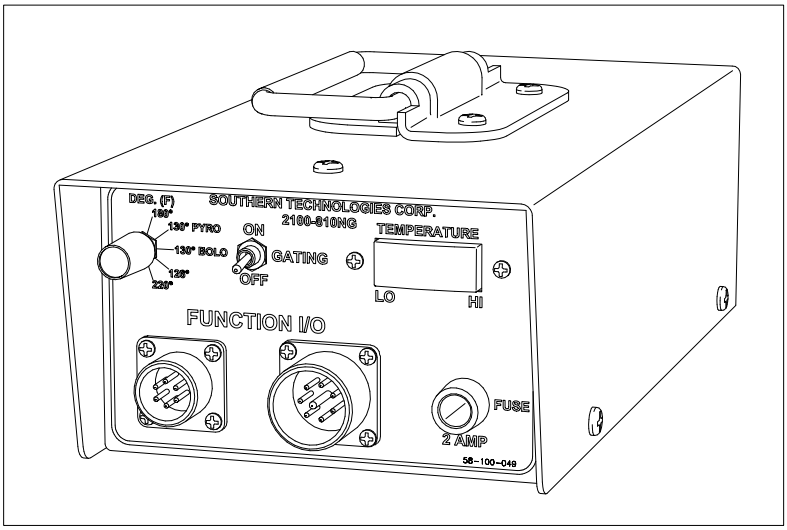
EUD-2014147-00

STC 2100-810NG Calibrated Heat Source

Reference Guide



27 May 2014

Because products evolve, this guide may not be
an exact representation of the product that you are using.

STC assumes no responsibility for errors or omissions in this document. Nor does STC make any commitment to update the information contained herein.

Product and company names mentioned herein are
trademarks or registered trademarks of their respective owners.

CAUTION

Contact with electrically active parts could result in sparks, burns, and electric shock. Because of this, you should avoid all electrical hazards when using the STC 2100-810NG. Failure to do so could result in damage to the equipment or serious injury to you or to others.

WARNING

ONLY USE THE POWER CORD THAT

WAS SHIPPED WITH THIS HEAT SOURCE.

OLDER VERSION POWER CORDS ARE **NOT COMPATIBLE** WITH NEWER REVISION HEAT SOURCES AND WILL CAUSE DAMAGE IF USED (see Page 11).

STC's web site is www.southern-tech.com

their email address is stcemail@southern-tech.com

their fax number is 423-499-0045

their telephone number is 423-892-3029

Contents

This section lists the headings of this guide in sequential order with their page references.

Introduction

This section summarizes the purpose of this guide and provides a brief overview of the STC 2100-810NG Calibrated Heat Source. Additionally, it tells how to comment on this guide and how to order more copies of this guide.

Purpose of This Guide

The technical staff at Southern Technologies Corporation (STC) created the 2100-810NG Calibrated Heat Source. Along with the supplied adapters, it is used to calibrate STC scanners and those made by others.

In this guide, you will find detailed information about the 2100-810NG Calibrated Heat Source. Here you will learn about the physical characteristics and purpose of its meter, knob, switch, and connectors. Here too, you will learn how to use it to calibrate scanners.

This guide is for those who buy or use the 2100-810NG Calibrated Heat Source.

Product Overview

When a new scanner is installed, calibration is done. Thereafter, calibration usually is done only when needed or on a regular basis during scheduled maintenance.

Using the supplied adapters, the heat source can be used to calibrate Harmon, Servo ACS, Servo 8909, and STC scanners. For Harmon and Servo scanners, it can use the function cable already at the site, or a new function cable may be ordered from STC.

The 2100-810NG Calibrated Heat Source operates from a 120-volt 60 Hz power source. Minimum operating voltage is 105 volts. A frequency of 50 Hz won't work. The supplied 16-gauge orange power cable provides the necessary safety ground. This cable is 50-foot (15.2-meter) long. If you need to add an extension cord to this cable, make sure it is 16 gauge or larger thickness of wire.

For a site that doesn't have a 120-volt 60 Hz power source, the heat source should be powered from a true sine wave inverter capable of 250 watts with an output of at least 110 volts at 60 Hz. The inverter should operate from an input voltage of 10.5 VDC to 15 VDC. A 120-volt USA socket should be provided to match the heat source power cord. The inverter should be grounded according to the manufacturer's recommendations.

On the front of the heat source is a knob that lets you select one of five delta temperatures, ranging from 126°F to 220°F. The heat source contains a heat block that can reach a combined temperature of your delta temperature and the ambient temperature. It can maintain this temperature for extended periods. The heat block is controlled by a circuit that references both ambient temperature and the temperature of the heat block, and maintains the selected differential. For example, if the ambient temperature were 85°F (29.4°C) and the knob were set to 180°F (100°C), the heat block would be maintained at 265°F (129.4°C).

