

FOREGROUND AND BACKGROUND OPERATION

The 11TA offers the capability of "background editing" as a basic feature. This function allows the programmer/operator to load, edit and check programs with the aid of a graphic display (optional). Therefore, programs may be prepared for the next job without waiting for the completion of the current machining operation. This feature increases machine productivity as well as operator/programmer efficiency.

FLEXIBLE PROGRAMS

The 11TA offers a unique programming capability called "custom macro". This feature permits parametric programming, arithmetic functions, logical calculations, conditional jump functions, message display capability, etc. By using these capabilities, the control can be customized to meet the requirements of user-defined applications. The

following are just a few of the examples of how the "custom macro" feature may be used.

- Family programs
- Customized canned cycles
- In-process/post-process gauging routines
- Multi-function M codes
- Feedrate program by workpiece surface finish
- Automatic retraction and recover cycle at tool breakage

APPLICATION FLEXIBILITY

The 11TA offers a wide range of applications from a simple two axes lathe to a FMS cell. The powerful built-in Programmable Machine Controller (PMC), with wide communication channels, along with the NC control software offers access to all necessary data for construction of a FMS. The combination of a high-level language (PASCAL) and conventional ladder type program provides for an

optimum PMC system. Along with a large memory 80K and 208K (optional) and the large number of I/O (752 inputs/496 outputs), the system is more than adequate for construction of complex cells. The wide communication channels will accommodate the following items:

- Control of program loading/unloading through serial port
- Terminal emulation by MDI/CRT
- Reporting NC and machine status
- Supervising machining by a host computer
- NC command format conversion

TECHNICAL SPECIFICATIONS

BM BASIC MACHINE INTERFACE: System with BM interface (the only interface with which all functions of SYSTEM 11 can be used). PMC is required.

6 . . System with which interface is compatible with the current SYSTEM 6.

1. BASIC FUNCTIONS

Specifications	With PMC		Without PMC	Note
	BM	6	6	
Controlled axes : 2 axes	★	★	★	
Name of axes : Optional from X, Z, Y, A, B, C	★	★	★	
Simultaneously controllable axes : 2 axes	★	★	★	
Tape code : EIA RS244A, ISO 840 Automatic recognition	★	★	★	
Decimal point programming	★	★	★	Pocket calculator type available
Max. command value : 8 digits	★	★	★	
Rapid traverse override : F0, F1, 50, 100%	★	★	★	
Feed rate command : mm/min or inch/min, mm/rev or inch/rev, E6 digits specifying (G94, G95)	★	★	★	
Feed rate override: 0-254% per every 1%	★	✓	✓	✓: Up to 200% in 6 (Per 10%)
Tangential speed constant control	★	★	★	
Automatic acceleration/deceleration Rapid traverse; linear; cutting feed : exponential	★	★	★	Acceleration/deceleration after interpolation
Positioning (G00)	★	★	★	
Linear interpolation (G01)	★	★	★	
Multi-quadrant circular interpolation (G02, G03)	★	★	★	
Circular interpolation by radius programming	★	★	★	
Thread cutting, continuous thread cutting, synchronous feed (G33)	★	★	★	
Combined use of absolute/incremental command: possible in the same block	★	★	★	G90/G91 or XZ/UW
Coordinate system setting (G92)	★	★	★	
Local coordinate system setting (G52)	★	★	★	
Work coordinate system selection : 6 pairs (G54-G59)	★	★	★	

