ISO 14649-10:2004-12 (E)

Industrial automation systems and integration - Physical device control - Data model for computerized numerical controllers - Part 10: General process data

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Terms and definitions 2

4 General Process data 3
4.1 Header and references 3
4.2 General types and definitions 4
4.2.1 Measure units 4
4.2.2 Other general types 6
4.3 Where to start: Project 6
4.3.1 Person and address 7
4.4 What to machine: Workpiece and manufacturing feature 7
4.4.1 Workpiece 7
4.4.2 Manufacturing feature 9
4.5 Catalogue of manufacturing features 10
4.5.1 Region 10
4.5.2 Two5D manufacturing feature 12
4.5.3 Machining feature 12
4.5.4 Planar face 13
4.5.5 Pocket 14
4.5.6 Slot 17
4.5.7 Step 21
4.5.8 Profile feature 22
4.5.9 Round hole 27
4.5.10 Toolpath feature 31
4.5.11 Boss 31
4.5.12 Spherical cap 32
4.5.13 Rounded end 33
4.5.14 Compound feature 33
4.5.15 Replicate feature 35
4.5.16 Transition feature 40
4.5.17 Thread 42
4.5.18 Profile 45
4.5.19 Travel path 52
4.5.20 Surface texture parameter 53
4.6 To make things happen: Executables 54
4.6.1 Executable 54
4.6.2 Workingstep 55
4.6.3 NC function 61
4.6.4 Program structure 62
4.7 How to machine: Operations 71
4.7.1 Operation 72
4.7.2 Machining operation 73
4.8 To be in full control: Explicit toolpath definition 76
4.8.1 Toolpath 76

4.8.2 Feedstop 79
4.8.3 Trajectory 79
4.8.4 Cutter location trajectory 79
4.8.5 Cutter contact trajectory 80
4.8.6 Axis trajectory 81
4.8.7 Parameterised path 82
4.8.8 Connector 82
4.8.9 Approach and lift path 83
4.9 Rules 85
4.9.1 dependent_instantiable_representation_item 85
4.9.2 dependent_instantiable_shape_representation 85
4.9.3 geometric_representation_item_3d 86
4.10 End of schema 86

5 Conformance requirements 86
5.1 Conformance class 1 entities 87
5.2 Conformance class 2 entities 87
5.3 Conformance class 3 entities 89
5.4 Conformance class 4 entities 91
5.5 Conformance class 5 entities 93
5.6 Conformance class 6 entities 96

Annex A (normative) EXPRESS expanded listing 99

Annex B (normative) Short names of entities 125

Annex C (normative) Implementation method specific requirements 133

Annex D (informative) EXPRESS-G figures 134

Annex E (informative) Computer-interpretable listings 150

Index 151