Infrared scanners respond to rapid changes in infrared radiation. The heat source accomplishes the rapid changes by employing a rotating wheel with an aperture in one side. As the wheel turns, the infrared radiation from the heat block is shielded from the scanner until the aperture lines up with the opening in the bottom of the heat source case. The wheel rotates at 300 rpm.

The heat source is placed over the opening of the scanner cover. With the heat source in place, it is then possible to calibrate the scanner at a precise value above ambient temperature.

STC recommends that you use the heat source only when the outside (ambient) temperature is above 0°F (-18°C) and below 90°F (32°C). If you must use it at other times, do so only when the needle is centered on the front of the temperature meter. If the needle isn't stabilized within ± 2 degrees of set point, the heat source isn't operating properly.

How to Comment on This Guide

We want to hear from you. Tell us what you like or don't like about this guide. Send your comments to:

Southern Technologies Corporation
Technical Publications Department
6145 Preservation Drive
Chattanooga, Tennessee 37416-3638
USA

All comments become the sole property of STC and none will be returned.

How to Order More Copies of This Guide

When placing an order for more copies of this guide, refer to the order number shown on the cover of this guide. To request pricing and delivery, call 423-892-3029, fax 423-499-0045, or send email to stcemail@southern-tech.com. Electronic copies of this guide are also available.

Standard Warranty

Systems manufactured by Southern Technologies Corporation carry a 14-month warranty from date of shipment. Warranty is limited to repair or replacement at the sole discretion of STC, of any goods found to be defective in either materials or workmanship during the 14-month period following shipment. Warranty does not apply to product with signs of obvious abuse, or product that has been improperly installed.

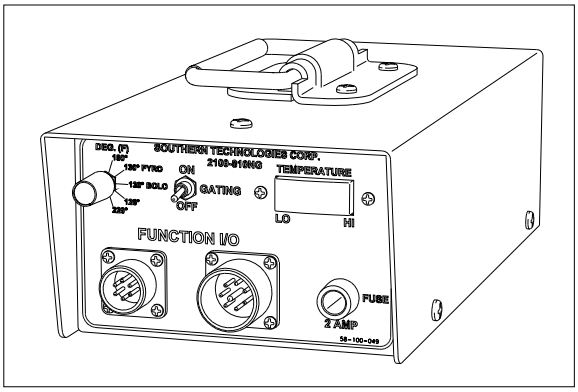
STC warrants that goods represented by this warranty statement have been designed and manufactured with all reasonable care and attention to appropriate regulatory documents. STC makes no representation that the goods covered by this warranty are suitable for the application they are used for. Application of the goods is at the sole discretion of the purchaser.

Purchaser is responsible for shipment of the defective product to STC. STC will pay the return shipping charges.

