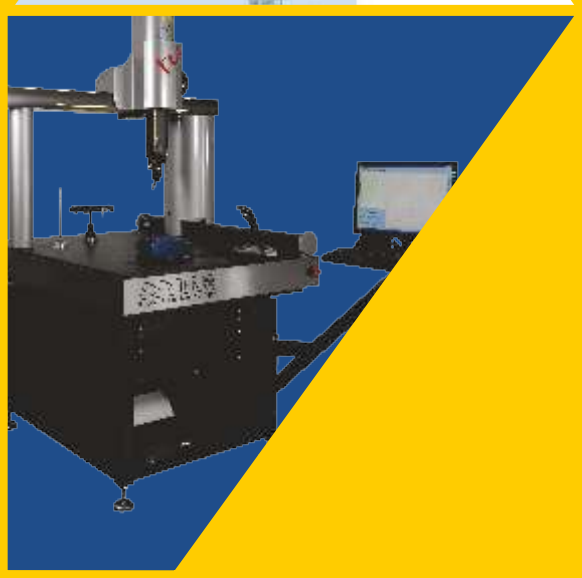

COORDINATE MEASURING MACHINES

EXTOL SHOP FLOOR CNC CMM - CMM Accuracy Wherever You Need It

True to Aberlink's heritage for innovation, the Extol is the world's first CMM to utilise a Delta Mechanism. Designed for robustness and reliability, the Extol CMM will run around the clock making it ideal whether it is positioned next to a machine tool, in a manufacturing cell, or used in a dedicated inspection area.

Five temperature sensors monitoring both the machine and ambient temperature ensure that the Extol is capable of operating in uncontrolled environments and reporting measurements as though they had been taken at 20°C. The software will also produce a warning should the temperature change at a rate that is not conducive with reasonable metrology practice.

The Automatic Tool Offset Correction available with the Aberlink 3D software compliments the attributes of the Extol perfectly, allowing utilisation as part of a fully automated production process in the midst of a manufacturing environment.

The ergonomics of the Extol have also been a significant design factor. It is not only quick and easy to perform one-off inspections, but also has ample access for either batch inspection or to facilitate automatic loading. With a larger measuring volume and smaller overall footprint than its predecessor, the Xtreme, the Extol can be positioned exactly where the measurement is needed.

Robust, accurate and reliable, the Extol CMM is the perfect solution to automatically verify part quality for critical components.

FEATURES

- No compressed air required - the Extol is 'plug and go'
- Built-in temperature control - accuracy is maintained even when ambient temperature is not controlled
- Automation and automatic tool offset compensation options mean that the Extol is ideally suited for automated manufacturing cells
- Fully sealed recirculating bearings that improve smoothness and dirt immunity
- The Extol's direct drive belts eliminate the need for a gearbox and any associated backlash issues
- Aberlink's revolutionary easy-to-use measurement software
- Free software upgrades till machine life

Model	Extol 370	Extol 520
Axis Travel (mm) Cylindrical At Centre	XY : Ø370mm Z : 270mm Z : 365mm	XY : Ø520mm Z : 300mm Z : 400mm
Overall Size (mm)	X 715	X 950
	Y 730	Y 990
	Z 2000	Z 2200
Overall Size (mm) with monitor arm	X 1000	X 1180
	Y 1030	Y 1320
	Z 2000	Z 2200
*Volumetric Accuracy:	TP20 (2.4 + L/250) µm	TP20 (2.4 + L/250) µm
	TP200 (2.3 + L/250) µm	TP200 (2.3 + L/250) µm
	SP25M (2.1 + L/250) µm	SP25M (2.1 + L/250) µm
Scale Resolution:	0.1µm	0.1µm
Operational Temp Range:	5 - 45°C	5 - 45°C
Table:	Granite plate	Granite plate
Max. Velocity Vector:	500mm/sec	500mm/sec
*The machine should not be positioned where it will be subjected to rapid changes in temperature. Max rate of ambient temperature change should not be more than 1°C/hour.		

