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INTERNATIONAL STANDARD



Field device integration (FDI®) – Part 5: FDI Information Model

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE INTEGRATION (FDI®) –

Part 5: FDI® Information Model

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 62769-5:2021. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 62769-5 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This third edition cancels and replaces the second edition published in 2021. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) added INTERACTIVE_TRANSFER_TO_DEVICE ACTION.

The text of this International Standard is based on the following documents:

| Draft | Report on voting |
|-------------|------------------|
| 65E/858/CDV | 65E/915/RVC |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 62769 series, published under the general title *Field device integration (FDI[®])*, 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The IEC 62769 series has the general title *Field Device Integration (FDI)* and the following parts:

- ~~Part 1: Overview~~
- ~~Part 2: FDI Client~~
- ~~Part 3: FDI Server~~
- ~~Part 4: FDI Packages~~
- ~~Part 5: FDI Information Model~~
- ~~Part 6: FDI Technology Mapping~~
- ~~Part 7: FDI Communication Devices~~
- ~~Part 100: Profiles – Generic Protocol Extensions~~
- ~~Part 101-1: Profiles – Foundation Fieldbus H1~~
- ~~Part 101-2: Profiles – Foundation Fieldbus HSE~~
- ~~Part 103-1: Profiles – PROFIBUS~~
- ~~Part 103-4: Profiles – PROFINET~~
- ~~Part 109-1: Profiles – HART and WirelessHART~~
- ~~Part 115-2: Profiles – Protocol-specific Definitions for Modbus RTU~~
- ~~Part 150-1: Profiles – ISA 100.11a~~

FIELD DEVICE INTEGRATION (FDI®) –

Part 5: FDI® Information Model

1 Scope

This part of IEC 62769 defines the FDI®¹ Information Model. One of the main tasks of the Information Model is to reflect the topology of the automation system. Therefore, it represents the devices of the automation system as well as the connecting communication networks including their properties, relationships, and the operations that can be performed on them. The types in the AddressSpace of the FDI® Server constitute ~~a~~ some kind of catalogue, which is built from FDI® Packages.

The fundamental types for the FDI® Information Model are well defined in OPC UA for Devices (IEC 62541-100). The FDI® Information Model specifies extensions for a few special cases and otherwise explains how these types are used and how the contents are built from elements of DevicePackages.

The overall FDI® architecture is illustrated in Figure 1. The architectural components that are within the scope of this document have been highlighted in this illustration.

¹ FDI® is a registered trademark of the non-profit organization Fieldbus Foundation, Inc. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance does not require use of the trade name. Use of the trade name requires permission of the trade name holder.

