



9

Accessories

General

This chapter lists and describes Agilent Technologies optic mounts and cables, alignment aids, and other devices available for Agilent Laser measurement systems.

Adjustable Mounting Hardware

Table 9-1. Adjustable mounting hardware

Component	Comment(s)
Adjustable Mounts	Adjustable mounts simplify installation and alignment of the optics listed below:
Agilent 10710B	Use with Agilent 10700A, 10701A, 10705A, 10707A
Agilent 10711A	Use with Agilent 10702A, 10706A, 10706B, 10715A, 10716A
Height Adjuster and Post	The Height Adjuster and Post simplifies installation and alignment of the optics listed below:
Agilent 10785A	Agilent 10767A, 10770A, 10771A, 10774A, 10775A, 10776A
	The Height Adjuster and Post may be used with the Agilent 10784A Base
Straightness Accessory Kit	The Straightness Accessory Kit simplifies installation and alignment of the optics listed below:
Agilent 10776A	Agilent 10774A, 10775A

Adjustable mounts

The optical elements inside several of the Agilent Laser Transducer System optics are not precisely referenced to their housings. In most applications involving these optics, a few simple alignments during system installation can usually provide equal or better alignment than referencing the optics to their housings. Therefore, slight positioning adjustments of the unreferenced interferometers, beam splitters, and beam benders are needed for proper system alignment.

Positioning adjustments for most optics can be provided by using Agilent 10710B or Agilent 10711A Adjustable mounts, as appropriate. These mounts allow adjustment of pitch and yaw of any attached optic. (Roll adjustment is typically not required, and can usually be avoided by careful optical system layout.)

Adjustable Mounting Hardware

In general, when aligning Agilent optics, it will be necessary to adjust most or all of the optical components. Most optics are not referenced to their housings, some simple adjustments by the user can provide optimum alignment. The Agilent 10710B and Agilent 10711A Adjustable mounts should be used to provide the adjustment capability for most optical components.

In general, the alignment procedures are performed with all optical components in place. Your measurement system design should allow for adjustment of the laser, optics, and receivers during alignment.

For optics that are not referenced to their housings, use of an Agilent 10710B or Agilent 10711A adjustable mount is recommended. These mounts provide a convenient means for mounting, aligning, and securely locking measurement optics into position.

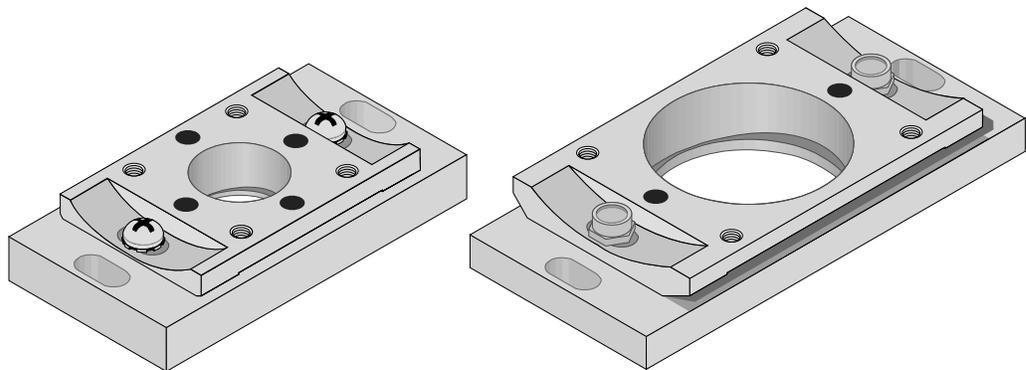
Both mounts allow angular adjustment in two directions (tilt and yaw).

The Agilent 10710B allows $\pm 8^\circ$ in tilt and yaw adjustment.

The Agilent 10711A allows $\pm 5^\circ$ in tilt and yaw adjustment.

The mounts also allow a component to be rotated about its optical centerline (roll) providing simple, time-saving installations.

Any optical component that fits an adjustable mount is supplied with a Hardware Kit (5061-6021 kit for the Agilent 10710B; 5061-6022 kit for the Agilent 10711A) to mount it on the appropriate adjustable mount.



**Agilent 10710B
Adjustable Mount**

**Agilent 10711A
Adjustable Mount**

Figure 9-1. Agilent 10710B and Agilent 10711A adjustable mounts

Adjustable Mounting Hardware

Height adjuster and post, and base

Some of the optics described in this manual, primarily those intended for use in an Agilent Laser Calibrator System, are designed for use with the Agilent 10785A Height Adjuster and Post. In many cases, the Agilent 10785A can be installed in an existing tapped hole in the device being measured; where this is not possible, it may be possible to use the Agilent 10784A Base as a mounting surface.

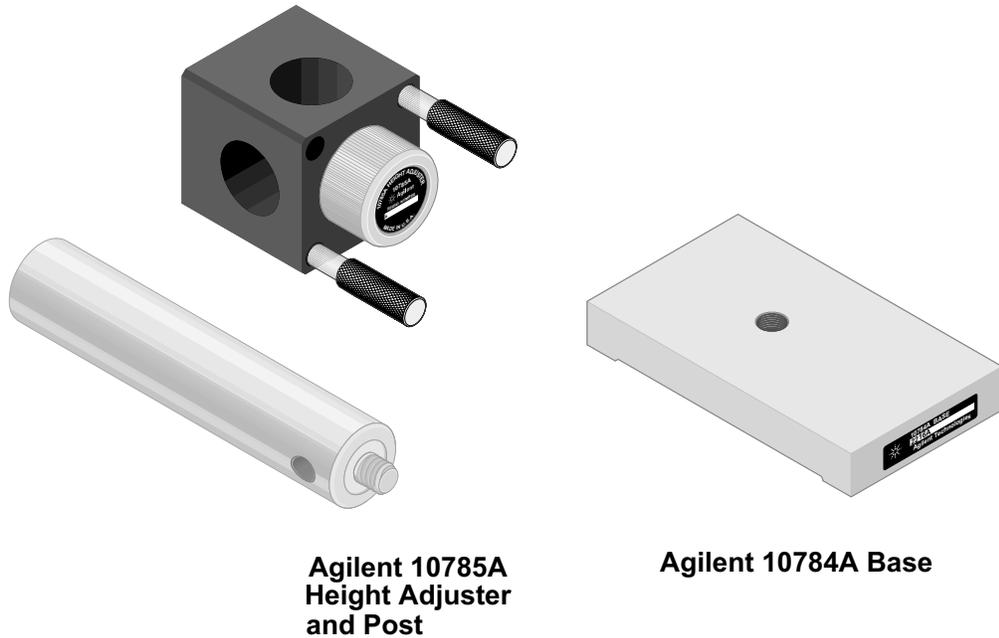


Figure 9-2. Agilent 10785A Height Adjuster and Post and Agilent 10784A Base

Specifications

Specifications describe the device's warranted performance. Supplemental characteristics (indicated by TYPICAL or NOMINAL) are intended to provide non-warranted performance information useful in applying the device.

Adjustable Mounting Hardware

Agilent 10710B/10711A Adjustable Mount Specifications

Figures 9-3 and 9-4 show the specifications for the Agilent 10710B and Agilent 10711A adjustable mounts.

