

# CnC Runtime Model with Trailing Edge

## MODULE CNC-SYNTAX

Runtime initialization commands

SYNTAX  $CollID ::= Int$

SYNTAX  $InitCommand ::= (item-coll CollID) \mid (step-coll CollID)$

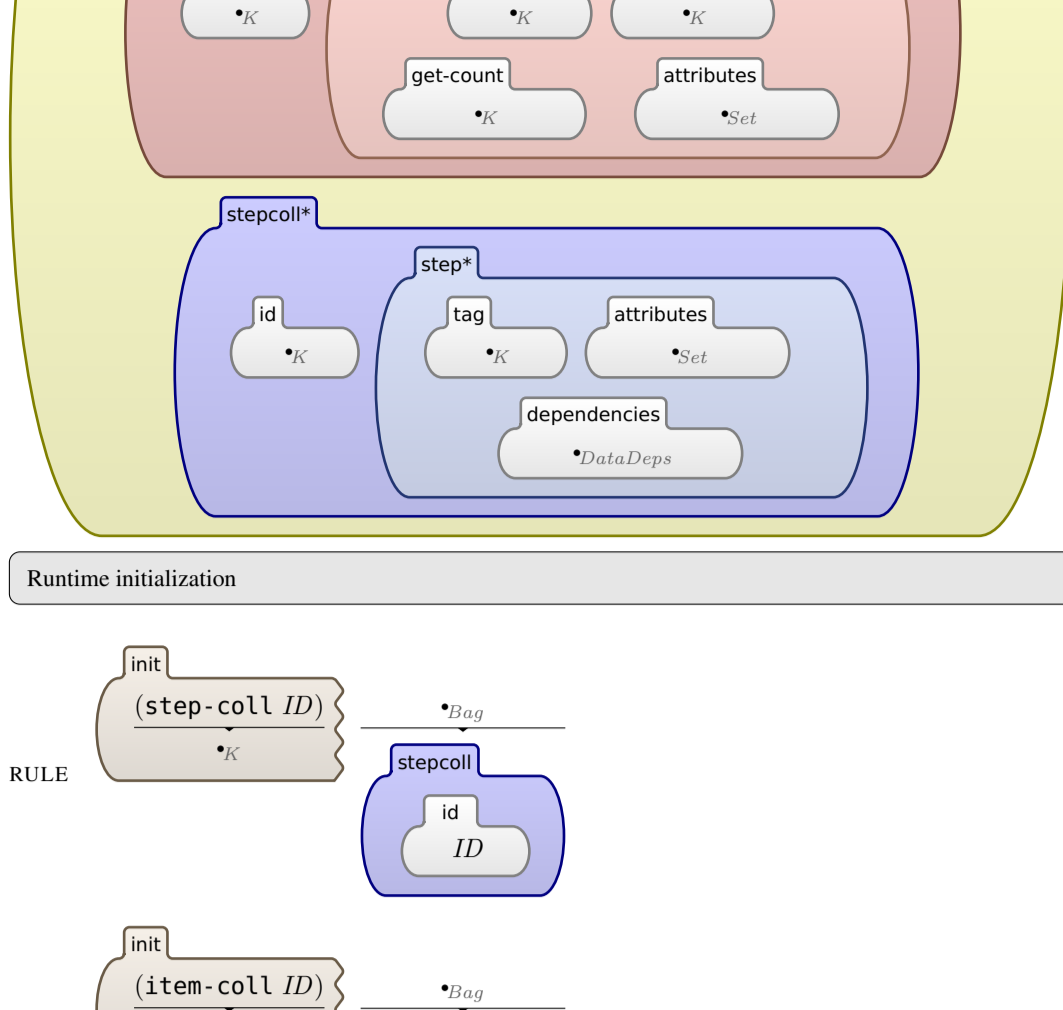
SYNTAX  $InitSeq ::= List\{InitCommand, ""\}$

