





MEASUREMENT & CALIBRATION SYSTEMS





Measurement & Calibration

MIC TRAC 4000 In-House Precision Gage Calibration System

Inspect Parts, Calibrate, and Track Gages



Choosing the Right

Step 1: Find what type of gages you have.

Gages & Indicators for Calibration

RG-7000	PD-8000	Calipers	Depth Micrometers	Indicators	LG-5002 / Allen Lead Gage	LG-5003
PG-6000	ET-7000 IT-6000					

Step 2: Determine which system you need.

MT-4000
(Accuracies to .00001"
(.254μ))



(≥0.0001" Res.)

MT-3000
(Accuracies to .00002"
(.508μ))



(≥0.0005" Res.)

Step 3: Locate the fixtures and accessories necessary.

Cal-Pak Calibration Package

Included with MT-4000 In-House Calibration System; can be purchased separately.

Necessary Fixtures & Accessories By Gage Type

TF-1F	TF-SA	TF-CA	TF-DG	TF-IND	TF-LG-2	TF-LG-3
TF-SA to Support RG-7000/ PG-6000 for Setting	TF-1F 	TF-SA to Support Long Calipers	TF-SS Required to Support Extended Probes		TF-1F 	TF-1F
	TF-SV 		TF-SS 			



MIC TRAC 3000 Shop Floor Gage Setting and Part Measurement System

Measure Parts, Calibrate Hand-Held Gages, and Preset Indicator Style Gages

Calibration System

TH-3000	PD-8000	Test Indicator	Cylindrical Ring	Threaded Plug	Threaded Ring (Solid Only)	Cylindrical Plug (NPT)	Spline Gage	Dial Bore Gage
<p>MRP Upper Arm</p>	<p>OD Micrometer</p> <p>Micrometer Standard</p> <p>ET-7000</p> <p>IT-5000</p>							



($\geq 0.0001''$ Res.)



($\geq 0.0005''$ Res.)

Additional Calibration Accessories

These fixtures and accessories are not part of the CAL-PAK and must be purchased separately.

TF-VB	TF-SV	TF-SS (included in the CAL-PAK)	TF-CR	TF-2R	TF-IT	TF-TP	TF-SP	TF-VN
TF-1F	TF-1F	TF-1F (included in the CAL-PAK)	1-2-3 BLOCKS	MASTER RING GAGE BLOCK	1-2-3 BLOCKS	TF-2R THREAD WIRES	1-2-3 BLOCKS	TF-1F (included in the CAL-PAK)
		<p>TF-TI Required with TF-SS to Test Indicator Probes</p> <p>TF-TI</p>	<p>INTERNAL GAGE BLOCK</p>	<p>TF-WH</p>				



Choosing the Right Calibration System

Most companies use various gages and tools that need calibrating, setting, and zeroing. Historically, calibration caused multiple headaches from tracking, scheduling, shipping, and instrument downtime. Now, companies who implement in-house calibration see a quick return on their investment with less headaches and increased efficiency. Gagemaker systems are customizable, allowing you to create your own calibration plan as simple or as comprehensive as you want. Our versatile, cost effective and easy-to-use **MIC TRAC** calibration and gage setting systems produce accurate, repeatable, reproducible results that you can trust.

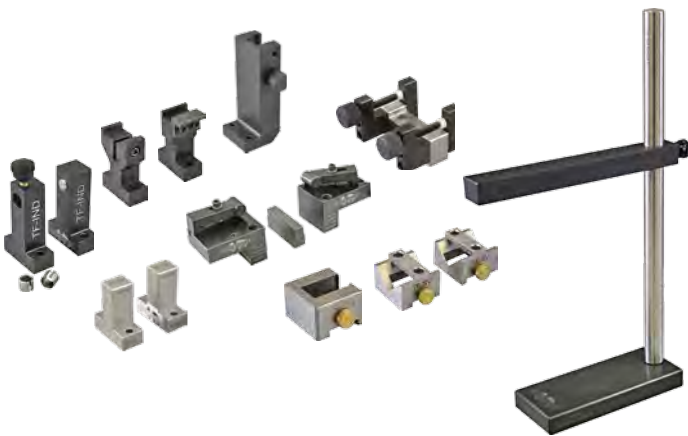




**MIC TRAC 3000
Shop Floor Gage Setting and
Part Measurement System**



**MIC TRAC 4000 In-House Precision
Gage Calibration System**



Calibration Accessories



Calibrator Gage



Shop Floor Gage Setting and Part Measurement System

Employing a versatile bench mounted length measuring system allows you to calibrate hand-held gages, preset indicator style gages, and with the optional Force-Lok, measure parts. The MIC TRAC 3000 Shop Floor Series Gage Setting and Part Measurement System sets or zeros most gages with the standard resolution of .00005", accuracies ranging from $\pm.0001"$ to $\pm.0004"$ (traceable to the NIST) and the digital read out is CE approved. The cost effective Force-Lok feature improves repeatability from operator to operator and is well suited for a variety of environments including the shop floor.