MACHINE OPTIONS

- Dual monitors, ideal for use with CAD software options
- TP200B Probe upgrade available where high volume or high accuracy solutions are required
- 3 or 6-Port change racks available for both TP20 & TP200 options.
  (6-Port recommended for Extol 520 only)
- Fixturing automation & integration with Robot allows Extol to work in the automated manufacturing cells

BAKER

ABERLINK Innovative Metrology

Axiom too... Manual or CNC CMM

Fast, accurate and reliable, the Axiom too CMM comes in three different sizes with Y axis travel up to 1200mm. Available as either a manual machine or with full CNC control, the Axiom too can be used with touch trigger probe, continuous contact scanning probe or with Aberlink's revolutionary non-contact camera system.

The all aluminium bridge structure not only ensures that the Axiom too has low inertia and hence high acceleration to get the job done quickly, but also that the temperature of the machine rapidly follows the temperature of the room, ideal when the CMM is not housed in a controlled environment. Temperature compensation in the software reports results as if they had been measured at 20°C.

The standard high-tech granite and aluminium table, originally developed for the optics industry, provides fantastic natural damping of high frequency vibration and the granite Y rail allows pre-loading of the bridge air bearings in both directions for superior accuracy.

Another unique feature of the Axiom too is that manual machines can be simply upgraded to CNC at any point in the future, which is great if you are not initially sure of your requirement or perhaps can't initially justify the additional cost of a CNC machine.

Because of Aberlink's fully integrated manufacturing processes, the Axiom too offers unbelievable value, but above all it is simple to use. Aberlink 3D measurement software is way out on its own as the market leader for ease-of-use, perfect for both occasional user and also metrology professional alike.

FEATURES

- Shortest learning curve of any equivalent system
- Smallest overall footprint of any comparable size CMM
- Choice of Y axis sizes ranging from 600mm to 1500mm
- Suitable for the workshop environment
- Protection from environmental vibrations as standard
- Optimized friction free air bearings, all aluminium bridge and granite table
- Free software upgrades till machine life.

Axis Travel (mm)	X 640 Y 600, 900, 1200 Z 500
Overall Size (mm)	X 1040 Y 900, 1200, 1500 Z 2320
*Volumetric Accuracy:	TP20 (2.4 + L/250) μm TP200 (2.3 + L/250) μm SP25M (2.1 + L/250) μm
Scale Resolution:	0.5μm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	5 - 45°C
Table:	Honeycomb aluminium & granite or solid granite
Table Load Capacity:	300kg (Honeycomb) or 500kg (Solid)
Max. Velocity Vector:	600mm/sec (CNC)
Max. Acceleration Vector:	600mm/sec² (CNC)
Air Consumption:	65 l/min (1.8 cfm)
Required Air Pressure:	5 bar (72 psi)
*Maximum Permissible Error MPEE according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.	
**Installation environment thermal limits: Rate of change <1°C/hr and <2°C/24hr. Temperature gradient <1°C/m	

COMMON PROBE OPTIONS

- MH20i
- RTP20
- PH10T (w/TP20, TP200)
- PH10M (w/SP25)
- PH6M (w/SP25)

MACHINE OPTIONS

- Automatic Temperature Compensation
- Touch Screen Joystick
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor
- Fixture Kit

BAKER
ABERLINK
Innovative Metrology

Axiom too HS... High Specification CNC CMM

The Axiom too HS is both faster and more accurate than the standard model, and all without compromising the fantastic value for money for which Aberlink have become renowned.

Rather than using the belt drive system, the Axiom too HS incorporates drive rod technology developed on our larger machines and vision products. This allows even greater accelerations to be achieved meaning that the HS model measures approximately 20% quicker than the standard variant – ideal for high volume measurement.

