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2. Purpose

The purpose of this document is to provide the user with general information about the use, operation, maintenance, and suitability of the CA-200DV Calibration Assistant unit.

3. Revision History


This document supersedes all previously issued versions, providing new or revised information. The most recent publication can be determined by comparing the last three characters at the end of the part number and the date issued.


Calibration Assistant Part Number 100348-003 AD0			
Revision Level	Date Issued	General Description of Changes	Revision By
AA0	12/16/03	Original Release	
AB0	02/20/04	Revised part numbers and voltage and temperature specifications	
AC0	06/25/07	Added MicroScanIR information and photos	
AD0	06/19/23	Updated formatting and branding to PR. Updated technical product information based on current requirements.	J. Huisenga
AD1	07/13/23	Updated info pertaining to specification of 400018-67-AC cable	J. Huisenga

4. Important Information

4.1. Safety Alert Symbols





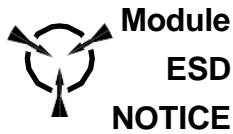
The  symbol indicates that important personal safety information follows. Carefully read this text for the warnings information it contains. The signal word next to each safety alert symbol is defined as:

<u>WARNING</u>		<i>Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</i>
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Static Sensitive Symbols for Equipment Handling Instructions



The  and  symbols indicate important handling guidelines established by AREMA (American Railway Engineering and Maintenance-of-Way Association) for proper handling of electronic equipment modules and sensitive components for the prevention of potential damage that could be caused by ESD (electrostatic discharge) during routine maintenance, handling, and transportation.



<i>To protect against ESD damage to electronic equipment containing modules, follow the field procedures in AREMA C&S MP-11.4.5. Failure to use protective measures could result in permanent equipment damage, either immediate or latent, when handling modules.</i>
--

Important / Notable Information

Important: *Indicates an operating procedure, practice, or condition which, if not strictly followed, may cause equipment damage.*

Note: *Indicates additional information or emphasizes a topic related to the subject being discussed.*

5. Personal Safety Instructions

Only qualified personnel should work on or around this equipment. To ensure the highest degree of personal safety, all who use this equipment are required to become thoroughly familiar with all safety instructions contained in this document. Successful and safe operation of this equipment depends upon proper handling, operation, maintenance, and application of associated railroad equipment.



WARNING *No information in this manual supersedes or replaces your railroads' operating rules. If there is a difference in instructions between this manual and the railroads' operating rules, follow the most restrictive instruction. Deliberate misuse or abuse of electronic components may cause personal injury or death.*

6. Foreword

6.1. Technical Support

Progress Rail will accept telephone calls between 8:00 AM and 5:00 PM CST. Call TOLL FREE (888) 701-3479 regarding installation, maintenance, calibration, adjustment, or repair of any components.

You may also email us at Insepection.Orders@ProgressRail.com

6.2. Scope

Progress Rail, Technical Information Department under the direction of the designated equipment Product Manager, issues this document. The manual provides installation, theory of operation, and maintenance information for the Calibration Assistant. Please read carefully and thoroughly understand the instructions and processes before making any adjustments or modifications to the equipment. Carelessness may result in loss of life or property damage.

6.3. How to Order an Additional Copy or a Revised Printing

Additional copies of this document may be ordered by directing all correspondence to Progress Rail, Customer Service Department, 3801 S Selsa Rd #1, Independence, MO 64057 or calling Toll Free (888) 701-3479.

You may also email us at Insepection.Orders@ProgressRail.com

7. General Information

7.1. Introduction

This manual presents installation, operation, theory of operation, and maintenance information for the Calibration Assistant manufactured by Progress Rail.



WARNING *The Calibration Assistant is used to non-vitally calibrate non-vital Hot Box Detector and Hot Wheel Detector Systems. Failure conditions of both the calibrator and the HBD or HWD system should be covered by individual railroad operating rules.*



WARNING *The user of the Calibration Assistant must thoroughly understand the proper operation of the calibration device before using it in the calibration of Hot Box Detector Systems, or Hot Wheel Detector*



WARNING *To prevent operator electrical shock in the unlikely event of an internal electrical wiring failure involving the AC Power Input, the Calibration Assistant must be powered through a GFCI (Ground Fault Circuit Interrupter) Device.*

7.2. Purpose

Calibration Assistant Model 200, Dual Voltage (CA-200DV) is used in the installation, testing, and maintenance of various Hot Box Detector Systems (HBD Systems) and Hot Wheel Systems (HWD Systems). The CA-200DV is modeled after its predecessors, the Function Simulator, and Calibrated Heat Source and can be used to provide an accurate method of calibrating the infrared scanners used in HBD & HWD Systems.

7.3. Principles of Operation

The CA-200DV delivers a time phased IR Energy delta for the purposes of calibrating HBD & HWD systems. The CA-200DV contains a heated black body that radiates IR energy. The IR energy radiated by the black body is "chopped" by a rotating wheel possessing an aperture where the wheel alternately blocks or passes the black body IR energy through the aperture and out of the CA-200DV. The chopper wheel itself radiates IR energy at a level near the external operating temperature of the device. The temperature of both the black body and the chopper wheel are monitored by the CA-200DV and then used to control the heating of the black body based on IR energy calculations.