MT-3012-50

MIC TRAC 3000 Shop Floor Gage Setting and Part Measurement System

MT-3000 Standard Base Units Without Force-Lok. Supplied with Digital Readout, TF-PL setting blocks, and shipping carton.

Model	Description	Accuracy	Resolution	Internal Range	External Range
MT-3012-50	MIC TRAC Base Unit w/ DRO	$\pm.0001"$	.00005"	0" – 12"	1½" – 13½"
MT-3024-50	MIC TRAC Base Unit w/ DRO	$\pm.0002"$	.00005"	0" – 24"	1½" – 25½"
MT-3036-50	MIC TRAC Base Unit w/ DRO	$\pm.0003"$	.00005"	0" – 36"	1½" – 37½"
MT-3048-50	MIC TRAC Base Unit w/ DRO	$\pm.0004"$	.00005"	0" – 48"	1½" – 49½"
MT-3060-50	MIC TRAC Base Unit w/ DRO	$\pm.0005"$	.00005"	0" – 60"	1½" – 61½"

MT-3000 Standard Base Units With Force-Lok. Supplied with Digital Readout, TF-PL setting blocks, and shipping carton.

Model	Description	Accuracy	Resolution	Internal Range	External Range
MT-3012F-50	MIC TRAC Base Unit w/ DRO	$\pm.0001"$	.00005"	0" – 12"	1½" – 13½"
MT-3024F-50	MIC TRAC Base Unit w/ DRO	$\pm.0002"$	.00005"	0" – 24"	1½" – 25½"
MT-3036F-50	MIC TRAC Base Unit w/ DRO	$\pm.0003"$	.00005"	0" – 36"	1½" – 37½"
MT-3048F-50	MIC TRAC Base Unit w/ DRO	$\pm.0004"$	.00005"	0" – 48"	1½" – 49½"
MT-3060F-50	MIC TRAC Base Unit w/ DRO	$\pm.0005"$	.00005"	0" – 60"	1½" – 61½"

*A computer can be added for additional cost to any of the above MT-3000 models.
Setting Blocks are also available. Please see pages 132 -133 for more options.*

Gage Setting, Part Measurement, & Hand Tool Calibration System

Gagemaker offers the MT-3000 system with data capture and document storage options. This system includes a computer connected to the MIC TRAC and the CERTIFI software for producing calibration documents. The base unit ships with the Force-Lok feature that allows for calibration of micrometer and rod standards.



MT-3012F-50-USBC

MIC TRAC 3000 Gage Setting, Part Measurement, and Hand Tool Calibration System

MT-3000 Base Units With Force-Lok, Computer, MT-4-USB, TF-PL setting blocks, and a shipping carton.

Model	Description	Accuracy	Resolution	Internal Range	External Range
MT-3012F-50-USBC	MIC TRAC Base Unit with Force-Lok, Computer, & MT-4-USB	±.0001"	.00005"	0" – 12"	1½" - 13½"
MT-3024F-50-USBC	MIC TRAC Base Unit with Force-Lok, Computer, & MT-4-USB	±.0002"	.00005"	0" – 24"	1½" - 25½"
MT-3036F-50-USBC	MIC TRAC Base Unit with Force-Lok, Computer, & MT-4-USB	±.0003"	.00005"	0" – 36"	1½" - 37½"
MT-3048F-50-USBC	MIC TRAC Base Unit with Force-Lok, Computer, & MT-4-USB	±.0004"	.00005"	0" – 48"	1½" - 49½"
MT-3060F-50-USBC	MIC TRAC Base Unit with Force-Lok, Computer, & MT-4-USB	±.0005"	.00005"	0" – 60"	1½" - 61½"

*Even higher resolution MT-3000 systems are also available.
Setting Blocks can be found on page 133.*



MIC TRAC 4000 In-House Precision Gage Calibration System

Establishing an in-house calibration service represents an investment in facilities, equipment and trained personnel, but grants you total control over all of your calibration process as well as saves you time and money over the long term. Gagemaker's MIC TRAC 4000 Series In-House Precision Gage Calibration System enables you to inspect parts, calibrate and track a wide variety of gage styles including solid ring and plugs. This innovative high precision metrology system with 1.00" travel guarantees extremely high accuracies to ± 0.00002 and a resolution of $.00001$ " (traceable to the NIST). This system also enables you to track and maintain gage history as well as produce calibration certificates.