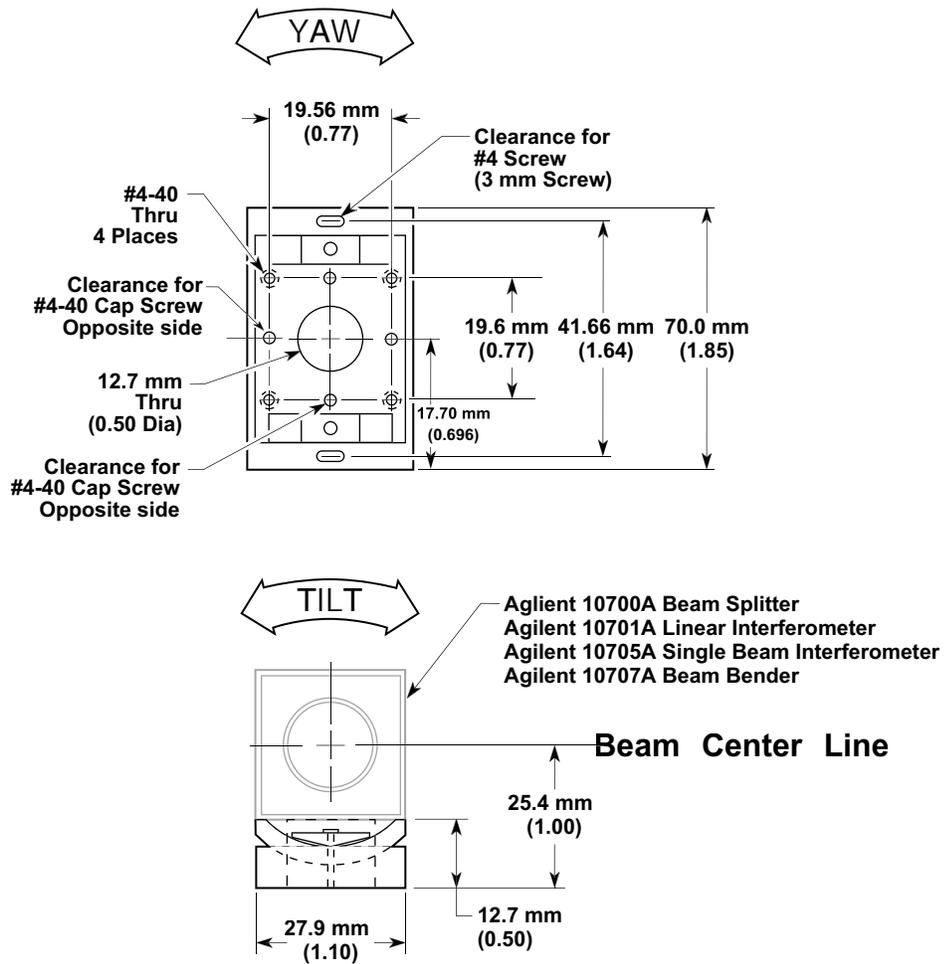


Figure 9-3. Agilent 10710B Adjustable Mount — dimensions

Chapter 9 Accessories
Adjustable Mounting Hardware

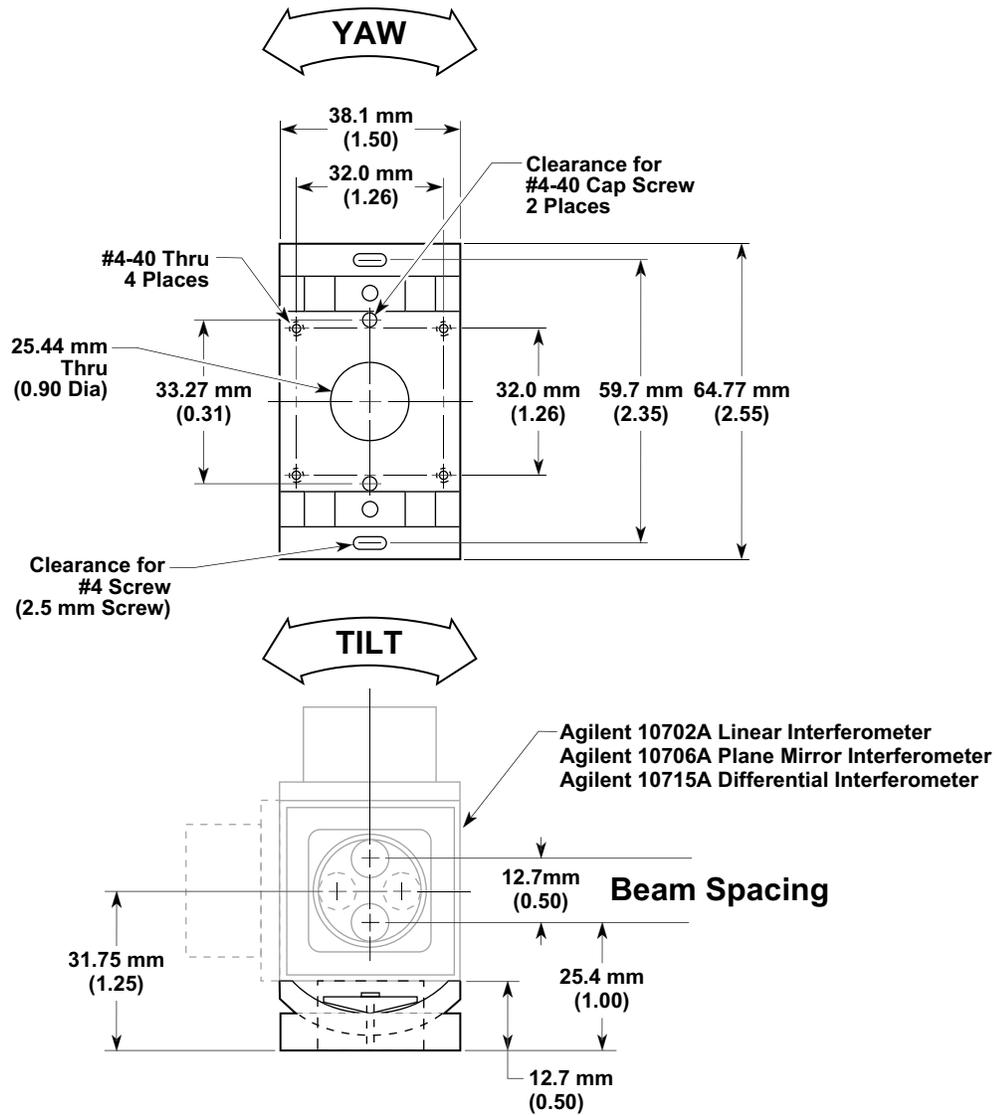


Figure 9-4. Agilent 10711A Adjustable Mount — dimensions

Adjustable Mounting Hardware

Agilent 10785A Height Adjuster/Post and the Agilent 10784A Base Specifications

Figure 9-5 shows the specifications for the Agilent 10785A Height Adjuster and Post and the Agilent 10784A Base.

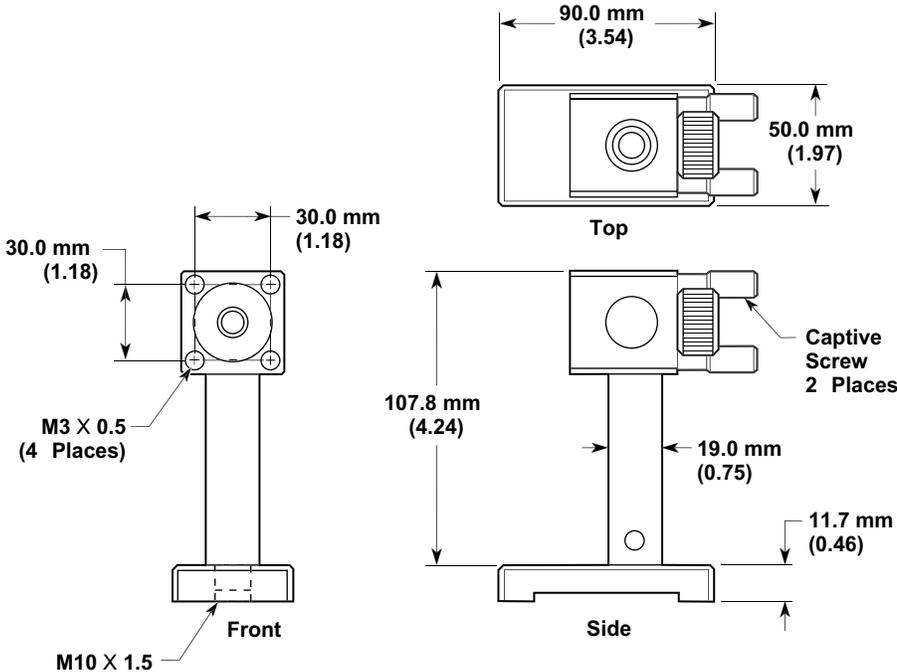


Figure 9-5. Agilent 10785A Height Adjuster and Post and Agilent 10784A Base — dimensions

Cables

Cables

Cables for transmission of power, reference, and measurement signals are available from Agilent.

A typical laser measurement system requires cables as listed in Table 9-3.

NOTE

If you use the Agilent 5519A/B Laser Head's internal receiver, a receiver cable is not necessary.

Table 9-2 is a summary listing of the Agilent cables that are available for connecting the laser head and receiver(s) in a measurement system to the system control electronics.

Table 9-2. Summary of available laser system cables

Device	Agilent Measurement Electronics	
	PC	VME
Agilent 5517A Laser Head	10881	—
Agilent 5517B Laser Head	10881, N1251	N1251
Agilent 5517C Laser Head	10881, N1251	N1251
Agilent 5517D Laser Head	10881, N1251	N1251
Agilent 5519A Laser Head	10882	—
Agilent 5519B Laser Head	10882	—
Agilent 10780C Receiver	10880	10790
Agilent 10780F Remote Receiver	10880	10790
Agilent E1708A Remote Dynamic Receiver	—	N1250
Agilent E1709A Remote High-Performance Receiver	—	N1250

Note that cable numbers shown in Table 9-2 identify a “family” of cables, available in different lengths. Table 9-3 provides additional cable information.

