OPERATING INSTRUCTIONS
Extensions of the machine

INDEX

Job control of external clients

Interface description

INDEX Single spindle lathes

Control INDEX C200-sl

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Note on applicability

Illustrations in this publication may deviate from the product supplied. Errors and omissions due to technical progress expected.

A word on copyright

Table of contents

Interface tasks

The job control interface allows an external client to process different jobs one after the other.

Tasks of the external client

- Storing the workpiece program as a folder on the machine (external memory area due to the use of EES)
- Transmission of the workpiece name and, in the case of piece count-controlled job control, also of the target number of parts
- Starting the job when the machine reports itself as ready.
- Timely notification of the end of the job in the case of signal-controlled job control

Machine tasks

- Selection and start of the workpiece program, provided that it is stored correctly.
- Positive feedback to the external client if the selection of the workpiece program was successful
- Error message to the external client if it is not possible to select the workpiece program (for example, if it does not exist).
- Finishing the workpiece until the target number of parts is reached (in the case of piece count-controlled job control) or the end of the job is signaled (in the case of signal-controlled job control)
- Ready state message as soon as the machine is in the basic state and no job is active.

Interface requirements

The communication takes place via DP/DP coupler or PN/PN coupler. However, it is also possible for the external client to write directly to or read from the addresses of the machine control via CMI. In this case, a DP/DP coupler or PN/PN coupler is not necessary for job control.

If a UNIHAND interface is included in the job, the same DP/DP coupler or PN/PN coupler is used for the UNIHAND and the job control.

Data formats

Byte order

The byte order must be executed as BIG-ENDIAN

Size [bit]	Size [byte]	Name	Sign	min	max.	Decimal places
1	---	BOOL	---	0	1	---
8	1	BYTE	unsigned	0	255	3
8	1	CHAR	---	---	---	---
16	2	INT	signed	-32,768	+32,767	5

Signal descriptions

External client → Machine

Description	Length	Format	Input address	DB address at CMI	Software version
Reserved	BYTE	BYTE	EB0	DB130.DBB18	
Reserved	BIT	BOOL	E1.0	DB130.DBX19.0	
Reserved	BIT	BOOL	E1.1	DB130.DBX19.1	
Reserved	BIT	BOOL	E1.2	DB130.DBX19.2	
Reserved	BIT	BOOL	E1.3	DB130.DBX19.3	
Reset from external • Cancellation of the currently running job • If this bit is set at the start of a new job, the start is inhibited, and the machine reports ready for a new job again	BIT	BOOL	E1.4	DB130.DBX19.4	ES.S1.2020.02.00.00
End of job • End of job for signal-controlled job control • Must be 0 for unit-count-controlled job control	BIT	BOOL	E1.5	DB130.DBX19.5	ES.S1.2020.02.00.00
Reserved	BIT	BOOL	E1.6	DB130.DBX19.6	

Description	Length	Format	Input address	DB address at CMI	Software version
Job start Job start • The signal may only be set if the machine is in the basic state, the workpiece to be selected is stored on the machine, the workpiece name and, if applicable, the nominal number of parts are on the interface • Must be 0 after acknowledgment of the workpiece selection (with positive and negative acknowledgment) on the part of the machine	BIT	BOOL	E1.7	DB130.DBX19.7	ES.S1.2020.02.00.00
Workpiece name: Maximum number of characters (always 32)	BYTE	BYTE	EB2	DB130.DBB20	ES.S1.2020.02.00.00
Workpiece name: Actual number of characters	BYTE	BYTE	EB3	DB130.DBB21	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 1st character	BYTE	CHAR	EB4	DB130.DBB22	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 2nd character	BYTE	CHAR	EB5	DB130.DBB23	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 3rd character	BYTE	CHAR	EB6	DB130.DBB24	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 4th character	BYTE	CHAR	EB7	DB130.DBB25	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 5th character	BYTE	CHAR	EB8	DB130.DBB26	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 6th character	BYTE	CHAR	EB9	DB130.DBB27	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 7th character	BYTE	CHAR	EB10	DB130.DBB28	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 8th character	BYTE	CHAR	EB11	DB130.DBB29	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 9th character	BYTE	CHAR	EB12	DB130.DBB30	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 10th character	BYTE	CHAR	EB13	DB130.DBB31	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 11th character	BYTE	CHAR	EB14	DB130.DBB32	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 12th character	BYTE	CHAR	EB15	DB130.DBB33	ES.S1.2020.02.00.00

