Drive System Application

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& TOOLS

SIMATIC / MICROMASTER 4

Application Description

Function block to operate MICROMASTER 4 on Profibus DP

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                                                          MICROMASTER 4

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2 Description

2.1 Use of the application

This application is used to implement a drive that can be operated with a setpoint that can continually change.
A SIMATIC S7 300/400 with a MICROMASTER MM4 is used as basis for this solution.

Both the SIMATIC S7 300/400 and MICROMASTER MM4 are coupled through Profibus DP. The following functional areas are handled using this function block.

- The PLC controls (operates) the drive.

- The PLC saves the drive parameters and automatically commissions the drive. A PG/PC is not required for series commissioning (when several drive systems are commissioned).

- If a Micromaster is replaced, the PLC automatically commissions the new Micromaster. Neither special know-how nor PC with parameterizing software is required.

- Diagnostic functions are displayed:

    ➢ Error with error values
    ➢ Old errors with old error values
    ➢ Alarms
    ➢ Old alarms
    ➢ Profibus errors
    ➢ Block errors
    ➢ Micromaster version

- Any parameter can be read and written to (at the OP, parameters can only be read)

- The software can be simply adapted to specific requirements.

MPI

Profibus DP
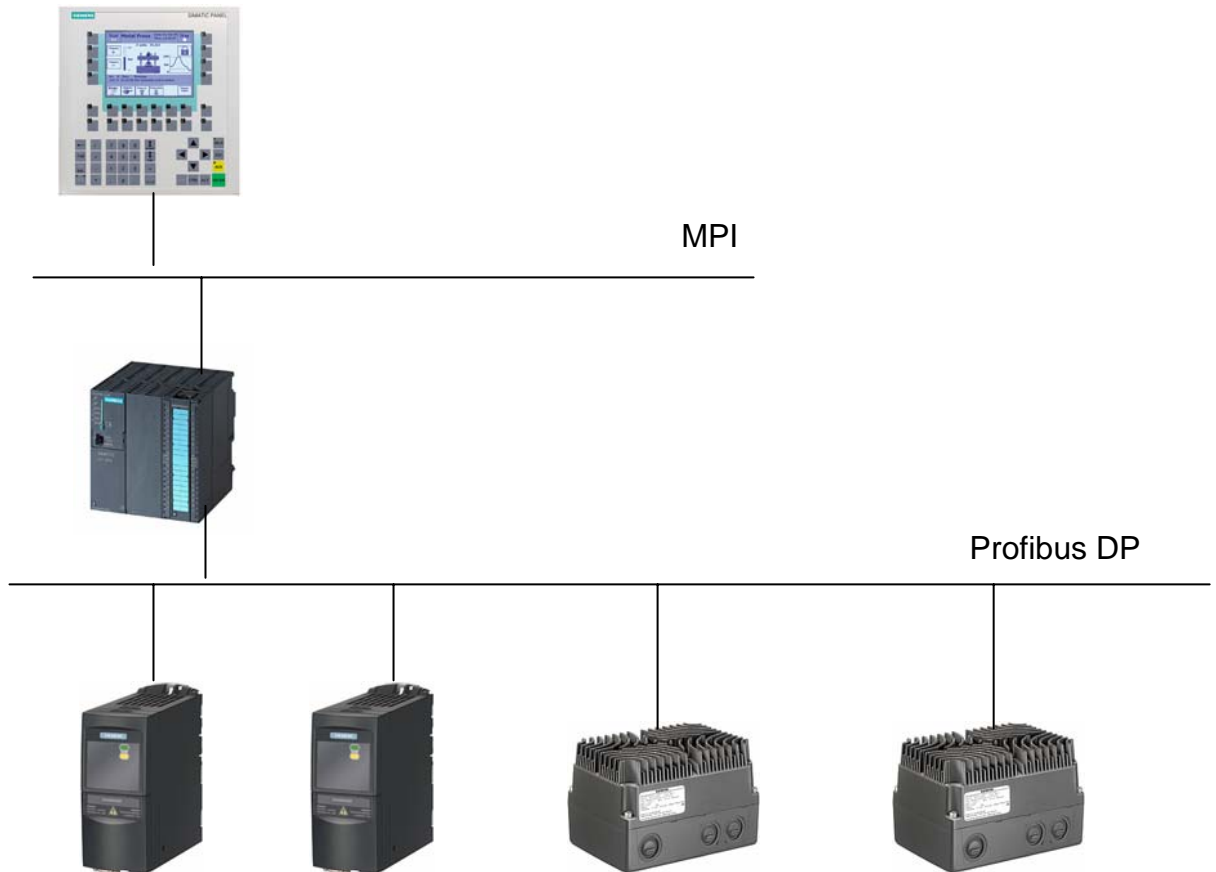
2.2 Block functions

- The drive is started and stopped.
- The setpoint is cyclically entered as percentage value [-100 to +100].
- Fast stop with its own ramp-down time.
- Drive faults and alarms are automatically displayed and the DP error evaluated.
- The Micromaster type, the version and the firmware version are displayed
- The configured parameters are saved in a motor DB
- "Quick commissioning" and then additional parameters are transferred
- Motor data is identified with parameter change
- Saturation characteristic is identified with parameter change
- User interface that can be used to read or write any parameter
- A minimum of CPU programming is required when implementing the operator interface on the OP.

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2.3   Limitations/constraints

2.3.1   Can be used for MICROMASTER from

- MM 411 V 1.10
- MM 420 V 1.17
