

Series 31i -B CNC for Milling
STANDARD FEATURES

Axis Control

Digital Servo Function
1 Controlled Path
3 (up to maximum of 4) Simultaneously Controllable Axes (J801) (J803)
Serial Encoder Interface
Axis Names Selected from X,Y,Z,U,V,W,A,B,C
Least Input Increment of 0.001mm, 0.0001", 0.001deg
Inch/Metric Conversion (J876)
Interlock per Axis
Machine Lock
Emergency Stop
Overtravel Signal
Stored Stroke Check 1
Mirror Image
Follow-up Function
Servo Off
Mechanical Handle Feed
Backlash Compensation
Stored Pitch Error Compensation (J841)

Operation

Memory Operation
DNC Operation
MDI Operation
Program Number Search
Sequence Number Search
Buffer Register
Dry Run Mode
Single Block Mode
Manual Feed Mode (Jog)
Manual Reference Point Return
Manual Handle Feed (J835) *(requires MPG)*
Incremental Feed

Interpolation

Positioning (G00)
Exact Stop Mode (G61)
Exact Stop (G09)
Linear Interpolation
Circular Interpolation
Dwell (G04)
Helical Interpolation (J819)
Skip Function (G31)
Automatic Reference Point Return (G28, G29)
Reference Point Return Check (G27)
2nd Reference Point Return (G30)

Series 31i -B CNC for Milling

Feed Function

Rapid Traverse Feedrate 240m/min (100m/min @0.0001mm increment)
Rapid Traverse Feedrate Override (preset value, 25%, 50%, 100% settings)
Feed per Minute
Tangential Speed Control
Cutting Feedrate Clamp
Automatic Acceleration/Deceleration (Rapid Traverse: Linear; Cutting Feed: Linear or Exponential)
Rapid Traverse Bell-Shaped Acceleration/Deceleration
Feedrate Override 0-254%
Jog Override 0-655.34 %
Override Cancel

Programming

EIA/ISO Automatic Identification
Label Skip
Parity Check
Control In/Out
Optional Block Skip
Maximum Programmable Value - 8 digits
Program Number - O with 4 digits
Sequence Number - N with 5 digits
Absolute or Incremental Command
Programmable Data Input (G10)
Decimal Point Input
10 Times Input Unit
Plane Selection (G17, G18, G19)
Rotary Axis Setting
Rotary Axis Rollover
Coordinate System Setting (G92)
Automatic Coordinate System Setting
Manual Absolute On/Off
Subprogram Calling
Canned Drilling Cycles (G73, G74, G76, G80-G89, G98, G99) (J890)
Specifying the Radius of an Arc

Auxiliary and Spindle Functions

Miscellaneous Function - M with 8 digits
Miscellaneous Function Lock
High Speed M/S/T Interface
Multiple Commands of Miscellaneous Functions (up to 3)
Spindle Function - S with 5 digits
Serial Spindle Interface (J850)
Spindle Override 0-254%

Tool Functions and Tool Compensation

Tool Function - T with 8 digits
32 Tool Offsets
Tool Length Compensation (G43, G44, G49)
Tool Radius/Tool Nose Radius Compensation (J930)