7.4. Modes of Operation

The CA-200DV uses two different calculations to set the black body temperature, depending upon the type of scanner/detector it is being used to calibrate. For Pyrometer type HBD & HWD systems, the resultant IR energy delta radiated by the device is kept constant throughout its environmental operating range. For Bolometer type HBD & HWD systems, the IR energy is adjusted to compensate for the unique responsive of Bolometer detectors. The details of the compensation function are beyond the scope of this manual. In addition, the speed of the chopper wheel is monitored and kept at appropriate levels by the CA-200DV. For certain HBD & HWD Systems, two timing pulses are provided where the timing is based on the speed and position of the rotating chopper wheel. One of the gate pulses immediately precedes and the other pulse immediately follows the viewing of the black body energy by the HBD & HWD System.

7.5. Abbreviations & Terminology

“Hot Bearing Detector” is synonymous with “HBD”
 “Hot Wheel Detector” is synonymous with “HWD”
 “Micro Hot Bearing Detector” is synonymous with “MicroHBD”
 “HBD Phase II” may also be referred to as “ACSII”
 “HWD-Rail Mount” may also be referred to as “MSIR”

7.6. Application

The CA-200DV is designed primarily for the following functions related to HBD Systems:
 Calibration (reference individual HBD & HWD System calibration procedures)

The CA-200DV can be used with the following HBD & HWD System controllers:

- Micro Hot Box Detector
- Cyberscan 2000
- System 9000

The CA-200DV is used with the following HBD & HWD System scanners and associated saddles/brackets as shown in the following table.

Table 7.6

Scanner	Saddle
HBD Phase II (400082 Pyrometer Series)	400076-48* or 227571-001**
HWD-Pedestal Mount; PN: 400041-44-2/5	400042-84
HWD-Rail Mount; PN: 251377-100, 200, 201	227571-000

Notes:

*Use of the Calibration Assistant with the previous RED Phase II saddle (400076-40) is not recommended due to alignment uncertainty.

** 227571-001 is an “enclosed” version, for use in windy applications.

7.7. Physical Description

The Calibration Assistant consists of a black aluminum casting that is about 6.5 inches across the front by 8 inches deep by 7 inches tall. A handle is present on the top the unit for handling the device. On the back of the unit, there is an IR Energy viewing hole and an alignment pin used for mounting on various fixtures. The whole unit weighs about 12 pounds. The front of the CA-200DV possesses three switches, one for initiating power, one dual function switch for selecting mode of operation and chopper wheel function, and one for outputting the gate pulses. There are two indicator lights on the front panel. The first is a dual color LED that indicates the mode of operation and system health status. A second LED informs the user when the CA-200DV is ready to be used in the calibration process. The mil-standard connector on the front panel connects to the long cable from the bungalow interface panel bringing power to the unit and providing gate pulses and ready-to-use signals to the user.

The CA-200DV mounts to various scanner devices via a Saddle. See table in section 7.6 to determine which saddle is used for each scanner device.

7.8. Characteristics

The CA-200DV is characterized by the following parameters and technical specifications:

Feature	Description
IR Energy Delta Output	In the Pyrometer mode of operation, the CA-200DV outputs a nominal IR Energy Delta equivalent to the radiated IR energy difference of two bodies where one body is at 200F(93C) and the other body is at 70°F (21°C). In the Bolometer mode of operation, the constant energy function is modified to provide correct calibration for the unique response of this type of detector. The actual relationship between the chopper wheel temperature and the controlled blackbody temperature for both modes of operation is shown in figures 7.8a & 7.8b below.
Accuracy	The CA-200DV will output the proper IR Energy Delta within $\pm 3^\circ$ F of nominal over the operating range of the device.
Emissivity	The emissivity of the radiating bodies within the CA-200DV is nominally 0.91
Operating Range	The CA-200DV will operate in temperatures between -40F to 113F (-40C to 45C). Safety Considerations – Avoid extreme environmental conditions/weather when calibrating. If required to calibrate in extreme condition, use enclosed calibration bracket (227571-001). Ideal calibrating temperature is 70°F (21°C).
Time Until Ready to Use	The CA-200DV will be ready to use in the calibration procedure within 10 minutes of power-on.
Power Requirements	The CA-200DV will operate using either AC or DC power supply. If used, the DC input must be between 9 and 16 VDC at the front panel connector for proper operation. Note: The DC supply voltage must be greater in the bungalow to account for cable loss (e.g. a 100 foot cable will drop 2 -3 volts) If the AC input is used, the voltage must be in the range 85-264VAC, 47-65Hz (90W maximum/30W to operate). Note that if the AC input is active, the DC input pins will be ignored as a power source. In this instance, the CA-200DV may also be used with Hot Box Detector Systems that supply a -14VDC reference level (Cyberscan and System 9000) on the 12V DC supply pins.
Overload Protection	The CA-200DV is internally fused at 5 amps, slow blow. The fuse should not need to be replaced in normal circumstances, and is not field replaceable.
Operating Mode	The CA-200DV IR energy output can be selected to work with HBD systems incorporating either bolometer or pyrometer type IR detectors. The selection is accomplished by positioning the dual function MODE/SPIN switch to the appropriate setting before the Power switch is turned ON.
Health Indication	The CA-200DV indicates health by flashing the system health indicator. A fault condition is present when the system health indication is steady on.
Ready to Use Indication	The CA-200DV indicates that it has reached the proper calibration temperature and is ready to be used in the equipment calibration procedure by lighting its "Ready-To-Use" indicator "steady-on".
Ready to Use Signal	The CA-200DV provides a ready-to-use signal through the cable back to the bungalow and will illuminate the DS1 "Ready to Use" LED light on the Field Interface Panel.
Gate Pulses	The CA-200DV, when used with Cyberscan and System 9000 systems, provides two gate pulses ("A" and "B" pulses) that simulate transducer actuation. The on-state voltage of the gate pulses will be controlled by the type of power supply in use. If the DC power input is in effect (no AC), or if the AC power input is in use but no DC, the gate pulses will have an on-state voltage of 0 Volts. When DC Power input is supplied with a negative voltage, the gated pulse outputs will have an on-state voltage equal to the negative supply voltage + 0.7 volts, but not less than -14 volts. This function is not used with MicroHBD systems, because this system generates it's own gate pulses within the software, when in Calibration Mode.

