

# TECHNICAL REPORT



Intelligent device management –  
Part 1: Concepts and terminology

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## INTELLIGENT DEVICE MANAGEMENT –

## Part 1: Concepts and terminology

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IEC TR 63082-1, which is a Technical Report, has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation.

The text of this Technical Report is based on the following documents:

Draft TR	Report on voting
65E/653/DTR	65E/677/RVDTR

Full information on the voting for the approval of this Technical Report can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.



A list of all parts in the IEC 63082 series, published under the general title *Intelligent device management*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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## INTRODUCTION

The purpose of the IEC 63082 series is to define an environment that enables the effective use of industrial intelligent devices (IID). The documents provide common concepts, terminology, and management activities.

Intelligent device management (IDM) represents activities for managing intelligent devices through the facility lifecycle and does not imply a particular asset management tool or set of those tools. Hardware and software tools are necessary to support work processes and procedures, but specification of the tools is not a part of the IEC 63082 series. IDM can be one of many enterprise programs. IDM activities optimize the value from intelligent devices and supports the concepts of integration of data from the production level with business systems. IDM is consistent with smart manufacturing initiatives.

The IEC 63082 series is not intended to replace or contradict other standards, for example IEC 61511 (all parts) for safety instrumented systems and IEC 62443 (all parts) for cybersecurity.

While the work processes and implementation practices specified in the IEC 63082 series might be used for non-automation equipment with some diagnostic capability, the IEC 63082 series does not cover these equipment types.

The IEC 63082 series will consist of the following parts:

- IEC TR 63082-1: Concepts and terminology (informative);
- IEC 63082-2: Work process requirements (normative).

IEC 63082-1 describes intelligent device management concepts and terminology necessary for in-depth understanding and effective communication. It gives the basic concepts of how intelligent devices can be managed and an overview of how this device management works throughout the facility lifecycle. IEC 63082-1 provides basic knowledge to understand the concepts of intelligent device management necessary to implement an IDM program.

IEC 63082-2 will provide normative requirements for IDM.

# INTELLIGENT DEVICE MANAGEMENT –

## Part 1: Concepts and terminology

### 1 Scope

This part of IEC 63082 describes concepts and terminology necessary to understand and communicate effectively about IDM. This document explains the relationship between IDM and other existing asset management standards.

Additionally, this document provides activity structures and concepts associated with IDM programs. This document also introduces the concept of IDM programs for coordination of multiple stakeholders.

### 2 Normative references

There are no normative references in this document.

### 3 Terms, definitions and abbreviated terms

#### 3.1 Terms and definitions (standards.iteh.ai)

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

##### 3.1.1 activity

set of actions that consume time and resources and whose performance is necessary to achieve, or contribute to, the realization of one or more objectives

Note 1 to entry: Includes work processes, procedures, and tasks.

[SOURCE: ISO/IEC TR 24766:2009, 3.1, modified – "outcomes" was replaced with "objectives" and the note has been added.]

##### 3.1.2 alarm

notification to the operator of an equipment malfunction, process deviation, or abnormal condition requiring a unique, timely, and documented (predetermined) response from the operator

[SOURCE: IEC 62682:2014, 3.1.7, modified – "an audible and/or visible means of indicating" was replaced with "notification", "timely response" was replaced with "unique, timely, and documented (predetermined) response from the operator".]

### 3.1.3

#### **alarm management**

work processes and practices for determining, documenting, designing, operating, monitoring, and maintaining alarm systems

[SOURCE: IEC 62682:2014, 3.1.17, modified — "collection of" was replaced with "work".]

### 3.1.4

#### **alert**

notification to a responsible person of an abnormal condition that can require action with a time tolerance much longer than for alarms

Note 1 to entry: A "responsible person" can include: operators, maintenance personnel, or engineering personnel.

### 3.1.5

#### **apparatus**

device or assembly of devices which can be used as an independent unit for specific functions

EXAMPLE Intelligent measuring and control devices, inspection and testing devices, host systems.