Series 31i-B CNC for Milling

ORDER FORM

<input type="checkbox"/>	Series 31i-B CNC Express Package A for Milling - 10.4" LCD Mount w/o Touch Screen.	Pick One
<input type="checkbox"/>	Series 31i-B CNC Express Package B for Milling - 2 Slot Stand Alone. Choose Only 1.	Pick One
Package A Options		
<input type="checkbox"/>	PROFIBUS DP Master Board (J311, S731, J562#6552)	Choose no more than two Option Boards
<input type="checkbox"/>	PROFIBUS DP Slave Board (J313, S732, J563#655C)	
PROFIBUS Application Software, J535#655B, required for all PROFIBUS		
HSSB Board (High Speed Serial Bus) (J202) (includes Extended D/L Function, 10m F/O cbl)		
1st Fast Ethernet Board (J147) Requires Communication Option Below:		
Fast Ethernet Function (S707) (Uses FOCAS Protocol)		
Data Server Funct (S737,R953)(req's ATA Flash Mem Card)(Uses FTP for data transfer)		
Ethernet/IP Adapter Function (R967), Data Server requires a separate Ethernet Board		
Ethernet/IP Scanner Function (R966), Data Server requires a separate Ethernet Board		
2nd Fast Ethernet Board (J147)(Add'l Enet Port) Requires 2 of 3 (S707 or S737,R966,R967).		
Manual Guide i in Package A - Requires Custom Macro (J873) for full functionality.		
<input type="checkbox"/>	Manual Guide i (S790) 10.4" Color LCD Type A - Large Screen Animation not supported.	
<input type="checkbox"/>	Manual Guide i Multi Path function (S786) - to use on 2nd Path	
Package B Options		
<input type="checkbox"/>	PROFIBUS DP Master Board (J311, S731, J562#6552)	Choose no more than two Option Boards
<input type="checkbox"/>	PROFIBUS DP Slave Board (J313, S732, J563#655C)	
PROFIBUS Application Software, J535#655B, required for all PROFIBUS		
1st Fast Ethernet Board (J147) Requires Communication Option Below:		
Fast Ethernet Function (S707) (Uses FOCAS Protocol)		
Data Server Funct (S737,R953)(req's ATA Flash Mem Card)(Uses FTP for data transfer)		
Ethernet/IP Adapter Function (R967), Data Server requires a separate Ethernet Board		
Ethernet/IP Scanner Function (R966), Data Server requires a separate Ethernet Board		
2nd Fast Ethernet Board (J147)(Add'l Enet Port) Requires 2 of 3 (S707 or S737,R966,R967).		
Do not use HSSB from Package B. (Removes A02B-0207-J900). For LCD or Ethernet Display.		
<input type="checkbox"/>	10.4" LCD A Color w/ Tch Scrn (C084)(290x220mm), J682, Pen & 10m F/O cbl, A02B-0120-K323, A02B-0120-K324, A02B-0319-K191	Only one LCD
<input type="checkbox"/>	15.0" LCD Color w/ Tch Scrn (C092)(400x320mm), J682, Pen & 10m F/O cbl, A02B-0120-K323, A02B-0120-K324	Req MDI below.
CNC Side HSSB Board (incl's A02B-0207-J900, 10m F/O cbl) Requires one Option Slot		
Without Standard CNC Display Unit - HSSB (J389) to Panel i or PC side HSSB, 10m F/O cbl.		
Without Standard CNC Display Unit - Embedded Ethernet (J390) connects to iPendant only		
Ethernet Display Function (R950 & J573#658N) Embedded Ethernet to PC, not for iPendant		
<input type="checkbox"/>	Sep Type MDI (Vert PC Type) (QWERTY) (290x160mm)	A02B-0323-C128 or equivalent
<input type="checkbox"/>	Sep Type MDI (QWERTY Type B)(400x145mm) No 10.4" LCD	A02B-0303-C129 or equivalent
<input type="checkbox"/>	Sep Type MDI (ONG Type) (Vertical) (290x220mm)	A02B-0323-C126#M or equivalent
<input type="checkbox"/>	Sep Type MDI (ONG Type) (Horizontal) (230x220mm)	A02B-0323-C125#M or equivalent
Manual Guide i in Package B - Requires Custom Macro (J873) for full functionality.		
<input type="checkbox"/>	Manual Guide i (S790)	<i>Only on 1st path of control.</i>
<input type="checkbox"/>	Manual Guide i Multi Path function (S786) - to use on 2nd Path	
<input type="checkbox"/>	10.4" Color LCD A w/ Touch Screen does not support "Large Window Animation" in Manual Guide i.	
High Speed Serial Bus (HSSB) includes: Extended D/L Function J900 & 10m F/O Cable		

Series 31i -B CNC for Milling

SERIES 31i-B MILLING OPTIONS

The following options may be ordered for Packages A or B

Basic Function

<input type="checkbox"/>	G411 Basic S/W for up to 4 paths, 20 controlled axes, 12 per path, and 6 spindles, 4 per path	
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Number of Paths

<input type="checkbox"/>	Two Control Paths	Minimum of 6 Axes	
<input type="checkbox"/>	Three Control Paths, requires G411 Basic Function	Minimum of 9 Axes	
<input type="checkbox"/>	Four Control Paths, requires G411 Basic Function	Minimum of 12 Axes	

Axis Control: up to 20 axes and 6 spindles are possible.