The Axiom too HS also utilises 0.1μm resolution scales on each axis. Incorporated with state-of-the-art error mapping techniques this means that the HS model is the most accurate machine ever produced by Aberlink – ideal when measuring tight tolerances.

FEATURES

- Fitted with 0.0001mm linear encoders for superior accuracy
- Angled bearing zero backlash drive system for quicker acceleration and faster travel
- Shortest learning curve of any equivalent system
- Choice of Y axis sizes ranging from 600mm to 1500mm
- Suitable for the workshop environment
- Protection from environmental vibrations as standard
- Optimised friction free air bearings, aluminium bridge and granite table
- Free software upgrades till machine life

Axis Travel (mm)	X 640 Y 600, 900, 1200 Z 500
Overall Size (mm)	X 1040 Y 900, 1200, 1500 Z 2320
*Volumetric Accuracy:	TP20 (2.1 + L/250) μm TP200 (2.0 + L/250) μm SP25M (1.8 + L/250) μm
Scale Resolution:	0.1μm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	5 - 45°C
Table:	Honeycomb aluminium & granite or solid granite
Table Load Capacity:	300kg (Honeycomb) or 500kg (Solid)
Max. Velocity Vector:	866mm/sec
Max. Acceleration Vector:	1200mm/sec^2
Air Consumption:	65 l/min (1.8 cfm)
Required Air Pressure:	5 bar (72 psi)
*Maximum Permissible Error MPEE according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.	
**Installation environment thermal limits: Rate of change <1°C/hr and <2°C/24hr. Temperature gradient <1°C/m	

COMMON PROBE OPTIONS

- MH20i
- RTP20
- PH10T (w/TP20, TP200)
- PH10M (w/SP25)
- PH6M (w/SP25)

MACHINE OPTIONS

- Automatic Temperature Compensation
- Touch Screen Joystick
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor
- Fixture Kit

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Horizon 800... Starting The Linear Drive Revolution

The Horizon CMM breaks new ground in design and innovation using frictionless linear drives, which are the key to its fast and exceptionally smooth motion.

The kinematic isolated drive structure is completely independent of the CMM structure and ensures that the motor thrust is directed through the centre of gravity of the moving parts. This not only avoids acceleration induced metrology errors but also has the effect of thermally isolating the motors from the metrology structure of the CMM.

Linear motors are non-contact and therefore have no wearing parts and thus provide the perfect solution for CMM drives, improving reliability and reducing maintenance.

The Horizon is the stand-out machine with fast, smooth, silent motion ideally suited to contact scanning and with a first-term accuracy specification of under two microns.

FEATURES

- Linear motors offer frictionless, smooth, silent motion.
- No wearing parts means greater reliability and reduced maintenance.
- Drives applied through the centre of gravity improves both speed and accuracy.
- Thermal isolation of linear motors from the metrology structure avoids thermally induced metrology errors.
- Smooth motion allows for fast and accurate contact scanning.
- The most accurate machine in the Aberlink range. First term volumetric error specification under 2µm
- Automatic temperature compensation ensures that measurement results are reported as if they had been measured at 20°C
- Free software upgrades till machine life

Axis Travel (mm)	X 800 Y 1000, 1600 Z 600
Overall Size (mm)	X 1403 Y 1530, 2130 Z 2700
*Volumetric Accuracy:	TP20 (1.9 + L/250) µm TP200 (1.8 + L/250) µm SP25M (1.75 + L/250) µm
Scale Resolution:	0.1µm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	5 - 45°C
Table:	Granite
Table Load Capacity:	1000kg as standard
Max. Velocity Vector:	1020mm/sec
Max. Acceleration Vector:	1020mm/sec²
Air Consumption:	65 l/min (1.8 cfm)
Required Air Pressure:	5 bar (72 psi)
*Maximum Permissible Error MPEE according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.	
**Installation environment thermal limits: Rate of change <1°C/hr and <2°C/24hr. Temperature gradient <1°C/m	

COMMON PROBE OPTIONS

- RTP20
- PH10T (w/TP20, TP200)
- PH10M (w/SP25)
- PH6M (w/SP25)

MACHINE OPTIONS

- Automatic Temperature Compensation
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor
- Fixture Kit

Horizon 1000… Extending The Linear Drive Horizon

Drawing upon the tremendous success of the Horizon 800, the Horizon 1000 has a larger X-Y-Z axis travel whilst utilising the same frictionless linear drives.