★ = Available

✓ = Restricted

□ = Not Available

2. OPTIONAL FUNCTIONS CONTINUED

Specifications	With PMC		Without PMC	Note
	BM	6	6	
Inch/metric conversion (G20, G21)	★	★	★	
Programmable data input (G10)	★	★	★	
Stored stroke check 2,3 (G22, G23)	★	★	★	
Stroke check before move	★	★	★	
Stored pitch error compensation	★	★	★	
Straightness compensation	★	★	★	
Program restart	★	★	★	
Block restart	★	★	□	
Sequence number comparison and stop	★	★	★	
Optional block skip addition 2-9	★	★	★	
External work number search : 31 programs	★	★	★	
External data input/output	★	✓	✓	
Input/output interface:RS232C x1, RS422 x1, RS232C or current loop 20mA x1	★	★	★	
Custom macro	★	✓	✓	✓ : DI/DO = 16/16
Expanded macro	★	★	★	
Interruption type custom macro	★	★	★	
Automatic corner override (G62)	★	★	★	
Programmable mirror image (G50.1, G50.2)	★	★	★	
Mirror image for double turrets (G68, G69)	★	★	★	
Direct drawing dimension programming	★	★	★	
Chamfering, corner R	★	★	★	
Handle interruption	★	★	★	
Play back	★	★	□	
Tool life management	★	★	★	
Menu switch	★	★	✓	
Manual numerical command under JOG mode	★	★	★	
G code system C	★	★	★	
Graphic display function A	★	★	★	For 14" CRT only
14" color CRT	★	★	★	
Run hour display	★	★	★	
External I/O port control	★	□	□	
2nd feedrate override	★	□	□	
Actual spindle speed output	★	□	□	
High speed skip signal input	★	★	★	
High speed tool measuring signal input	★	★	★	
Additional common variables: 200/300/600 total	★	★	★	
Program encoding and password	★	★	★	
Auto-Manual simultaneous control	★	□	□	
Expanded part program edit	★	★	★	
Axis status output	★	✓	□	✓ Axis selection status only
External position display	★	★	★	
Bubble cassette & adaptor	★	★	★	
Floppy cassette adaptor	★	★	★	
Portable tape reader	★	★	★	
Printer Punch Reader	★	★	★	
Programmable controller	★	★	□	PMC-MODEL I
PC window	★	□	□	

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1. BASIC FUNCTIONS CONTINUED

Specifications	With PMC		Without PMC	Note
	BM	6	6	
External power on/off	★	★	★	
Connectable servo motors : AC/DC SERVO MOTOR	★	★	★	
Connectable servo units : AC/DC drive	★	★	★	
Connectable position detectors : Pulse coder/Optical scale	★	★	★	
Connectable spindle motor : AC/DC SPINDLE MOTOR	★	★	★	
Connectable spindle servo units : AC/DC drive	★	★	★	
Power : 200VAC +10%, -15%, 1 phase, 50/60Hz ± 1Hz or 220VAC +10% -15%, 1 phase, 60Hz ± 1Hz	★	★	★	

2. OPTIONAL FUNCTIONS

Specifications	With PMC		Without PMC	Note
	BM	6	6	
Tape reader without reels	★	★	★	
Tape reader with reels	★	★	★	
Resolver/Inductosyn interface	★	★	★	
Multi-tap transformer 200-550VAC + 10, -15%	★	★	★	
Controllable axes expansion : Max. 5 axes plus spindle control (add. axes)	★	✓	✓	✓: 4 axes
Simultaneous controllable axes expansion : Max. up to all controllable axes	★	★	★	
Hypothetical axis interpolation	★	★	□	
Skip functions (G31)	★	★	★	
Multiple Repetitive Cycles	★	★	★	
Canned cycle for drilling (G80-G89)	★	□	□	
Tool nose radius compensation (G40-G42)	★	★	★	
Tool offset amount memory B : ±6 digits, geometry/wear memory, 32 pairs	★	★	★	
Additional tool compensation sets (64 pairs/160 pairs)	★	★	★	
Direct input of offset value measured	★	★	★	
Automatic tool compensation : (G37.1-G37.3)	★	★	★	
Addition in registered programs : 200/400	★	★	★	Necessary to add tape storage length
2nd, 3rd, 4th reference point return : Automatic (G30)	★	✓	✓	3rd & 4th restricted
Tape storage length : Bubble memory 1050/2100/4200/8400/12,600 ft.	★	★	★	Max. memory length may be limited according to selection offset memory.
Cutting feed automatic acc/dec : Linear before interpolation	★	★	★	
External deceleration	★	★	□	
Manual pulse generator : Max. 3	★	★	★	
Variable lead thread cutting (G34)	★	★	★	
Tool retract during threading cycle	★	★	★	
Circular thread cutting (G35, G36)	★	★	★	
Spindle speed binary/analog output	★	★	★	
Spindle positioning	★	★	★	
Constant surface speed control (G96, G97)	★	★	★	
2nd miscellaneous functions	★	□	□	8 digits (binary) select address from A, B, C so that it does not duplicate with control axes, address