MIC TRAC 4000 In-House Precision Gage Calibration System

This package features the MIC TRAC/MT-4000 as a precision calibration system. The system accepts fixtures that inspect and calibrate a wide range of gage diameters and thread pitches. The package includes all the equipment necessary to calibrate precision handheld gages. **Solid ring and plug inspection requires the purchase of additional accessories.**

Package includes:

- MT-4012-10 MIC TRAC electronic adjustable measurement master, range 0" to 12". Base unit is error compensated to an accuracy of ± 0.00005 ", resolution $.00001$ ", travel 12.000".
- Ultra precision scale with 1.00" travel, accuracy ± 0.00002 ", and resolution $.00001$ ".
- Computer with CERTIFI Calibration Software. CERTIFI produces calibration reports, has a recall database, and a digital readout acquisition module. (MT-4-USB)
- CRC MT-4000 Calibration Reference card set-up procedures documenting calibrations with the Gagemaker system
- TF-2R: Carbide anvil set, $\frac{3}{8}$ " diameter
- TF-XYT: Adjustable X, Y & tilt support table for use with the MIC TRAC
- CAL-PAK: Assortment of fixtures designed to hold gages for calibration
- TDWIN Thread Disk software program: provides critical thread dimensions for manufacturing and inspection of UN, Acme, Stub Acme, Metric, Buttress, and NPT threads.
- Torque wrench, 50 in. lb. (TW-50)
- AWH-100 bench-top tool holder with wrenches
- Reusable shipping container

Model	Description	Range
PGC-12-W2	Precision Calibration Package	0" - 12"
PGC-24-W2	Precision Calibration Package with MT-4024-10 MIC TRAC	0" - 24"
PGC-36-W2	Precision Calibration Package with MT-4036-10 MIC TRAC	0" - 36"
PGC-48-W2	Precision Calibration Package with MT-4048-10 MIC TRAC	0" - 48"



MIC TRAC 4000 Base Units with Software

A MIC TRAC 4000 (MT-4000) base unit supplied only with digital readout software, a computer, TF-2R setting blocks, and a shipping carton.

Model	Description	Accuracy	Resolution	Range
MT-4012-10	MIC TRAC Base Unit	±.00005"	.00001"	0" - 12"
MT-4024-10	MIC TRAC Base Unit	±.00005"	.00001"	0" - 24"
MT-4036-10	MIC TRAC Base Unit	±.00005"	.00001"	0" - 36"
MT-4048-10	MIC TRAC Base Unit	±.00005"	.00001"	0" - 48"

MIC TRAC 4000 Ring and Plug Accessories*

Model	Description
TF-1F	Flat face setting blocks
TF-1F-C	Carbide flat face setting blocks
TF-CP	Ball contact holders, .500 ID measurement
TF-CR	Set of 3 fixtures for measuring cylindrical ring gages and bores. CR-1 (.170"-.249"), CR-2 (.250"-.879"), CR-3 (.880" - Larger)
TF-IT	Internal threaded ring arm P.D. module (for solid threaded ring gages). Contains ball contacts and holders for 6, 8, 10, 12, 14, 16, 18, and 20 pitch 60° threads (Diameter range 1.500" & Larger).
TF-SP-5	For vertically holding gage pins .062 - .500
TF-SP-75	For vertically holding gage pins .062 - .750
TF-TP	Calibration fixture for NPT, NPTF and ANPT tapered plug gages (includes wires for 27, 18, 14, and 11 ½ pitch threaded plugs). (Requires TF-2R blocks)
TF-WSV	Thread wire holder set. Contains wires and holders for 6, 8, 10, 12, 14, 16, 18, 20, 24, 28 and 32 pitch 60° threads.
TF-WSA	Thread wire holder set. Contains wires and holders for 4, 5, 6, 8, 10, 12, 14 and 16 pitch Acme 29° threads.
TF-WSM	Thread wire holder set. Contains wires and holders for .5, .6, .75, 1.0, 1.25, 1.5, 2.0, 3.0, 4.0 and 5.0 pitch metric 60° threads.

