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**Industrial automation systems and  
integration — Physical device control —  
Dimensional Measuring Interface  
Standard (DMIS)**

*Systèmes d'automatisation industrielle et intégration — Contrôle du  
dispositif physique — Norme d'interface de mesurage dimensionnel  
(DMIS)*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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ISO 22093 was prepared by the American National Standards Institute (ANSI) (as DMIS 5.2) and was adopted, under a special "fast track procedure", by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 1, *Physical device control*.

## ITIN STANDARD REVIEW

This second edition cancels and replaces the first edition (ISO 22093:2003), which has been technically revised.

The significant changes are listed below: [ISO 22093:2011](#)

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Annex G: New annex to list deleted statements. Because of the confusion and ambiguity created if a new statement is created to replace or enhance an existing statement, this annex was added.

FEAT/LINE: Changed the definitions for the endpoints of the line to explicitly state that the first point is the starting point and the second point is the ending point.

Intrinsic functions: Changed CONCAT(str,str var\_2) to CONCAT(str var\_2).

Changed MN(x,x var\_4) to MN(x var\_4)

Changed MX(x,x var\_4) (to MX(x var\_4))

FEAT/OBJECT: removed ambiguity with input & output values.

DATDEF: the syntax did not allow for a single datum target, though this is explicitly allowed by Note 3 text.

Clause 5.3.1: added normative text for vector operators.

CONST (input format 6): added Ellipse to the var\_1 options.

Clause 5.1.6 Removed the 80 character line length limitation and changed it to a max line length of 65,536 characters and the line is terminated with a carriage return(CR) and line feed(LF).

IF: Modified the var\_x options.

TOL/ANGLWRT: Modified the var\_1 options.

SCNSET: Added the minor word DEFLECTION with a deflection value.

VALUE: Added the minor word DEFLECTION to the var\_1 option.

CONST (input format 15): Removed search\_radius from a var\_3 option.

CALIB: Added the ability to recalibrated sensors.

CRGDEF: Added the ability to define a carriage without volume parameters.

FROM: Added DME, RAM and SCALE options.

ROTAB: Added the ability to position a rotary table relative to a feature direction.

Annex C: The EBNF has been updated to reflect all changes to DMIS. Additionally several typographical errors have been corrected.

GECOMP: The GECOMP statement has been added to Annex G and removed from DMIS.

KEYCHAR: New major word which defines a key characteristic that associates nominal feature(s) and nominal tolerance(s) with an optional key characteristic criticality designation and assigns a unique label to it.

## **iTeh STANDARD PREVIEW (standards.iteh.ai)**

[ISO 22093:2011](#)  
<https://standards.iteh.ai/catalog/standards/sist/7b2eb442-9c9a-4820-8803-3c7a5f09bd71/iso-22093-2011>

# Industrial automation systems and integration — Physical device control — Dimensional Measuring Interface Standard (DMIS)

## 1 Scope

This International Standard defines a neutral language for communication between information systems and Dimensional Measurement Equipment (DME) called the Dimensional Measuring Interface Standard (DMIS). DMIS is an execution language for measurement part programs and provides an exchange format for metrology data such as features, tolerances, and measurement results.

DMIS conveys the product and equipment definitions along with the process and reporting information necessary to perform dimensional measurements that employ coordinate metrology. DMIS contains product definitions for nominal features, feature constructions, dimensional and geometric tolerances, functional datums, and part coordinate systems. It also communicates equipment definitions for various measurement sensors, measurement resources, and machine parameters. DMIS instructs the DME's motions and measurements for product acceptance or verification and for manufacturing process validation and control. Furthermore, DMIS guides the analysis of coordinate data to report and tag measurement results that ascertain product/process quality.

Finally, to aid in its implementation, application functional subsets of DMIS have been defined that ensure successful interoperability and to validate DMIS conformance. Also, DMIS addresses the associativity of DMIS product definitions with CAD information.

While primarily designed for communication between automated equipment, DMIS is designed to be both human-readable and human-writable, allowing inspection programs to be written and inspection results to be analyzed without the use of computer aids. With the enhancement of the High Level Language extensions, DMIS can function and be implemented as a complete DME language.