8. Installation

8.1. Introduction

The Calibration Assistant requires no permanent installation procedures. "Saddle" brackets are used to temporarily mount the Calibration Assistant to various scanning equipment during calibration.

8.2. Unpacking and Inspection

The Calibration Assistant should be unpacked and carefully examined upon receipt to determine any damage due to shipping. Any adverse findings should be reported immediately to the carrier and to Progress Rail.

8.3. Placement and Mounting

The Calibration Assistant is mounted on scanners using various saddles and brackets (reference *Application Section 7.6* for a list of applicable scanners and their associated fixtures).

8.4. HBD Phase II Saddle Installation

Install by first sliding the arms of the saddle around the scanner housing until the saddle pin-nuts engage the scanner drainage holes on the side of the scanner. You should feel a definite "click" when the saddle arms properly engage the scanner. Next, lower the saddle onto the scanner lid such that the scanner alignment pins engage the saddle notches. Check saddle installation by rocking the saddle to ensure that it is fully seated on the scanner.

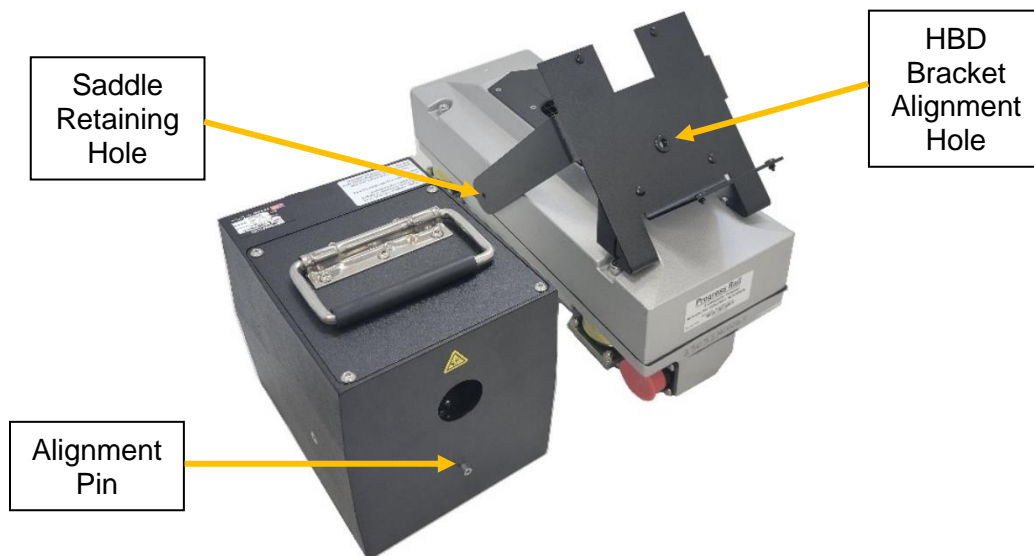


Figure 8.4a HBD – Rail Mount

8.5. HWD-Rail Mount Saddle Installation

Install by first sliding the arms of the saddle around the scanner housing until the saddle holes engage the scanner pins on the side of the scanner. You should feel a definite "click" when the saddle arms properly engage the scanner. Check saddle installation by rocking the saddle to ensure that it is fully seated on the scanner.