[SOURCE: IEC 60050-151:2001, 151-11-22, modified — the example was added.]

### 3.1.6

#### **asset management**

coordinated activities of an organization to ensure the intended capability of assets is available

Note 1 to entry: The capability of an asset is dynamic and asset management will respond to satisfy changing objectives.

[SOURCE: ISO 55000:2014, 3.3.1, modified — "to realize value from assets" was replaced with "to ensure the intended capability of assets is available"; the notes were replaced with a new note to entry.]

### 3.1.7

#### **calibration**

procedure of checking or adjusting (by comparison with a reference standard) the accuracy of a measuring instrument

[SOURCE: ISO 15378:2017, 3.3.2, modified – "process" was replaced with "procedure" and the note was deleted.]

### 3.1.8

#### **commissioning**

procedure prior, or related, to the handing over of a product ready for putting into service, including final acceptance testing, the handing over of all documentation relevant to the use of the product and, if necessary, instructing personnel

[SOURCE: IEC 82079-1:2012, 3.3, modified – "procedures" was replaced with "procedure".]

### 3.1.9

#### **configuration database**

structured collection of parameter settings for intelligent devices

### 3.1.10

#### **corrective action**

action to eliminate the cause of a non-fulfilment of a requirement and to prevent recurrence

[SOURCE: ISO 55000:2014, 3.4.1, modified – "nonconformity" was replaced with "non-fulfilment of a requirement" and the note was deleted.]

**3.1.11****covert fault**

fault in relation to hardware and software, undetected by the diagnostics, proof tests, operator intervention (for example physical inspection and manual tests), or through normal operation

Note 1 to entry: These are sometimes called latent faults or unknown faults.

[SOURCE: IEC 61508-4:2010, 3.8.9, modified – "fault" and "and software" were added, "diagnostic tests" was replaced with "diagnostics"; the example was deleted and the Note 1 to entry was added.]

**3.1.12****criticality**

degree of risk represented by a specified set of levels

**3.1.13****device**

independent physical entity capable of performing one or more specified functions in a particular context and delimited by its interfaces

[SOURCE: IEC 61499-1:2012, 3.29]

**3.1.14****device configuration**

procedure that loads parameters into an intelligent device to define its function

**3.1.15****device lifecycle**

period of time over which a device with a specific model code is developed, brought to the market and eventually removed from the market

**3.1.16****device template**

set of predefined parameters which characterize a specific device release for a particular type of application

Note 1 to entry: Device templates are normally prepared by the device supplier.

**3.1.17****diagnostics**

automated function which detects faults, malfunctions, deviations, and/or variations of hardware or software

Note 1 to entry: Diagnostics can be initiated manually for off-line diagnostics.

Note 2 to entry: Diagnostic is used as an adjective and as a generic word.

**3.1.18****enterprise**

group of organizations sharing a set of goals and objectives to offer products or services or both

[SOURCE: ISO 14258:1998, 2.1.1]

### 3.1.19 equipment

single apparatus or set of devices or apparatuses, or the set of main devices of an installation, or all devices necessary to perform a specific task

EXAMPLE Intelligent measuring and control devices, inspection and testing devices, and host systems.

[SOURCE: IEC 60050-151:2001, 151-11-25, modified — the note has been deleted and the example added.]

### 3.1.20 facility

physical entity that is built, constructed, installed or established to perform some particular function or to serve or facilitate some particular end

EXAMPLE Plant, factory, mill, site, or similar production location.

[SOURCE: IEC TR 62066:2002, 3.6, modified — the examples are listed separately.]

### 3.1.21 facility implementation project

set of activities to put into practice before the facility starts or continues its intended service

### 3.1.22 failure

<of an item> loss of the ability to perform as required

Note 1 to entry: A failure of an item is an event that results in a fault of that item.

Note 2 to entry: Qualifiers, such as catastrophic, critical, major, minor, marginal and insignificant, can be used to categorise failures according to the severity of consequences, the choice and definitions of severity criteria depending upon the field of application.