## END MODULE

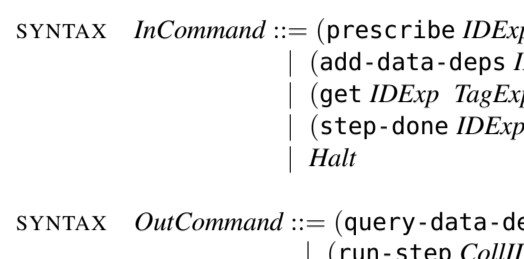
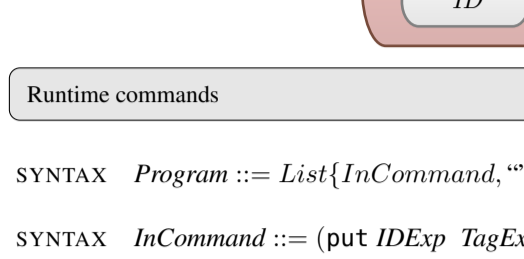
## MODULE CNC

CnC runtime state representation

CONFIGURATION:



Runtime initialization



Runtime commands

SYNTAX  $Program ::= List\{InCommand, ""\}$

SYNTAX  $InCommand ::= (put IDExp TagExp DataExp DataExp) [seqstrict]$

SYNTAX  $InCommand ::= (prescribe IDExp TagExp) [seqstrict]$   
 $\mid (add-data-deps IDExp TagExp DepsExp) [seqstrict]$   
 $\mid (get IDExp TagExp) [seqstrict]$   
 $\mid (step-done IDExp TagExp) [seqstrict]$   
 $\mid Halt$

SYNTAX  $OutCommand ::= (query-data-deps CollID Tag)$   
 $\mid (run-step CollID Tag)$   
 $\mid (give CollID Tag DataItem)$   
 $\mid (finished)$   
 $\mid (error-thrown)$

SYNTAX  $DataItem ::= Int$

SYNTAX  $DataItems ::= DataItems DataItem \mid DataItem$

SYNTAX  $Tag ::= (DataItems)$

SYNTAX  $IDExp ::= CollID$

SYNTAX  $TagExp ::= Tag$

SYNTAX  $DataExp ::= DataItem$

SYNTAX  $DepPair ::= IDExp TagExp [seqstrict]$

SYNTAX  $DepPairExp ::= DepPair$

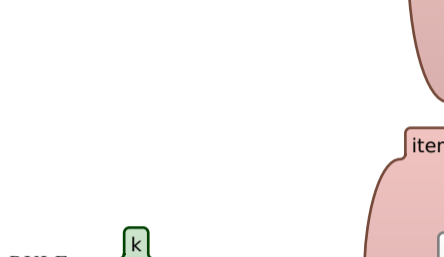
SYNTAX  $ReadCmd ::= (read-cmd)$

SYNTAX  $Halt ::= halt \mid error-halt$

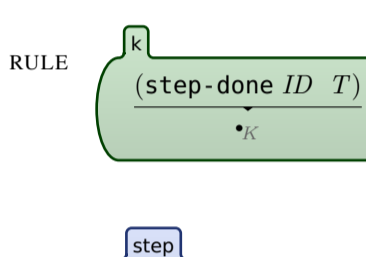
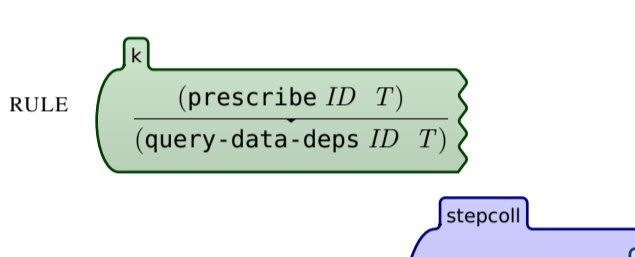
SYNTAX  $Attribute ::= control-ready \mid data-ready \mid enabled \mid done$