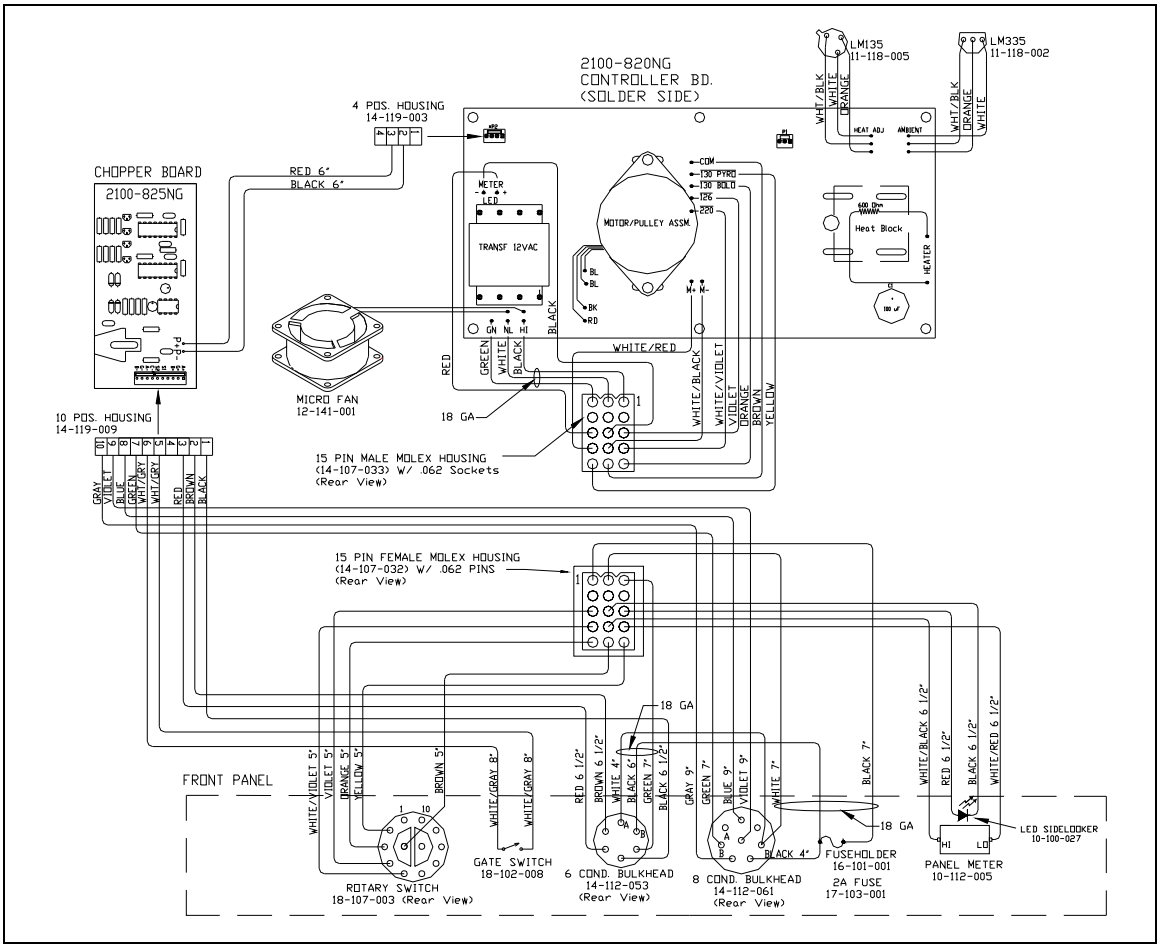
Products purchased from others, but included in STC systems carry the original manufacturer's warranty, typically 12 months. Warranty claims for these products must be made directly to the original equipment manufacturer.

Components

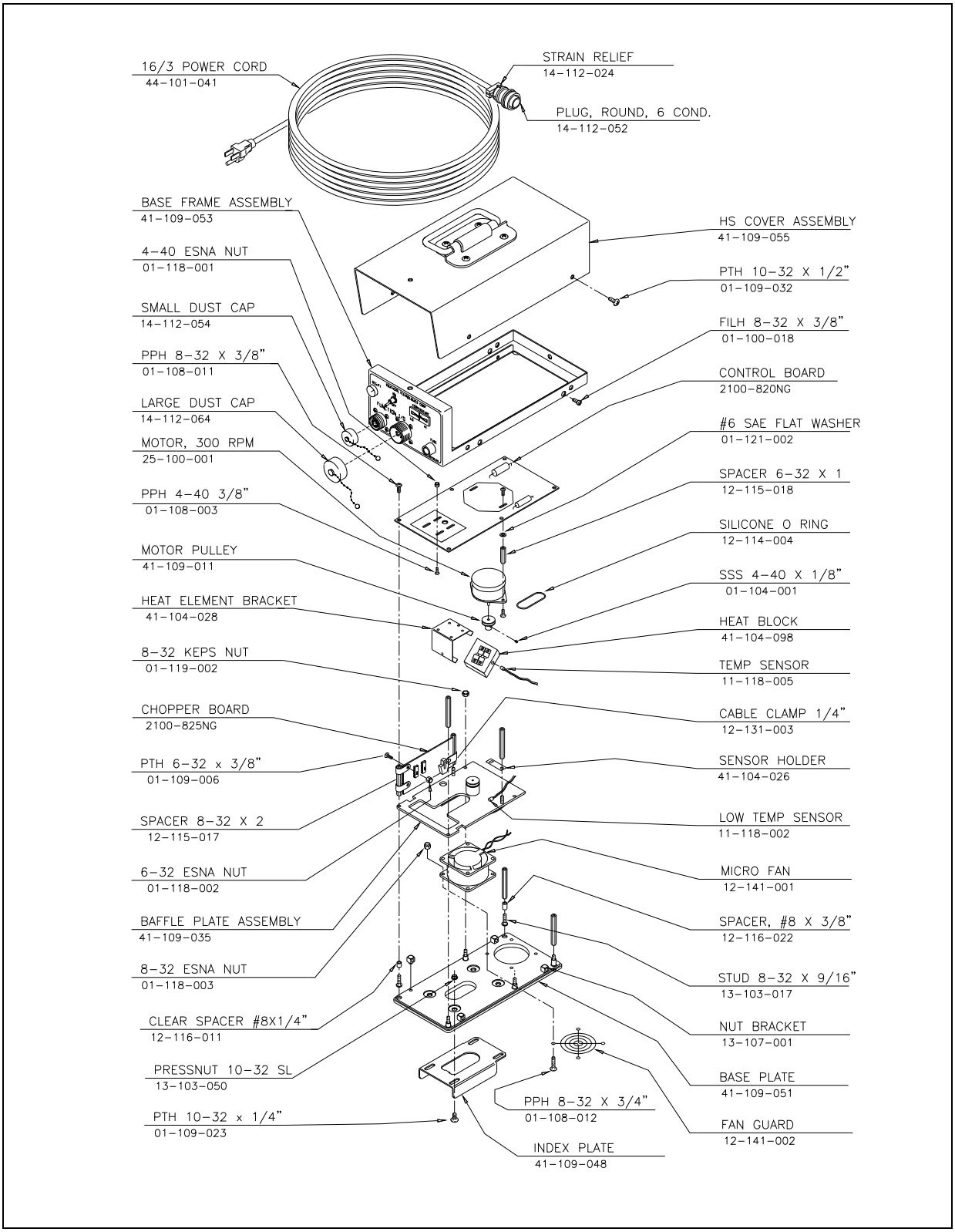
The figure below shows an assembled 2100-810NG Calibrated Heat Source.