<input type="checkbox"/>	4th Axis	
<input type="checkbox"/>	5th Axis	
<input type="checkbox"/>	6th Axis	
<input type="checkbox"/>	7th Axis changes to B12 Servo Card, 1 FSSB Servo Line	
<input type="checkbox"/>	8th Axis	
<input type="checkbox"/>	9th Axis	
<input type="checkbox"/>	10th Axis	
<input type="checkbox"/>	11th Axis	
<input type="checkbox"/>	12th Axis	
<input type="checkbox"/>	13th Axis, Requires G411 Basic SW, changes to B13 Servo Card, 1 FSSB Servo Line	
<input type="checkbox"/>	14th Axis	
<input type="checkbox"/>	15th Axis	
<input type="checkbox"/>	16th Axis	
<input type="checkbox"/>	17th Axis	
<input type="checkbox"/>	18th Axis	
<input type="checkbox"/>	19th Axis changes to B24 Servo Card, 2 FSSB Servo Lines	
<input type="checkbox"/>	20th Axis	

Number of Serial Spindles (default is one). >1 Spindle per path requires Multi Spindle Control.

<input type="checkbox"/>	2 Spindles	
<input type="checkbox"/>	3 Spindles	
<input type="checkbox"/>	4 Spindles	
<input type="checkbox"/>	5 Spindles, Requires G411 Basic SW.	
<input type="checkbox"/>	6 Spindles	
<input type="checkbox"/>	Multi Spindle Control. Required if more than one spindle is used per path.	

Analog Spindle.

<input type="checkbox"/>	Analog Spindle (J860) replaces Serial Spindle (J850). Having Serial Spindle requires R584.	
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Serial/Analog Spindle Control - includes Multi Spindle Control.

<input type="checkbox"/>	1 Serial Spindle and 1 Analog Spindle (R584, J850, J860)	
<input type="checkbox"/>	2 Serial Spindles and 1 Analog Spindle	
<input type="checkbox"/>	3 Serial Spindles and 1 Analog Spindle	
<input type="checkbox"/>	4 Serial Spindles and 1 Analog Spindle, Requires G411 Basic SW.	
<input type="checkbox"/>	5 Serial Spindles and 1 Analog Spindle	

Series 31i -B CNC for Milling

Axis Control Options

<input type="checkbox"/>	Axis Control by PMC (up to 16 axes) (J804)	
<input type="checkbox"/>	Synchronous Axis Control (up to 6 pairs axes) (J843)	
<input type="checkbox"/>	Controlled Axis Detach (J807)	
<input type="checkbox"/>	Chopping Function (J707)	
<input type="checkbox"/>	Least Input Increment of 0.0001mm, 0.00001", 0.0001deg (J805)	
<input type="checkbox"/>	Dual Position Feedback (J704)	
<input type="checkbox"/>	Stroke Limit External Setting (J845)	
<input type="checkbox"/>	Stored Stroke Check 2 (J840)	
<input type="checkbox"/>	Stored Limit Check Before Move (J749)	
<input type="checkbox"/>	Interpolation type pitch error compensation (S644)	
<input type="checkbox"/>	Bi-directional pitch error compensation (S656)	
<input type="checkbox"/>	Straightness Compensation (J747) (4 points)	
<input type="checkbox"/>	Interpolation Type Straightness Compensation (S639) (128 points)	
<input type="checkbox"/>	Position Switch (J846)	
<input type="checkbox"/>	Rotary Axis Control (J743)	

Tool Center Point Features

<input type="checkbox"/>	Smooth TCP (R639) includes (S677) Tool Center Point Control	Choose only one.
<input type="checkbox"/>	Tool Center Point Control (S677)	
<input type="checkbox"/>	Tilted Working Plane Indixeng Command (R522)	
<input type="checkbox"/>	3-Dimensional Cutter Compensation (S667)	
<input type="checkbox"/>	Workpiece Setting Error Compensation (S993)	
<input type="checkbox"/>	3-dimensional manual feed (S679)	

