

SynDEx v7 Grammar

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Chapitre 1

Conventions

- upper-case text stands for keywords or base types ;
- lower-case text stands for rule names ;
- the first square brackets [...] for a rule only delimit the description of the rule ;
- the second square brackets (inside a rule description) [...] represent optional elements ;
- curly brackets {...} represent zero, one or several repetitions of the enclosed element ;
- pipes | represent alternatives for a rule ;
- usual brackets (...) are used inside a rule for sub-alternatives ;

Chapitre 2

Keywords and base types

2.1 General application information

"include":	INCLUDE
"def":	DEF
"main":	MAIN
"application":	APPLICATION
"description":	DESCRIPTION

2.2 Operation Groups were previously called Software Components

"operation_group":	OG
"software_component":	XSC
"constraint":	CONSTRAINT
"absolute":	ABSOLUTE
"relative":	RELATIVE
"union":	UNION
"disjunction":	DISJUNCTION
"syndex_version":	SYNDEX_VERSION
"initseq":	INIT_SEQ
"loopseq":	LOOP_SEQ
"endseq":	END_SEQ
"code_phases":	CODE_PHASES

2.3 Algorithm

"constant":	CONSTANT
"sensor":	SENSOR
"actuator":	ACTUATOR
"memory":	DELAY
"algorithm":	ALGORITHM
"internal":	INTERNAL
"attach_all":	ATTACH_ALL
"attach_ref":	ATTACH_REF

"attach_condi":	ATTACH_CONDI
"attach_condo":	ATTACH_CONDO
"attach_explode":	ATTACH_EXPLODE
"attach_implode":	ATTACH_IMPLODE
"conditions":	CONDITIONS
"references":	REFERENCES
"dependences":	DEPENDANCES
"strong_precedence_data":	STRONGPRECEDENCEDATA
"weak_precedence_data":	WEAKPRECEDENCEDATA
"precedence":	PRECEDENCE
"data":	DATA
"condition_synchro":	CONDITION_SYNCHRO

2.4 Architecture

"architecture":	ARCHITECTURE
"operator":	OPERATOR
"operators":	OPERATORS
"gate":	GATE
"media":	MEDIA
"medias":	MEDIAS
"sampp":	SAMPP
"sammp":	SAMMP
"ram":	RAM
"broadcast":	BROADCAST
"no_broadcast":	NOBROADCAST
"extra_durations_operator":	EXTRA_DURATIONS_OPERATOR
"extra_durations_media":	EXTRA_DURATIONS_MEDIA
"connections":	CONNECTIONS

2.5 Adequation result

"ports":	PORTS
"schedules":	SCHEDULES
"operation_scheduled":	OPERATION_SCHEDULED
"scheduled":	SCHEDULED
"calcul":	CALCUL
"communication":	COMMUNICATION
"send":	SEND
"receive":	RECEIVE
"sync":	SYNC
"send_synchro":	SEND_SYNCHRO
"receive_synchro":	RECEIVE_SYNCHRO
"read":	READ
"write":	WRITE
"ihm":	IHM
"condI":	CONDI
"condO":	CONDO
"explode":	EXPLODE
"implode":	IMPLODE

"synchro_constant":	SYNCHRO_CONSTANT
"cond_level":	COND_LEVEL
"schedule_dependences":	SCHEDULE_DEPENDENCES
"schedule_conditions":	SCHEDULE_CONDITIONS

2.6 Misc

"on":	ON
"true":	TRUE
"false":	FALSE

2.7 Symbols

eof:	EOF
"?":	IN
"!":	OUT
"->":	TO
"<=":	BACKARROW
'@':	AT
'=':	EQU
'\':	BACKSLASH
'/' :	DIV
'-':	MINUS
' ':	BAR
'[':	LDIM
']':	RDIM
'<':	LARG
'>':	RARG
'{':	LLIST
'}':	RLIST
'(':	LPAR
')':	RPAR
'&':	AND
':':	COL
'#[^\n]*:	COMMENT
'"[\^"]*"':	STRING

['a' - 'z' 'A' - 'Z' ' _ '] ['a' - 'z' 'A' - 'Z' ' _ ' ' 0 ' - ' 9 ' '*'] *: NAME (if not a keyword)

['+' '-' ' _ '] ? [' 0 ' - ' 9 '] + (' . ' [' 0 ' - ' 9 '] *) ? (' e ' ['+' '-' ' _ '] ? [' 0 ' - ' 9 '] +) ? : FLOAT

Chapitre 3

Regular expressions

```
expr_list      ::= [ [ expr_list_continue ] ]
expr_list_continue ::= [ { expr COMMA } expr ]
expr           ::= [ NAME | FLOAT | STRING | LPAREN expr RPAREN | expr PLUS expr
                    | expr MINUS expr | expr TIMES expr | expr DIV expr | CEIL expr |
                    MINUS expr | LLIST expr_list RLIST | BAR expr BAR ]
expression     ::= expr EOE
```