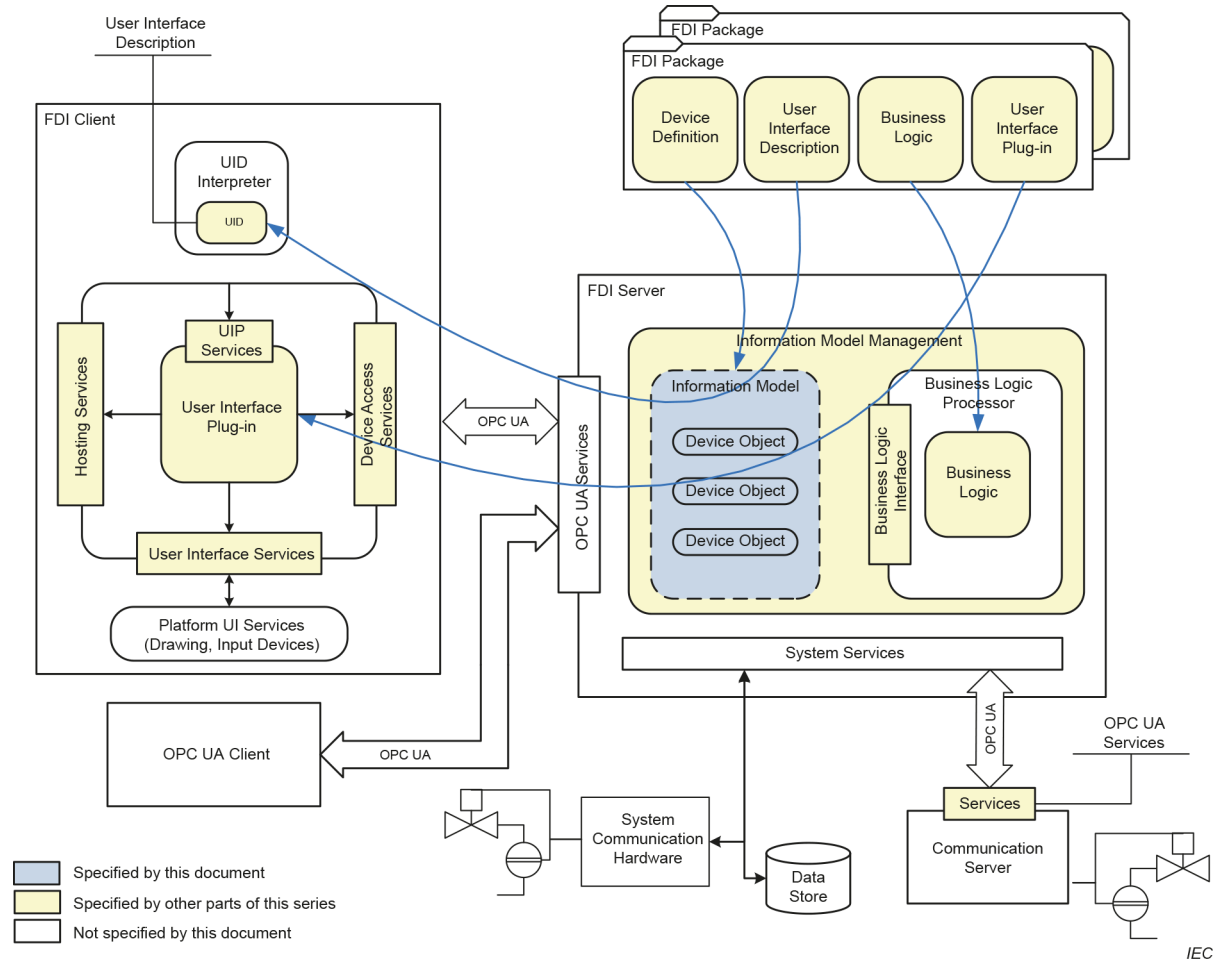


Figure 1 – FDI® architecture diagram

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

~~IEC 61784-1, Industrial communication networks – Profiles – Part 1: Fieldbus profiles~~

IEC 61784-1-3:2023, Industrial networks – Profiles – Part 1-3: Fieldbus profiles – Communication Profile Family 3

IEC 61804-3, Devices and integration in enterprise systems – Function blocks (FB) for process control and electronic device description language (EDDL) – Part 3: EDDL syntax and semantics

IEC 61804-4, Devices and integration in enterprise systems – Function blocks (FB) for process control and electronic device description language (EDDL) – Part 4: EDD interpretation

IEC 62541-3, OPC Unified Architecture – Part 3: Address Space Model

IEC 62541-4, OPC Unified Architecture – Part 4: Services

IEC 62541-5, OPC Unified Architecture – Part 5: Information Model

IEC 62541-6, *OPC Unified Architecture – Part 6: Mappings*

IEC 62541-8, *OPC Unified Architecture – Part 8: Data Access*

IEC 62541-100, *OPC Unified Architecture – Part 100: ~~OPC UA for Devices~~ Device Interface*

IEC 62769-1, *Field Device Integration (FDI®) – Part 1: Overview*

IEC 62769-2, *Field Device Integration (FDI®) – Part 2: ~~FDI~~-Client*

IEC 62769-3, *Field Device Integration (FDI®) – Part 3: Server*

IEC 62769-4, *Field Device Integration (FDI®) – Part 4: FDI® Packages*

IEC 62769-6, *Field Device Integration (FDI®) – Part 6: FDI® Technology Mappings*

IEC 62769-7, *Field Device Integration (FDI®) – Part 7: ~~FDI~~-Communication Devices*