Operation

<input type="checkbox"/>	Program Restart (J838)	
<input type="checkbox"/>	Tool Retract & Recover (J823)	
<input type="checkbox"/>	Retrace (J730)	
<input type="checkbox"/>	Manual Handle Retrace (J998)	
<input type="checkbox"/>	Manual Handle Feed 2/3 Units (J836)	
<input type="checkbox"/>	Manual Handle Interruption (J837)	
<input type="checkbox"/>	Change Active Offset Value with Manual Move (S825)	

Interpolation

<input type="checkbox"/>	Unidirectional Positioning (G60) (J812)	
<input type="checkbox"/>	Polar Coordinate Interpolation (J815)	
<input type="checkbox"/>	Cylindrical Interpolation (J816)	
<input type="checkbox"/>	Thread Cutting and Feed per Revolution (J824)	(requires Spindle Encoder)
<input type="checkbox"/>	High Speed Skip (J848)	
<input type="checkbox"/>	Multi Step Skip (J849)	
<input type="checkbox"/>	3rd, 4th Reference Point Return (J830)	
<input type="checkbox"/>	Normal Direction Control (J813)	
<input type="checkbox"/>	Index Table Indexing (J822)	(requires 4th Axis)
<input type="checkbox"/>	Linear Scale I/F w/ absolute address reference mark (J670). Requires Separate Detector I/F.	

Series 31i -B CNC for Milling

Feed Function

Bell Shaped Acc/Dec After Interpolation for Cutting Feed (J829)	
2nd Feedrate Override (J810)	
Inverse Time Feed (J715)	
AI Contour Control I (30 Block Look Ahead) (S807)	Choose only S807 or S808
Simultaneously Commanded Paths for AICC I, one path (S807#1)	
Simultaneously Commanded Paths for AICC I (Max.two paths) (S807#2)	
Simultaneously Commanded Paths for AICC I (Max.four paths) (S807#4)	
AI Contour Control II (200 Block Look Ahead) (S808)	
Machining Condition Selecting Function (S637) Requires AICC I or AICC II.	

Grinding Options

Canned Cycles for Grinding (S974)	
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Programming

Optional Block Skip (total 9) (J955)	
Polar Coordinate Command (J818)	
Workpiece Coordinate System (G52-G59) (J894)	
Additional Work Coordinate System, 48 Pairs (J895)	
Workpiece Coordinate System Preset (J917)	
Optional Angle Chamfering/Corner Rounding (S615)	
Custom Macro (J873)	
Additional Custom Macro Common Variables (J887), 100 + 500 = 600 Total	Only One.
Additional Custom Macro Common Variables 1000 (R687), 100 + 1000 = 1100 Total	
Interruption for Custom Macro (J874)	
Pattern Data Input (J884)	
Peck Drilling Cycle for Small Hole (J896)	
Scaling (J892)	Choose only one
Automatic Corner Override (J891)	
Coordinate System Rotation (J893)	
Programmable Mirror Image (J880)	
Series 15 Tape Format (J882)	
Macro Executor (J888) 96K Reserved for System S/W.	Choose only one Macro
Macro Executor + C-language Executor (J734) 700K Reserved for System S/W.	
FANUC PICTURE Executor (R644) 2M Reserved for System S/W.	Available with J888/J734.
Custom Software Size 512KB (J738#512K)	Not with J734 or R644.
Custom Software Size 2MB (J738#2M)	Not with R644.
Custom Software Size 4MB (J738#4M)	Choose only one Custom Software Size.
Custom Software Size 6MB (J738#6M)	
Custom Software Size 8MB (J738#8M)	
Custom Software Size 12MB (J738#12M)	