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Note: These specifications are subject to change without notice.

1. BASIC FUNCTIONS CONTINUED

Specifications	With PMC		Without PMC	Note
	BM	6	6	
Machine coordinate system selection (G53)	★	★	★	
Buffer register	★	★	★	
Dwell (G04)	★	★	★	
Auxiliary functions : M 8-digit (Binary output)	★	✓	✓	✓: BCD 2-digit
Spindle functions : S 8-digit (Binary output)	★	✓	✓	✓: BCD 2-digit
Tool functions : T 8-digit (Binary output)	★	✓	✓	✓: BCD 2-digit
Display of actual feedrate per revolution	★	★	★	
Tool offset: T code	★	★	★	
Tool offset amount memory A : 6 digits, 32 pairs	★	★	★	
Incremental offset	★	★	★	
Offset counter input	★	★	★	
Keyboard type manual data input (MDI)	★	★	★	
CRT Character display: 9" monochrome	★	★	★	
Part program storage, editing	★	★	★	
Background editing functions : Editing during automatic operation	★	★	★	
Tape storage length : Bubble memory 262 ft (80m)	★	★	★	
Registerable programs : 100	★	★	★	Program name display possible
Canned cycle: (G77-G79)	★	★	★	
Reference point return A : Manual, Automatic (G27-G29)	★	★	★	
Self-diagnosis functions	★	★	★	
Diameter and radius programming for X axis	★	★	★	
Backlash compensation : Max 9999 pulses	★	★	★	
Single block	★	★	★	
Optional block skip	★	★	★	
Manual absolute on/off	★	★	★	
External mirror image : For all axes	★	★	✓	✓ :X axis only
Dry run	★	★	★	
Interlock	★	★	★	
Every axis interlock	★	★	★	
Machine lock	★	★	★	
Every axis machine lock	★	★	□	
Auxiliary functions lock	★	★	★	
Feed hold	★	★	★	
Manual jogging	★	★	★	
Manual incremental feed : x1, x10, x100, x1000, x10000, x100000	★	★	★	
Overtravel	★	★	★	
Stored stroke check 1	★	★	★	
Emergency stop	★	★	★	
Servo off signal input	★	★	★	
Follow up : Emergency stop signal input	★	★	★	
Sequence number : 5 digits	★	★	★	
Sequence number search	★	★	★	
Program number : 4 digits	★	★	★	
Program number search	★	★	★	
Exact stop (G09, G61/G64)	★	★	★	
NC status output	★	★	□	

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2. NEW OPTIONAL FUNCTIONS

Specifications	With PMC		Without PMC	Note
	BM	6	6	
Polar coordinate interpolation	★	★	★	Contour by X & C
Cylindrical interpolation	★	★	★	Contour on cylinder, Z & C
Turret axis control	★	★	☐	Closed loop turret
Synchronous axes control	★	☐	☐	
Spindle monitor	★	★	☐	
Parts counter	★	★	★	
Parameter set by part program	★	☐	☐	
Quick tool offset data set	★	☐	☐	
Key stroke generation by PMC	★	★	☐	
IPR jog	★	☐	☐	
Feed stop	★	★	★	
Absolute position feedback	★	★	★	
NC/PMC WINDOW B	★	☐	☐	
Fine CMR	★	★	★	
Direct input of offset value measured B	★	★	☐	

★ = Available

↙ = Restricted

☐ = Not Available

GENERAL NUMERIC

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