The entire design of the Horizon 1000 has been optimised to take full advantage of parts already used on the Horizon 800 whilst improving the stiffness-to-weight ratio across the bridge assembly. Most notably: The Y-axis rail is 200mm taller so that the same right-hand-side linear drive system is common and improves rigidity; the carriage assembly has reduced in size and weight, without compromising metrology performance.

To improve the stiffess-to-weight ratio; the Z-axis motor has increased power to optimise its performance; the left-hand-side air bearing assembly has a custom extruded profile to keep weight to an absolute minimum and maintain stiffness.

FEATURES

- Linear motors offer frictionless, smooth, silent motion.
- No wearing parts means greater reliability and reduced maintenance.
- Drives applied through the centre of gravity improves both speed and accuracy.
- Thermal isolation of linear motors from the metrology structure avoids thermally induced metrology errors.
- Smooth motion allows for fast and accurate contact scanning.
- The most accurate machine in the Aberlink range. First term volumetric error specification under 2μm
- Automatic temperature compensation ensures that measurement results are reported as if they had been measured at 20°C
- Free software upgrades till machine life

Axis Travel (mm)	X 1000 Y 1200, 2000 Z 800
Overall Size (mm)	X 1603 Y 1830, 2630 Z 3070
*Volumetric Accuracy:	TP20 (1.9 + L/250) μm TP200 (1.8 + L/250) μm SP25M (1.75 + L/250) μm
Scale Resolution:	0.1µm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	5 - 45°C
Table:	Granite
Table Load Capacity:	1000kg as standard
Max. Velocity Vector:	1020mm/sec
Max. Acceleration Vector:	1020mm/sec^2
Air Consumption:	65 l/min (1.8 cfm)
Required Air Pressure:	5 bar (72 psi)
*Maximum Permissible Error MPEE according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.	
**Installation environment thermal limits: Rate of change <1°C/hr and <2°C/24hr. Temperature gradient <1°C/m	

COMMON PROBE OPTIONS

- RTP20
- PH10T (w/TP20, TP200)
- PH10M (w/SP25)
- PH6M (w/SP25)

MACHINE OPTIONS

- Automatic Temperature Compensation
- CCD Camera System
- Collimated Back Light Option
- Dual Monitor
- Fixture Kit

BAKER

Azimuth... Rapid, High Accuracy Large Volume CNC CMM

As CMMs get larger, it is not simply a case of scaling up the design of smaller models. Stiffness of the structure is critical, but weight must also be kept to a minimum. The Azimuth CMM is not only Aberlink's largest in their range of CMM products, but it is the culmination of over twenty years' experience and excellence in the design and manufacture of innovative metrology equipment incorporating the very latest materials technology.

The revolutionary bridge of the Azimuth incorporates aluminium honeycomb sheets developed for use in formula one and the aerospace industry. The remarkable stiffness to weight ratio that this provides gives the Azimuth an edge in both performance and speed. For a machine of this size, the Azimuth is not only fast, but extremely accurate.

The drive systems designed for the Azimuth offer simplicity and reliability and the novel system used on the Y axis ensures that there is no degradation of performance across the full range of machine sizes offered up to 3m. A big machine should also be able to measure a heavy component and this is another area where Aberlink have applied innovative thinking. Rather than simply increasing the depth of the granite table, which adds huge cost and weight to the machine, we offer a specially designed load plate to sit on the granite base. This plate can accept up to a six tonne load which will then be transmitted directly through the feet of the machine bench directly to the floor, meaning no loss of metrology performance.