- MM 430 V 2.00
- MM 440 V 2.05

2.3.2   Can be used for MICROMASTER with

- SIMATIC S7 300 from CPU 313-2DP
- SIMATIC S7 400
- SIMATIC C7
- SINUMERIK

2.3.3   Cannot be used for

- SIMATIC S7 200
- SIMATIC S5

2.3.4   Restrictions:

- The system does not monitor as to whether the start signal is permissible.

2.3.5   Software prerequisites

- Step 7 V 5.1 SP 6

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3   Installing the example

3.1   MM4 connected to S7 and OP without Drive ES Basic and without Starter

- Set the DP address at the MM4.

  Additional settings do not have to be made.

  The MM4 does not have to have the factory settings.

- Start HW Config

- Configure the PLC

- Configure MICROMASTER 4

  In the PROFIBUS-DP/SIMOVERT Catalog, select MICROMASTER 4.
    1. Select the bus in the working sheet
    2. In the Catalog, double click on PROFIBUS-DP/SIMOVERT/MICROMASTER 4 Here, the sub-points are still not selected. The Micromaster 4 directory that might be listed is for Drive ES and is therefore not used in this case.

- Set and accept the Profibus address

- The slot allocation for the MM4 is displayed at the bottom left in the window (the MM4 that is set-up must be selected)

- Select slot 1 and under PROFIBUS-DP/SIMOVERT
  > MICROMASTER 4 select 4 PKW, 2 PZD (PPO1).

- "Save and Compile" HW Config and "Download to Module"

- Copy the blocks from the program example into the user program.

- Copy the symbol table in the user program and adapt.

- All of the block numbers can be changed.

- Load the program into the PLC and start the PLC.

- Call the OP screen form, MM4 diagnostics and if required, remove any DP errors.

- Call the OP screen form – commissioning or VAT commissioning.

- Enter motor data into the parameter DB

- Start automatic commissioning.

  (I_Enable = 0; I_Enable_QC = 1; IO_W_Parameters = 1)

- After the automatic commissioning has been completed without any errors, start the motor identification routine.

- The motor can now be started using the variable tables.

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3.2   MM4 connected to S7 and OP with Drive ES Basic and with Starter

- Set the DP address at the MM4.
  Other settings are not required. The MM4 must not have the factory settings.

- Start HW Config

- Configure the PLC

- Configure MICROMASTER 4
  In the PROFIBUS-DP / SIMOVERT / MICROMASTER 4 Catalog, select a Micromaster.