IEC 62769-1xx (all parts), *Field Device Integration (FDI®) – Part 1xx-y: Profiles*

OPC 10000-19, *OPC Unified Architecture – Part 19: Dictionary Reference*

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Field device integration (FDI®) –
Part 5: FDI Information Model**

**Intégration des appareils de terrain (FDI®) –
Partie 5: Modèle d'Information FDI**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIELD DEVICE INTEGRATION (FDI®) –

Part 5: FDI® Information Model

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IEC 62769-5 has been prepared by subcommittee 65E: Devices and integration in enterprise systems, of IEC technical committee 65: Industrial-process measurement, control and automation. It is an International Standard.

This third edition cancels and replaces the second edition published in 2021. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) added INTERACTIVE_TRANSFER_TO_DEVICE ACTION.

The text of this International Standard is based on the following documents:

| Draft | Report on voting |
|-------------|------------------|
| 65E/858/CDV | 65E/915/RVC |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 62769 series, published under the general title *Field device integration (FDI)*[®], 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
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- amended.

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FIELD DEVICE INTEGRATION (FDI®) –

Part 5: FDI® Information Model

1 Scope

This part of IEC 62769 defines the FDI¹ Information Model. One of the main tasks of the Information Model is to reflect the topology of the automation system. Therefore, it represents the devices of the automation system as well as the connecting communication networks including their properties, relationships, and the operations that can be performed on them. The types in the AddressSpace of the FDI[®] Server constitute some kind of catalogue, which is built from FDI[®] Packages.

The fundamental types for the FDI[®] Information Model are well defined in OPC UA for Devices (IEC 62541-100). The FDI[®] Information Model specifies extensions for a few special cases and otherwise explains how these types are used and how the contents are built from elements of DevicePackages.

The overall FDI[®] architecture is illustrated in Figure 1. The architectural components that are within the scope of this document have been highlighted in this illustration.

¹ FDI[®] is a registered trademark of the non-profit organization Fieldbus Foundation, Inc. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the trademark holder or any of its products. Compliance does not require use of the trade name. Use of the trade name requires permission of the trade name holder.

