



**BSI Standards Publication**

## **Industrial automation systems and integration — Product data representation and exchange**

---

Part 16: Description methods: SysML XMI to EXPRESS transformation

## National foreword

This Published Document is the UK implementation of ISO/TS 10303-16:2021.

The UK participation in its preparation was entrusted to Technical Committee AMT/4, Industrial data and manufacturing interfaces.

A list of organizations represented on this committee can be obtained on request to its committee manager.

### Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

This publication is not to be regarded as a British Standard.

© The British Standards Institution 2022  
Published by BSI Standards Limited 2022

ISBN 978 0 539 03807 1

ICS 25.040.40

### Compliance with a Published Document cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 August 2022.

### Amendments/corrigenda issued since publication

| Date | Text affected |
|------|---------------|
|------|---------------|

**TECHNICAL  
SPECIFICATION**

**ISO/TS  
10303-16**

First edition  
2021-07

---

---

**Industrial automation systems  
and integration — Product data  
representation and exchange —**

Part 16:

**Description methods: SysML XMI to  
EXPRESS transformation**



Reference number  
ISO/TS 10303-16:2021(E)



## **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

|   |           |
|---|-----------|
| <b>Foreword</b>   | <b>iv</b> |
| <b>Introduction</b>   | <b>v</b>  |
| <b>1 Scope</b>  | <b>1</b>  |
| <b>2 Normative references</b>   | <b>1</b>  |
| <b>3 Terms, definitions and abbreviated terms</b>   | <b>2</b>  |
| 3.1 Terms and definitions   | 2         |
| 3.1.1 Terms and definitions for generic concepts  | 2         |
| 3.1.2 Terms and definitions for SysML constructs  | 3         |
| 3.2 Abbreviated terms   | 5         |
| <b>4 SysML XMI to EXPRESS</b>   | <b>5</b>  |
| 4.1 General   | 5         |
| 4.2 Presentation conventions  | 5         |
| 4.3 Common mapping conventions  | 5         |
| 4.3.1 Reference to external files   | 5         |
| 4.3.2 xmi:id, xmi:uuid, and UUID  | 6         |
| 4.3.3 Assumed sysml:Block in fragments  | 6         |
| 4.3.4 Containment and reference relationship  | 6         |
| 4.3.5 Used stereotypes to represent STEP concepts   | 6         |
| 4.3.6 Select type not treated as SysML supertype  | 7         |
| 4.4 Mapping of the primary schema   | 7         |
| 4.5 Mapping of Entities   | 7         |
| 4.5.1 General mapping of Entity   | 7         |
| 4.5.2 Mapping of abstract entity  | 7         |
| 4.5.3 Mapping of entity with one supertype  | 8         |
| 4.5.4 Mapping of entity with multiple supertypes  | 8         |
| 4.6 Mapping of simple type  | 9         |
| 4.7 Mapping of aggregation type   | 11        |
| 4.8 Mapping of aggregation of aggregation type  | 12        |
| 4.9 Mapping of Select type  | 13        |
| 4.9.1 General mapping of select type  | 13        |
| 4.9.2 Mapping of select type containing value type  | 14        |
| 4.10 Mapping of enumeration type  | 15        |
| 4.11 Mapping of entity attribute  | 15        |
| 4.11.1 Mapping of multiplicity and optionality  | 16        |
| 4.11.2 Attribute typed as an Entity   | 18        |
| 4.11.3 Attribute typed as Select  | 18        |
| 4.11.4 Attribute typed as Enumeration type  | 19        |
| <b>Annex A (normative) Information object registration</b>  | <b>20</b> |
| <b>Annex B (informative) EXPRESS/Information modelling constructs and the equivalent SysML modelling constructs</b> | <b>21</b> |
| <b>Bibliography</b>   | <b>33</b> |