The figure below shows the wiring of a 2100-810NG Calibrated Heat Source.

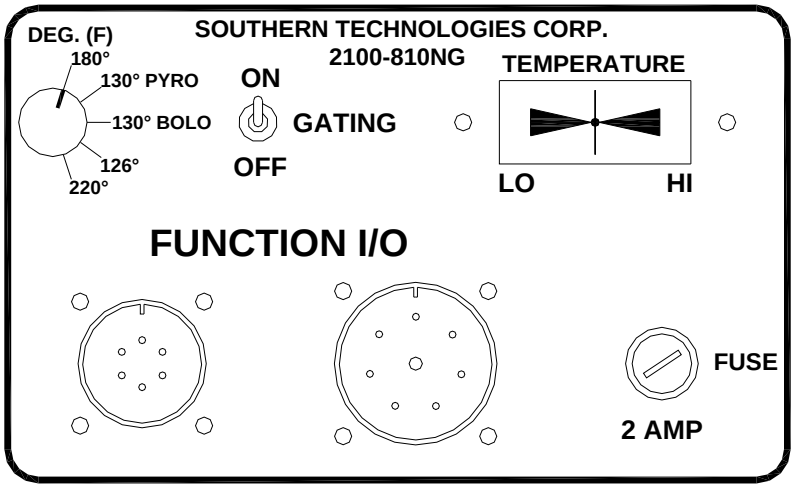


The figure below shows the parts of a 2100-810NG Calibrated Heat Source.



Control Panel

The figure below shows the control panel that's on the front of the 2100-810NG Calibrated Heat Source.



This section describes the physical characteristics and purpose of the various components on this panel.

Temperature Knob

The temperature knob allows you to select one of five delta temperatures. The temperature at each knob setting represents degrees Fahrenheit above ambient.

Setting	Scanner Type
126	Normally used with Harmon scanners
130 BOLO	Normally used with Servo 8909 scanners and Servo ACSs containing bolometer preampliers
130 PYRO	Normally used with Servo ACSs containing pyrometer preampliers
180	Normally used with all STC scanners
220	During diagnostic testing, can be used to generate an alarm

Gating Switch

On the front of the heat source is the **Gating** switch. Toggling it on causes gating signals to be sent to the Function I/O connectors. The first signal sent is a simulated TO1 or A-transducer signal. The second signal sent is a simulated TO2 or B-transducer signal. As long as this switch is toggled on, this sequence continues at a rate of 10 signals per second (five of them being TO1s and five of them being TO2s).

Temperature Meter

The temperature meter shows when heat block has reached the selected temperature setting and has stabilized within ± 2 degrees of set point. From a cold start, this could take 5 to 8 minutes. The heat block is stabilized when the needle is centered.

Function Connectors

The function connectors provide the I/O lines to the heat source including AC power in and gating signals out.

The six-contact circular connector (on the left-side) is compatible with the power cord included with the heat source. One end of the supplied 2100-832 power cord is connected to the heat source. The other end is plugged into a stable grounded three-wire AC outlet capable of at least 105 VAC at 15 amperes.

The table below shows the pin assignment for the six-contact connector.

Pin	Assignment
A	AC Neutral
B	**AC Hot**
C	AC Ground
D	TO1 (positive output pulse)
E	TO2 (positive output pulse)
F	Ground

The eight-contact circular connector (on the right-side) is used when calibrating Harmon and Servo scanners. One end of the Harmon or Servo supplied cable is connected to the heat source. The other end is connected to the hotbox detection system.

