



X-90 Quick Start Guide and Application Information

April 8th, 2013

Available Products and Accessories

<p><u>AP13 – X-90 V3-AUX</u></p> 	<p><u>AP11 – X-90 V3</u></p> 	<p><u>AP13001 - XX90 Scavenger Cable</u></p> 	<p><u>AP13002 - BA-5590 28V Emulator Cable</u></p> 
<p><u>AP13003 – 12V to 28V Boost Regulator</u></p> 	<p><u>AP13004 - AUX Power Y-Cable</u></p> 	<p><u>AP13005 - AUX Power 4-Way Cable</u></p> 	<p><u>AP13006 - Universal AC/DC Converter - 150W</u></p> 
<p><u>AP13007 - PRC-148/152 Battery Eliminator</u></p> 	<p><u>AP13008 - Rugged 2.1A USB Charger</u></p> 	<p><u>AP13009 - RCR123A Battery Charger + 6 Batteries</u></p> 	<p><u>AP13012 - AA/AAA Fast Charger</u></p> 
<p><u>AP13014 - DC Input/Output Alligator Clips -IN or -OUT</u></p> 	<p><u>AP13015 - DC Input/Output Ring Terminals -IN or -OUT</u></p> 	<p><u>AP13016 - 12V Cigarette Lighter Socket - 6 Feet</u></p> 	<p><u>AP13017 - 12V Cigarette Lighter Charging Cable</u></p> 

Available Products and Accessories (cont'd)

<p>AP13018 - 12V Barrel Plug Cable - 1.4mm or -2.5mm</p> 	<p>AP13019 - NATO Input Cable</p> 	<p>AP13020 - Ruggedized AA/AAA Charger (MAHA Ruggedized)</p> 	<p>AP13023 - Stubby 1-into-2 SAE Y Cable</p> 
<p>AP13024 - 12V Cigarette Lighter Socket - 3", -12", or -18"</p> 	<p>AP13025 - SAE to CLA Socket and SAE Y Cable</p> 	<p>AP13026 - SAE to Two CLA Sockets Y Cable</p> 	<p>AP13027 - SAE Extension Cable, -24", -36", or -8'</p> 
<p>AP13028 - High Rate USB Charging Plug - Micro USB B -9", -12", or -18'</p> 	<p>AP13029 - MBITR Battery Charging Smart Cable</p> 	<p>AP13030 - Ruggedized 4-Bay NiMH/NiCD/USB Charger</p> 	



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Possible Direct Connections to the X-90 (AP13 and AP11)