SYNTAX  $ItemAttr ::= dead$

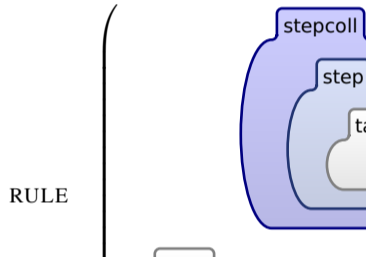
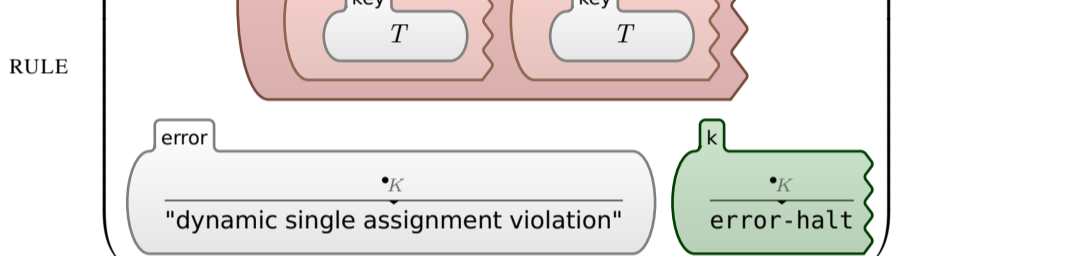
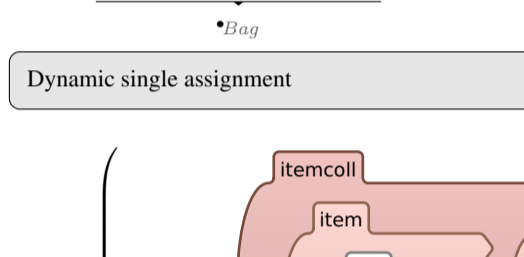
Read in calls to runtime



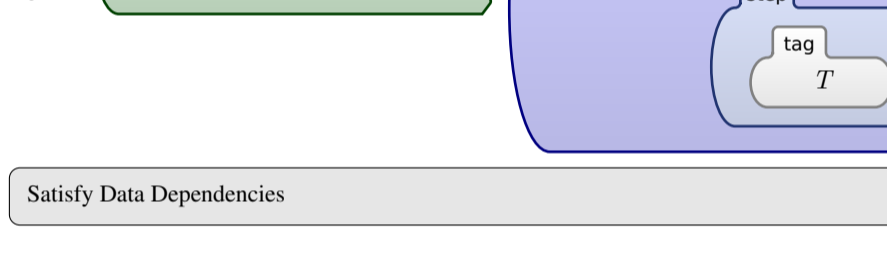
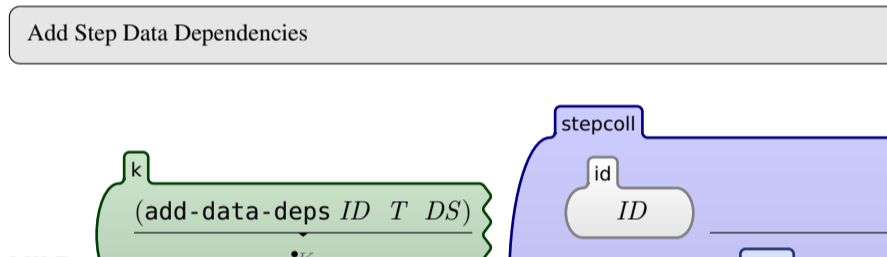
Data items