The table below shows the pin assignment for the eight-contact connector.

Pin	Assignment
A	*not used*
B	C-Transducer (negative output pulse)
C	B-Transducer (negative output pulse)
D	**AC Hot**
E	AC Neutral
F	*not used*
G	A-Transducer (negative output pulse)
H	Transducer Return

Fuse

On the front of the heat source is a 2-amp 250-volt fast-acting fuse. It protects the heat source from excessive current.

STC recommends that you use the calibrated heat source (2100-810NG) only when the outside (ambient) temperature is above 0°F (-18°C) and below 90°F (32°C). If you must use it at other times, do so only when the needle is centered on the front of the temperature meter. If the needle isn't stabilized within ± 2 degrees of set point, the heat source isn't operating properly.

WARNING!

USE <u>ONLY</u> THE POWER CORD THAT CAME WITH YOUR HEAT SOURCE!

Older version power cords were found to be a shock hazard because the male pin contacts were not electrically "finger-safe" (see image below). The new power cord plugs have recessed sockets to reduce the risk of accidental shock. The mating contacts of the "old" heat source connector were subsequently changed to male pin contacts to accommodate connectivity with the new power cord.

Before connecting… **ALWAYS** inspect power cord plug contacts and heat source connector contacts to ensure gender compatibility.

Old style plug with pins

New heat source with pins

NEVER attempt to force the "old style" plug and the "new" heat source connector together. The two sets of male pins will make contact and cause a reverse polarity situation which **WILL DAMAGE** the heat source.

To use the 2100-810NG Calibrated Heat Source to calibrate scanners:

1 On the control panel, toggle the **Gating** switch off.

> **WARNING**
> Once plugged in, both function connectors will have live AC present.

2 Using the supplied dust cap, cover the function connector that isn't being used.

Sixty Hz is critical for proper operation. For a site that doesn't have a 120-volt 60 Hz power source, the heat source should be powered from a true sine wave inverter capable of 250 watts with an output of at least 110 volts at 60 Hz. The inverter should operate from an input voltage of 10.5 VDC to 15 VDC. A 120-volt USA socket should be provided to match the heat source power cord. The inverter should be grounded according to the manufacturer's recommendations.

3 If this is a **Harmon or Servo scanner**:

a Plug the proper end of the Harmon or Servo supplied cable to the **eight**-contact circular connector on the front of the calibrated heat source.

b Plug the other end of the cable to the hotbox detection system.

c Go to step **5**.

4 If this is a **STC scanner**:

a Plug the proper end of the supplied 50-foot (15.2-meter) power cord into the **six**-contact circular connector on the front of the calibrated heat source.

b Plug the other end of the power cord into the 120-volt USA socket.

5 On the control panel, turn the temperature knob to the correct setting.

6 Put the heat source in a shady area, out of direct sunlight and out of the wind.

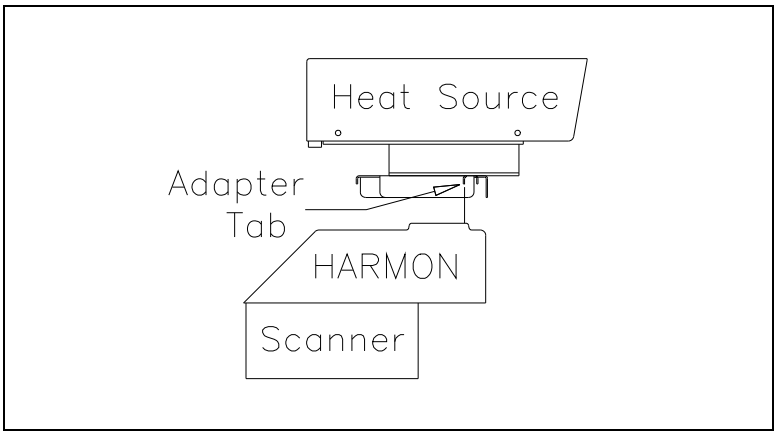
7 Wait about 8 minutes for the heat source to reach operating temperature and stabilize.

The heat source has reached operating temperature and stabilized when the temperature meter needle remains centered.

Once the temperature stabilizes, calibration may begin. Once stabilized, the temperature will change less than plus-or-minus one degree Fahrenheit.

