

Job control of external clients

Interface description

INDEX Single spindle lathes

Control INDEX C200-sl

Note on applicability

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

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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 / OPC UA. 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 / OPC UA | 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 / OPC UA | Software version |
|---|--------|--------|---------------|----------------------------|---------------------|
| Job start Job start <ul style="list-style-type: none"> 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 / OPC UA | 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 / OPC UA | Software version |
|---|--------|--------|----------------|----------------------------|---------------------|
| Reserved | BYTE | BYTE | AB0 | DB131.DBB18 | |
| Ready for new job <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> When the follow-up start is switched on, the new workpiece 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 <ul style="list-style-type: none"> 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 / OPC UA | 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 / OPC UA | 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

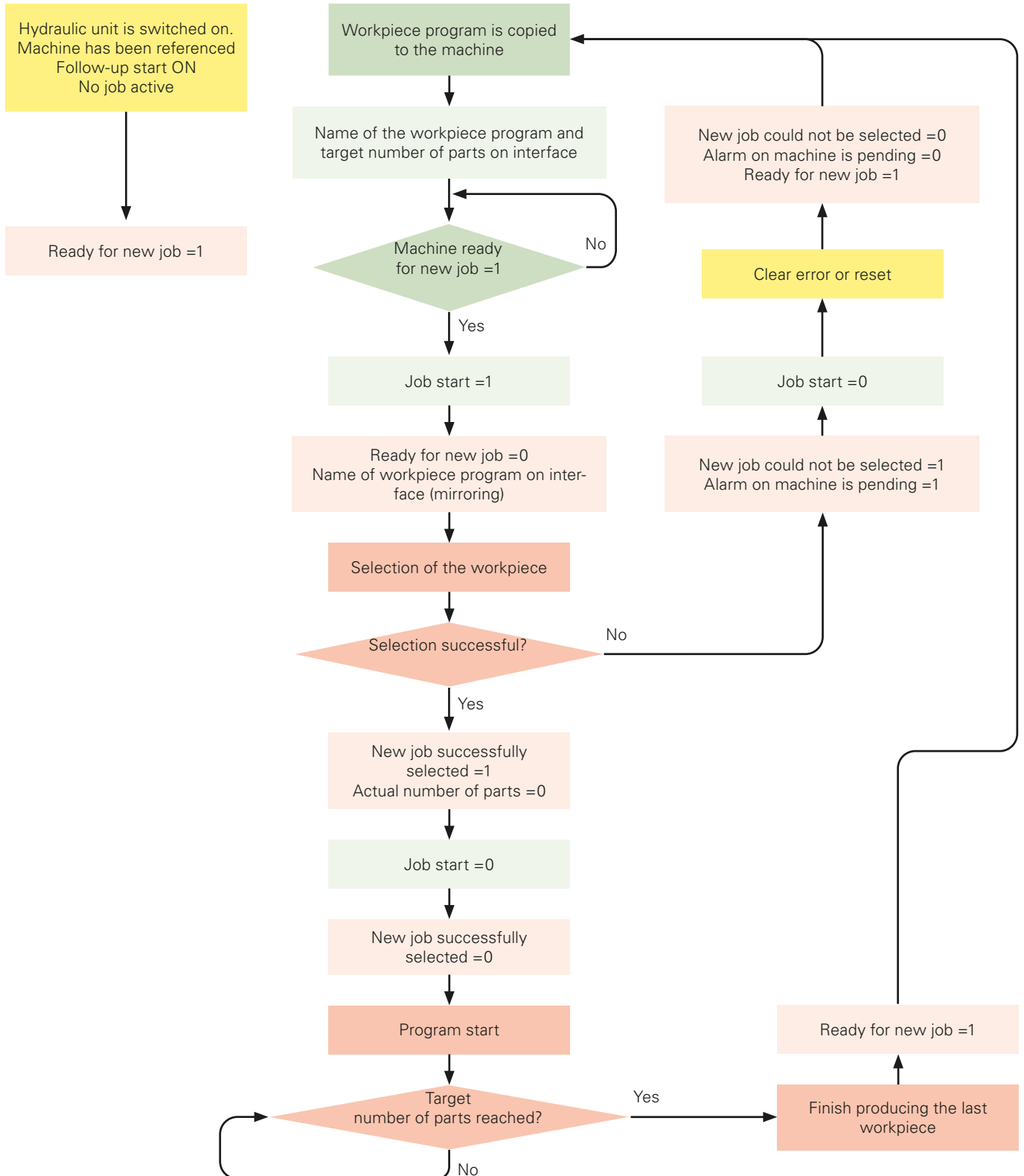
Signal change Machine → Client

Signal change Client → Machine

Operator action

Machine action

Client action



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 condition¹ 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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