ISO 18629-12 :2005-10 (E)

Industrial automation systems and integration_- Process specification language_- Part_12: Outer core

Content

Page

1 Scope 1
2 Normative references 1
3 Terms, definitions, and abbreviations 2
3.1 Terms and definitions 2
3.2 Abbreviations 7
4 ISO 18629 general 7
5 Organization of ISO 18629-12 8
5.1 Extensions in Outer core 8
6 Subactivity core theory 9
6.1 Primitive Relations of the Subactivity core theory 9
6.2 Defined Relations of the Subactivity core theory 9
6.3 Relationship to other sets of axioms 10
6.4 Informal Semantics of the Subactivity core theory 10
6.4.1 subactivity 10
6.4.2 primitive 10
6.5 Definitions in the Subactivity core theory 10
6.5.1 Definition 1: 10
6.6 Axioms of the Subactivity core theory 11
6.6.1 Axiom 1 11
6.6.2 Axiom 2 11
6.6.3 Axiom 3 11
6.6.4 Axiom 4 11
6.6.5 Axiom 5 12
6.6.6 Axiom 6 12
7 Occurrence tree core theory 13
7.1 Primitive Relations 13
7.2 Primitive Functions 13
7.3 Relationship to other sets of axioms 13
7.4 Informal Semantics of the Occurrence tree core theory 13
7.4.1 earlier 13
7.4.2 initial 14
7.4.3 legal 14
7.4.4 poss 14
7.4.5 precedes 14
7.4.6 successor 15
7.5 Axioms for the Occurrence tree core theory 15
7.5.1 Axiom 1 15
7.5.2 Axiom 2 15
7.5.3 Axiom 3 15
7.5.4 Axiom 4 16
7.5.5 Axiom 5 16
7.5.6 Axiom 6 16
7.5.7 Axiom 7 17
7.5.8 Axiom 8 18
7.5.9 Axiom 9 18

7.5.10 Axiom 10 18
7.5.11 Axiom 11 18
7.5.12 Axiom 12 19
7.5.13 Axiom 13 19
7.5.14 Axiom 14 19
7.5.15 Definition 1 19
7.5.16 Definition 2 19
8 Discrete state core theory 20
8.1 Primitive categories in the Discrete state core theory 20
8.2 Primitive relations in the Discrete state core theory 20
8.3 Relationship to other sets of axioms 20
8.4 Informal semantics of the Discrete state core theory 20
8.4.1 state 20
8.4.2 holds 21
8.4.3 prior 21
8.5 Axioms for the Discrete state core theory 21
8.5.1 Axiom 1 21
8.5.2 Axiom 2 21
8.5.3 Axiom 3 22
8.5.4 Axiom 4 22
8.5.5 Axiom 5 22
8.5.6 Axiom 6 22
8.5.7 Axiom 7 23
9 Atomic activity core theory 23
9.1 Primitive Relations in the Atomic activity core theory 24
9.2 Primitive Functions in the Atomic activity core theory 24
9.3 Relationship to other sets of axioms 24
9.4 Informal semantics of the Atomic activity core theory 24
9.4.1 atomic 24
9.4.2 conc 24
9.5 Definitions in Atomic activity core theory 24
9.6 Axioms of the Atomic activity core theory 25
9.6.1 Axiom 1 25
9.6.2 Axiom 2 25
9.6.3 Axiom 3 25
9.6.4 Axiom 4 25
9.6.5 Axiom 5 25
9.6.6 Axiom 6 26
9.6.7 Axiom 7 26
9.6.8 Axiom 8 26
9.6.9 Axiom 9 26
10 Complex activity core theory 27
10.1 Primitive Relations in the Complex activity core theory 27
10.2 Defined Relations in the Complex activity core theory 27
10.3 Relationship to other sets of axioms 27
10.4 Informal Semantics of the Complex activity core theory 28
10.4.1 min_precedes 28
10.4.2 root 28
10.4.3 subtree 28
10.4.4 leaf 28
10.4.5 do 29

10.4.6 next_subocc 29
10.4.7 sibling 29
10.5 Definitions in Complex activity core theory 29
10.5.1 Definition 1 30
10.5.2 Definition 2 30
10.5.3 Definition 3 30
10.5.4 Definition 4 31
10.5.5 Definition 5 31
10.6 Axioms of the Complex activity core theory 31
10.6.1 Axiom 1 32
10.6.2 Axiom 2 32
10.6.3 Axiom 3 32
10.6.4 Axiom 4 33
10.6.5 Axiom 5 33
10.6.6 Axiom 6 33
10.6.7 Axiom 7 34
10.6.8 Axiom 8 34
10.6.9 Axiom 9 34
10.6.10 Axiom 10 35
10.6.11 Axiom 11 35
11 Activity occurrence core theory 35
11.1 Primitive Relations in the Activity occurrence core theory 35
11.2 Defined Relations in the Activity occurrence core theory 35
11.3 Relationship to other sets of axioms 36
11.4 Informal Semantics of the Activity occurrence core theory 36
11.4.1 subactivity_occurrence 36
11.4.2 mono 36
11.4.3 root_occ 36
11.4.4 leaf_occ 37
11.4.5 iso_occ 37
11.4.6 hom 37
11.4.7 same_grove 37
11.5 Definitions for Activity occurrence core theory 38
11.5.1 Definition 1 38
11.5.2 Definition 2 38
11.5.3 Definition 3 38
11.5.4 Definition 3 39
11.5.5 Definition 4 39
11.5.6 Definition 5 39
11.6 Axioms for Activity occurrence core theory 40
11.6.1 Axiom 1 40
11.6.2 Axiom 2 40
11.6.3 Axiom 3 40
11.6.4 Axiom 4 41
11.6.5 Axiom 5 42
11.6.6 Axiom 6 42
11.6.7 Axiom 7 42
11.6.8 Axiom 8 43

11.6.9 Axiom 9 43
11.6.10 Axiom 10 43
11.6.11 Axiom 11 44
11.6.12 Axiom 12 44
11.6.13 Axiom 13 44
11.6.14 Axiom 14 44
11.6.15 Axiom 15 45

Annex A (normative) Use of ASN.1 Identifiers in SC4 standards 46
Annex B (informative) Relationship to Situation Calculus 47
Annex C (informative) Example of process description using PSL-Outercore 48

Bibliography 56
Index 57

Figures

Figure 1: Relationships among sets of axioms within PSL Outer core. 9
Figure C1: TOP level process for manufacturing a GT350 [1] 48
Figure C.2: PROCESS for manufacturing the 350–Engine [1] 51
Figure C.3: PROCESS for manufacturing the 350–Block [1] 52
Figure C.4: PROCESS for manufacturing the 350–Harness [1] 53
Figure C.5: PROCESS for manufacturing the harness wire [1] 54
Figure C.6 : Process for manufacturing the 350-Wire [1] 54