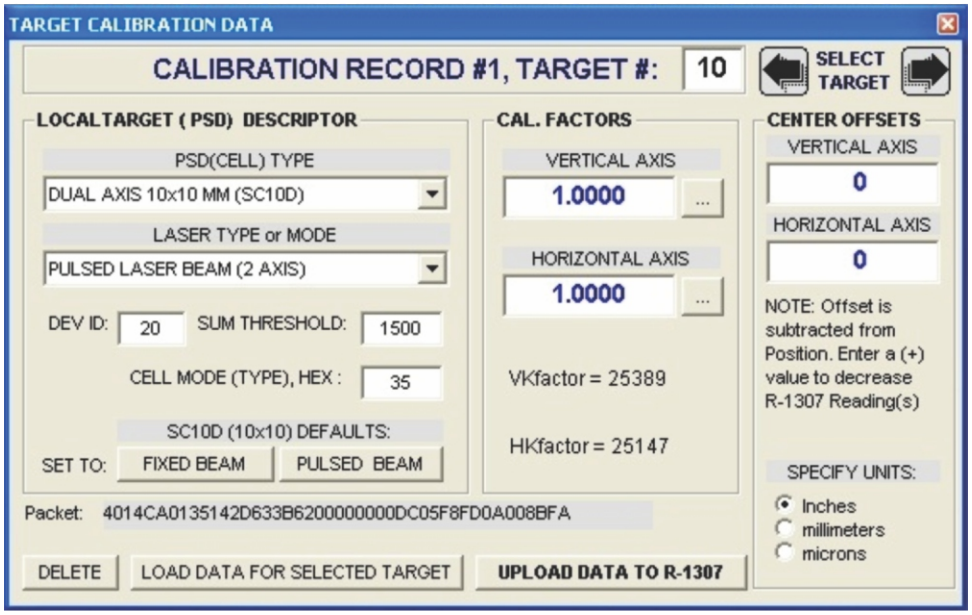
S-1410 Calibration Software for the R-1307 Readout and Calibration Fixtures

Calibrate any Hamar Laser Bore Alignment Laser and 2-Axis Cabled Target to the R-1307 Readout at your own facility



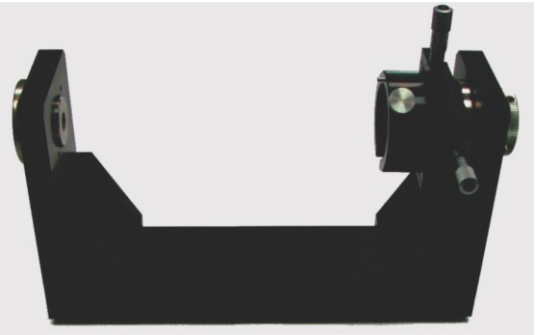
The S-1410 Calibration software for the R-1307 Readout series provides the capability to calibrate any Hamar Laser bore alignment laser, such as the L-705, L-706 or L-708, and any 2-axis cabled target to the R-1307 Readout *at your own facility* rather than shipping the equipment to Hamar Laser for calibration. **The A-808 X-Y Center Calibration Fixture**, which comes with an X-Y stage with certified micrometers and a mount for the L-705/L-706 Lasers, is used with the lasers/targets and their appropriate adapters to detect centering and calibration errors. The S-1410 Calibration and Utility software is used to generate calibration factors that are then uploaded to the R-1307 Readout via the S-1410 software.

Hardware setup is fast and easy. Adapters (when required) are available for any Hamar Laser bore alignment laser/2-axis cabled target to ensure compatibility with your equipment. Both *pulse* and *continuous* laser modes are supported in the software.

The general calibration procedure is as follows:

1. Use the S-1410 Utility Software program to remove the old factors from the R-1307.
2. Use the A-808 fixture, its X-Y stage and adapters to mount the hardware and follow the step-by-step calibration procedure to generate new calibration factors.
3. Upload the factors into the R-1307 again using the utility software.
4. Repeat the calibration procedure to verify the calibration factors are correct.

A-807 Calibration Fixture for the L-700 Laser System with calibrated angular and center micrometers



A-808 Calibration Fixture with X-Y Target Stage for T-218/219 Targets and L-705/706 Laser Mount

Also available for calibration procedures is the **A-801 Centering Fixture**, which is used to set the laser beam concentric to the L-700 mounting stud before performing an alignment. This procedure puts the laser beam in the center of the adjustment range of 4 axes of adjustment for the L-700 Laser. Requires a T-261A Target, R-358 Readout and Read8 Software.