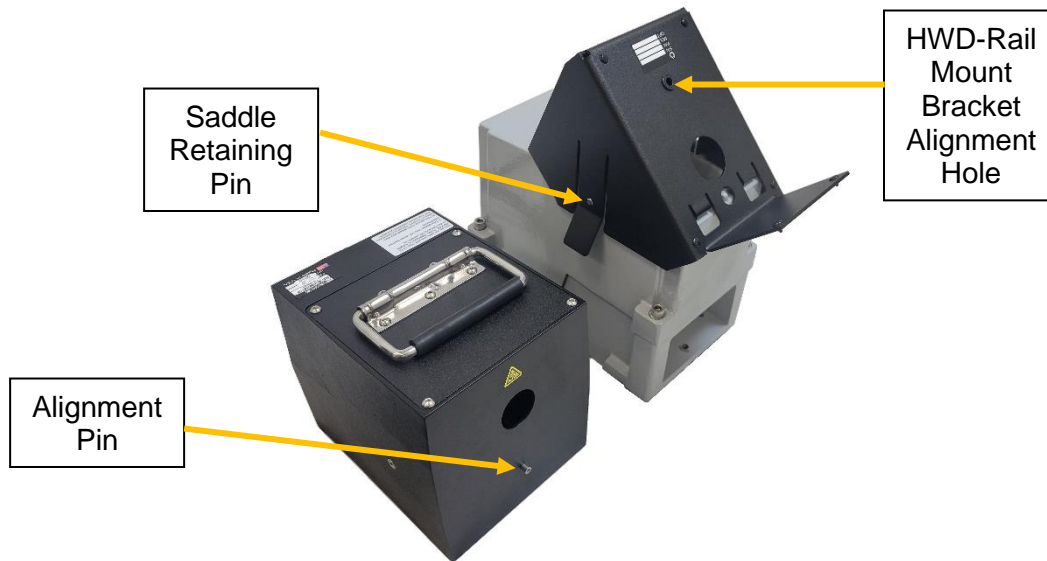


Figure 8.5a HWD – Rail Mount

8.6. HWD – Pedestal Mount Saddle Installation

Install by first removing the two Phillips-head screws from the front of the HWD-Pedestal Mount housing. Set them aside in a safe place, as they will be reinstalled once the calibration process is complete.

Next, install the saddle as shown below, using the two thumb screws. Tighten the two screws with a flathead screwdriver.

Note: The HWD-Pedestal Mount may be calibrated with the Visor installed or removed.

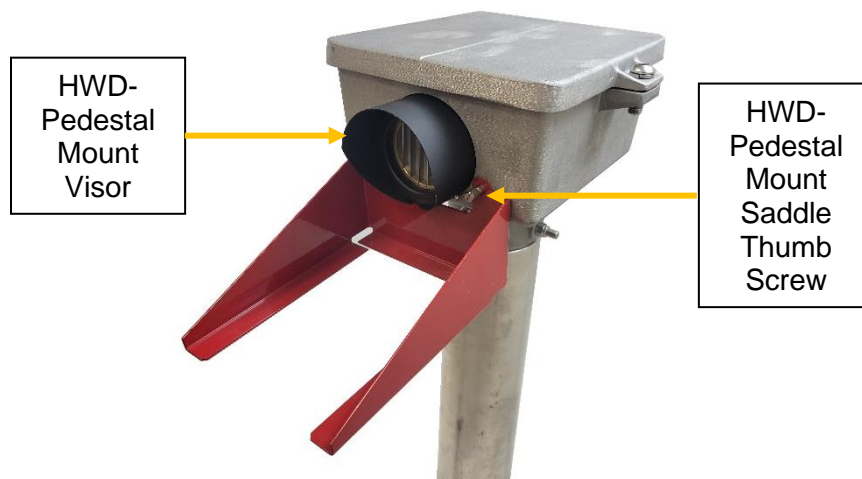


Figure 8.6a HWD – Pedestal Mount



CAUTION Due to the weight and shape of the Calibration Assistant, Progress Rail recommends proper protective shoes be worn while handling and mounting the unit.

8.7. Mounting CA-200DV to Saddle

When mounting the CA-200DV in the HBD or HWD-Rail Mount saddle, ensure the CA-200DV alignment pin engages the nylon bushing in the saddle alignment hole (see figures in section 8.6).

Note: The alignment pin is not used on the HWD-Pedestal Mount scanner.

Once the CA-200DV is resting in the saddle, verify correct placement by observing that the CA-200DV sits squarely on both saddle surfaces. The CA-200DV should be slightly rocked to ensure that it is properly mounted and seated.