- Set and accept a Profibus address

- Select the unit version. (V1.1x is only set for older units.)
  The drive unit version is located on the side of the Micromaster rating plate:
  Example: Issue: A01/2.05   means drive unit version 2.0x

- Under pre-assignment/default, select "PPO type 1, PKW+PZD-2/2".

- Enter the I/O address of the MM4 in the I/O address column, PKW line.
  This address must be specified at the parameter I_Address of the FB.

- Enter the subsequent address (+ 8) in the I/O address column, actual/setpoint line.

- "Save and Compile" HW Config and "Download to Module"

- Copy the blocks from the program example into the user program.

- Copy the symbol table in the user program and adapt.

- All of the block numbers can be changed.

- Load the program into the PLC and start the PLC.

- Call the OP screen form, MM4 diagnostics and if required, remove any DP errors.

- If required, install an OP project.
  The "MM4" text list must be adapted to the drive DBs.
  The text list "ParameterDB" must be adapted.

- Call the OP screen form – commissioning or VAT commissioning.

- Enter motor data into the parameter DB

- Alternatively, the MM4 can be engineered using Starter.
  The parameters used must be entered into the parameter DB.
  Start the parameter read operation.

- Start automatic commissioning. (I_Enable = 0; I_Enable_QC = 1; IO_W_Parameters = 1)

- After the automatic commissioning has been completed without any errors, start the motor identification routine.

- The motor can now be started using the variable tables.

4 Function description

4.1 Control and feedback signals

Parameter	Units	Type	Description
I_Address	INT	IN	Peripheral (I/O) address from HW Config (start of the PKW area)
I_Enable	BOOL	IN	Corresponds to OFF 1; only set if O_Drive_ready is set.
I_Fast_STOP	BOOL	IN	Must be set; 0: Stop with the shortest ramp-down time
I_RESET_Error	BOOL	IN	Acknowledge error
I_Enable_QC	BOOL	IN	Enable automatic commissioning, motor identification routine and measurement of the saturation characteristic
I_Setpoint	INT	IN	Setpoint: [-100% to +100%]
O_Actual_frequency	INT	OUT	Frequency actual value: [-100% to +100%]
O_STOP	BOOL	OUT	1: actual frequency < shutdown frequency (P 2167)
O_Right	BOOL	OUT	Motor rotates clockwise
O_Left	BOOL	OUT	Motor rotates counter-clockwise
O_Drive_ready	BOOL	OUT	1: Indicates that I_Enable may be set
O_Warning	BOOL	OUT	1: Alarm
O_Fault	BOOL	OUT	1: Fault/error from the MM4; data errors are not supplied
O_Data_error	BOOL	OUT	1: Error, parameter transfer / commissioning
O_Data_transfer_running	BOOL	OUT	Automatic commissioning running
IO_W_Parameters	BOOL	IN/OUT	Start automatic commissioning
IO_R_Parameters	BOOL	IN/OUT	Write parameters from MM4 into the parameter DB
IO_Motor_identification	BOOL	IN/OUT	Motor data identification routine with parameter change
IO_sat_charact	BOOL	IN/OUT	Saturation curve identification routine with parameter change

Programming information:

I_Fast_STOP: this is set with I_Enable. If motion is to be interrupted with a fast stop ramp (P 1135 OFF3 ramp-down time), then I_Fast_STOP must be set to 0. I_Enable remains set until the axis comes to a standstill. If I_Fast_STOP is not required, then the input can be continuously set to 1.

4.2 Controlling the drive

4.2.1 Starting the drive:

- Set I_Fast_STOP.

  If a fast stop is not required, then I_Fast_STOP can be permanently assigned a 1.

- O_Drive_ready is output.

  The following conditions must be fulfilled:

  + the drive is stationary

  + I_Fast_STOP = 1

  + no fault/error

  + I_Enable = 0

  + a commissioning function is not running

- The speed is entered in I_Setpoint in the range from −100 % to +100 %.

  If 0% setpoint is entered with the enable signal switched-in, the drive is stationary and the motor temperature can inadmissibly rise (temperature problem).