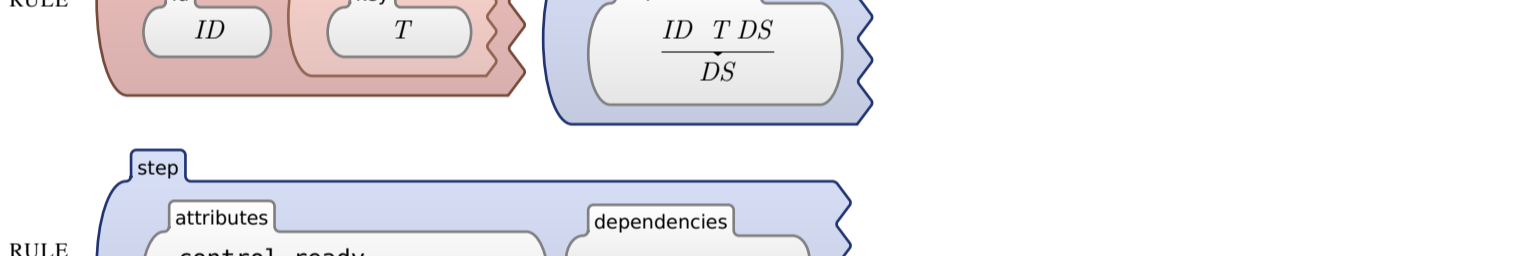
Steps



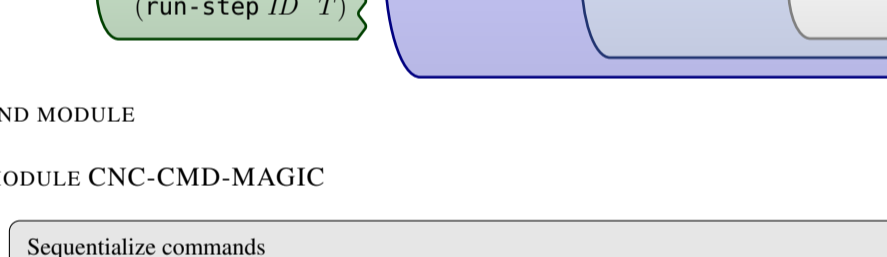
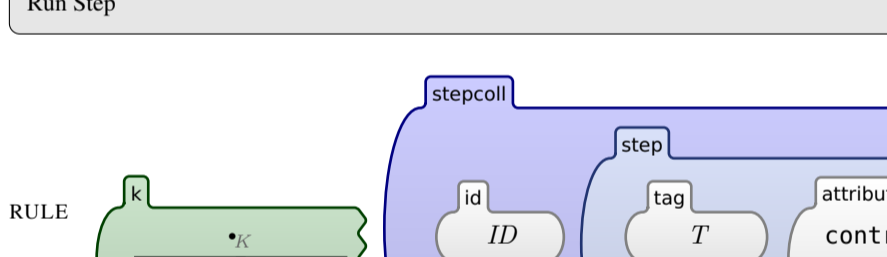
Dynamic single assignment