Figure 8.7a



Note: CA-200DV is inverted when mounted to the HWD-Rail Mount scanner

Figure 8.7b

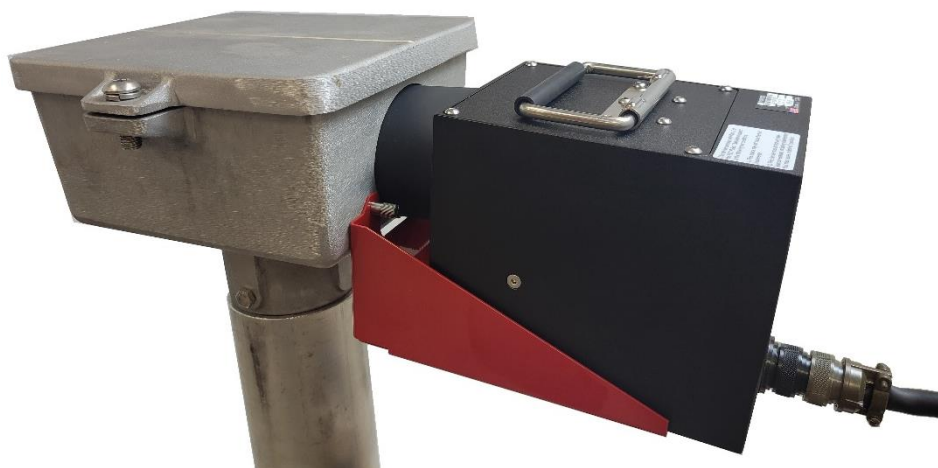


Figure 8.7c

8.8. Electrical Connection



WARNING *The Calibration Assistant is used to non-vitally calibrate non-vital Hot Box Detector Systems. Failure conditions of both the calibrator and the HBD system should be covered by individual railroad operating rules.*

The CA-200DV is electrically connected to the HBD System via an interface cable. Two standard cable lengths are available as follows:

CA-200DV Calibration Assistant Kits

Kit Part Number	Cable Part Number	Cable Length
180543-000	400018-67-2	100 Feet
180543-001	400018-67-3	200 Feet
180543-002	No cable supplied	
400018-67-AC	Power cable (used for validation process), 9 Feet, 2-prong 120vac (Optional)	
180520-000	Housing Aperture Plug Kit (Included with new units as of July 2023, Retrofittable to older units)	
061014008	Housing Aperture Cap (Red Plastic Plug) (Superseded by 180520-000, but still available to order)	

When connecting the cable to the CA-200DV, align the connector key-ways and then press the cable connector onto the CA-200DV front panel connector. The other end of the cable should be connected to the appropriate interface panel and/or interface adapter.

Note: The cable pushes onto the connector, and does not thread into place.



CAUTION *Due to the inherent tripping hazard, care should be taken when working around the long interface cable.*



CAUTION *To avoid personal injury or equipment damage the Calibration Assistant and any associated cables and fixtures must be removed as necessary from the path of oncoming trains.*

The connector pin-out for the CA-200DV connector and cable are as follows:

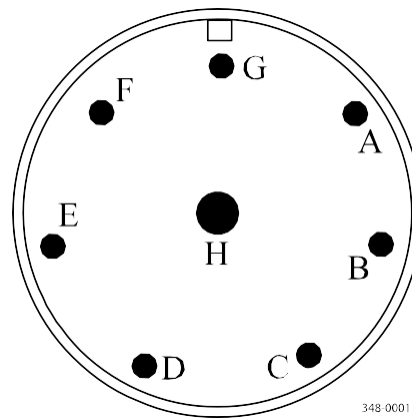


Figure 8.8a – Calibration Assistant Connector (Pin Side View)

Pin Number	Signal Description	Input / Output	Signal Specification	Comments
A	No Connect	No Connect		
B	Ready to Use Signal	Output	Open Collector Output, with diode selected reference to pin H / Common (MicroHBD) or Pin F / - 14Vdc Cyber Scan or System 9000, 120 ma 16VDC max	
C	“B” Gate Pulse	Output	Open Collector Output, with diode selected reference to pin H / Common (MicroHBD) or Pin F / - 14Vdc Cyber Scan or System 9000, 120 ma 16VDC max	
D	120V AC Power (BX)	Input	85-264VAC, 47-65Hz 90W max/30W to operate	Will Fall back to 12V Power on Pin F if available, when AC is not present.
E	120V AC Power (NX)	Input		
F	B12 / Signal Power	Input	9-16V DC 4 amps max -10 to -14V DC 100 ma max	-12 For signal compatibility with Cyber Scan and System 9000, AC Power Required To operate unit.
G	“A” Gate Pulse	Output	Open Collector Output, with diode selected reference to pin H / Common (MicroHBD) or Pin F / - 14Vdc Cyber Scan or System 9000, 120 ma 16VDC max	
H	Signal / Power Common	Common		

8.9. Ready-to-Use Signal

The CA-200DV supplies a Ready-to Use signal through the interface cable. This signal can be used to notify the user when to start the calibration procedure. The signal can also be used to light a LED in the bungalow.

A typical circuit employing this technique is as follows:

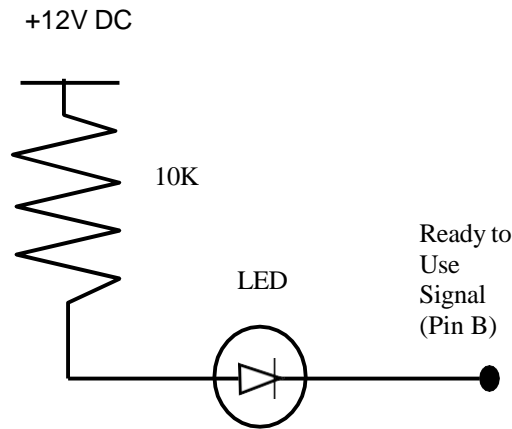


Figure 8.9a

Using this circuit, once the LED turns ON, the user can begin the HBD System calibration procedure.

