is in Standby mode.
3. Verify that the Manual Grid Connection Switch in the BCS is in the "Disconnected from Grid" position.
4. In the Main AC panel, close the breaker for the BCS.
5. In InsightLocal, confirm the AC2 voltage input of the master inverter:
   - AC2 Voltage: 240 V
   - AC2 L1 Voltage: 120 V
   - AC2 L2 Voltage: 120 V
6. Set the XW Pro inverter to Operating mode. Confirm that the Manual Grid Connection Switch moves to "Connected to Grid". Note: The relay will change state in approximately 40 s with the default inverter to grid transfer time delay.
7. In the Main AC panel, open the main AC circuit breaker. Confirm that the Manual Grid Switch moves to "Disconnected from Grid".
8. In InsightLocal, confirm that the master inverter is providing voltage:
   - AC1 Voltage: 240 V
   - AC1 L1 Voltage: 120 V
   - AC1 L2 Voltage: 120 V
9. Close the main AC circuit breaker.

7.4 Verify Power Meter Operation
To establish communication with the InsightHome or InsightFacility:
1. Go to Setup > Configuration > Modbus Settings and set the following:
   - Baud rate: 19200
   - Parity: none
   - Stop bits: 1
   - Error limit: 1
   - Timeout (ms): 500
2. Go to Setup > Device Detection and then expand the Detect devices menu.
3. On the RS-485 Port that is connected to the power meter, enter the Modbus address range. The address is the Modbus slave address of the meter.
4. Click Detect. Once the power meter is detected and online, it will appear as a configurable device.
5. Go to Devices > [your power meter] > Configuration.
6. Under Meter Settings, enter the Rated current of attached CTs: 200 A.

7. Set Averaging to Fast.
8. Under Advanced Device Settings, configure the Device Association, based on the location of the CTs in the system.
9. Check that the power meter is tracking the power flow accurately.

7.5 Close the BCS
Once all commissioning and voltage checks are complete:
1. Install the small screw to fasten the Manual Grid Connection Switch cover closed.
2. Close and latch the BCS.

8.0 Electrical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>BCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Voltage</td>
<td>120/240 VAC</td>
</tr>
<tr>
<td>Frequency</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Phase</td>
<td>1 Ph</td>
</tr>
<tr>
<td>Max. current rating (mains)</td>
<td>200 A</td>
</tr>
</tbody>
</table>

Certified for use with 167°F (75°C) copper and aluminum conductors.
Suitable for use as Service Equipment when Main AC Circuit Breaker is installed.

9.0 Mechanical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>BCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulatory approvals</td>
<td>UL 1741, UL 899a, UL 67 (relevant sections)</td>
</tr>
<tr>
<td>Enclosure Type</td>
<td>NEMA Type 3R outdoor</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>-40°F to 122°F (-40°C to 50°C)</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>35 x 19 x 7 in³ (889 x 485 x 196 mm)</td>
</tr>
<tr>
<td>Shipping Dimensions (H x W x D)</td>
<td>40 ½ x 25 ½ x 17 ½ in³ (1035 x 645 x 440 mm)</td>
</tr>
<tr>
<td>Weight</td>
<td>30 lbs (13.6 kg)</td>
</tr>
</tbody>
</table>

All values are true at the time of publication. Always check the specifications for the electrical components.

10.0 Recycling and Disposal
Always follow regional, national, and/or local waste disposal directives concerning disposing, discarding, and recycling of equipment containing electronic and electrical components.
11.0 System Diagrams

The diagrams below illustrate the most basic configurations and are for reference only. Specific installations may require additional equipment to meet national or local electric codes. Ensure that all safety requirements are strictly followed.

Whole Home Backup (Service Entrance)

Legend

1. XW Pro inverters (with optional Conext MPPT Charge Controllers)
2. InsightHome or InsightFacility
3. BCS
4. CTs for AC Grid input L1/L2
5. Main AC panel
6. Residential loads
7. Optional AC-coupled PV inverter
8. Grid
9. PV panels
10. Optional non-backup subpanel

- Auxiliary wiring
- Communication wiring
- CT wiring

Subpanel Backup

Legend

1. XW Pro inverters (with optional Conext MPPT Charge Controllers)
2. InsightHome or InsightFacility
3. BCS
4. Non-backup residential loads
5. Main AC panel
6. CT (optional location on AC Grid input cables (L1/L2))
7. Backup subpanel
8. Backup loads
9. Optional AC-coupled PV inverter
10. Grid
11. PV panels

- Auxiliary wiring
- Communication wiring
- CT wiring