Cables**Table 9-3. Cables**

Component	Comment(s)
Receiver Cable connects the measurement signal from the Agilent 10780C/F Receiver to the Agilent 10895A VME Axis Board—one cable required per receiver.	
Agilent 10790A	5 meters (16.4 feet)
Agilent 10790B	10 meters (32.8 feet)
Agilent 10790C	20 meters (65.6 feet)
Receiver Cable connects the measurement signal from the Agilent 10780C/F Receiver to an Agilent 10885A PC Axis Board, Agilent 10889B PC Servo Axis Board, Agilent 10896B VME Laser Compensation Board, Agilent 10897B VME High Resolution Laser Axis Board, Agilent 10898A VME High Resolution Dual Laser Axis Board, or Agilent N1231A PCI Three-Axis Board—one required per receiver.	
Agilent 10880A	5 meters (16.4 feet)
Agilent 10880B	10 meters (32.8 feet)
Agilent 10880C	20 meters (65.6 feet)
Laser Head Cable connects the Agilent 5517A/B/C/D Laser Head to an Agilent 10885A, 10889B, 10896B, 10897B, 10898A, or N1231A axis board. <i>It has a DIN connector for connecting to the Agilent 10884A Power Supply to provide power to the laser head—one required per system.</i>	
Agilent 10881A	3 meters (9.8 feet)
Agilent 10881B	7 meters (23.0 feet)
Agilent 10881C	20 meters (65.6 feet)
Laser Head Cable connects the Agilent 5517A/B/C/D Laser Head to an Agilent 10885A, 10889B, 10896B, 10897B, 10898A, or N1231A axis board. <i>It has spade lugs for connection to a power supply to provide power to the laser head—one required per system.</i>	
Agilent 10881D	3 meters (9.8 feet)
Agilent 10881E	7 meters (23.0 feet)
Agilent 10881F	20 meters (65.6 feet)
Laser Head Cable connects the Agilent 5519A/B Laser Head to the Agilent 10887P Programmable PC Calibrator Board in the Agilent 5529A system.	
Agilent 10882A	3 meters (9.8 feet)
Agilent 10882B	7 meters (23.0 feet)
Agilent 10882C	20 meters (65.6 feet)
High Performance Receiver Cable connects the measurement signal from the Agilent E1708A or Agilent E1709A Receiver to an Agilent 10897B, 10898A, or N1231A axis board—one required per receiver.	
Agilent N1250A	5 meters (16.4 feet)
Agilent N1250B	10 meters (32.8 feet)

Cables**Table 9-3. Cables (Continued)**

Component	Comment(s)
	High Performance Laser Head Cable connects the Agilent 5517A/B/C/D Laser Head to an Agilent 10897B, 10898A, or N1231A axis board—one required per system.
Agilent N1251A	3 meters (9.8 feet)
Agilent N1251B	7 meters (23.0 feet)

Cables

Agilent 10790A/B/C Receiver Cable

The Agilent 10790A/B/C Receiver Cable, shown in Figure 9-6, is used to connect the measurement signal from the Agilent 10780C/F Receiver to the Agilent 10895A VME Axis Board.

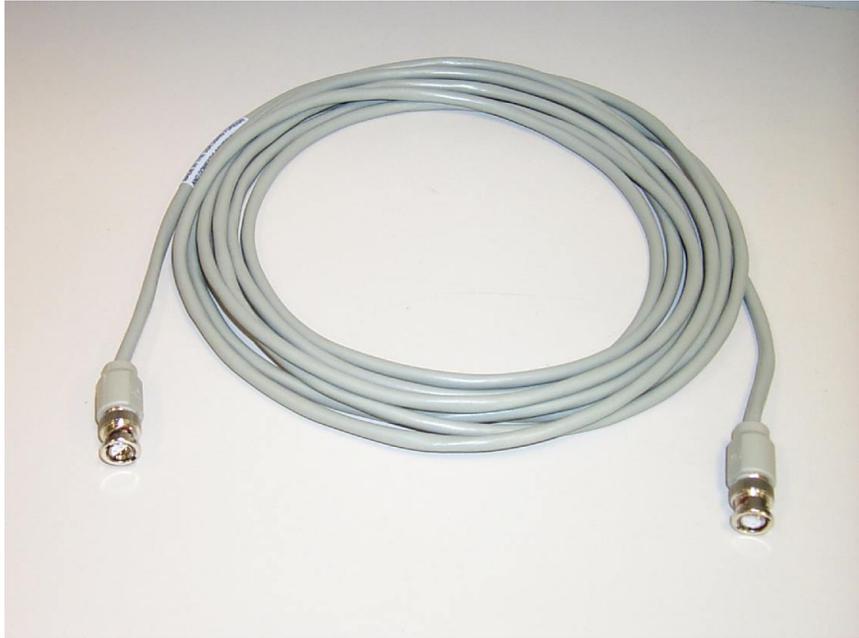


Figure 9-6. Agilent 10790A/B/C Cable

Cables

Agilent 10880A/B/C Receiver Cable

The Agilent 10880A/B/C Receiver Cable, shown in Figure 9-7, is used to connect the measurement signal from the Agilent 10780C/F Receiver to the Agilent 10885A PC Axis Board, Agilent 10889B PC Servo Axis Board, Agilent 10896B VME Laser Compensation Board, Agilent 10897B VME High Resolution Laser Axis Board, Agilent 10898A VME High Resolution Dual Laser Axis Board, or Agilent N1231A PCI Three-Axis Board.



Figure 9-7. Agilent 10880A/B/C Cable

Cables

Agilent 10881A/B/C Laser Head Cable

The Agilent 10881A/B/C Laser Head Cable, shown in Figure 9-8A, is used to connect an Agilent 5517A, Agilent 5517B, Agilent 5517C, or Agilent 5517D Laser Head to an Agilent 10885A PC Axis Board, Agilent 10889B PC Servo Axis Board, Agilent 10896B VME Laser Compensation Board, Agilent 10897B VME High Resolution Laser Axis Board, Agilent 10898A VME High Resolution Dual Laser Axis Board, or Agilent N1231A PCI Three-Axis Board. *It has a **DIN** connector for connecting to the Agilent 10884A Power Supply to provide power to the laser head.*



Figure 9-8A Agilent 10881A/B/C Laser Head Cable

Cables

Agilent 10881D/E/F Laser Head Cable

The Agilent 10881D/E/F Laser Head Cable, shown in Figure 9-8B, is used to connect an Agilent 5517A, Agilent 5517B, Agilent 5517C, or Agilent 5517D Laser Head to an Agilent 10885A PC Axis Board, Agilent 10889B PC Servo Axis Board, Agilent 10896B VME Laser Compensation Board, Agilent 10897B VME High Resolution Laser Axis Board, Agilent 10898A VME High Resolution Dual Laser Axis Board, or Agilent N1231A PCI Three-Axis Board. *It has **spade lugs** for connection to a power supply to provide power to the laser head.*

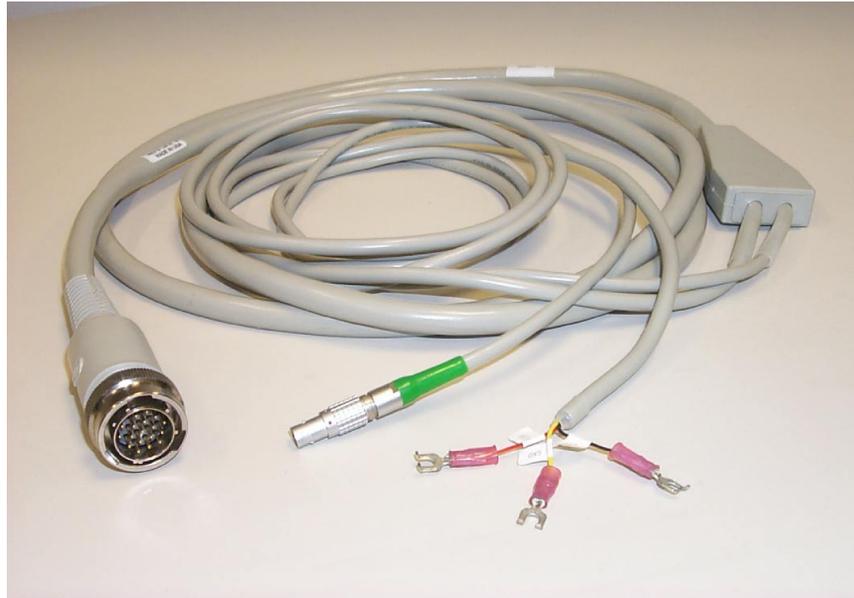


Figure 9-8B. Agilent 10881D/E/F Laser Head Cable

Cables

Agilent 10882A/B/C Laser Head Cable

Agilent 10882A/B/C Laser Head Cable, shown in Figure 9-9, is used to connect the Agilent 5519A/B Laser Head to the Agilent 10887P Programmable PC Calibrator Board.



Figure 9-9. Agilent 10882A/B/C Laser Head Cable

Cables

Agilent N1250A/B High Performance Receiver Cable

The Agilent N1250A/B Receiver Cable, shown in Figure 9-10, is used to connect the measurement signal from an Agilent E1708A Receiver or Agilent E1709A Receiver to an Agilent 10897B VME High Resolution Laser Axis Board, Agilent 10898A VME High Resolution Dual Laser Axis Board, or Agilent N1231A PCI Three-Axis Laser Board.