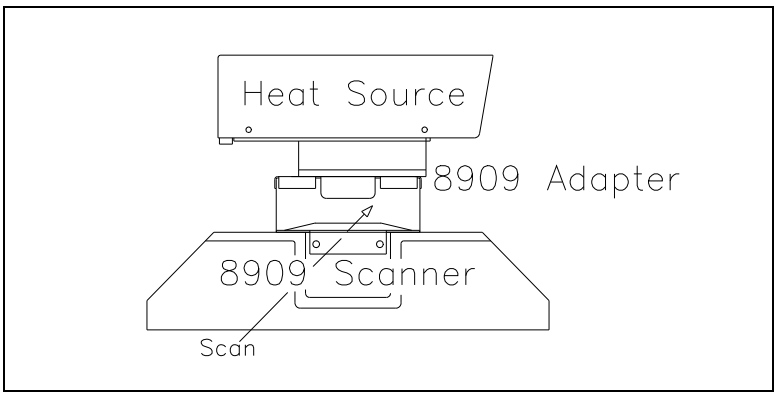
Harmon Scanner Adapter

The Harmon Scanner Adapter adapts the 2100-810NG Calibrated Heat Source to the Harmon scanner. There is one right-hand and one left-hand adapter. They only fit one way, as shown below.



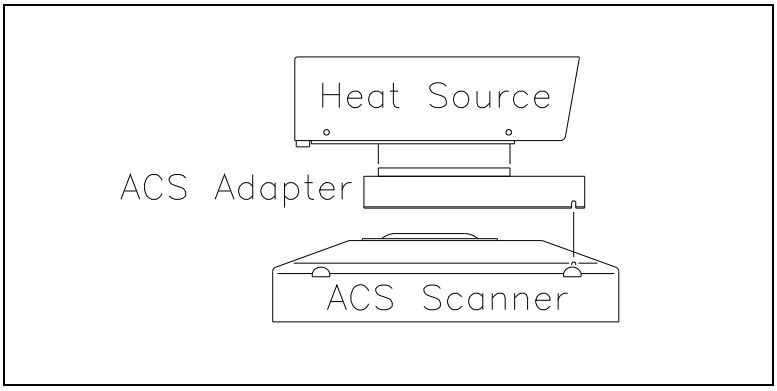
Servo 8909 Scanner Adapter

The Servo 8909 Scanner Adapter adapts the 2100-810NG Calibrated Heat Source to the Servo 8909 scanner. It only works one way, as shown below.



Servo ACS Adapter

The Servo ACS (aka GE Transportation ACS) Adapter adapts the 2100-810NG Calibrated Heat Source to the Servo ACS. It only fits one way, as shown below.

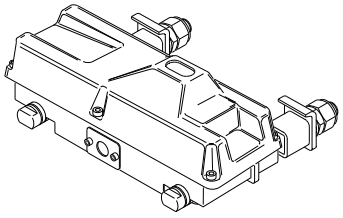


STC Scanners

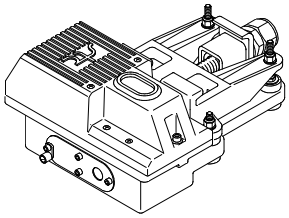
STC supplies two kinds of scanners. One kind scans the temperature of axle bearings. The other scans the temperature of wheels.

STC supplies three types of bearing scanners. Type1 is larger and uses two clamps for installation. Type2 and type3 are smaller and use one clamp for installation. The only difference between the type2 bearing scanner and the type3 bearing scanner is the cover-and-module assembly. Their mount is the same.

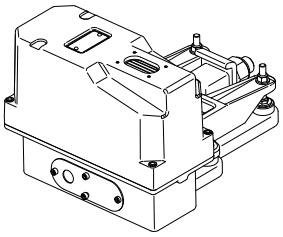
Except for the addition of a plastic **attenuation plug** on the type2 wheel scanner cover, the type2 bearing scanner and type2 wheel scanner covers and modules are identical and can be used interchangeably. Except for different aluminum **filter frames** within the type3 scanner module, the type3 bearing scanner and type3 wheel scanner covers and modules are identical and can be used interchangeably. There is no type1 wheel scanner. The wheel scanners use a different mount than their bearing scanner counterparts.