FEATURES

- Capable of measuring parts up to 6000kg in weight
- Fitted with 0.0001mm linear encoders for superior accuracy
- Unique self-contained drive system ensures excellent performance over the entire measuring volume
- Choice of Y axis sizes ranging from 1000mm to 3000mm
- Supplied with the CMM touch screen joystick as standard
- Free software upgrades till machine life

Axis Travel (mm)	X 1200 Y 2000, 3000 Z 1000
Overall Size (mm)	X 1940 Y 3000, 4000 Z 3595
*Volumetric Accuracy:	TP20 (2.9 + L/250) μm TP200 (2.8 + L/250) μm SP25M (2.6 + L/250) μm
Scale Resolution:	0.1μm
**Optimum Temp Range:	18 - 22°C
Operational Temp Range:	5 - 45°C
Table:	Granite
Table Load Capacity:	1500kg as standard (Options up to 6000kg)
Max. Velocity Vector:	600mm/sec
Max. Acceleration Vector:	600mm/sec^2
Air Consumption:	65 l/min (1.8 cfm)
Required Air Pressure:	5 bar (72 psi)
*Maximum Permissible Error MPEE according to 10360-2, 2009 within the thermal limits defined for optimum temperature range.	
**Installation environment thermal limits: Rate of change <1°C/hr and <2°C/24hr. Temperature gradient <1°C/m	

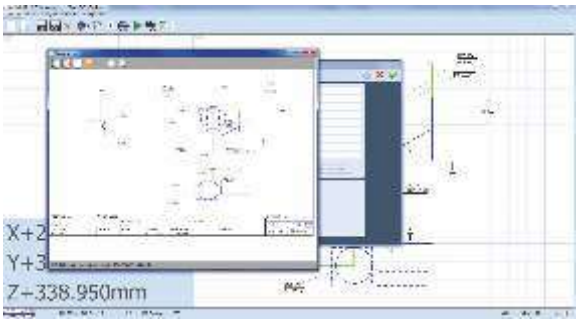
COMMON PROBE OPTIONS

- PH10T (w/TP20, TP200)
- PH10M (w/SP25)
- PH6M (w/SP25)

MACHINE OPTIONS

- Automatic Temperature Compensation
- CCD Camera System
- Collimated Back Light Option
- Load plate for loads up to 6 tonnes
- Dual Monitor
- Fixture Kit

Aberlink 3D Measurement Software - Making Measurement Easy



The whole philosophy for Aberlink is to make measurement easy. Aberlink 3D software has been written by engineers for engineers and sets the industry standard for simple-to-use software. Designed around a graphical interface, Aberlink 3D can work in 2D or 3D, on manual or CNC CMMs and is equally at home when used with either touch, scanning or vision systems.

Aberlink 3D software is not only ahead of its competition in being the industry standard for 'easy-to-use' software, but also has the depth of functionality to make it the choice for either occasional users or full-time inspection professionals.

Aberlink 3D software is revolutionary. For example, Feature Predict enables you to just take measurement points and the software automatically determines if you are measuring a Plane, Line or Circle feature. Move from feature to feature and the software predicts what you are measuring. As a component is measured a representation of it is built up on the screen. The user simply clicks on the measured features to call up dimensions exactly as they would appear on a drawing.

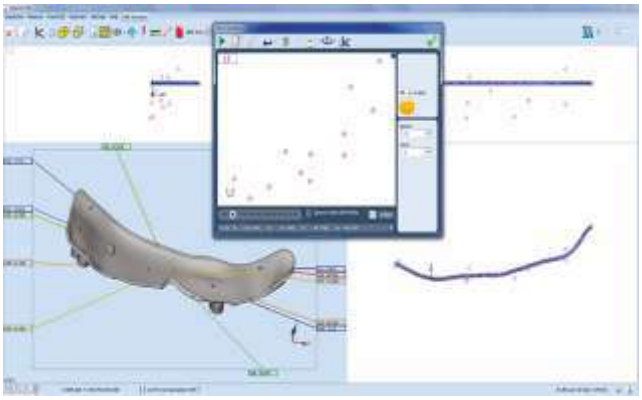
Inspection reports can be in the form of fully dimensioned graphical representations as created on the screen, or tabulated reports in various formats that can show nominals, tolerances, errors, pass/fails, geometric tolerances etc. These reports can also be output to an Excel spreadsheet. Real-time SPC is included.

