TSX CAY/CFY module software setup

PL7 Junior/Pro or Unity Pro setup software provides:
■ SMOVE and XMOVE motion control functions for programming movements. These functions can be used in Ladder language, Instruction list language or Structured Text language.
■ Specialized screens for configuring, adjusting and debugging axes.

Programming movements

A movement on an independent axis is initiated by executing an SMOVE control function in the application program.
Example: go to the absolute position 10 000 000 μm, at a speed of 200 mm/min, without stopping.
A screen enables the assisted entry of parameters in the SMOVE function in an operation block.

The XMOVE command enables movement to be initialized on interpolated axes (TSX CAY 33 only).

Instruction codes

The characteristics of movements are described using a syntax similar to that for a numerical controller program block written in ISO language. TSX CAY and TSX CFY motion control modules use the following instructions:
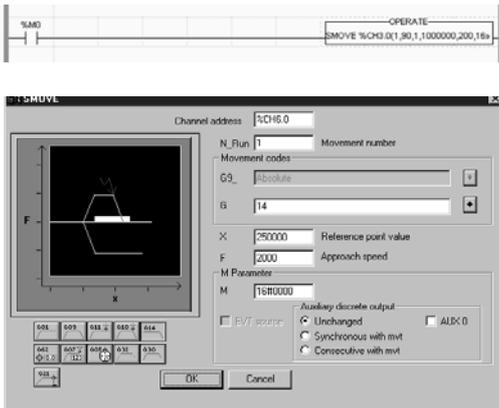
Code and type of instruction		Individual axes (SMOVE)			Interpol. axes (XMOVE)
		TSX CAY 21/41	TSX CAY 22/42/33	TSX CFY 11/21	TSX CAY 33
09	Move to the position and stop				
01	Move to the position without stopping				
10	Move until an event is detected and stop				
11	Move until an event is detected without stopping				
14	Homing				
04	Stop command				
05	Await an event				
07	Memorize the current position when an event occurs				
62	Forced homing				
30/32	Simple machining				
92	Initialization of memorized positions				
21	Move without stopping, with homing on the fly				
22	Flying shear on two axes		*(1)*		
90/98	Cutting mode (on position or on event)		*(1)*		

Possible instruction

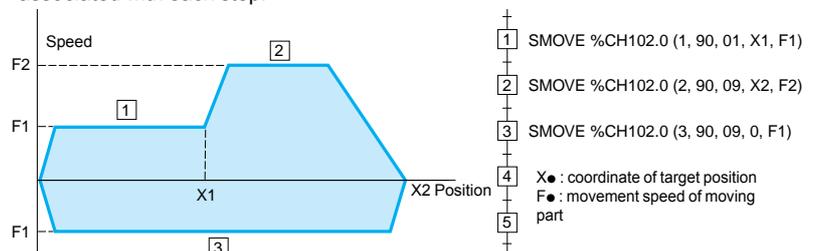These instruction codes can be represented as symbols by the user in G code (for example: 09 can be represented by G09).
The instruction codes are preceded by another code indicating the type of target position:
90 : if the target position is absolute.
91 : if the target position is relative to the current position.
98 : if the target position is relative to a memorized position (index).
60 : if the target position is absolute and movement direction is fixed (TSX CAY 22/42/33 only).
68 : if the target position is relative to a memorized position and movement direction is fixed (TSX CAY 22/42/33 only).

Programming a path

A complete path can be programmed by means of a series of SMOVE or XMOVE elementary motion control functions.

Grafcet language is ideal for this type of programming. An elementary movement is associated with each step.

1 SMOVE %CH102.0 (1, 90, 01, X1, F1)

2 SMOVE %CH102.0 (2, 90, 09, X2, F2)

3 SMOVE %CH102.0 (3, 90, 09, 0, F1)

4 X● : coordinate of target position
5 F● : movement speed of moving part

(1) Only with TSX CAY 22 module. Requires the version > 4.1 of PL7 Junior/Pro software. Not available with Unity Pro software.

Modicon Premium automation platform
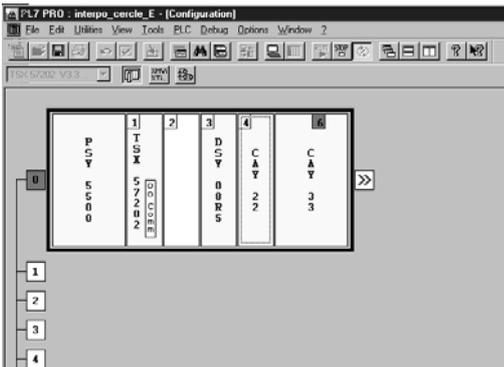## Motion control modules

TSX CAY/CFY module software setup (continued)

When setting up application-specific functions, screens specific to axis control and stepper control functions can be accessed via PL7 Junior/Pro software for configuration, adjustment, debugging and documentation of applications.
These services are performed by editors which can be directly accessed from the basic screen using icons in the tool bars. Windows relating to the editors can be simultaneously displayed on one screen (example: it is possible to simultaneously program using the program editor and define the symbols in the variables editor).

Declaring the axis control modules and stepper control modules

Parameter entry screens for application-specific functions can be accessed via the configuration screen by clicking on the slot.

Example : modules **TSX CAY 21** and **TSX CFY 21** in which the module has been defined.

Configuring the modules

The configuration editor provides assistance with entering and modifying the values of the various axis configuration parameters. These parameters enable the operation of the axis control module, **TSX CAY 21** for example, to be adapted to the machine which is to be controlled.
Axis configuration parameters are :
■ Units of measurement.
■ Resolution.
■ Type of encoder.
■ Maximum and minimum limits.
■ Maximum speed.
■ …
This data relates to the machine and cannot be modified by the program.
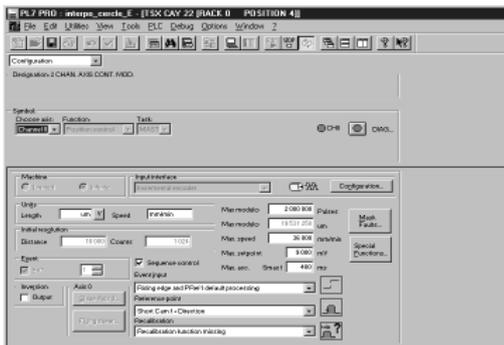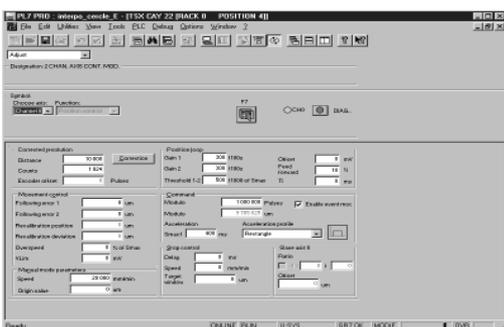
Adjusting the modules

These parameters are associated with operation of the axes. They generally require the operations on and movements of the moving part to be known. These parameters are adjusted in online mode (they are initialized during configuration, in offline mode). They concern:
■ Encoder offset.
■ Resolution.
■ Servo control parameters.
■ …

□
□

Debugging the modules

In online mode, the configuration editor also provides the user with a control panel screen, giving him a quick visual display which he can use to control and observe the behaviour of the axis.

The control panel provides different information and commands according to the selected operating mode :
■ Automatic mode (Auto).
■ Manual mode (Manu).
■ Direct mode (Dir_Cde).
■ Off mode (Off).