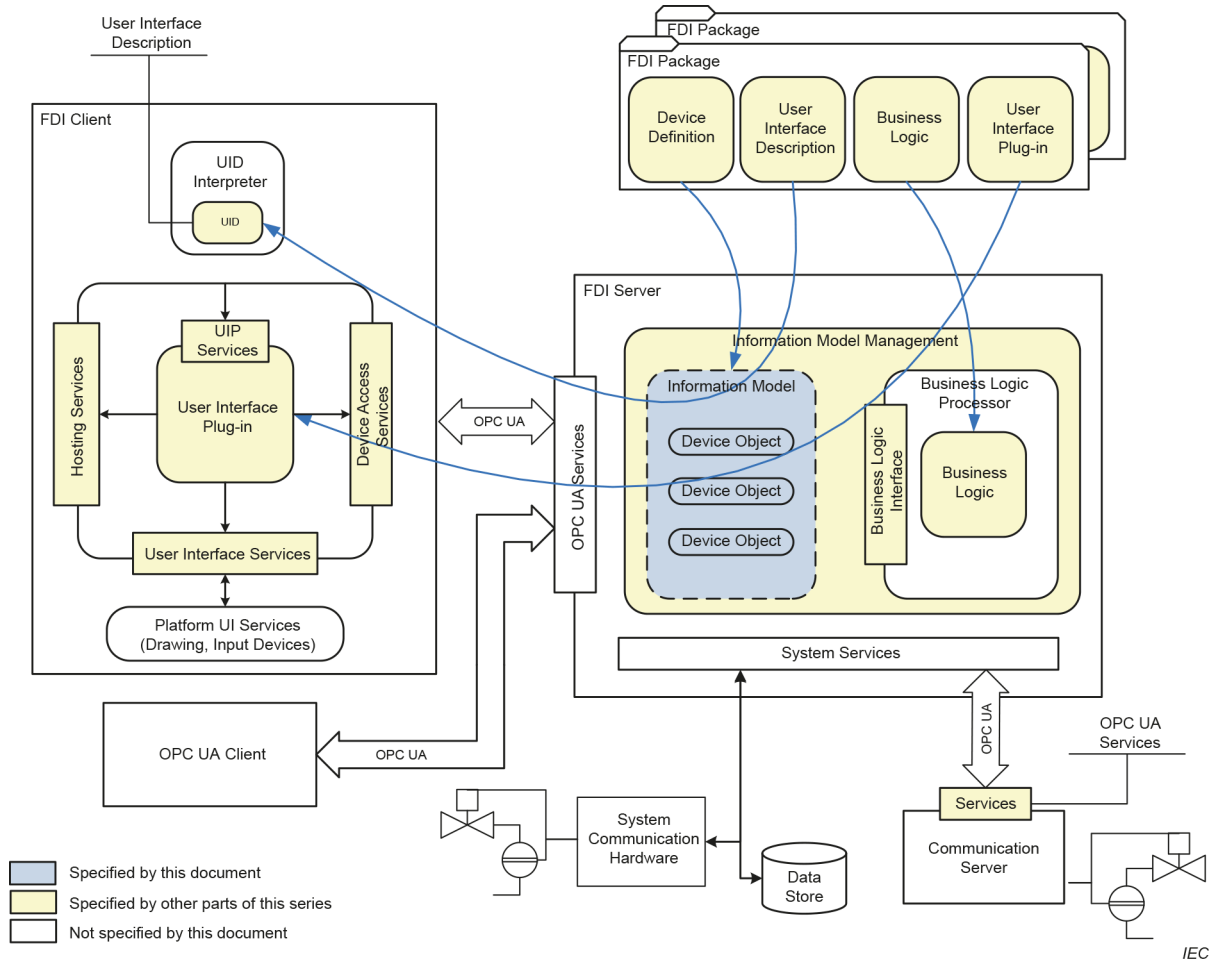


Figure 1 – FDI® architecture diagram

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61784-1-3:2023, *Industrial networks – Profiles – Part 1-3: Fieldbus profiles – Communication Profile Family 3*

IEC 61804-3, *Devices and integration in enterprise systems – Function blocks (FB) for process control and electronic device description language (EDDL) – Part 3: EDDL syntax and semantics*

IEC 61804-4, *Devices and integration in enterprise systems – Function blocks (FB) for process control and electronic device description language (EDDL) – Part 4: EDD interpretation*

IEC 62541-3, *OPC Unified Architecture – Part 3: Address Space Model*

IEC 62541-4, *OPC Unified Architecture – Part 4: Services*

IEC 62541-5, *OPC Unified Architecture – Part 5: Information Model*

IEC 62541-6, *OPC Unified Architecture – Part 6: Mappings*

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IEC 62541-8, *OPC Unified Architecture – Part 8: Data Access*

IEC 62541-100, *OPC Unified Architecture – Part 100: Device Interface*

IEC 62769-1, *Field Device Integration (FDI®) – Part 1: Overview*

IEC 62769-2, *Field Device Integration (FDI®) – Part 2: Client*

IEC 62769-3, *Field Device Integration (FDI®) – Part 3: Server*

IEC 62769-4, *Field Device Integration (FDI®) – Part 4: FDI® Packages*

IEC 62769-6, *Field Device Integration (FDI®) – Part 6: FDI® Technology Mappings*

IEC 62769-7, *Field Device Integration (FDI®) – Part 7: Communication Devices*

IEC 62769-1xx (all parts), *Field Device Integration (FDI®) – Part 1xx-y: Profiles*

OPC 10000-19, *OPC Unified Architecture – Part 19: Dictionary Reference*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

INTÉGRATION DES APPAREILS DE TERRAIN (FDI®) –

Partie 5: Modèle d'Information FDI®

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L'IEC 62769-5 a été établie par le sous-comité 65E: Les dispositifs et leur intégration dans les systèmes de l'entreprise, du comité d'études 65 de l'IEC: Mesure, commande et automation dans les processus industriels. Il s'agit d'une Norme internationale.