Further reports are available to show the form of features (roundness, straightness etc.), hole or point positions, or complete batch results on one report. The user's company name also appears on all outputs.

Every time a component is inspected, a programme for measuring subsequent components is automatically created. The software also calculates 'safe' moves between features, even when the probe is indexing – just another thing that the operator doesn't have to worry about.

The new Leapfrog Feature in Aberlink 3D version allows to measure the component larger than the measuring volume of the machine.

Aberlink CAD Comparison Software Module

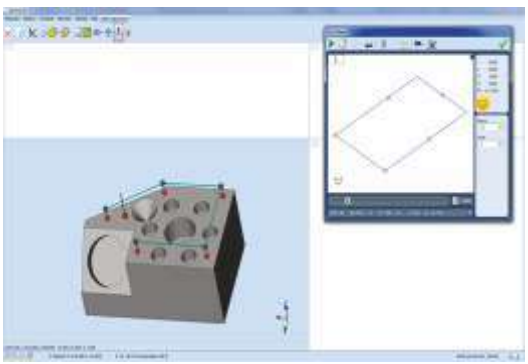


The Aberlink CAD Comparison software module enhances Aberlink 3D with the capability to compare measured points to a CAD model. Often this will be the only way to measure complex parts, or perhaps sometimes drawings for the component simply don't exist.

Powerful alignment routines allow measurement points to be best-fitted to the model. Colour coded errors can then be displayed on the model to produce both graphical and tabulated reports that are extremely clear and very easy to understand.

Aberlink's CAD comparison module allows the input of either STEP or IGES files as standard and allows reports to be exported as an Excel spreadsheet. It really does make measuring complex parts easy, whether on a manual or CNC CMM.

Aberlink CAD Programming Software Module



For many years Aberlink 3D software has been setting the industry standard for both ease of use and speed of programming. However, until now this has been best done by using the teach-and repeat method of programming when measuring a component. But what if you want to prepare the measurement programme before you even have the first component? Now, we are pleased to introduce our new CAD programming module, which in true Aberlink fashion, allows the simplest programming possible from either an IGES or STEP CAD model.

If you can use Aberlink 3D software then you will already know how to use the CAD programming module – it couldn't be easier. Rather than taking measurement points on a component, you can now just click on the surface of the model where you would like the points to be taken.

Feature Predict works in the same way as when measuring, for instance, if you click in four places on the same plane on the model, then the software will automatically create a Plane Measure unit with those four points in it. Then click on a different feature and it will automatically close the Plane window and look for another feature. If you click on a circular feature it will take just one click to produce a circle or two for a cylinder. Suddenly programming in Aberlink 3D just got even easier!

Aberlink's CAD programming module can be used either on the CMM or off-line... nothing could be more straightforward.

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Probe Options

Every bridge-type Aberlink CMM fully supports the range of probe heads and both touch trigger and scanning probes supplied by Renishaw. The following are common options:

TP8 PROBE

The TP8 probe offers an entry level option for customers that require infrequent indexing of the probe and no indexing during the running of a measurement programme. The TP8 is supplied with two knuckle joints to allow infinite alignment of the probe to the feature being measured, but this alignment is non-repeatable, meaning that the stylus will need to be requalified following each index. The TP8 probe accepts the M3 range of styli.