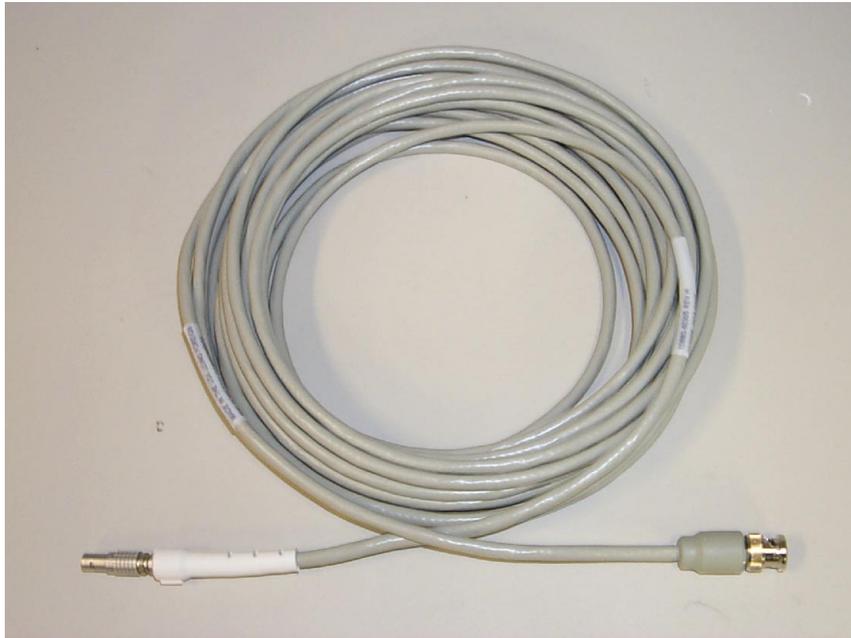


Figure 9-10. Agilent N1250A/B High Performance Receiver Cable

Cables

Agilent N1251A/B High Performance Laser Head Cable

The Agilent N1251A/B Laser Head Cable, shown in Figure 9-11, is used to connect the Agilent 5517A/B/C/D Laser Head to an Agilent 10897B VME High Resolution Laser Axis Board, Agilent 10898A VME High Resolution Dual Laser Axis Board, or Agilent N1231A PCI Three-Axis Laser Board. *It has a **DIN** connector for connecting to the Agilent 10884A Power Supply to provide power to the laser head.*



Figure 9-11. Agilent N1251A/B High Performance Laser Head Cable

Alignment Targets and Aids

Alignment targets and alignment aids, shown in Figure 9-12, can ease the job of aligning optical components of the laser measurement system.



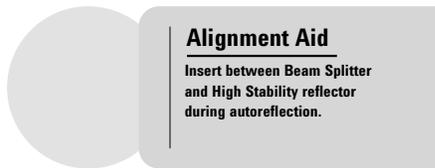
Alignment Target
P/N 10702-60001



Alignment Target
P/N 10705-60001



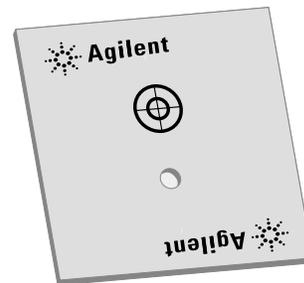
Alignment Aid
P/N 10706-60001



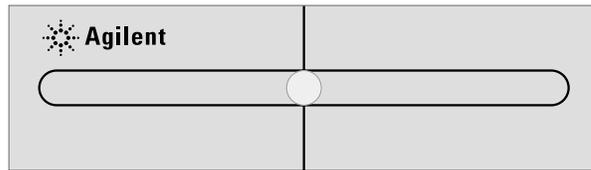
Alignment Aid
Insert between Beam Splitter
and High Stability reflector
during autoreflexion.



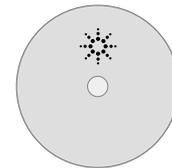
Alignment Aid
P/N 10706-60202



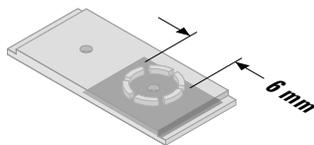
Alignment Aid
P/N 10767-67001



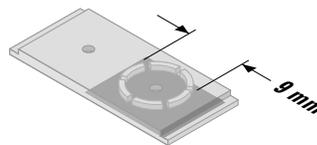
Alignment Target
P/N 10774-20021



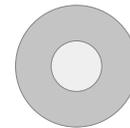
Alignment Aid
P/N 10774-67001



Alignment Target
P/N 10780-40003



Alignment Target
P/N 10780-40009



Alignment Target
P/N 7121-1114

Figure 9-12. Alignment targets and aids

Alignment Targets and Aids**Table 9-4. Alignment targets and aids**

Interferometer, other optic, or Receiver	Alignment Target	Alignment Aid
Agilent 10702A or Agilent 10702A-001	10702-60001	none
Agilent 10705A	10705-60001	none
Agilent 10706A	10702-60001	10706-60001
Agilent 10706B	10702-60001	10706-60001 10706-60202
Agilent 10715A	none	10706-60001
Agilent 10716A	none	10706-60001 10706-60202
Agilent 10717A	none	10706-60001
Agilent 10719A	none	10706-60202
Agilent 10721A	none	10706-60202
Agilent 10722A	none	10706-60001
Agilent 10735A	none	10706-60001
Agilent 10736A or Agilent 10736B-001	none	10706-60001
Agilent 10766A	none	10767-67001
Agilent 10767A	none	10767-67001
Agilent 10770A	none	10767-67001
Agilent 10774A	10774-20021	10774-67001
Agilent 10775A	10774-20021	10774-67001
Agilent 10780C	10780-40003	none
Agilent 10780F with 9 mm beam sensor head	10780-40009	none

Agilent 10753B Laser Tripod

The Agilent 10753B Laser Tripod is intended primarily for use with the Agilent 5519A/B Laser Head in an Agilent 5529A/55292A Dynamic Calibrator system. Information about the Agilent 10753B Laser Tripod is presented in the *Agilent 5529A/55292A Dynamic Calibrator Getting Started Guide* (Agilent manual part number 10747-90047).

Agilent 10759A Footspacing Kit

The Agilent 10759A Footspacing Kit is intended primarily for use when making Flatness Measurements with the Agilent 5529A/55292A Dynamic Calibrator system.

Information about the Agilent 10759A Footspacing Kit is presented in the *Agilent 5529A/55292A Dynamic Calibrator Measurement Reference Guide* (Agilent manual part number 10747-90051).

Optics

The optics listed here are those that are 1) not interferometers, and 2) not usually referred to as “beam-directing optics”.

Table 9-4 provides summary descriptions of the optics. More-complete descriptions follow the table.

Specification drawings of the optics described in this chapter are provided as part of the descriptions.

Available Agilent Technologies measurement optics are described in Chapter 7, “Measurement Optics,” of this manual.

Available Agilent Technologies beam-directing optics are described in Chapter 6, “Beam-directing Optics,” of this manual.

Agilent 10724A Plane Mirror Reflector**Table 9-5. Optics**

Component	Comment(s)
Order as required to manipulate beam path for your application.	
Agilent 10724A	Plane Mirror Reflector
Agilent 10728A	Plane Mirror (requires user-supplied mounting hardware)
Agilent 10772A	Turning Mirror
Agilent 10773A	Flatness Mirror
Agilent 10776A	Straightness Accessory Kit
Agilent 10777A	Optical Square

All Agilent laser systems can use the same Agilent 107XX series of optics.

Vacuum applications

Many of the optical components of the laser measurement system have vacuum options, which are compatible with vacuum environments. Contact Agilent Call Center for information (telephone numbers of various call centers are listed on the “Service and Support” page at the back of this manual). Typically, these components have housings made of stainless steel and optical elements attached to the housings using a lower volatility (vacuum-grade) adhesive. See the specifications for a list of materials used in the optics.

For those optics (such as the Agilent 10728A mirror) which require a user-created mount arrangement, it is the user’s responsibility to create a vacuum-compatible mounting, if one is required.

Agilent 10724A Plane Mirror Reflector

For linear applications requiring a plane mirror reflector, the Agilent 10724A Plane Mirror Reflector (see Figure 9-13) is recommended. It can be used with the Agilent 10706A, Agilent 10706B, Agilent 10715A, or Agilent 10716A plane mirror interferometers. The Agilent 10724A can only be used for single-axis linear measurements; for multi-axis applications that involve compound motions (such as X-Y stages), custom mirrors must be supplied by the user.

Agilent 10724A Plane Mirror Reflector



**Agilent 10724A
Plane Mirror Reflector**

Figure 9-13. Agilent 10724A Plane Mirror Reflector

Agilent 10724A Plane Mirror Reflector Mounting

These instructions give the details for mounting and installing the Agilent 10724A Plane Mirror Reflector. The Agilent 10724A is shipped with the 5061-6009 Hardware Kit.

The Agilent 10724A is designed to be mounted into a hole or pocket on the stage (moving object). The mounting surface for the Agilent 10724A should be closely perpendicular to the axis of machine travel.

Figure 9-14 shows the mounting hole details. Provision is made to lift the flange slightly off the mounting surface, thereby allowing pitch and yaw corrections to be made to align the Agilent 10724A exactly to the axis of machine travel.