Note: *The Calibration Assistant should only be used in the HBD System calibration procedure if the Ready- to-Use indicator is on.*

9. Operation

9.1. General

This section provides a description of the operating controls and the basic operating procedure for the Calibration Assistant. Reference the appropriate HBD System manual for complete calibration and/or alignment procedures when using a calibrator.



CAUTION

To avoid personal injury or equipment damage the Calibration Assistant and any associated cables and fixtures must be removed as necessary from the path of oncoming trains.

9.2. Controls and Indicators

The following picture and table depict and describe the various controls and indicators for the Calibration Assistant.



Figure 9.2a

(See chart on next page)

Control / Indicator	Description / Function	Indication / Action
POWER ON/OFF Switch	The power switch turns the unit ON or OFF ** (MODE switch must be set <u>prior</u> to Power On)	"0" = power OFF "1" = power ON
MODE / SPIN Switch	The MODE/SPIN switch serves two purposes. <ol style="list-style-type: none"> When the power switch is turned on, the unit checks the position of the Mode switch to select between bolometer mode or pyrometer mode. The mode selected in then maintained as long as power is ON. The function of the switch after power is turned ON is to turn the chopper wheel on or off. 	"0", Red = the bolometer mode is selected. System Health LED will be RED. "1", Green, the pyrometer mode is selected. System Health LED will be GREEN. As long as power is ON, mode has been determined, use this switch now to turn the chopper wheel on by selecting the right depressed position.
GATE PULSE ON/OFF Switch	The Gate Pulse switch turns the "A" and "B" gate pulses sent through the interface cable on or off.	"0" turns pulses OFF "1" turns pulses ON
SYSTEM HEALTH LED Indicator	The system health LED: <ol style="list-style-type: none"> Indicates condition of system health. Indicates mode of operation selected. 	LED flashes at about a 1 Hz rate to indicate good system health. "Steady-on" indicators system fault. Note that the color of the System Health LED will change dependent upon the mode of operation selected. (See above MODE/SPIN description)
READY-TO-USE LED Indicator	The ready-to-use indicator will come on and remain on as long as the CA-200DV is outputting the proper IR Energy Delta at the proper rate. (A ready-to-use signal is also output by the CA-200DV through the interface cable and is controlled by the same logic controlling the ready-to-use LED. Reference <i>Ready-to-Use Signal</i> section for a method to employ this feature.)	

9.3. Operating Procedure



CAUTION *During train passage, the CA-200DV Gate Pulse switch should be turned OFF when using the ACSII, MSIR, and Pedestal Mount HWD Scanners with a Micro System. In addition, the CA-200DV, saddle bracket, and interface cable should be cleared from the path of the train. The CA-200DV power switch may remain turned ON during train passage.*



CAUTION *The Calibration Assistant contains a heat source that can reach temperatures of 250°F (120°C). Use care when working with the device and keep fingers out of the unit to avoid contact with the heat source.*



CAUTION *The Calibration Assistant contains a rotating wheel. Use care when working with the device and keep fingers out of the unit to avoid contact with the rotating wheel.*

- 9.3.1. The basic calibration operating procedure for the CA-200DV is as follows
- 9.3.2. Place the CA-200DV on the scanner and connect it to the HBD System (see figures in section 8)
- 9.3.3. With the Power Switch set to "0", select the IR energy mode of operation suitable for the scanner being calibrated (Pyrometer or Bolometer). Do so by depressing the MODE/SPIN switch to the left for Bolometer mode, or to the right for Pyrometer mode. As a reminder, the correct switch positions are indicated by the color-coded (red and green) faceplate sections and text.
- 9.3.4. Depress the CA-200DV Power Switch to "1" to initiate power. The Health Status Indicator should begin flashing within several seconds. Make sure that the color of the Health Status LED matches the desired mode of operation: RED for Bolometer, GREEN for Pyrometer.
- 9.3.5. If the Bolometer mode of operation was selected, depress the CA-200DV MODE/SPIN switch to the right to begin the rotation of the chopper wheel. You should hear the DC motor begin working within the CA-200DV. If the unit was turned ON in the Pyrometer mode, the chopper wheel should begin rotation automatically
- 9.3.6. (Optional) If the HBD System requires the use of gate pulses, depress the CA-200DV Gate Pulse switch to "1" to output "A" and "B" gate pulses. (HBD Systems requiring the use of gate pulses include Cyberscan 2000 and System 9000.)
- 9.3.7. Wait for the CA-200DV Ready-to-Use LED indicator or signal (reference *Ready-to-Use Signal* for signal information) before initiating the HBD System calibration. Once the CA-200DV indicates that it is ready to use, follow the appropriate HBD System calibration procedure.

Note: *The Calibration Assistant should only be used in the HBD System calibration procedure if the Ready- to-Use indicator is on.*

10. Troubleshooting, Maintenance, and Calibration

10.1. General

This section contains information relating to troubleshooting, maintenance, and calibration of the Calibration Assistant.