MH20i Probe Head

The MH20i probe offers repeatable manual indexing of the probe head from 0° to 90° in the A axis and through 360° in the B axis, in 15° increments. Ideal for manual CMMs, it can also be used on CNC models, but will require intervention from the operator whenever indexing is required. The MH20i uses a TP20 stylus module, which in turn accepts the M2 range of styli.

RTP20 Probe Head

The RTP20 probe offers a really cost effective solution for customers that require automatic indexing on CNC machines. Modelled on the MH20i body, the RTP20 uses the CNC motion of the CMM to position itself using a post mounted to the bed of the machine. Like the MH20i it is able to index from 0° to 90° in the A axis and through 360° in the B axis, in 15° increments and uses a TP20 stylus module, which in turn accepts the M2 range of styli. The RTP20 is also fully compatible with the MCR20 change rack to provide an option that provides both automatic stylus changing as well as automatic indexing.

PH10T Probe Head

The PH10T is a fully motorised probe head that offers immediate indexing from 0° to 105° in the A axis and through 360° in the B axis, in 7.5° increments. This probe head should be used by customers requiring frequent indexing or when more precise alignment to the features being measured is required.

Common probe options for the PH10T :

TP20

The TP20 is a robust probe for general purpose measurement that can be used in conjunction with the MCR20 change rack to facilitate automatic stylus changing. The TP20 stylus modules can be supplied with different trigger forces which accept M2 styli up to 60mm long, and with different length modules to assist with probing at greater depths.

TP200

The TP200 probe utilizes strain gauge technology and so does not exhibit lobing characteristics and therefore should be considered by customers requiring more accurate measurement of form. It can be used with the SCR200 change rack for automatic stylus changing and the TP200 modules are available as standard or low force for use with M2 styli up to 100mm long.

PH10M Probe Head

Like the PH10T probe head, the PH10M is also a fully motorised probe head that offer immediate indexing from 0° to 105° in the A axis and through 360° in the B axis, in 7.5° increments. The M head, however, incorporates an autojoint with multiwire capability, which is necessary for the SP25M scanning probe. The PH10M probe head can also be fitted with either TP20 or TP200 probes and should be chosen in preference to the PH10T when using these probes if the future use of a scanning technology may be required.

PH6M Probe Head

This head provides a fixed autojoint for when an SP25M scanning probe is needed without the requirement for indexing.

SP25M Scanning Probe

The SP25M scanning probe uses an isolated optical metrology transducer system to enable extremely accurate measurements to be taken with the stylus in continuous contact with the feature being inspected. This enables more data to be taken which is important when form is critical. A range of modules are available for the SP25M to provide optimised scanning performance using M3 styli up to 400mm long.

Probe Head Comparison	Integral Probe	Index Motion	Maximum Length	Index Resolution	Index Positions	Repeatable Indexing	Repeatable Stylus Changing
TP8	Yes	Manual	105mm	Infinite	Infinite	No	No
MH20i	Yes	Manual	150mm	15°	168	Yes	Yes
RTP20	Yes	Automated	168mm	15°	168	Yes	Yes
PH10T	No	Motorised	450mm	7.5°	720	Yes	Yes
PH6M	No	No	450mm	No	No	No	Yes
PH10M	No	Motorised	450mm	7.5°	720	Yes	Yes

CMM CAMERA

(TOUCH & VISION ON THE SAME MACHINE)

Aberlink's camera system offers a non-contact facility on any Aberlink CMM. A clever design of magnetic, kinematic joint allows the probe and camera to be swapped in just seconds. This means that components can be inspected using both touch trigger and vision inspection technology on the same machine.

The camera incorporates a telecentric lens that gives a distortion-free image on the monitor. It also contains a fully programmable 16-LED light ring which contains alternate white and UV LEDs. The white LEDs provide surface illumination in the normal manner while the UV LEDs provide an ingenius solution to the perennial problem of backlighting on a CMM - the component to be measured is simply placed on a plate containing special reflective paper.