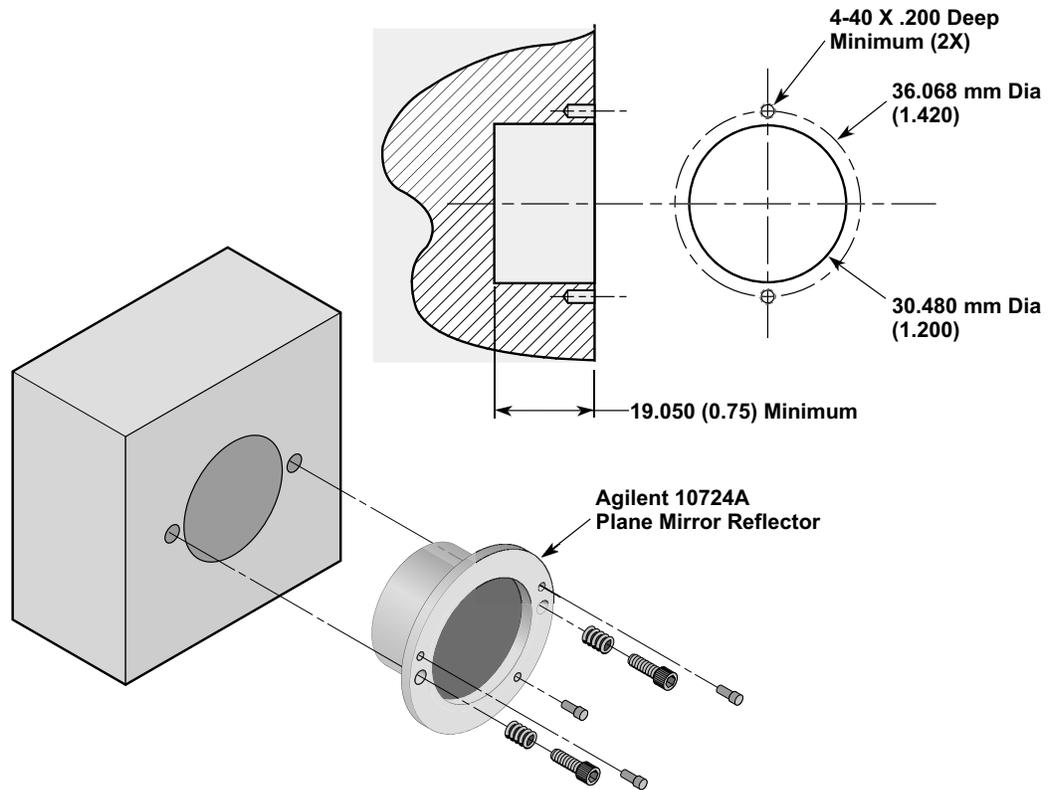
Agilent 10724A Plane Mirror Reflector**Agilent 10724A MOUNTING REQUIREMENTS**

Figure 9-14. Agilent 10724A Plane Mirror Reflector — mounting requirements and installation

To install the Agilent 10724A:

- 1** Install three #2-56 cap screws into the flange from the mirror side, but do not let the screws protrude through the flange.
- 2** Insert the labeled end (non-flanged end) of the Agilent 10724A into the mounting hole or pocket. Start the two #4-40 cap screws through the compression springs and the clearance holes in the flange and then into the mounting surface (See Figure 9-14).
- 3** Tighten the #4-40 screws so they contact, but do not compress, the springs.

Agilent 10724A Plane Mirror Reflector**CAUTION**

In steps 4 through 7 below, take care not to distort the mirror by over compressing the springs. The springs should never be tightened down solid; leave at least 0.001 clearance between the coils at all times. This may be checked by passing a piece of paper (about 0.001 inch thickness) through the coils.

- 4 Tighten each of the #4-40 screws one and a half turns. The springs are now initially compressed.
- 5 Advance the three #2-56 screws until they just contact the mounting surface. Then tighten each by one and a half turns to lift the housing off the mounting surface and further compress the springs.
- 6 Adjust the mirror in the pitch and yaw planes until it is perpendicular to the machine axis of travel by unscrewing the #2-56 cap screws. An auto-collimator or pre-aligned laser beam may be used for this purpose.
- 7 Again confirm that the springs have not been compressed solid by passing a piece of paper (about 0.001 inch thickness) through the coils.

Agilent 10724A Plane Mirror Specifications

Dimensions: see figure below

Weight: 50 grams (1.8 ounces)

Housing Material: 416 Stainless Steel

Reflectivity: 98% at 633 nanometers at normal incidence

Flatness: $\lambda/10$ (at 633 nanometers)

Installed Angular Adjustment Range: Pitch/Yaw: 1° Configurations

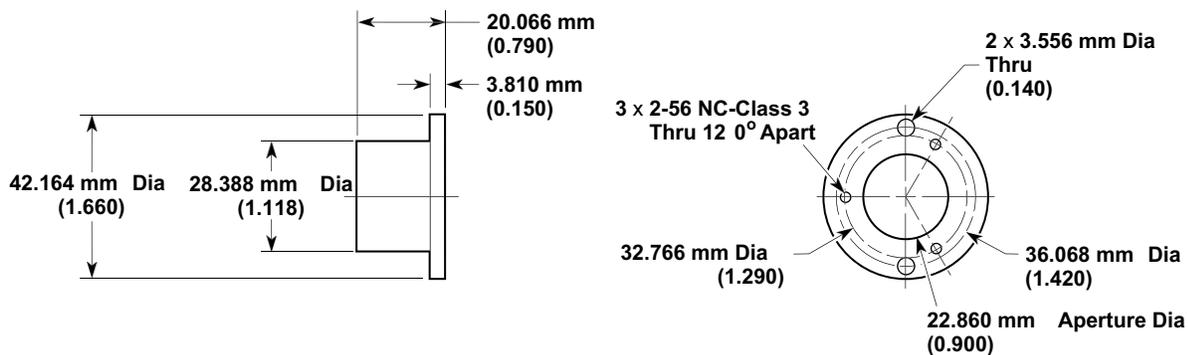


Figure 9-15. Agilent 10724A Plane Mirror — dimensions

Agilent 10728A Plane Mirror

This mirror is intended for use in a laser measurement system that uses a 9 mm (nominal) diameter or smaller laser beam. The 9-mm beam diameter requires use of this mirror, rather than a mirror that can only handle a beam up to 6 mm in diameter. A typical use of the Agilent 10728A Plane Mirror would be in a system that includes one or more of the following interferometers: Agilent 10735A, Agilent 10736A, Agilent 10736A-001. This mirror can also be used with smaller-diameter laser beams.

The Agilent 10728A Plane Mirror can be used with the Measurement Axis #2 beam paths from the Agilent 10736A-001 Three-axis Interferometer with Beam Bender. The Agilent 10728A is supplied without a housing.

Agilent Technologies does not provide mounting hardware for the Agilent 10728A mirror. This optic is intended for use in user-designed mounts. The user is responsible for devising a mounting method that does not cause stresses in the optical devices that will result in distortion of the reflected laser wavefronts.

Use of the Agilent 10728A mirror in a vacuum application depends on the materials used in the user-created mounting arrangement. Contact Agilent call center for information on a vacuum option Agilent 10728A.

Agilent 10728A Plane Mirror Specifications

Dimensions: see figure below

Weight: 21 grams (0.74 ounce)

Reflectivity: 98% at 633 nanometers at normal incidence

Flatness: $\lambda/10$ (at 633 nanometers)

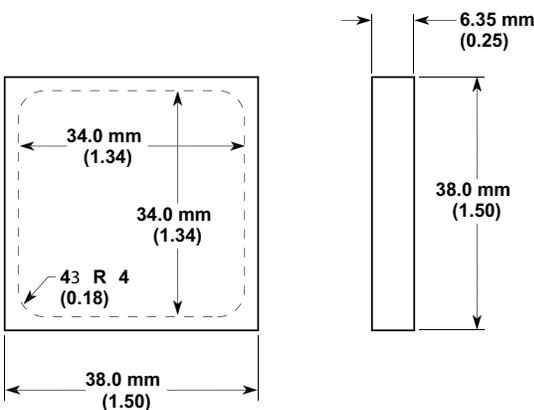


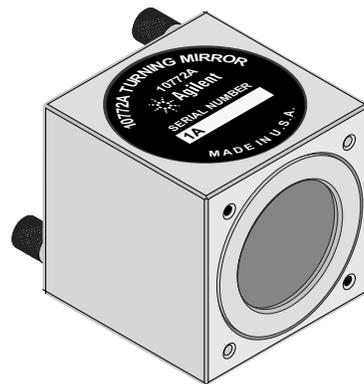
Figure 9-16. Agilent 10728A Plane Mirror — specifications

Agilent 10772A Turning Mirror

The Agilent 10772A Turning Mirror (see Figure 9-17) is a 100% reflectance mirror which turns the direction of an incoming laser beam 90 degrees. It can be used in place of the Agilent 10707A Beam Bender, if a larger aperture is needed, such as for use with a 9-mm diameter laser beam. The primary use of the Agilent 10772A Turning Mirror is in the laser calibration systems for machine tools.

The Agilent 10772A mounting screws have metric threads.

The same mirror is used in both the Agilent 10772A Turning Mirror and the Agilent 10773A Flatness Mirror; only the mounting is different.