Description	Length	Format	Input address	DB address at CMI	Software version
Workpiece name (ASCII format) – 13th character	BYTE	CHAR	EB16	DB130.DBB34	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 14th character	BYTE	CHAR	EB17	DB130.DBB35	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 15th character	BYTE	CHAR	EB18	DB130.DBB36	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 16th character	BYTE	CHAR	EB19	DB130.DBB37	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 17th character	BYTE	CHAR	EB20	DB130.DBB38	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 18th character	BYTE	CHAR	EB21	DB130.DBB39	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 19th character	BYTE	CHAR	EB22	DB130.DBB40	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 20th character	BYTE	CHAR	EB23	DB130.DBB41	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 21st character	BYTE	CHAR	EB24	DB130.DBB42	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 22nd character	BYTE	CHAR	EB25	DB130.DBB43	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 23rd character	BYTE	CHAR	EB26	DB130.DBB44	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 24th character	BYTE	CHAR	EB27	DB130.DBB45	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 25th character	BYTE	CHAR	EB28	DB130.DBB46	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 26th character	BYTE	CHAR	EB29	DB130.DBB47	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 27th character	BYTE	CHAR	EB30	DB130.DBB48	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 28th character	BYTE	CHAR	EB31	DB130.DBB49	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 29th character	BYTE	CHAR	EB32	DB130.DBB50	ES.S1.2020.02.00.00
Workpiece name (ASCII format) – 30th character	BYTE	CHAR	EB33	DB130.DBB51	ES.S1.2020.02.00.00
Target number of parts	WORD	INT	EW34	DB130.DBW52	ES.S1.2020.02.00.00