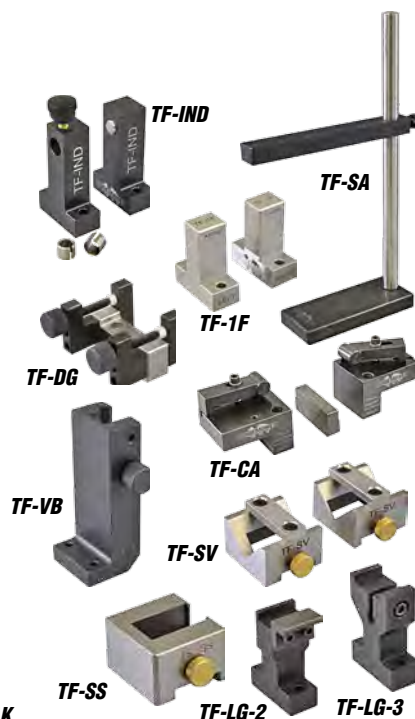
*Additional Thread Wire Holders and Cylindrical Ring and Thread Ring and Plug Gage accessories are on page 135.



System Accessories

Gagemaker provides multiple fixtures and accessories that enable you to calibrate many types of hand-held gages using the MIC TRAC System. Precision fixtures are designed to ensure the gage's proper positioning which is vital in securing the highest calibration accuracy and most consistent measurement results.

The CAL-PAK collection of fixtures handles most standard Gagemaker gages, as well as calipers, dial indicators, test indicators, bore gages, micrometers, micrometer standards and depth gages (See pages 84-85 for calibration guide.) The CAL-PAK can be used on both the MT-3000 and MT-4000, while other fixtures and accessories are only applicable to the MT-3000. This huge variety of accessories provides unmatched versatility in measurement capabilities.



MIC TRAC System Options

The following base units and accessories are available for additional requirements for either the MIC TRAC 3000 or MIC TRAC 4000.

Model	Description
CAL-PAK	Complete Calibration Package (All fixtures are also individually available.) Includes: TF-1F, TF-CA, TF-DG, TF-IND, TF-LG-2, TF-LG-3, TF-SA, TF-SS, TF-SV, TF-VB, and storage case
TF-TI	Test indicator calibration block*
TF-VN	"V" blocks for calibration of axial travel probes and bore gages
TF-BA	Base support block for setting dial bore gages**
TF-BI	Base support plate for setting dial bore gages**
TF-CG	Universal clamping fixture for calibration of indicators and gages*

*One TF-1F block required with this accessory, sold separately; **Two TF-1F blocks required with this accessory, sold separately

MIC TRAC 3000 Calibration Documentation

Model	Description
CRC-MT3000	Complete procedural documentation for the calibration of handheld inspection equipment including: O.D. & I.D. micrometers, calipers, depth micrometers, and more.

MIC TRAC 4000 Only Accessories

Model	Description
CRC-MT4000	Complete procedural documentation for the calibration of handheld inspection equipment including: O.D. & I.D. micrometers, calipers, depth micrometers, ring and plug gages, and more.
MT-4-USB	Digital readout software module with digital data acquisition card w/ CERTIFI
TF-2R	3/8" diameter carbide anvil set
TF-SB	Adjustable height support table
TF-SB-1	Bearing rail support base
TF-XYT	Adjustable height support table, X-axis & Y-axis support base

Bench Calibrator

The Gagemaker calibrator gage, CG-1001/CG-1001E, calibrates gages and indicators per AGD specification. The CG-1001 uses a non-rotating spindle screw type micrometer which reads directly to .0001" and can be estimated to the closest .00005".

Disassembling the gage is not required for calibration. The vise assembly allows full vertical and horizontal adjustment of the gage or indicator clamped in the vise jaws. During calibration, an outboard arm and arm support allows for larger gage assemblies to be securely supported.

Four supplied accessory fixtures will help speed up calibration while maintaining accuracy.



CG-1001



CG-1001E

Bench Calibrator

The CG-1001 is our standard bench calibrator, while the CG-1001E is our digital version which includes an SPC output. The CG-1000 models are shipped in a durable custom shipping/storage case. Optional wooden storage cases available.

Model	Description	Range	Accuracy
CG-1001	Bench Calibrator	.0001" Resolution, Mechanical	±.0001
CG-1001E	Digital Bench Calibrator w/ SPC Output	.00005"/.001 mm Resolution, Digital	±.00015

Bench Calibrator Fixtures

Bench Calibrator fixtures are included with the purchase of any bench calibrator, but are also offered individually as additional or replacements. These fixtures are used in calibration of select gages. Not all applicable gages require a fixture; however, some gages require two fixtures.

Model	Description	Applicable Gages
CG-1001-A	Bench Calibrator Fixture A	Lead Gages, Internal Taper Gage (IT-6000)
CG-1001-B	Bench Calibrator Fixture B	Lead Gages, Internal Taper Gage (IT-6000)
CG-1001-C	Bench Calibrator Fixture C	MRP Series, Internal Thread Height (TH-3000 INT)
CG-1001-D	Bench Calibrator Fixture D	Indicators