The **A-807 Calibration Fixture is** designed primarily for the L-700 Laser System to calibrate the T-261A target to the Read8 Software. The fixture has calibrated angular and center micrometers to generate the calibration factors for Read8. This fixture can also be used to center the laser the the L-700 mounting stud. Requires a T-261A Target, R-358 Readout and Read8 Software.

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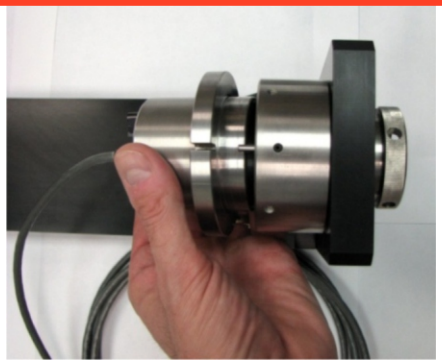
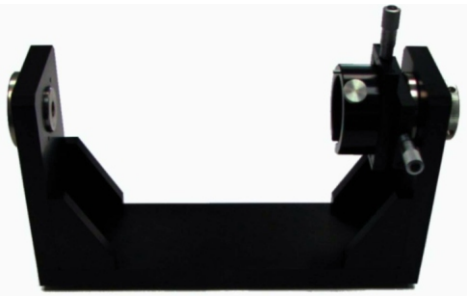
Hardware Features

Hardware for Calibration



Mounting a Target for Centering using the T-218 Target and A-808-1218C Centering Adapter
The adapter is inserted into the A-808 Calibration Fixture and the T-218 Target is inserted into the adapter.

Mounting a target for the A-808-218XY Mounting Stage
The X-Y Mounting Stage is inserted into the A-808 Calibration Fixture. The Mounting Stage micrometers are adjusted to .250" and the T-218 Target is inserted into the Mounting Stage.

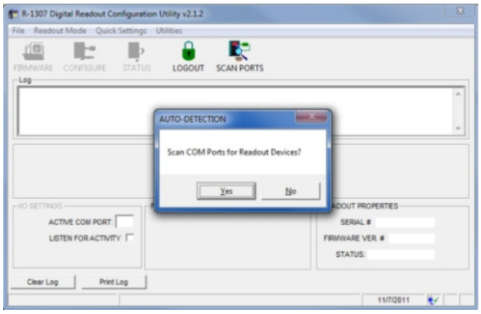


A-808 Calibration Fixture with X-Y Target Stage for T-218/T-219 Targets and L-705/L-706 Laser Mount.

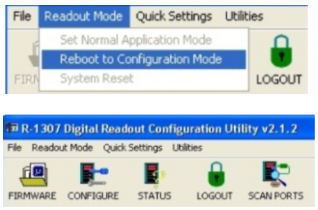
Target and laser mounted in the A-808 Calibration Fixture with X-Y Target Stage and connected to the R-1307 Readout.