10.2. Troubleshooting

The following table describes potential problems and recommended actions. If the recommended actions fail to resolve the problem, return the Calibration Assistant to Progress Rail for repair.

Symptom	Potential Problem	Recommended Action
System health indicator remains dark/off	Power Switch Off	Depress the CA-200DV Power Switch to the "1" position
	Power not properly supplied to unit	If the unit is operating from a DC power supply, ensure +9 to +16VDC is being supplied on the pin F with a ground return on pin H of the CA-200DV connector (Note: Target for +12VDC nominal and account for cable less – e.g. a 100 foot cable will drop 2-3VDC) If the unit is operating from an AC power supply, ensure that 110VAC is present between pins D and E of the CA-200DV connector/cable.
	Faulty cable connection	Ensure cable is properly mated to the CA-200DV connector and to the interface panel in the bungalow.
	Internal overload protection fuse blown	No field action recommended. Since a fuse failure is potentially an indication of a more severe problem, the CA-200DV should be returned for service.
System health indicator light remains "steady-on"	Internal processor or memory fault	Cycle power on the CA-200DV
	Black body heat source is not controllable	If operating from a DC power supply, Increase DC voltage input to the CA-200DV at the connector (target for +12VDC nominal and account for cable loss - e.g. a 100 foot cable will drop 2-3VDC)
		Cycle power on the CA-200DV
	Motor speed is out of limits	If operating from a DC power supply, Increase DC voltage input to the CA-200DV at the connector (target for +12VDC nominal and account for cable loss - e.g. a 100 foot cable will drop 2-3VDC) CA-200DV
Cycle power on the CA-200DV		
Ready-to-Use indicator fails to light within the proper time	The Chopper Rotate switch is off	Depress the Chopper Rotate switch to the "1" position
	Black body heat source is not receiving enough power	If operating from a DC power supply, Increase DC voltage input to the CA-200DV at the connector (target for +12VDC nominal and account for cable loss - e.g. a 100 foot cable will drop 2-3VDC)
HBD System calibration parameters are not as expected (e.g. readings too low)	The CA-200DV and/or saddle are not properly seated on the scanner	Ensure the CA-200DV and saddle are properly mounted on the scanner. (Refer to Installation and figures in section 8.7)
	The calibration process is initiated before the Ready-to-Use indicator is on	Ensure that the HBD System calibration procedure is initiated only after the Ready-to-Use indication is given by the CA-200DV.
	The Gate Pulses switch is off (for systems requiring timing pulses)	Depress the Gate Pulses switch to the "1" position for Cyberscan and System 9000 calibration.

10.3. Periodic Maintenance



CAUTION The Calibration Assistant contains a heat source that can reach temperatures of 250°F (120°C). Exercise care when working around the heat source.



CAUTION The chopper wheel represents a rotating hazard. Ensure power is removed from the unit before working in the chopper wheel cavity.

- 10.3.1. To prevent fouling the internal sensitive coatings, it is recommended that the Housing Aperture remain covered when the unit is not in use. (See page 21). Consider installing the optional Housing Aperture Plug Kit, part number 180520-000.
- 10.3.2. About once every six months or more often if usage and environmental conditions warrant, remove accumulated dust and dirt from the unit as follows:
- 10.3.3. Using compressed air, blow away accumulated dust from the outside of the unit.
- 10.3.4. Do not touch the wheel with a sharp object or dirty finger. Doing so will foul the sensitive coating of the wheel.
- 10.3.5. With the unit unplugged from the interface cable, remove the four screws securing the lid of the CA- 200DV.
- 10.3.6. Using compressed air, gently blow dust and dirt from inside the main cavity surrounding and chopper wheel.
- 10.3.7. Clean the inside of the lid as necessary.
- 10.3.8. Replace the lid using the four screws.
- 10.3.9. Ensure the spacer block attached to the lid is located directly over the heater assembly.

11. Calibration of System

- Calibration Assistant Operating Temperature Range -40F to 113F (-40C to 45C). If within this temperature range, calibration of scanners can occur.
- Safety Considerations – Avoid extreme environmental conditions/weather when calibrating
- Minimum Semi-Annual Calibration of System.
- Other conditions to re-calibrate include replacement of Scanner, Pyro Preamp, Lens Assembly, Mirror, Scanner Cable, or SIB Board

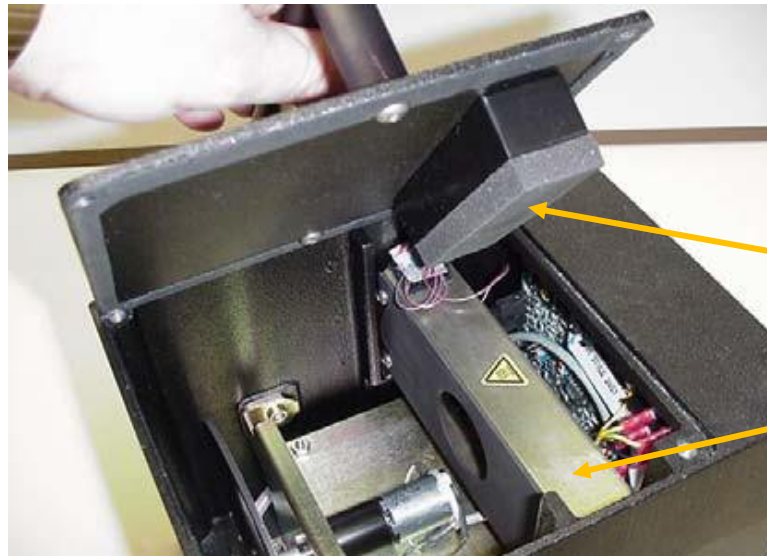
12. Calibration and Verification of Calibration Assistant

The Calibration Assistant must be verified to be working within specification at least once a year.