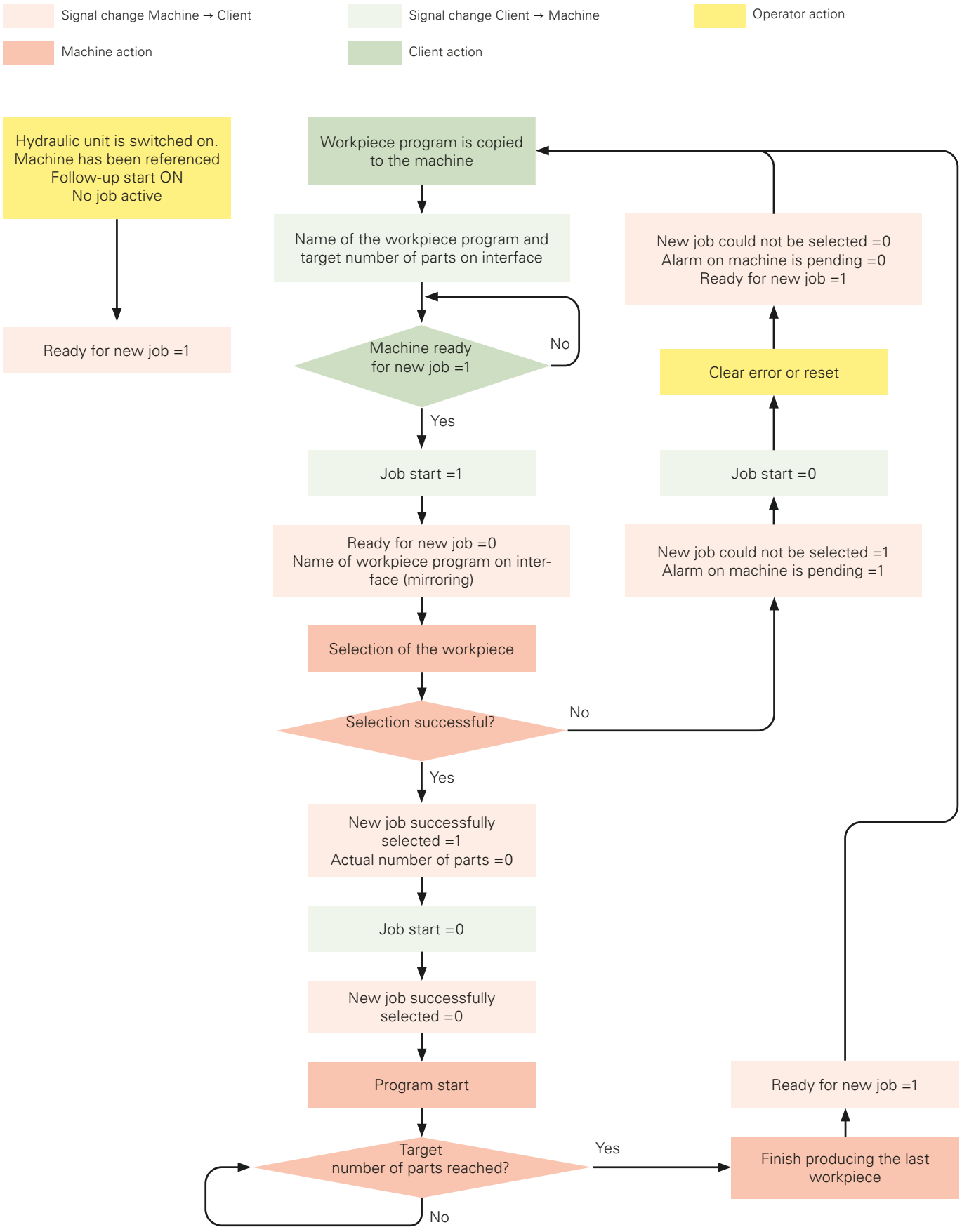
Machine → External client

Description	Length	Format	Output address	DB address at CMI	Software version
Reserved	BYTE	BYTE	AB0	DB131.DBB18	
Ready for new job • Machine is in basic state (hydraulics on, referenced) • No job is active at the moment	BIT	BOOL	A1.0	DB131.DBX19.0	ES.S1.2020.02.00.00
Reserved	BIT	BOOL	A1.1	DB131.DBX19.1	
Reserved	BIT	BOOL	A1.2	DB131.DBX19.2	
Alarm on, machine is on • An alarm with standstill of the machine is pending	BIT	BOOL	A1.3	DB131.DBX19.3	ES.S1.2020.02.00.00
Reserved	BIT	BOOL	A1.4	DB131.DBX19. 4	
Reserved	BIT	BOOL	A1.5	DB131.DBX19.5	
New job successfully selected • When the follow-up start is switched on, the new work-piece program is started • Otherwise a manual start is necessary	BIT	BOOL	A1.6	DB131.DBX19.6	ES.S1.2020.02.00.00
New job could not be selected • Possible cause for this is an incorrectly stored workpiece name on the interface or the absence of the workpiece on the machine	BIT	BOOL	A1.7	DB131.DBX19.7	ES.S1.2020.02.00.00
Workpiece name mirrored: Maximum number of characters (always 32)	BYTE	BYTE	AB2	DB131.DBB20	ES.S1.2020.02.00.00
Workpiece name mirrored: Actual number of characters	BYTE	BYTE	AB3	DB131.DBB21	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 1st character	BYTE	CHAR	AB4	DB131.DBB22	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 2nd character	BYTE	CHAR	AB5	DB131.DBB23	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 3rd character	BYTE	CHAR	AB6	DB131.DBB24	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 4th character	BYTE	CHAR	AB7	DB131.DBB25	ES.S1.2020.02.00.00

Description	Length	Format	Output address	DB address at CMI	Software version
Workpiece name mirrored (ASCII format) – 5th character	BYTE	CHAR	AB8	DB131.DBB26	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 6th character	BYTE	CHAR	AB9	DB131.DBB27	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 7th character	BYTE	CHAR	AB10	DB131.DBB28	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 8th character	BYTE	CHAR	AB11	DB131.DBB29	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 9th character	BYTE	CHAR	AB12	DB131.DBB30	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 10th character	BYTE	CHAR	AB13	DB131.DBB31	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 11th character	BYTE	CHAR	AB14	DB131.DBB32	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 12th character	BYTE	CHAR	AB15	DB131.DBB33	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 13th character	BYTE	CHAR	AB16	DB131.DBB34	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 14th character	BYTE	CHAR	AB17	DB131.DBB35	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 15th character	BYTE	CHAR	AB18	DB131.DBB36	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 16th character	BYTE	CHAR	AB19	DB131.DBB37	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 17th character	BYTE	CHAR	AB20	DB131.DBB38	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 18th character	BYTE	CHAR	AB21	DB131.DBB39	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 19th character	BYTE	CHAR	AB22	DB131.DBB40	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 20th character	BYTE	CHAR	AB23	DB131.DBB41	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 21st character	BYTE	CHAR	AB24	DB131.DBB42	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 22nd character	BYTE	CHAR	AB25	DB131.DBB43	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 23rd character	BYTE	CHAR	AB26	DB131.DBB44	ES.S1.2020.02.00.00

Description	Length	Format	Output address	DB address at CMI	Software version
Workpiece name mirrored (ASCII format) – 24th character	BYTE	CHAR	AB27	DB131.DBB45	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 25th character	BYTE	CHAR	AB28	DB131.DBB46	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 26th character	BYTE	CHAR	AB29	DB131.DBB47	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 27th character	BYTE	CHAR	AB30	DB131.DBB48	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 28th character	BYTE	CHAR	AB31	DB131.DBB49	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 29th character	BYTE	CHAR	AB32	DB131.DBB50	ES.S1.2020.02.00.00
Workpiece name mirrored (ASCII format) – 30th character	BYTE	CHAR	AB33	DB131.DBB51	ES.S1.2020.02.00.00
Actual number of parts	WORD	INT	AW34	DB131.DBW52	ES.S1.2020.02.00.00

Signal course



Process description

Input and output addresses are to be seen relative here (at DP/DP coupler the actual address is not relevant for the external client).