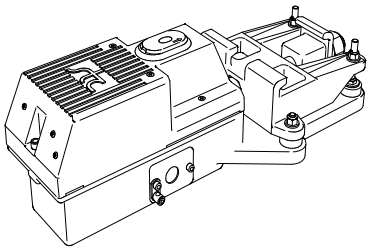
Type1 Bearing Scanner



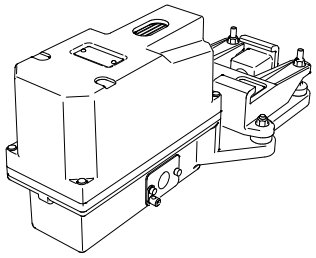
Type2 Bearing Scanner



Type3 Bearing Scanner



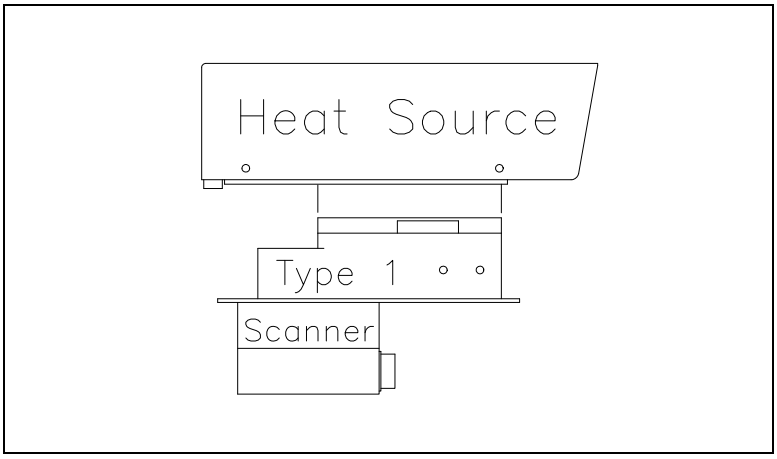
Type2 Wheel Scanner



Type3 Wheel Scanner

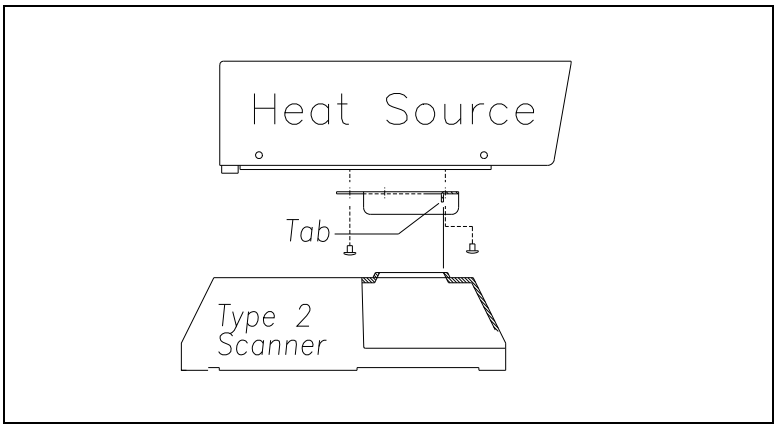
STC Type1 Bearing Scanner

The STC Type1 Bearing Scanner doesn't need an adapter to use the 2100-810NG Calibrated Heat Source. Instead, you will need to remove the scanner cover before placing the heat source on the scanner. The heat source has a pocket on its underside that fits the top of the scanner module.

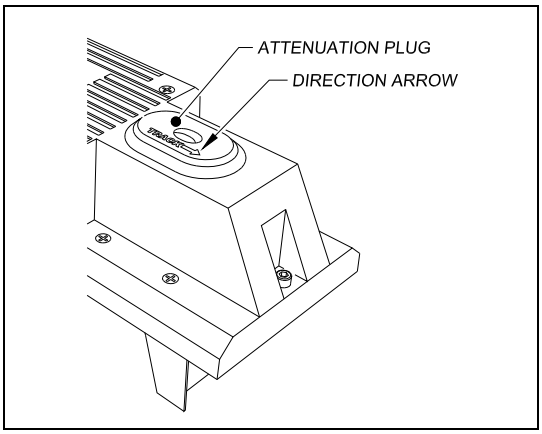


STC Type2 Bearing and Wheel Scanners

The STC Type2 Bearing Scanner Adapter must be attached to the 2100-810NG Calibrated Heat Source using the four 10-32 X 1/4-inch screws provided. It only works one way, as shown below.



The only difference between the wheel scanner cover-and-module assembly and the one for the bearing scanner is the addition of the plastic **attenuation plug**.