**10772-67002
Assembly**



**10772-67001
Turning Mirror
Mount Assembly**

**Agilent 10772A
Turning Mirror**

Figure 9-17. Agilent 10772A Turning Mirror

Agilent 10773A Flatness Mirror

Agilent 10772A Turning Mirror Specifications

Dimensions: see figure below

Weight: 510 grams (18 ounce)

Materials Used:

Housing: Stainless Steel (416)

Apertures: Plastic (Nylon)

Optics: Optical Grade Glass

Adhesives: Low Volatility (Vacuum Grade)

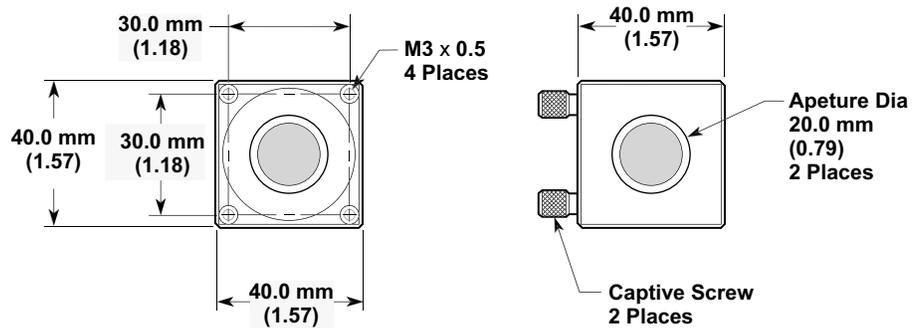


Figure 9-18. Agilent 10772A Turning Mirror — dimensions

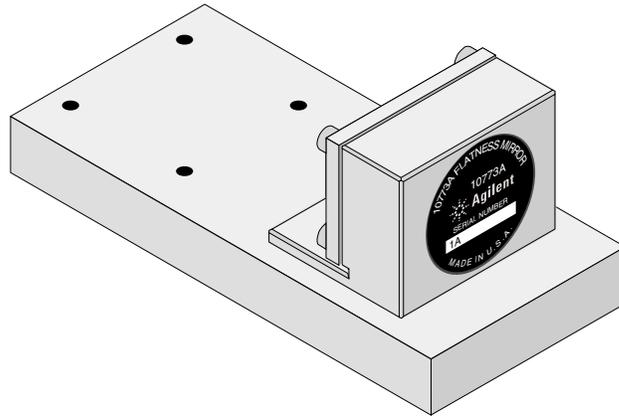
Agilent 10773A Flatness Mirror

The Agilent 10773A Flatness Mirror (see Figure 9-19) is a 100% reflectance mirror which turns the direction of an incoming laser beam 90 degrees. The same mirror is used in both the Agilent 10772A and Agilent 10773A, only the mounting is different. The Agilent 10773A can be used in place of the Agilent 10707A Beam Bender, if a larger aperture is needed.

The Agilent 10773A Flatness Mirror is used mostly in laser calibrator systems for machine tools. Its mounting is via a swivel-attached baseplate having no other tapped holes for alternate mounting.

The Agilent 10773A is shipped with the 5061-6019 Hardware Kit.

Agilent 10773A Flatness Mirror



**Agilent 10773A
Flatness Mirror**

Figure 9-19. Agilent 10773A Flatness Mirror

Agilent 10773A Flatness Mirror Specifications

Dimensions: see figure below

Weight: 661 grams (23.3 ounce)

Materials Used:

Housing: Stainless Steel

Optics: Optical Grade Glass

Adhesives: Low Volatility (Vacuum Grade)

Optical Efficiency: Typical — 99%, Worst Case — 98%

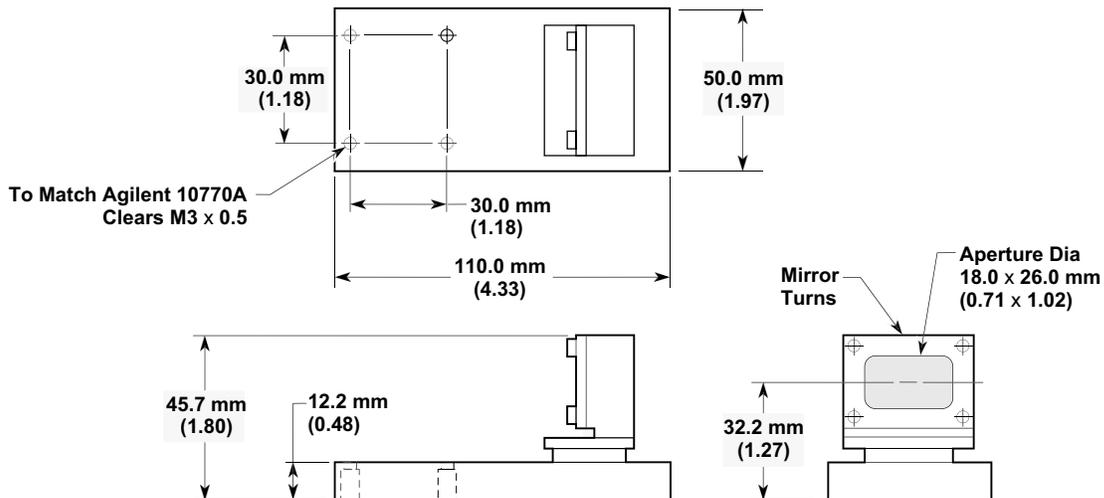


Figure 9-20. Agilent 10773A Flatness Mirror — dimensions

Agilent 10776A Straightness Accessory Kit

The Agilent 10776A Straightness Accessory Kit (see Figure 9-21) consists of a large retroreflector (Agilent part number 10776-67001) and mounting accessories. Its purpose is to facilitate vertical straightness measurements in calibrator applications. Refer to the *Agilent 5529A/55292A Dynamic Calibrator Measurement Reference Guide* (Agilent manual p/n 10747-90051) for application information.

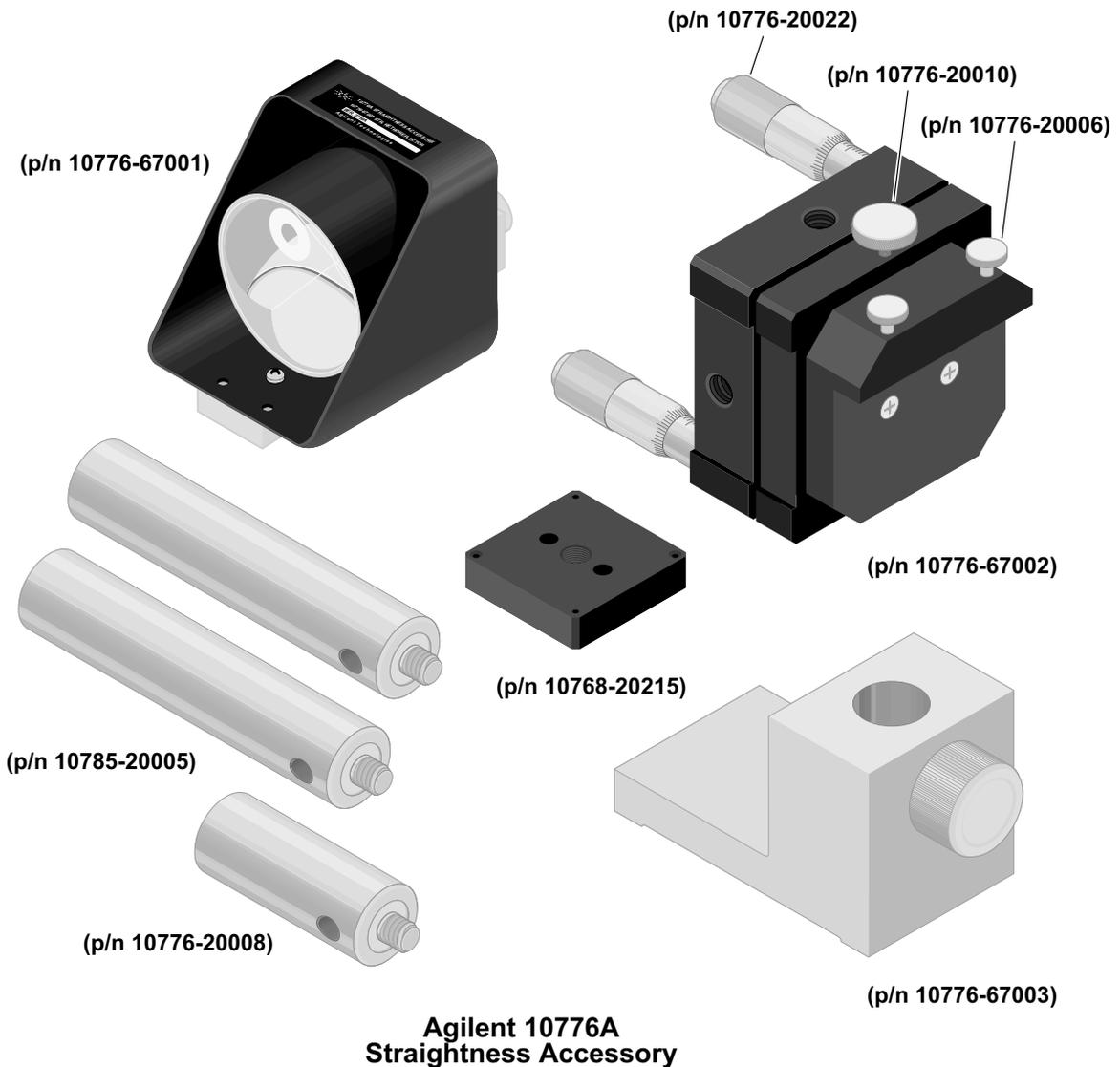


Figure 9-21. Agilent 10776A Straightness Accessory Kit

Agilent 10776A Straightness Accessory Kit

Agilent 10776-67001 Straightness Retroreflector Specifications

Dimensions: see figure below

Weight: 374 grams (13.2 ounces)