1. When the machine is in the basic state, the signal "Ready for new job" (A 1.0) is set by the machine.
2. The external client provides the workpiece program in folder structure on the machine.
3. The external client writes the workpiece name (EW 2 – EW 32) and possibly the number of parts (EW 34).
4. The external client sets the "Job start" signal (E 1.7).
5. The machine saves the workpiece name (EW 2 – EW 32) and possibly the number of parts (EW 34) and resets the signal "Ready for new job" (A 1.0).
6. The workpiece name is mirrored to the external client if required (AW 2 – AW 32).
7. The workpiece program is selected by the machine.
8. If the selection of the workpiece was not successful (for example, due to missing workpiece folder on the machine):
    a. A corresponding error message is triggered, and the signal "New job could not be selected" (A 1.7) is set.
    b. The signal "New job could not be selected" (A 1.7) is reset by a reset or "Clear error".
    c. The job control goes back to the first step where the signal "Ready for new job" (A 1.0) is set and waiting for a new job.
    d. CAUTION: If the "Job start" signal (E 1.7) from the external client is still present, the same sequence is run through again immediately.
9. If the selection was successful, the job control sets the signal "New job successfully selected" (A 1.6).
10. If available, the job control selects "Load" and/or "Bar start" and starts the machine.
11. The external client resets the "Job start" signal (E 1.7).
12. The job control resets the signal "New job successfully selected" (A 1.6).
13. If the termination condition[1] is fulfilled, the job control selects "Unload".
14. Once "Unload" has run through and the machine is in the basic state, the job control goes back to the first step where the signal "Ready for new job" (A 1.0) is set, and the machine waits for a new job.

[1] The termination condition is either the reaching of the target number of parts specified by the external client or the signal "End of job" (E 1.5), which is set by the external client. In the latter, note that the signal is set at the beginning of the last workpiece, since time is needed to select "Unload".
Similarly, the signal should be reset before starting the new job.

15. CAUTION: If the workpiece programs are to be restored to the server or deleted, this is only possible after the new workpiece has been selected. Workpiece programs that are not required must be deleted by the external client.

Hardware configuration

PN/PN coupler V4.2

The following modules are to be used: IO modules (extended compatibility V3.x)

INDEX Coupler -X1	IBO	Module	PLC address	External supplier Coupler - X2	Simatic Manager (Enhanced compatibility V3.x)	Module	PLC address
	*IN 2-byte	2 bytes Input	818		* OUT 2 bytes	2 bytes Output	From supplier
	*IN 32-byte	32 bytes Input	820		* OUT 32 bytes	32 bytes Output	From supplier
	*IN 2-byte	2 bytes Input	852		* OUT 2 bytes	2 bytes Output	From supplier
	*OUT 2-byte	2 bytes Output	818		*IN 2-byte	2 bytes Input	From supplier
	*OUT 32-byte	32 bytes Output	820		*IN 32-byte	32 bytes Input	From supplier
	*OUT 2-byte	2 bytes Output	852		*IN 2-byte	2 bytes Input	From supplier

DP/DP coupler

The following modules are to be used: Issue version 2/3 consistent

INDEX Coupler -X1	IBO	Module	PLC address	External supplier Coupler	Simatic Manager (Enhanced compatibility V3.x)	Module	PLC address
	2-byte input consistent	2 bytes Input	818		2-byte output consistent	2 bytes Output	From supplier
	32-byte input consistent	32 bytes Input	820		32-byte output consistent	32 bytes Output	From supplier
	2-byte input consistent	2 bytes Input	852		2-byte output consistent	2 bytes Output	From supplier
	2-byte output consistent	2 bytes Output	818		2-byte input consistent	2 bytes Input	From supplier
	32-byte output consistent	32 bytes Output	820		32-byte input consistent	32 bytes Input	From supplier
	2-byte output consistent	2 bytes Output	852		2-byte input consistent	2 bytes Input	From supplier

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