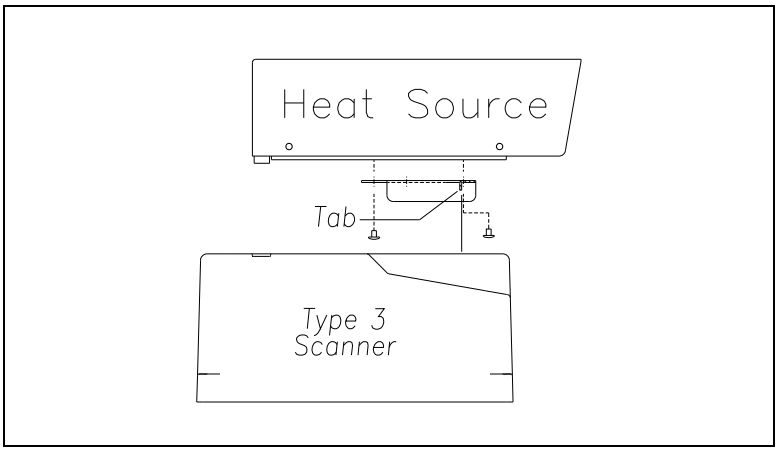


Before placing the 2100-810NG Calibrated Heat Source on top of a STC Type2 Wheel Scanner, you must remove its plug. To remove the plug, insert a small flat screwdriver blade into the slot in the back of the attenuation plug. Using a prying motion, lift the plug up and out.

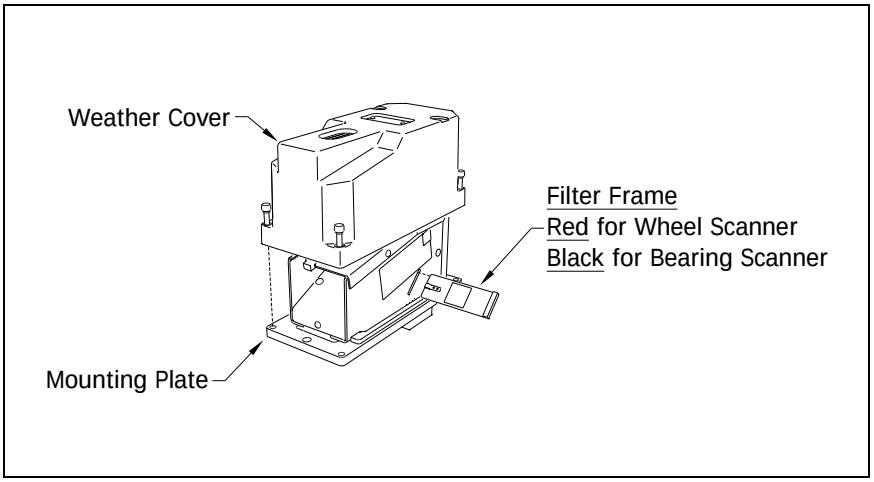
When calibrating STC Type2 Wheel Scanners, use the **180** setting on the heat source.

STC Type3 Bearing and Wheel Scanners

The STC Type3 Bearing Scanner Adapter must be attached to the 2100-810NG Calibrated Heat Source using the four 10-32 X 1/4-inch screws provided. It only works one way, as shown below.



During normal operation, a Type3 Bearing Scanner uses the black **filter frame** and a Type3 Wheel Scanner uses the red filter frame.



Before placing the 2100-810NG Calibrated Heat Source on top of a Type3 Wheel Scanner, you must change its red filter frame to black. You will need to remove the weather cover before you can check the color of the filter frame. Four socket-head-cap screws attach the weather cover to the mounting plate. Before continuing with calibration, be sure that the black filter frame is securely in place and that the four socket-head-cap screws on the weather cover are completely tight.

When calibrating STC Type3 Wheel Scanners, use the **180** setting on the heat source.

Customer Service

At STC, the customer is number one. STC is committed to products that work and customers that are satisfied. Nothing less is acceptable. This section tells how to get answers for questions and fixes for problems.

Reaching STC

You can reach STC by mail, telephone, fax, and email. By mail, you can reach STC at:

Southern Technologies Corporation
6145 Preservation Drive
Chattanooga, Tennessee 37416-3638
USA

Mail and shipments are replied to as soon as possible, normally within one working day. Equipment repair usually takes longer.

By telephone, you can reach STC at 423-892-3029, Monday through Friday, from 8:00 a.m. until 5:00 p.m. Eastern time. After business hours, a machine answers the calls. These calls are returned promptly the next business day. By fax, you can reach STC at 423-499-0045. The fax machine can receive faxes at all times. Faxes are replied to as soon as possible, normally within one working day. By email, you can reach STC at stcemail@southern-tech.com. Email is replied to as soon as possible, normally within one working day.

Returning Equipment for Repair

Return any defective or malfunctioning equipment to STC for repair or replacement. You don't need a return authorization number. You don't even need to make a telephone call first. Just ship it directly to the Repair Department at the address above.

With the returned equipment, include:

- Complete address where equipment can be returned.
- Name and telephone number of person who should be contacted to answer questions about the equipment.
- Written explanation of the equipment defect or malfunction.
- Any reports or other data that would be helpful in diagnosing the problem.
- If out of warranty, credit card number (to be charged) with its expiration date.