Cette troisième édition annule et remplace la deuxième édition parue en 2021. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) ajout d'INTERACTIVE_TRANSFER_TO_DEVICE ACTION.

Le texte de cette Norme internationale est issu des documents suivants:

| Projet | Rapport de vote |
|-------------|-----------------|
| 65E/858/CDV | 65E/915/RVC |

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications.

Une liste de toutes les parties de la série IEC 62769, publiées sous le titre général *Intégration des appareils de terrain (FDI®)*, se trouve sur le site web de l'IEC.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. A cette date, le document sera

- reconduit,
- supprimé,
- remplacé par une édition révisée, ou
- amendé.

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INTÉGRATION DES APPAREILS DE TERRAIN (FDI®) –

Partie 5: Modèle d'Information FDI®

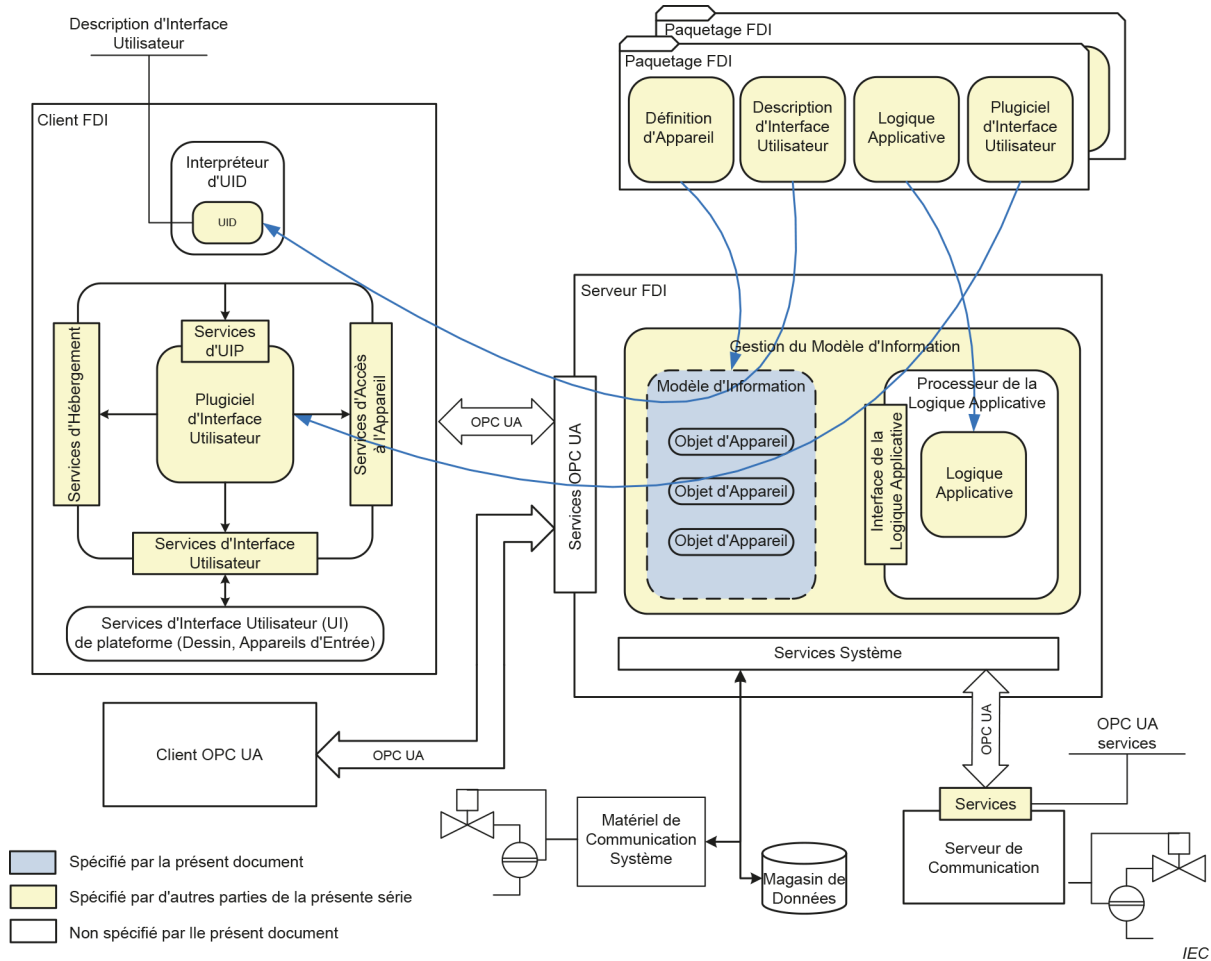
1 Domaine d'application

La présente partie de l'IEC 62769 définit le Modèle d'Information FDI®¹. L'un des principaux objectifs du Modèle d'Information est de refléter la topologie du système d'automatisation. Par conséquent, il représente les appareils du système d'automatisation ainsi que les réseaux de communication connectés, y compris leurs propriétés, leurs relations et les opérations dont ils peuvent faire l'objet. Les types présents dans l'AddressSpace du Serveur FDI® constituent un catalogue, qui est créé à partir des Paquetages FDI®.

Les types fondamentaux pour le Modèle d'Information FDI® sont définis dans l'OPC UA pour les Appareils (IEC 62541-100). Le Modèle d'Information FDI® spécifie des extensions pour quelques cas spéciaux et explique la façon dont ces types sont utilisés et dont les contenus sont construits à partir des éléments de DevicePackages.

L'architecture FDI® complète est représentée à la Figure 1. Les composants architecturaux qui relèvent du domaine d'application du présent document ont été mis en évidence dans cette représentation.