Series 31i -B CNC for Milling

PMC Options

<input type="checkbox"/>	PMC with 32K Steps (H990#32K)		
<input type="checkbox"/>	PMC with 64K Steps (H990#64K)		
<input type="checkbox"/>	PMC with 100K Steps (H990#100K)	24,000 Steps Standard, choose only One upgrade.	
<input type="checkbox"/>	PMC with 300K Steps (H990#300K)		
<input type="checkbox"/>	Multi-path PMC function (3 paths) (R855#3)	One PMC Path Standard.	
<input type="checkbox"/>	Multi-path PMC function (5 paths) (R855#5)	Choose Only One.	
<input type="checkbox"/>	PMC symbol, comment, and message capacity expansion (512KB) (R856#512K)		
<input type="checkbox"/>	PMC symbol, comment, and message capacity expansion (1MB) (R856#1M)		
<input type="checkbox"/>	PMC symbol, comment, and message capacity expansion (2MB) (R856#2M)	Only One.	
<input type="checkbox"/>	Function Block Function (R852)		
<input type="checkbox"/>	I/O Link expansion 2nd Channel w/ A20B-1007-0680 and 1m cable.		
<input type="checkbox"/>	I/O Link expansion 2nd/3rd Channel w/ A20B-1008-0360 and 1m cable.		
<input type="checkbox"/>	Dual Check Safety (S661) Req's I/O Link i, I/O Link 3rd Channel or PROFIBUS Master.		1
I/O Link i will be used for Dual Check Safety.		Check here:	

Auxiliary and Spindle Functions

<input type="checkbox"/>	1st Spindle Orientation (J853) (Applies to 1st Spindle per Path)	<i>(req's Serial Spindle)</i>	
<input type="checkbox"/>	Constant Surface Speed Control (J855)	<i>(requires Spindle Encoder)</i>	
<input type="checkbox"/>	2nd Miscellaneous Function (B8-digit binary) (J920)		
<input type="checkbox"/>	Rigid Tapping (J828)	<i>(Analog Spindle req's Spindle Encoder.)</i>	
<input type="checkbox"/>	Retraction for Rigid Tapping (J664)		
<input type="checkbox"/>	See Drives Tab for Spindle Separately Mounted Position Encoder.		

Tool Functions and Tool Compensation

<input type="checkbox"/>	64 Tool Offset items (J925)	Assignable by parameter per path.	
<input type="checkbox"/>	99 Tool Offset items (J926)		
<input type="checkbox"/>	200 Tool Offset items (J927)	Choose only one if more that 32 offsets needed.	
<input type="checkbox"/>	Tool Offset Memory C (D/H code, Geometry/Wear) (J937)		
<input type="checkbox"/>	Tool Life Management (J935)		
<input type="checkbox"/>	Automatic Tool Length Measurement (S618)		

Part Program Storage & Editing Total PPS in the system, available to all paths.

<input type="checkbox"/>	512KB Part Program Storage (J946) (Approx 1280m)		
<input type="checkbox"/>	1MB Part Program Storage (J947) (Approx 2560m)	Choose only one	
<input type="checkbox"/>	2MB Part Program Storage + 1000 Stored Part Programs (J948) (J953) (Approx 5120m)		
<input type="checkbox"/>	4MB Part Program Storage + 1000 Stored Part Programs (J949) (J953) (Approx 10240m)		
<input type="checkbox"/>	8MB Part Program Storage + 1000 Stored Part Programs (J959) (J953) (Approx 20480m)		
<input type="checkbox"/>	Playback (J879)		
<input type="checkbox"/>	Machine Time Stamp (J964)		

FANUC Picture

<input type="checkbox"/>	FANUC Picture Function (S879) Req's LCD w/ Tch Pnl, deletes J682, not w/ J734/J888/R644		
<input type="checkbox"/>	FANUC Picture Function for non-Touch panel display (S944)	Not w/ J734, J888 or R644	

Series 31i -B CNC for Milling

Ethernet or HSSB Options

Use Embedded Ethernet for BOP2 or Ladder Edit Function		
<input type="checkbox"/>	Basic Operation Package (BOP2) Function (J816) & CD (Also works w/ embedded Ethernet)	
<input type="checkbox"/>	CNC Screen Display Function (J858)	
<input type="checkbox"/>	Application Disk for HSSB (K775)	
<input type="checkbox"/>	Application Disk for Ethernet (K776)	
<input type="checkbox"/>	CNC Screen Dual Display Function (S884)	
<input type="checkbox"/>	CNC Screen Display for 19" Panel í (R624)	19" Panel í requires one of these options
<input type="checkbox"/>	Enlarged CNC Screen Display for 19" Panel í (R673)	
<input type="checkbox"/>	CNC Web Server Function (R728) Reqs Std LCD Disp, No CNC Scrn Disp, No simul iPndnt.	
<input type="checkbox"/>	Ladder Edit Function (J820) (Also works w/ embedded Ethernet)	