<http://standards.iec.ch/IECpub/CD/2011/7b2eb442-9c9a-4820-8803-3c7a5f09bd71/iso-22093-2011>

3c7a5f09bd71/iso-22093-2011

DMIS provides the vocabulary to pass inspection programs to dimensional measuring equipment and to pass measurement and process data back to an analysis, collection, and/or archiving system. A piece of equipment which interfaces to others, using the DMIS vocabulary, may do so directly or it may have a pre-processor to convert its own native data formats into the DMIS format and/or a postprocessor to convert the DMIS format into its own data structure.

An environment making use of the DMIS input and output formats as a data exchange standard is depicted in (Figure 1 — DMIS environment). As illustrated, an inspection program can be created by many different approaches. Inspection program creation can be assisted by CAD systems, non-graphical systems, automated systems, or constructed manually. A programming system may require a pre-processor which converts the program into DMIS format. A DMIS inspection program can then be executed on dissimilar dimensional measuring equipments. In (Figure 1 — DMIS environment), DME I has a DMIS pre-processor and post-processor which converts the DMIS data into its own unique data format. DME IV is utilizing DMIS as its native format and therefore no pre-processors or post-processors are required. Also, a host computer is being used to control DME II and DME III. The host has a post-processor which decodes the DMIS program and drives the two DMEs, either through DMIS formats, or through some user-defined data exchange format.

Resultant data may be passed back in DMIS format through various scenarios. For example, this data could be passed directly as DMIS or via a post-processor. Resultant data is typically passed to an analysis system and/or a storage system such as a Quality Information System (QIS).

The manual interface indicates that DMIS programs can be hand written, and results analyzed, without the use of computer aids. In addition, many other uses of the DMIS data exchange format could be applied.

The implementation of DMIS is dependent on individual users. DMIS simply defines a neutral data exchange format that can be transmitted via ASCII or UTF8 files from one DMIS supporting system to another. The method for the transmission, storage, and management of these files is user-dependent.