Materials Used:

Housing: Aluminum

Optics: Optical Grade Glass

Optical Efficiency: 80% (Worst Case)

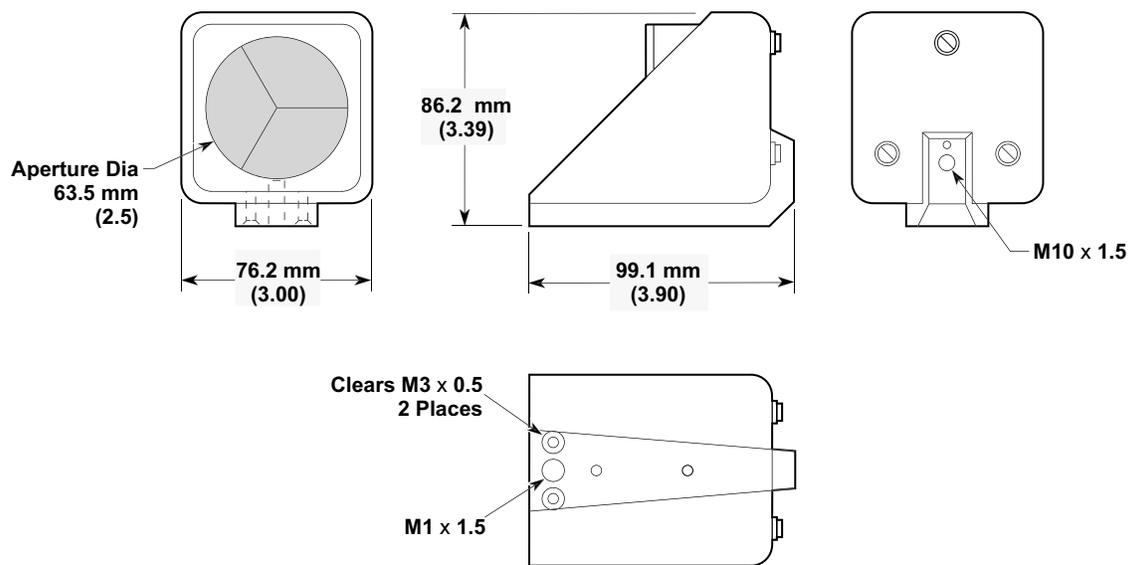
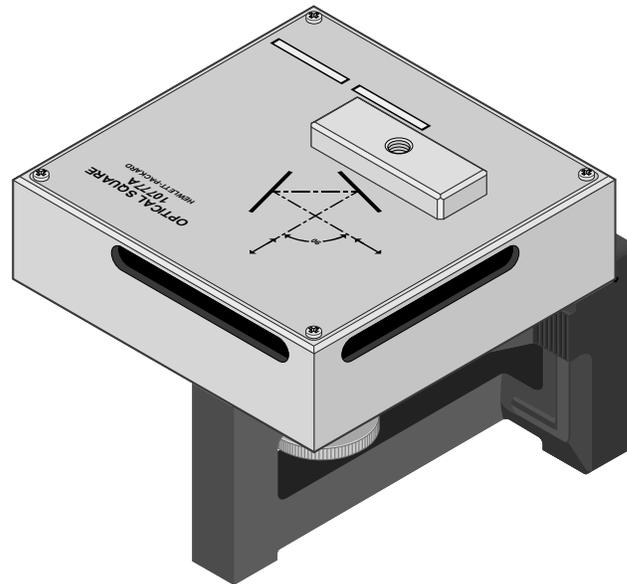


Figure 9-22. Agilent 10776-67001 Straightness Retroreflector — dimensions

Agilent 10777A Optical Square

The Agilent 10777A Optical Square (see Figure 9-23) directs an output beam at precisely 90 degrees to an input beam. It is used to measure the squareness of axes during laser calibration of a machine tool.

The Agilent 10777A Optical Square is used in specialized applications where the input beam must be turned at exactly 90 degrees. It contains two accurately aligned mirrors in a special housing. The optical square is a “constant-deviation” device because the 90-degree bend is constant even if there is an angular rotation between optical square and the input beam.



**Agilent 10777A
Optical Square**

Figure 9-23. Agilent 10777A Optical Square

Agilent 10777A Optical Square

Agilent 10777A Optical Square Specifications

Dimensions: see figure below

Weight: 4.0 kilograms (8.8 pounds)

Materials Used:

Housing: Aluminum

Optics: Optical Grade Glass

Optical Efficiency: 92% (Worst Case)

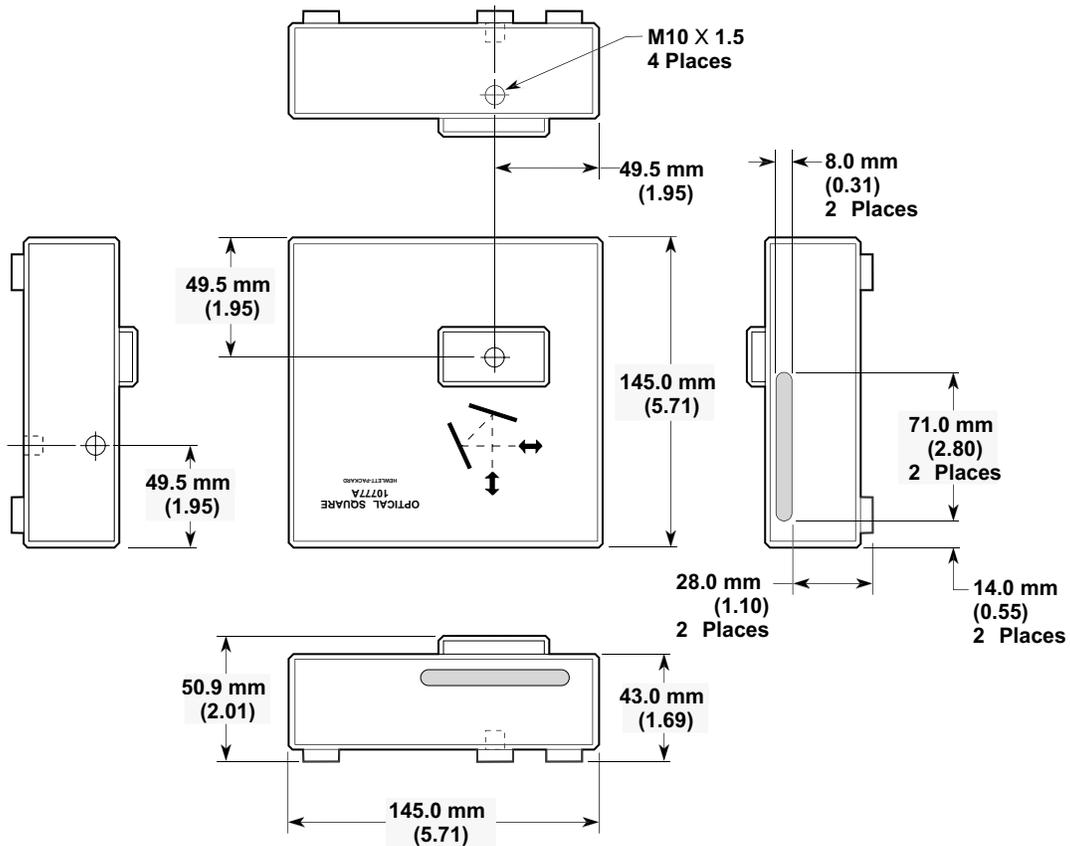


Figure 9-24. Agilent 10777A Optical Square — dimensions

Agilent N1203C/04C/07C Beam Manipulator Accessories

Adjustment tools

Adjustment tool kit (Agilent N1206T)

This kit contains a set of adjustment levers and an adapter that are designed to make user-desired beam alignment (by rotating the ball/mirror inside the manipulator) accessible from many different positions.

The tools (shown in Figure 9-25) contained in the kit are:

- Agilent N1206A Ball Adjustment Lever — long (176 mm)
- Agilent N1206B Adjustment Lever Adapter
- Agilent N1206F Ball Adjustment Lever — short (123 mm)
- Agilent N1206G Ball Adjustment Lever — bent (173 mm with 45° angle)

Customer-supplied hardware

A 5 mm Hex-key (customer-supplied) is needed to adjust the Agilent N1203C Precision Beam Translator Bender from the top or bottom, depending on how the translator is mounted.