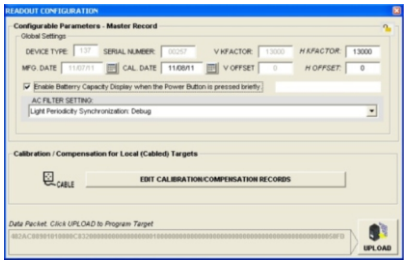
Program Features

S-1410 Software Features

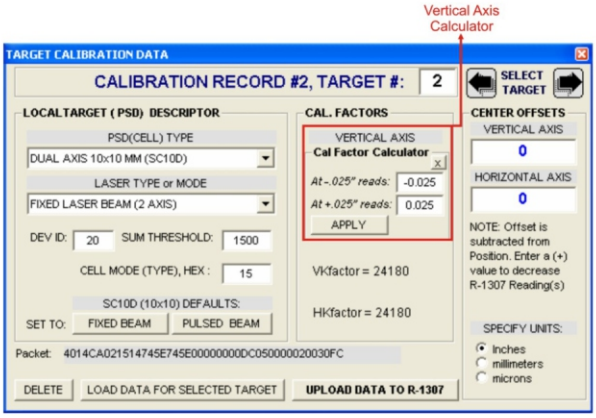


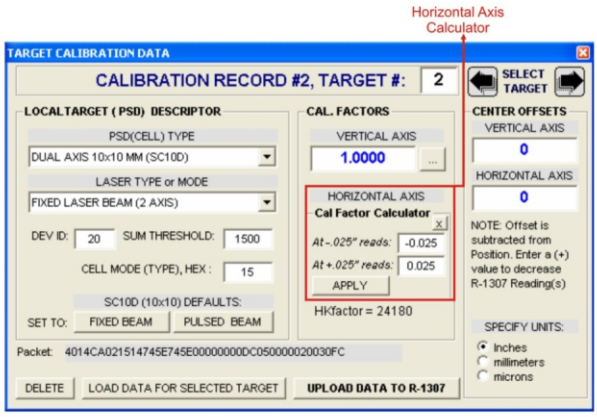
Initializing and Configuring the R-1307 Readout
The software initializes by prompting for a scan of connected R-1307 readouts. Once the R-1307 is detected, it can be rebooted to Configuration Mode.





The **Readout Configuration Screen** allows changes to be made to the calibration date, the AC Filter setting and the Battery Capacity Display. The user may then select **Upload** to program the new settings into the R-1307 memory or **EDIT CALIBRATION/COMPENSATION RECORDS** to enter new calibration/compensation data for targets connected to the local R-1307 port.





The **Target Calibration Data Screen** provides prompts for the calibration record to edit, the Local Target (PSD) Descriptor information, and the laser type and mode (fixed beam or pulsed beam).

- The **Local Target (PSD) Descriptor** contains settings that describe the type of Position Sensor (PSD) and the type of laser assigned to the selected record.
- The **Cal. Factors/Gain Adj.** are the gain compensation adjustment factors for the Vertical and Horizontal axes.
- The **Center Offsets** are the target PSD center offsets for the Vertical and Horizontal axes.
- The **Cal Factor Calculator**, where the positive (+) and negative (-) values obtained for each axis are entered to generate the calibration factors.

Two calibration parameters must be generated and entered into the S-1410 Calibration and Utility Software:

Gain Adjustment (Span Error)

This is a measure of how accurately the target (combined with the R-1307) displays a known amount of displacement. Typically, an X-Y micrometer stage is used to move the target a known amount (usually .025" or one full turn on the X-Y Stage micrometer) and this is compared to the value displayed on the R-1307 Readout. If the value displayed on the R-1307 is not the same as the micrometer value, then a calibration factor is entered into the S-1410 software and uploaded to the R-1307 to correct this error.

Concentricity (Center) Error

This is a measure of how far off center the sensor (PSD or *Position Sensing Detector*) is from the target housing OD (outside diameter) mounting surface. Typically, this is calculated by placing the target into a centering fixture and taking two readings: one at 0 degrees and one at 180 degrees. This is referred to as Hamar Laser's NORMin method. If the 0 and 180 degree values are not the same, a calibration factor is entered into the S-1410 software and uploaded to the R-1307 to compensate for this error.

Calibration Fixtures/Software Parts List

Part Number	Description
A-801	Laser Centering Fixture for L-700
A-807	X-Y Angle/Center Calibration Fixture for T-261/T-212 and R-358 or R-1307. Includes certified micrometers
A-808	X-Y Angle/Center Calibration Fixture for (T-212, T-218, T-1218, A-510, A-512, T-261) - includes X-Y Stage w/ certified micrometers and L-705 Laser Mount
A-808-1218C	T-1218 Target Concentricity Calibration Adapter
A-808-1218XY	T-1218/T1220 Target X-Y Calibration Stage
A-808-1220C	T-1220 Target Concentricity Calibration Adapter
A-808-1220XY	T-1220 Target X-Y Stage Adapter
A-808-212C	T-212 Target Concentricity Calibration Adapter
A-808-212XY	T-212 Target X-Y Calibration Stage Adapter
A-808-218C	T-218 Target Concentricity Calibration Adapter
A-808-219C	T-219 Target Concentricity Calibration Adapter
A-808-510C	A-510 Target Concentricity Calibration Adapter
A-808-510XY	A-510 Target X-Y Calibration Stage Adapter
A-808-512C	A-512 Target Concentricity Calibration Adapter
A-808-512XY	A-512 Target X-Y Calibration Stage Adapter
A-808-700	L-700 Laser Mounting Hardware
A-808-708	L-708 Mounting Flange
S-1410	R-1307 Calibration Software for cabled targets