Display

<input type="checkbox"/>	Graphic Display (J972)	Requires LCD or CNC Screen Display Function	
<input type="checkbox"/>	Software Operator Panel (J960)		
<input type="checkbox"/>	Software Operator Panel General Purpose Switch (J961)		
<input type="checkbox"/>	Selection of Five Optional Language (R521)		

Data Input/Output and Communications

		You may overwrite the QTY fields for qty >1	Qty	
<input type="checkbox"/>	Compact Flash Card 128MB, Card Adapter B		0	
<input type="checkbox"/>	Compact Flash Card 1GB (suggested for use with Data Server), 2 Card Adapters		0	
<input type="checkbox"/>	2nd Reader/Punch Interface (RS-232) (J901)			

Parallel Axis Tracking

<input type="checkbox"/>	Parallel Axis Tracking (S895) is the tracking of the W/Z Zero position when W and Z axis are parallel axes. Activated by G-Code. Applicable to popular Horizontal Boring Machines. Requires J888, J738#256K, J894, J917 & at least 4 axes. Includes DVD and Manual.	
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i Adapts

		Check to override required DVD.	
<input type="checkbox"/>	<i>i</i> Adapts (S898) maintains a constant load during part processing by modifying the feedrate override. This allows for the fastest possible cycle time based on the condition of the tool, part geometry and material variation. By maintaining the manufacturer's recommended load on the tool, tool life can also be extended. <i>i</i> Adapts works on the first serial spindle in the first path only. Req's J873, J810, J738#2M, J734.		
<input type="checkbox"/>	<i>i</i> Adapts S/W DVD D75F-0102-PB00	Each MTB/Retrofitter must purchase a DVD once.	
<input type="checkbox"/>	<i>i</i> Adapts S/W DVD with FANUC Picture (R644). Req's R644 >=J738#6M. D75F-0103-PB00.		

Cables

Optional: Replace 10m cable for LCD ordered with Package B with one of the following:	
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 1m
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 5m
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 20m
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 30m
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 40m
<input type="checkbox"/>	Fiber Optic Cable, CNC to LCD, 50m

Different MDI's

<input type="checkbox"/>	Separate Type MDI (ONG) (Vertical)	Replaces Vertical QWERTY in Pkg A
<input type="checkbox"/>	A02B-0323-C126#M or equivalent 290x220mm	(Do not order with Pkg B)
<input type="checkbox"/>	Separate Type MDI (ONG) (Horizontal)	Replaces Vertical QWERTY in Pkg A
<input type="checkbox"/>	A02B-0323-C125#M or equivalent 230x220mm	(Do not order with Pkg B)

Series 31i -B CNC for Milling

Product Manuals

<input type="checkbox"/>	Series 30i/31i/32i-B Descriptions,	B-64482EN	0		
<input type="checkbox"/>	Series 30i/31i/32i-Model B Connection Manual Hardware,	B-64483EN	0		
<input type="checkbox"/>	Series 30i/31i/32i-Model B Connection Manual (Function),	B-64483EN-1	0		
<input type="checkbox"/>	Series 30i/31i/32i-Model B Maintenance Manual *,	B-64485EN	0		
<input type="checkbox"/>	Series 30i/31i/32i-Model B Parameter Manual *,	B-64490EN	0		
<input type="checkbox"/>	Series 30i/31i/32i-B User's Manual Common, Machining Center *,	B-64484EN & -2	0		
<input type="checkbox"/>	Series 30i/31i/32i FAST Ethernet/Data Server Operator's Manual,	B-64014EN	0		
<input type="checkbox"/>	Manual Guide i Operator's Manuals & Setup Guide,	B-63874EN, -1 & -2	0		

These Manuals are NOT included on the complimentary product-specific CD. A complimentary copy is shipped with the CNC. Extra hard-copy manuals, if required, may be ordered here.

<input type="checkbox"/>	Series 30i/31i/32i Model B Operation and Maintenance Handbook,	B-64487EN	0		
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Check here if no I/O is needed.

<input type="checkbox"/>	Check here if I/O has already been purchased				
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