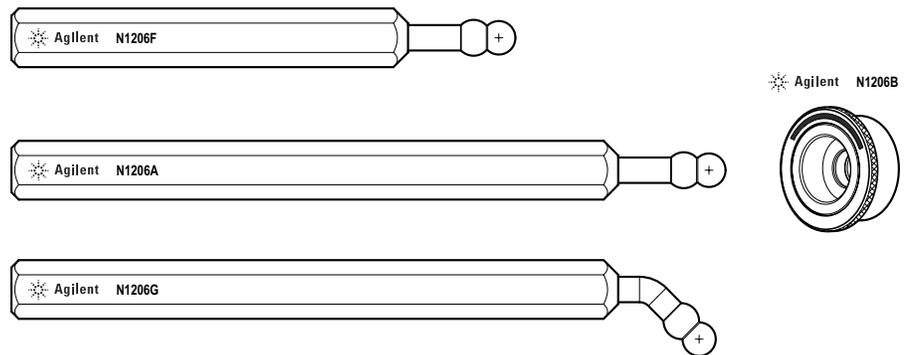


Figure 9-25. Agilent N1206T Adjustment Tool Kit

Agilent 10884A Power Supply

The Agilent 10884A Power Supply allows an Agilent Technologies laser head and up to six Agilent 10780C/F receivers to be operated from ac line power, in an Agilent laser transducer or laser calibrator system.

Agilent 10881A/B/C Laser Head Cable

The Agilent 10881A/B/C Laser Head Cable connects the Agilent 10884A Power Supply to the rear-panel connector of an Agilent laser head and to the Reference connector of an Agilent 10885A PC Axis Board, Agilent 10889B PC Servo Axis Board, or Agilent N1231A PCI Three-Axis Board. For other applications, such as with an Agilent 10887A PC Calibrator Board or in a VMEbus environment, a different cable is required (see “Cables” section in this chapter).

Laser heads and receivers with which the Agilent 10884A Power Supply and an Agilent 10881A/B/C cable may be used are:

- Agilent 5517A, Agilent 5517B, Agilent 5517C, or Agilent 5517D Laser Head
- Agilent 10780C Receiver, Agilent 10780F Remote Receiver, Agilent E1708A Remote Dynamic Receiver, or Agilent E1709A Remote High-Performance Receiver

As shown in the example, Figure 9-26, the receiver is connected to the Agilent 10885A board's Measurement connector. Receiver power is provided by a trace on the board. A multiple-receiver setup will use multiple Agilent 10885A axis boards; +15 V receiver power will be carried from one board to the next by a cable within the PC. As the number of receivers being used increases, the Agilent 10884A's +15 V output voltage may decrease to the point where it cannot operate the receivers and the laser head. Also, a longer receiver cable reduces the voltage available at the receiver. See the user's guide that is shipped with the Agilent 10884A Power Supply for more information.

Agilent 10884A Power Supply**Agilent 10884A and Agilent 10881A/B/C Installation and Use****NOTE**

If you are using an Agilent 10780C or 10780F receiver, connect it to the axis board's MEASurement connector.

- 1 Connect the Agilent 10881A/B/C cable to the Laser Head and to the PC or VMEbus axis board's Reference connector. A circuit trace on the board connects power from this connector to the Measurement connector, to which a receiver may be connected.
- 2 Connect the 10881A/B/C cable to the connector at the end of the Agilent 10884A's output cable.
- 3 Connect the ac line cord to the 10884A's input connector.
- 4 Plug the ac line cord into an operating ac line outlet.

The 10884A Power Supply has no power switch. As soon as it is plugged in, it will provide output power and its LED indicator will light.

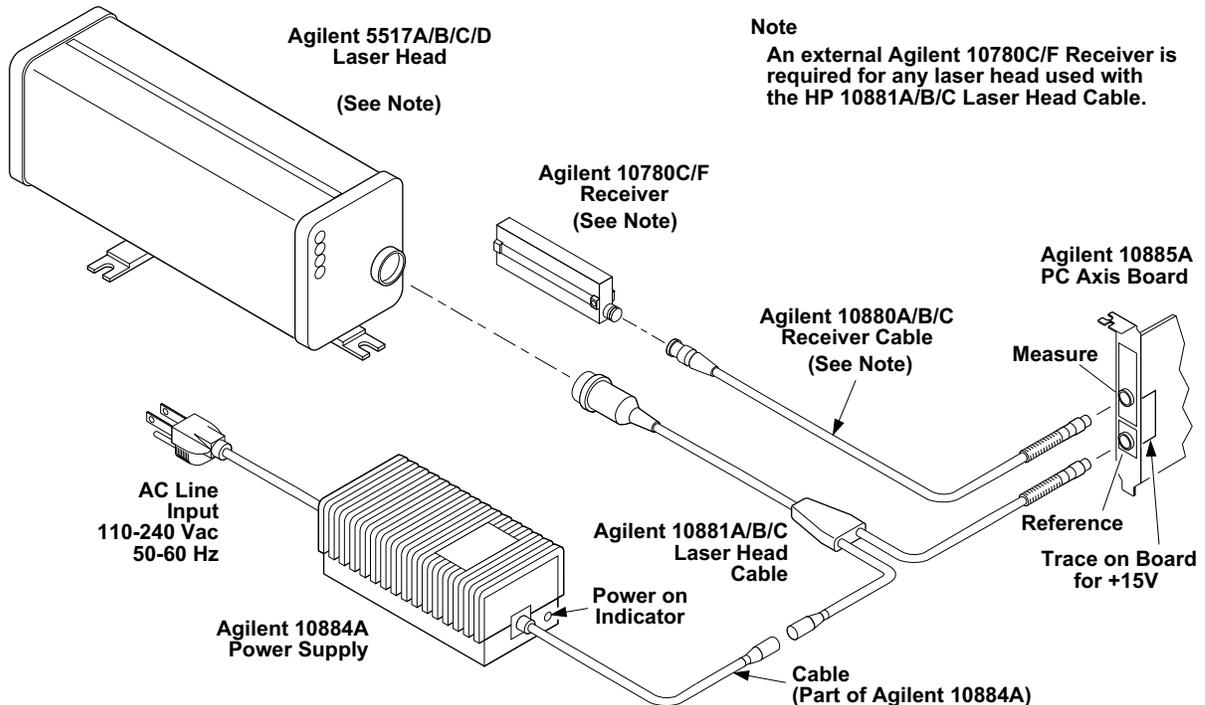


Figure 9-26. Agilent 10884A and Agilent 10881A,B,C installation and use

Agilent 10884A Power Supply

Agilent 10884A Power Supply Specifications and Characteristics

Dimensions: see figure below

Input Power: 110-240 Vac, 50-60 Hz

Output: +15 Vdc at 2.56 Amps

-15 Vdc at 0.03 Amps

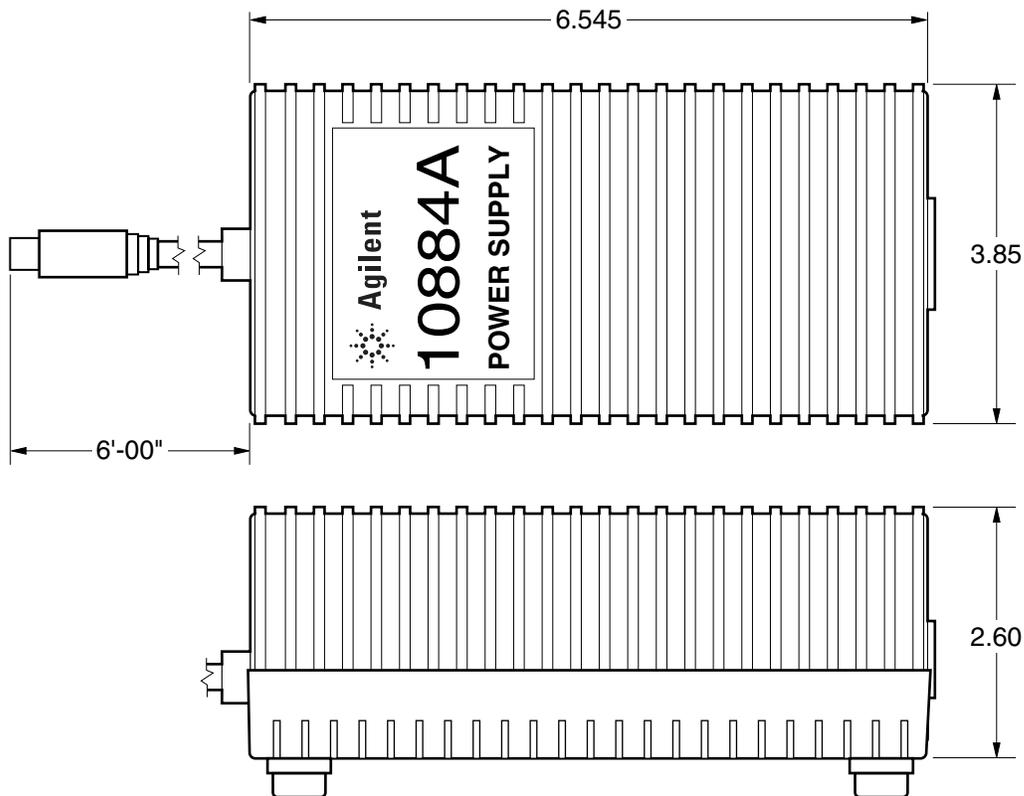


Figure 9-27. Agilent 10884A Power Supply — dimensions

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