Note 3 to entry: Failure could lead to loss of a single function of an item (e.g. secondary function such as diagnostics) not impacting the primary function of the item.

Note 4 to entry: In this definition "an item" refers to "a device".

[SOURCE: IEC 60050-192:2015, 192-03-01, modified – Note 3 to entry was replaced with a new Note 3 and Note 4 to entry was added.]

### 3.1.23 fault

<of an item> inability to perform as required, due to an internal state

Note 1 to entry: A fault of an item results from a failure, either of the item itself, or from a deficiency in an earlier stage of the lifecycle, such as specification, design, manufacture or maintenance.

Note 2 to entry: Qualifiers, such as specification, design, manufacture, maintenance or misuse, can be used to indicate the cause of the fault.

Note 3 to entry: In this definition "an item" refers to "a device".

[SOURCE: IEC 60050-192:2015, 192-04-01, modified – Note 3 to entry was replaced with a new Note 3 and Note 4 was deleted.]

### 3.1.24 host system

functions or tools that digitally communicate with intelligent devices

Note 1 to entry: Includes automated fault handling, management of notifications, and configuration management of intelligent devices.

Note 2 to entry: Functions and tools can be provided on one or more platforms.

### **3.1.25 incipient fault**

imperfection in the state or condition of a device so that a degraded performance or critical failure might eventually be the expected result if corrective action(s) is (are) not taken

[SOURCE: ISO 14224:2016, 3.40, modified – in the term, "failure" was replaced with "fault"; in the definition, "an item" was replaced with "a device", "or critical failure might (or might not)" was replaced with "performance or critical failure might" and "actions are" was replaced with "action(s) is (are)".]

### **3.1.26 industrial automation control system IACS**

collection of personnel, hardware, software, procedures and policies involved in the operation of the industrial process and that can affect or influence its safe, secure and reliable operation

Note 1 to entry: These systems include but are not limited to: a) industrial control systems, including distributed control systems (DCSs), programmable logic controllers (PLCs), remote terminal units (RTUs), intelligent electronic devices, supervisory control and data acquisition (SCADA), networked electronic sensing and control, and monitoring and diagnostic systems. (In this context, process control systems include basic process control system and safety-instrumented system (SIS) functions, whether they are physically separate or integrated.); b) associated information systems such as advanced or multivariable control, online optimizers, dedicated equipment monitors, graphical interfaces, process historians, manufacturing execution systems, and plant information management systems; c) associated internal, human, network, or machine interfaces used to provide control, safety, and manufacturing operations functionality to continuous, batch, discrete, and other processes.

Note 2 to entry: The IACS may include components that are not installed at the asset owner's site.

Note 3 to entry: Examples of IACSs include Distributed Control Systems (DCS) and Supervisory Control and Data Acquisition (SCADA) systems. IEC 62443-2-4 also defines the proper noun "Solution" to mean the specific instance of the control system product and possibly additional components that are designed into the IACS. The Automation Solution, therefore, differs from the control system since it represents a specific implementation (design and configuration) of the control system hardware and software components for a specific asset owner.

[SOURCE: IEC 62443-2-4:2015, 3.1.8, modified – Note 1 to entry has been added.]

### **3.1.27 infrastructure**

basic physical and organizational structures needed for the operation of an enterprise

### **3.1.28 inspection**

action comprising careful scrutiny of a device and its immediate environment in order to arrive at a reliable conclusion as to the condition of a device

[SOURCE: IEC 60050-426:2008, 416-14-02, modified – "an item" was replaced with "a device" and "carried out either without dismantling, or with the addition of partial dismantling as required, supplemented by means such as measurement," was replaced with "and its immediate environment".]

### **3.1.29 installation**

one apparatus or a set of devices and/or apparatuses associated in a given location to fulfil specified purposes, including all means for their satisfactory operation

[SOURCE: IEC 60050-151:2001, 151-11-26]