To ensure the accuracy of calibration, check the performance of this instrument using in Progress Rail Calibration Assistant Verification Document 082824-022. If unit does not pass verification, unit should be returned to Progress Rail for calibration or repair.

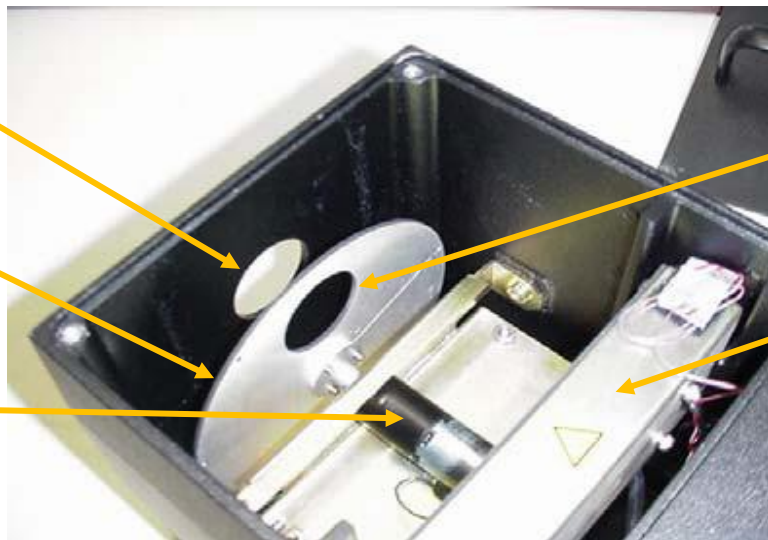
For service and calibration of the Calibration Assistant, contact Progress Rail by calling Toll Free (888) 701-3479 between 8:00 AM and 5:00 PM. Mark the RMA # on the outside of the box prior to shipping to Progress Rail, 3801 S Selsa Rd #1, Independence, MO 64057.

You may also email us at Insepection.Orders@ProgressRail.com



Heater
Spacer
Block

Heater
Assembly



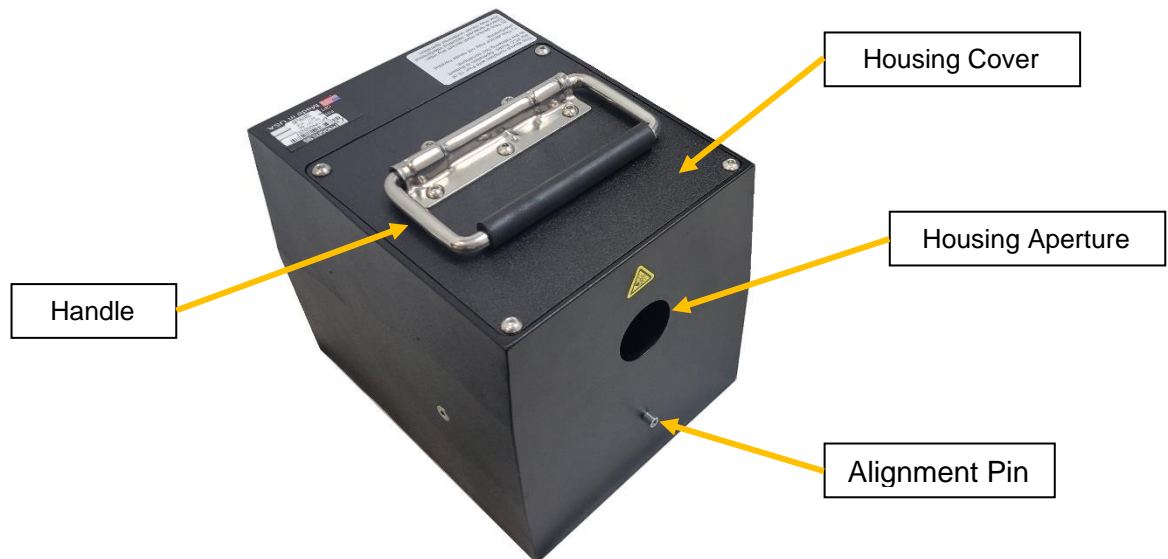
Housing
Aperture

Chopper
Wheel

Chopper
Wheel
Drive
Motor

Chopper
Wheel
Aperture

Heater
Assembly



Housing Cover

Housing Aperture

Handle

Alignment Pin