Chapitre 4

Application specification

The entry point of the application is the *file* rule.

def_desc	::=	[[DESCRIPTION COL STRING]]
rfc_desc	::=	[[STRING]]
comment	::=	COMMENT
boolean	::=	[FALSE TRUE]
int	::=	FLOAT
integer	::=	[[MINUS] int]
name_list	::=	[{ NAME }]
rfc	::=	[NAME [DIV NAME]]
rfc_name	::=	rfc DOT NAME
rfc_name_list	::=	[{ rfc_name }]
rfc_path	::=	[{ BACKSLASH [NAME] }]
attachement_type	::=	[ATTACH_ALL ATTACH_REF ATTACH_CONDI ATTACH_CONDO ATTACH_EXPLODE ATTACH_IMPLODE]
operation_attached	::=	[LDIM rfc_path (RDIM COMMA attachement_type RDIM)]
operation_attached_list	::=	[{ operation_attached }]
expression	::=	
arg_names_list	::=	[{ NAME SCOL } NAME]
arg_names	::=	[[LARG arg_names_list RARG]]
arg_vals_list	::=	[{ expression SCOL } expression]
arg_vals	::=	[[LARG arg_vals_list RARG]]
dimension	::=	[[LDIM expression RDIM]]
range	::=	[[LDIM expression (RDIM DOT DOT expression RDIM)]]
coord2d	::=	integer COMMA integer
period_port	::=	[[int]]
rfc_prd	::=	[[int]]
rank	::=	[[int]]
pos	::=	[[AT coord2d]]
dim_window	::=	[[coord2d]]
version	::=	SYNDEX_VERSION COL STRING
code_phase	::=	[INIT_SEQ LOOP_SEQ END_SEQ]
code_phase_list	::=	[{ code_phase }]
code_phases	::=	[[CODE_PHASES COL code_phase_list SCOL]]