<u>AP13 – X-90 V3-AUX or AP11 – X-90 V3</u> X-90 Input (Defined as “24V Sources”)	<u>AP13 – X-90 V3-AUX</u> X-90 Aux Output (Defined as “12V Loads”)	<u>AP13 – X-90 V3-AUX or AP11 – X-90 V3</u> X-90 Battery Port
<p style="text-align: center;">“24V Sources”</p> <p>Available Accessories: AP13001 - XX90 Scavenger Cable AP13003 - 12V to 28V Boost Regulator AP13004 - AUX Power Y-Cable AP13005 - AUX Power 4-Way Cable AP13006 - Universal AC/DC Converter - 150W AP13014-IN - DC Input Alligator Clips AP13015-IN - DC Input Ring Terminals AP13019 - NATO Input Cable AP13023 - Stubby 1-into-2 SAE Y Cable AP13027 - SAE Extension Cable</p> <p>Solar Panel: <u>Global Solar Energy, Inc.:</u> P3 124W 12V, P3 124W 24V, P3 62W 12V, P3 62W 24V, P3 30W 12V, P3 30W 24V <u>Other Solar Panels:</u> Open Circuit Voltage <60V Max. Power Voltage >17V</p> <p>24V Lead-Acid Battery: Min. 8A Discharge Capability</p>	<p style="text-align: center;">“12V Loads”</p> <p>Available Accessories: AP13003 - 12V to 28V Boost Regulator AP13004 - AUX Power Y-Cable AP13005 - AUX Power 4-Way Cable AP13007 - PRC-148/152 Battery Eliminator AP13008 - Rugged 2.1A USB Charger AP13009 - RCR123A Battery Charger AP13012 - AA/AAA Fast Charger AP13014-OUT - DC Output Alligator Clips AP13015-OUT - DC Output Ring Terminals AP13016 - 12V Cigarette Lighter Socket - 6 Feet AP13018 - 12V Barrel Plug Cable AP13020 - MAHA Ruggedized AA/AAA Charger AP13023 - Stubby 1-into-2 SAE Y Cable AP13024 - 12V Cigarette Lighter Socket AP13025 - SAE to CLA Socket and SAE Y Cable AP13026 - SAE to Two CLA Sockets Y Cable AP13027 - SAE Extension Cable AP13030 - Ruggedized 4-Bay NiMH/NiCD/USB Charger</p> <p>12V Loads: Need to be able to accept 10.5V to 16.5V with max. power of less than 120W continuous / 240W peak</p> <p>12V Lead-Acid Battery: only if no XX90 battery connected to X-90, and 12V Lead-Acid Battery has min. 8A Charge Capability</p>	<p>Available Accessories: AP13029 - MBITR Battery Charging Smart Cable</p> <p>XX90 Rechargeable Batteries: <u>Mathews Associates, Inc.:</u> BB-2590 SMBus, BB-2590/U, BB-390A/U or BB-390/U, BB-590/U <u>Bren-Tronics:</u> BB-2590/U, BB-390B/U, BB-590/U <u>Patco Electronics, Inc.:</u> BB-2590/U <u>UltraLife Batteries:</u> UBBL02 (UBI-2590), UBBL10 (UBI-2590 SMBus), UBBL09 (UBI-2590 12V/24V), UBBL36 (1/2 UBI-2590), UBBL13 (UBI-2590 HC)</p>

Possible Direct Connections to the 12V to 28V Boost Regulator (AP13003)

<u>AP13003 – 12V to 28V Boost Regulator</u> Input (Defined as “12V Sources”)	<u>AP13003 – 12V to 28V Boost Regulator</u> Output (Defined as “24V Loads”)
<p style="text-align: center;">“12V Sources”</p> <p>Available Accessories: AP13 - X-90 V3-AUX AP13004 - AUX Power Y-Cable AP13005 - AUX Power 4-Way Cable AP13014-IN - DC Input Alligator Clips AP13015-IN - DC Input Ring Terminals AP13017 - 12V Cigarette Lighter Charging Cable AP13023 - Stubby 1-into-2 SAE Y Cable AP13027 - SAE Extension Cable</p> <p>12V Lead-Acid Battery: Min. 8A Discharge Capability</p>	<p style="text-align: center;">“24V Loads”</p> <p>Available Accessories: AP13 - X-90 V3-AUX / AP11 - X-90 V3 AP13002 - BA-5590 28V Emulator Cable AP13004 - AUX Power Y-Cable AP13005 - AUX Power 4-Way Cable AP13014-OUT - DC Output Alligator Clips AP13015-OUT - DC Output Ring Terminals AP13023 - Stubby 1-into-2 SAE Y Cable AP13027 - SAE Extension Cable</p> <p>24V Loads: Need to be able to accept 26V to 29V with max. power of less than 80W continuous</p> <p>24V Lead-Acid Battery: Min. 4A Charge Capability</p>

Possible Direct Connections of Accessories Only

<u>AP13001 – XX90 Scavenger Cable</u>	<u>AP13002 - BA-5590 28V Emulator Cable</u>	<u>AP13006 – Universal AC/DC Converter – 150W</u>	<u>AP13019 - NATO Input Cable</u>
AP13002 - BA-5590 28V Emulator Cable	AP13001 - XX90 Scavenger Cable AP13006 - Universal AC/DC Converter - 150W AP13019 - NATO Input Cable	AP13002 - BA-5590 28V Emulator Cable	AP13002 - BA-5590 28V Emulator Cable

Setup Overview