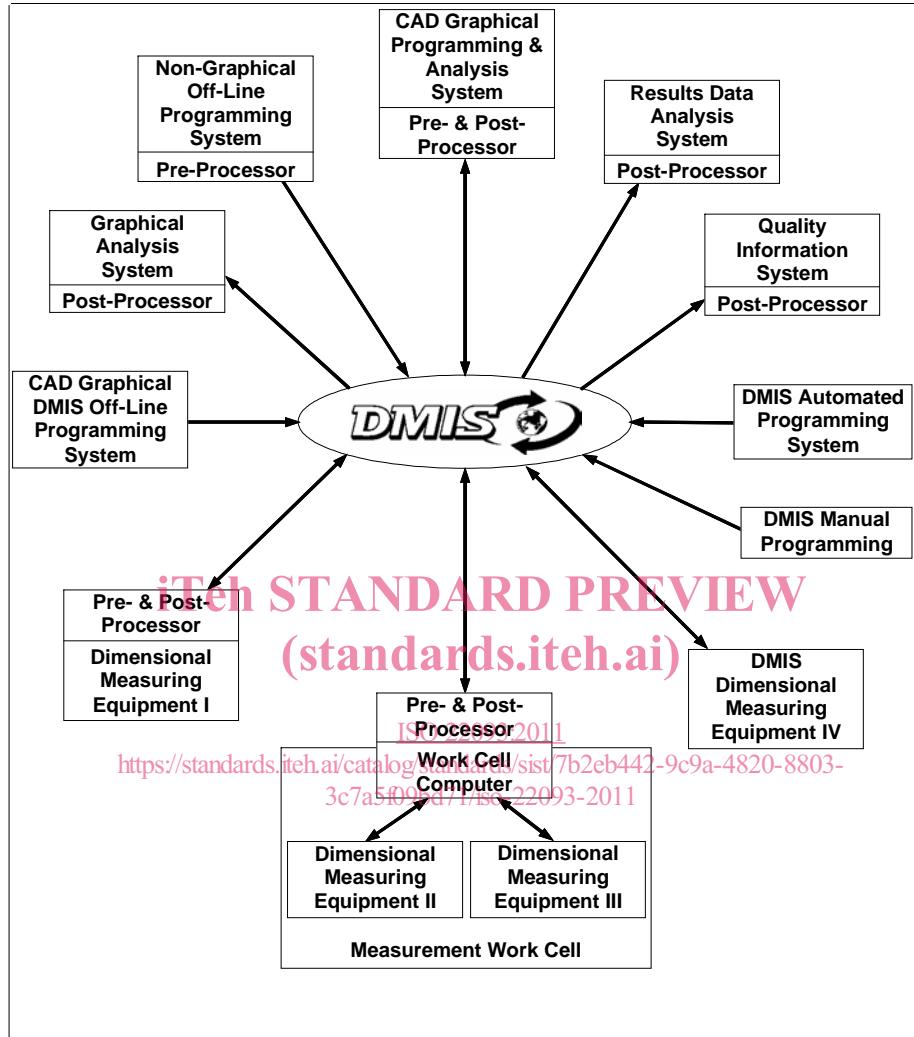


Figure 1 — DMIS environment

## 2 Conformance

The primary purpose of DMIS is to allow organizations to exchange and store measurement data among different dimensional measurement devices and computer applications both within their organizations, as well as with other organizations. DMIS is widely used and available for a broad range of measurement systems and applications. However, a DMIS file that is created by one DMIS product may not be fully or correctly interpreted by another DMIS product. Successful DMIS interchange can only be achieved if DMIS applications faithfully implement 1) the DMIS specification and 2) the appropriate formally recognized DMIS application profiles coupled with any addenda. DMIS is a large and complex standard. Vendors do not need to implement the entire standard. They implement functional characterized subsets. A characterized subset involves an application profile at a specific conformance level along with zero or many associated addenda at their specified conformance level.

The primary benefit of any DMIS profile is the ability to insure interoperability through the use of validation tools against DMIS instances and certification services for applications. Once an application has been certified through a testing service, behaviour of that application is predictable under the constraints of the profile.

## 2.1 DMIS conformance testing

DMIS conformance testing is a way of determining if a DMIS compliant product correctly implements the DMIS specification with its associated application profile.

Strictly speaking, this DMIS specification is solely an exchange file format. However, the term "DMIS" is often used to include a generator (a program which produces the DMIS), an interpreter (a program which reads the DMIS), as well as the metafiles (the actual DMIS input and output files). Together, the generator, metafiles, and interpreter form a total DMIS system.

Conformance of DMIS is defined in terms of conformance to a particular application profile of DMIS. Thus, the DMIS specification in conjunction with an application profile is necessary in order to test conformance of a total DMIS system.

Testing DMIS for conformance entails one or many of the following:

- a) verifying that the metafiles are syntactically correct,
- b) verifying that a generator produces conforming metafiles which accurately and correctly represent the intended results,
- c) verifying that an interpreter can correctly and completely read the metafile and produce the intended results, and
- d) verifying that the DMIS characterization file is syntactically correct and that it accurately represents the capabilities of the application.

An application profile conforms to DMIS if it adheres to all syntactic requirements defined in this standard.

Application software conforms syntactically to DMIS if it interprets all conforming DMIS application profiles.

Application software conforms semantically to DMIS if it interprets all metafiles that conform to DMIS application profiles according to all required semantics prescribed by this standard.

## 2.2 Conformance testing services

Conformance testing services will be recognized by the DSC to utilize test suites for validation of DMIS characterization files and to test implementations for conformance to one or many DMIS application profiles.

## 2.3 CHFile

A vendor's DMIS characterization file represents its compliance to the DMIS specification. Conformance testing will validate that the characterization file is syntactically correct and that it accurately represents the capabilities of the intended generator or interpreter.

## 2.4 Complete standard conformance

DMIS is a large and complex standard. Vendors do not need to implement the entire standard. However it is possible that a DMIS application may conform to the entire standard.

## 2.5 Application profiles

Currently, there are two application profiles that have been defined along with their two character identifier, Prismatic (PM) and Thin Walled (TW), to each of the three levels, as well as seven (7) addenda that expand the levels of conformance. The addenda along with their two character identifier are: Rotary Tables (RT), Multi Carriage(MC), Contact Scanning (CS), In-Process Verification (IP), Quality Information Systems (QI), Measurement Uncertainty (MU), and Soft Gaging (SG).