¹ FDI® est une marque déposée de l'organisation à but non lucratif Fieldbus Foundation, Inc. Cette information est donnée à l'intention des utilisateurs du présent document et ne signifie nullement que l'IEC approuve le détenteur de la marque ou l'emploi de ses produits. La conformité n'exige pas l'utilisation de la marque. L'utilisation de la marque exige l'autorisation du détenteur de la marque.



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Figure 1 – Diagramme de l'architecture FDI®

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 61784-1-3:2023, *Réseaux industriels – Profils – Partie 1-3: Profils de bus de terrain – Famille de profils de communication 3*

IEC 61804-3, *Les dispositifs et leur intégration dans les systèmes de l'entreprise – Blocs fonctionnels (FB) pour les procédés industriels et le langage de description électronique de produits (EDDL) – Partie 3: Sémantique et syntaxe EDDL*

IEC 61804-4, *Les dispositifs et leur intégration dans les systèmes de l'entreprise – Blocs fonctionnels (FB) pour les procédés industriels et le langage de description électronique de produits (EDDL) – Partie 4: Interprétation EDD*

IEC 62541-3, *Architecture unifiée OPC – Partie 3: Modèle d'espace d'adressage*

IEC 62541-4, *Architecture unifiée OPC – Partie 4: Services*

IEC 62541-5, *Architecture unifiée OPC – Partie 5: Modèle d'information*

IEC 62541-6, *Architecture unifiée OPC – Partie 6: Mappings*

IEC 62541-8, *Architecture unifiée OPC – Partie 8: Accès aux données*

IEC 62541-100, *Architecture unifiée OPC – Partie 100: Interface d'appareils*

IEC 62769-1, *Intégration des appareils de terrain (FDI®) – Partie 1: Vue d'ensemble*

IEC 62769-2, *Intégration des appareils de terrain (FDI®) – Partie 2: Client*

IEC 62769-3, *Intégration des appareils de terrain (FDI®) – Partie 3: Serveur*

IEC 62769-4, *Intégration des appareils de terrain (FDI®) – Partie 4: Paquetages FDI®*

IEC 62769-6, *Intégration des appareils de terrain (FDI®) – Partie 6: Mappings de technologies FDI®*

IEC 62769-7, *Intégration des appareils de terrain (FDI®) – Partie 7: Appareils de communication*

IEC 62769-1xx (toutes les parties), *Intégration des appareils de terrain (FDI®) – Partie 1xx-y: Profils*

OPC 10000-19, *OPC Unified Architecture – Part 19: Dictionary Reference* (disponible en anglais seulement)