Add Step Data Dependencies



Satisfy Data Dependencies



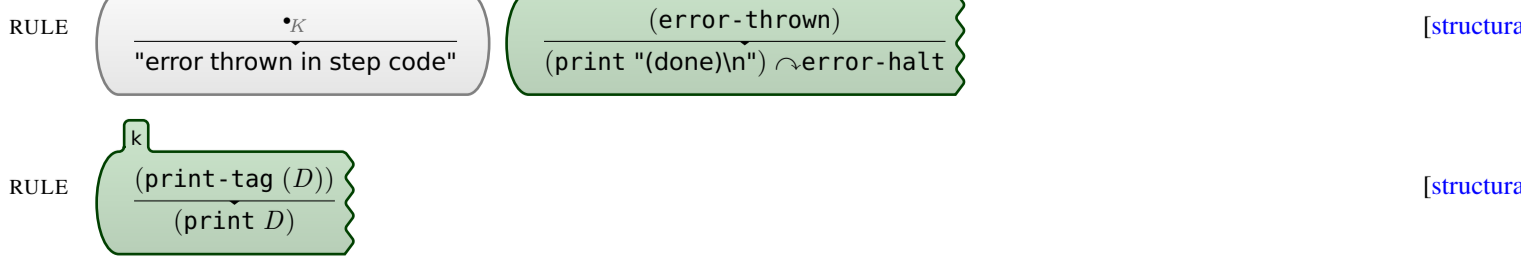
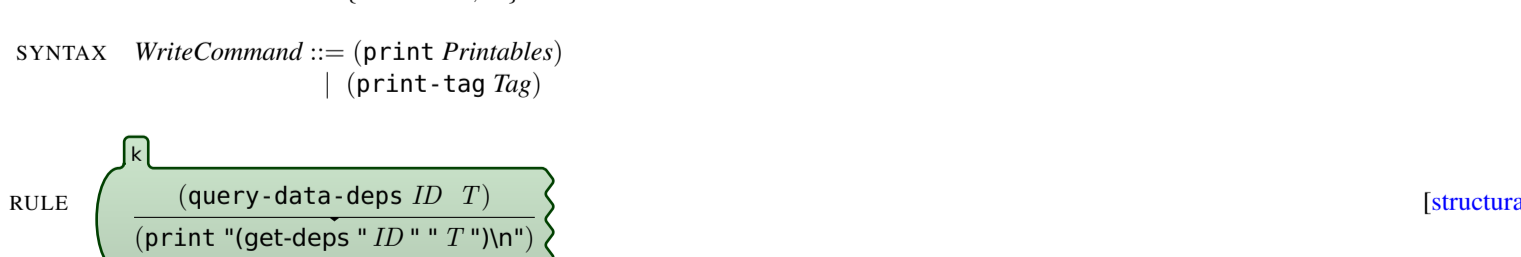
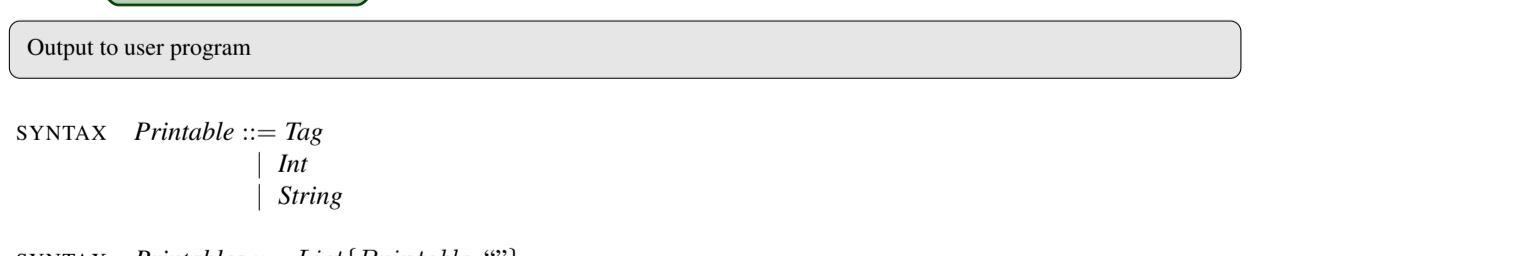
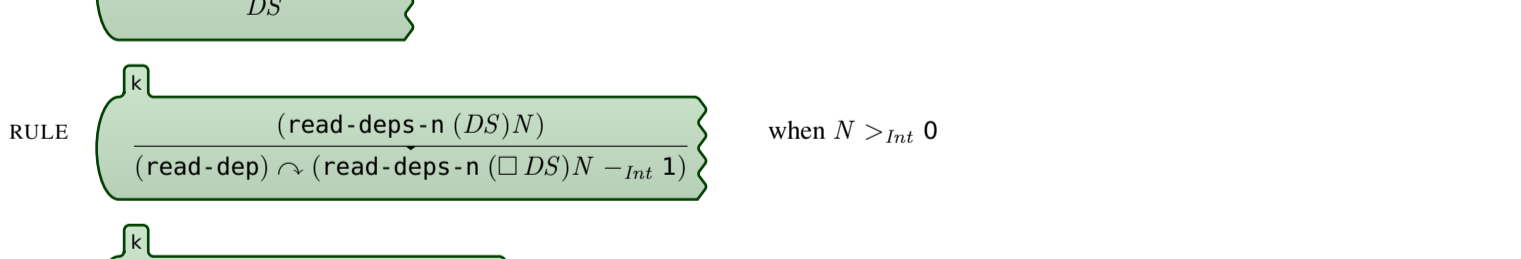
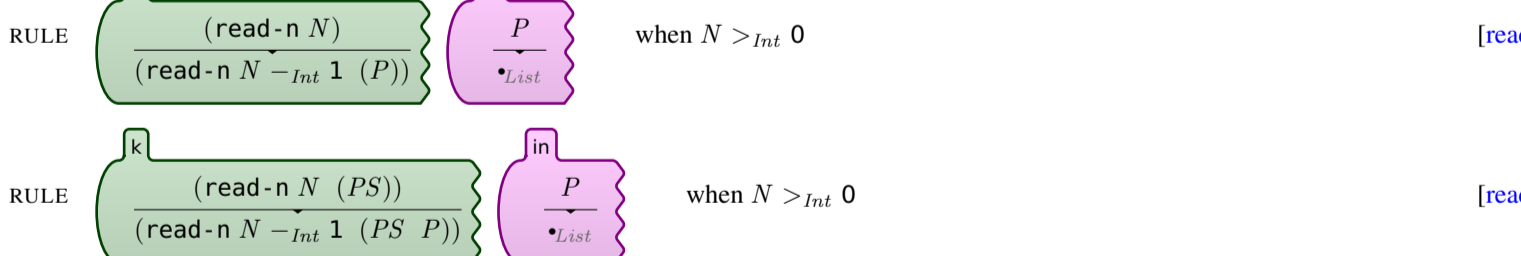
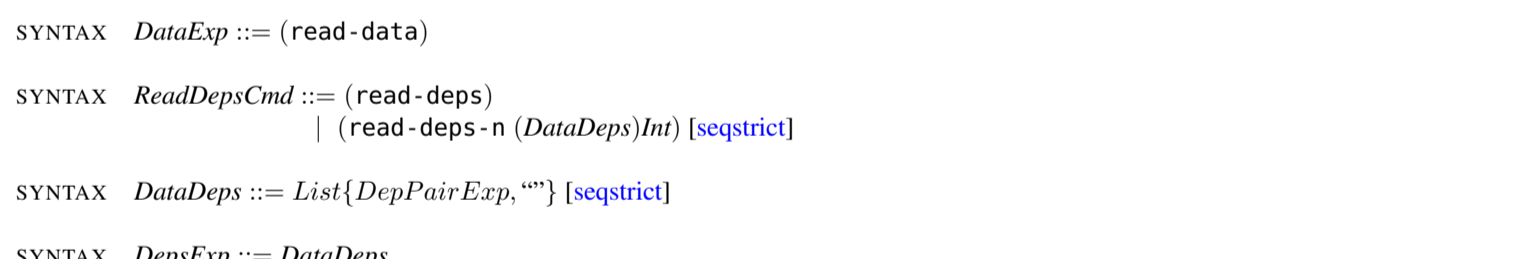
Run Step



## END MODULE

## MODULE CNC-CMD-MAGIC

Sequentialize commands

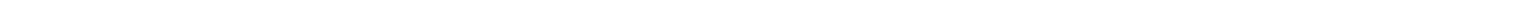


Output to user program

SYNTAX  $Printable ::= Tag \mid Int \mid String$

SYNTAX  $Printables ::= List\{Printable, ""\}$

SYNTAX  $WriteCommand ::= (print Printables) \mid (print-tag Tag)$



## END MODULE