in_port	: :=	IN NAME dimension NAME rank pos SCOL period_port
out_port	: :=	OUT NAME dimension NAME rank pos SCOL period_port
inout_port	: :=	AND NAME dimension NAME rank pos SCOL period_port
in_port_list	: :=	[{ in_port }]
out_port_list	: :=	[{ out_port }]
port_list	: :=	[{ (in_port out_port inout_port) }]
dpd_prt	: :=	[NAME [DOT NAME]]
abstract	: :=	[[TRUE FALSE]]
dpd_rfc	: :=	NAME
dependence	: :=	[(STRONGPRECEDENCEDATA dpd_prt TO dpd_prt WEAKPRECEDENCEDATA dpd_prt TO dpd_prt PRECEDENCE dpd_rfc TO dpd_rfc DATA dpd_prt TO dpd_prt) SCOL]
dependence_list	: :=	[{ dependence }]
rep_prts	: :=	[NAME BACKARROW NAME [COMMA rep_prts]]
rep	: :=	[[LDIM expression (RDIM COL rep_prts RDIM)]]
reference	: :=	rfc arg_vals rep NAME pos rfc_desc rfc_prd abstract SCOL
reference_list	: :=	[{ reference }]
condition_algo	: :=	[[boolean NAME EQU integer]]
condition	: :=	CONDITIONS COL condition_algo SCOL
references	: :=	REFERENCES COL reference_list
dependences	: :=	DEPENDANCES COL dependence_list
cnd_rfcs_dpds	: :=	condition references dependences
cnd_rfcs_dpds_list	: :=	[{ cnd_rfcs_dpds }]
internal	: :=	DEF INTERNAL NAME arg_names COL port_list
constant	: :=	DEF CONSTANT NAME arg_names dim_window COL out_port_list def_desc
sensor	: :=	DEF SENSOR NAME arg_names dim_window COL out_port_list def_desc
actuator	: :=	DEF ACTUATOR NAME arg_names dim_window COL in_port_list def_desc
delay	: :=	DEF DELAY NAME range arg_names dim_window COL port_list def_desc
algorithm	: :=	DEF ALGORITHM NAME arg_names dim_window COL port_list cnd_rfcs_dpds_list code_phases def_desc
algo	: :=	[internal constant sensor actuator delay algorithm]
bus_type	: :=	[(SAMPP SAMMP RAM) SCOL]
broadcast	: :=	[[BROADCAST NOBROADCAST]]
gate	: :=	GATE NAME NAME SCOL
gate_list	: :=	[{ gate }]
duration	: :=	rfc EQU FLOAT SCOL
durations_list	: :=	[{ duration }]
gateref	: :=	NAME DOT NAME
operatorref	: :=	rfc NAME pos SCOL
operatorref_list	: :=	[{ operatorref }]
mediaref	: :=	rfc NAME broadcast pos SCOL
mediaref_list	: :=	[{ mediaref }]

```

connection          ::= gateref NAME SCOL
connection_list     ::= [ { connection } ]
operators           ::= OPERATORS COL operatorref_list
medias              ::= MEDIAS COL mediaref_list
connections         ::= CONNECTIONS COL connection_list
main_operator       ::= [ [ MAIN OPERATOR NAME SCOL ] ]
operator            ::= DEF OPERATOR NAME COL gate_list durations_list
                    def_desc code_phases
media               ::= DEF MEDIA NAME COL bus_type durations_list
                    def_desc
extra_durations_operator ::= EXTRA_DURATIONS_OPERATOR rfc COL
                    durations_list
extra_durations_media ::= EXTRA_DURATIONS_MEDIA rfc COL durations_list
architecture        ::= DEF ARCHITECTURE NAME dim_window COL
                    operators main_operator medias connections def_desc
archi               ::= [ operator | media | extra_durations_operator |
                    extra_durations_media | architecture ]
main                ::= [ MAIN ( ALGORITHM rfc arg_vals SCOL |
                    ARCHITECTURE rfc SCOL ) ]
xsc_definition      ::= [ ( XSC | OG ) NAME COL operation_attached_list
                    SCOL ]
operationonproc     ::= CONSTRAINT COL rfc_path ON rfc_name_list SCOL
absoluteconstraint  ::= ABSOLUTE CONSTRAINT COL NAME ON
                    rfc_name_list SCOL
relativeconstraint_type ::= [ UNION | DISJUNCTION ]
relativeconstraint  ::= RELATIVE CONSTRAINT COL
                    relativeconstraint_type name_list SCOL
constraints         ::= [ operationonproc | absoluteconstraint | relativeconstraint
                    ]
description         ::= APPLICATION def_desc
calcul_path         ::= [ [ DIV | calcul_path ] DIV NAME ]
communication_name  ::= [ { NAME COMMA } NAME ]
string_path        ::= [ [ DIV | string_path ] DIV NAME ]
communication_path_not_repeated ::= [ DIV communication_name LPAR string_path DOT
                    NAME RPAR ]
communication_path  ::= [ communication_path_not_repeated [ NAME ] ]
operation_path      ::= [ calcul_path | communication_path ]
operator_list       ::= [ { NAME COMMA } NAME ]
receivers           ::= LPAR operator_list RPAR
operation_port      ::= operation_path DOT NAME
calcul_class        ::= [ CONSTANT | SENSOR | ACTUATOR | DELAY |
                    ALGORITHM | INTERNAL ]
communication_class ::= [ WRITE NAME operation_port | READ NAME
                    operation_port | SEND NAME receivers operation_port |
                    RECEIVE NAME receivers NAME operation_port |
                    SYNC NAME receivers NAME operation_port |
                    SEND_SYNCHRO NAME NAME |
                    RECEIVE_SYNCHRO NAME NAME ]
opn_class           ::= [ CALCUL calcul_class rfc | COMMUNICATION
                    communication_class ]
origin              ::= [ ( IHM | CONDI | CONDO | EXPLODE | IMplode |
                    SYNCHRO_CONSTANT ) operation_path ]
opn_title           ::= opn_class arg_vals LPAR origin RPAR SCOL

```

operator_class	: :=	[(OPERATOR MEDIA) NAME]
schedule_place	: :=	SCHEDULED COL operator_class integer FLOAT integer
adeq_condition	: :=	operation_port EQU integer
adeq_cond_list	: :=	[{ adeq_condition AND } adeq_condition]
adeq_conditions	: :=	[CONDITIONS COL (boolean adeq_cond_list)]
dir	: :=	[IN OUT AND]
port_class	: :=	[DATA PRECEDENCE DELAY CONDITION_SYNCHRO]
adeq_port	: :=	dir NAME LDIM int RDIM NAME port_class integer period_port SCOL
adeq_port_list	: :=	[{ adeq_port }]
adeq_ports	: :=	PORTS COL adeq_port_list
adeq_dependence	: :=	[(STRONGPRECEDENCEDATA COND_LEVEL EQU int operation_port TO operation_port STRONGPRECEDENCEDATA operation_port TO operation_port PRECEDENCE operation_path TO operation_path) adeq_conditions SCOL]
adeq_dpd_list	: :=	[{ adeq_dependence }]
adeq_dpds	: :=	SCHEDULE_DEPENDENCES COL adeq_dpd_list
operation_condition	: :=	operation_path adeq_conditions
operation_condition_list	: :=	[{ operation_condition }]
adeq_operations_conditions	: :=	SCHEDULE_CONDITIONS operation_condition_list
operation_scheduled	: :=	OPERATION_SCHEDULED operation_path COL opn_title schedule_place adeq_ports
schedules	: :=	SCHEDULES COL
command	: :=	[version description algo archi main schedules operation_scheduled adeq_dpds adeq_operations_conditions xsc_definition constraints comment]
command_list	: :=	[{ command }]
fileinclude	: :=	INCLUDE STRING SCOL
file	: :=	[command_list (fileinclude EOF)]