  The setpoint is cyclically transferred to the drive. Changes become immediately active.

  (ramp-up time in P1120; ramp-down time in P1121)

- Set I_Enable. (ramp-up time in P1120)

  The drive is only powered-up with a rising edge.

  In the user program it must be ensured that a rising edge at I_Enable is only permitted if O_Drive_ready is output.

- The outputs O_STOP, O_Right and O_Left indicate as to whether the motor is rotating and in which direction it is rotating.

- The frequency actual value is displayed in O_Actual_frequency. Units: -100 to +100%

4.2.2 Stopping the drive:

- Set I_Enable to 0: The drive stops with the ramp-down time in P1121 and is powered-down.

- Set the setpoint to 0: The drive stops with the ramp-down time in P1121. The closed-loop control is switched-out; this is the reason that the temperature must be carefully monitored.

- Set I_Fast_STOP to 0. I_Enable remains at 1 until the drive comes to a standstill.
  Drive stops with the ramp-down time in P1135.

4.3 Automatic commissioning

4.3.1 Tasks that are to be handled using this function

- The function of this software is essentially adequate.
  An OP is always used at the machine.
  The Starter software will not be used to provide support when commissioning the drive and when servicing the drive.
  When service is required, the electrical technician replaces the MM4, the cable or the motor without any commissioning know-how. The automatic commissioning function and when required the motor identification routine are then started at the OP. If an MM420 is defective, an MM440 must be installed as spare part taking into account the changed connection assignment.

- Starter is used when commissioning for the first time.
  The parameter DB is adapted when required and the parameters being used are saved (backed-up) in the DB.
  Service concept: refer above.

- Machines with several identical axes are constructed. The individual axes are identical in all of the machines. The 1st axis of a type is commissioned using Starter. All of the additional axes are commissioned just the same as when service is required.
  Service concept: refer above.

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4.3.2 Adapting the parameter DBs

The parameter DB comprises 2 areas

<u>1 area: Motor data</u>

All of the parameters associated with the fast commissioning function are entered here. The list is already prepared and should be adequate in almost all of the cases. The possible parameters are listed in the parameter descriptions in the Chapter Fast commissioning (P0010=1).
Motor data set 0 is used as standard. If several motor data sets are required for a motor, then several parameter DBs must be set-up. The number of the motor data set is then entered in the variable Z_Motor_data_DBNr.

<u>1 area: Technology data</u>

All of the other parameters that are being used are entered here

Rules to adapt the parameter DBs

All of the parameters used to commission a drive are entered into the list.

For the technology parameters, for each parameter, the required sub-parameter number can be entered under the index.

The 1st sub-parameter has the index 0.
The data [2] in the parameter list signifies that there are sub-parameters 0 and 1.

The data type of the value should always be adapted to the appropriate parameter.

The length of the list can be modified when required.

4.3.3   **Entering parameters into the DB**

<u>1st version</u>

- Axis was completely commissioned

- I_Enable is set to 0

- I_Enable_QC is set

- When IO_R_Parameters is set, data transfer starts
  An error message is not output if the data transfer cannot be started.

- O_Data_transfer_running: 1 while data is being transferred
  If commissioning cannot be started, then the bit is not set.

- The IO_R_Parameters is reset after transfer has been completed.

- If an error occurs, transfer is interrupted at the incorrect parameter.

<u>2nd version</u>

- The parameters are entered at the OP.

- However, only those parameters are to be displayed on the OP whose change makes sense.

- All of the other parameters should be defined using the initial values.

- If there are several drives in a system, then the data structure of the DBs should be identical.

- It is also permissible to have gaps in the lists. Advantage: Indirect addressing can be used at the OP.

4.3.4 Automatically commissioning the drive

4.3.4.1 Control and feedback signals for data transfer

Parameter	Type	Sort	Signal type	Description
Z_Motor_data_DBNr	INT	STAT	Permanently assign	Enter the number of the parameter DBs
Z_Tech_data_DBNr	INT	STAT	Permanently assign	Permanently set to 0. (only for special applications)
I_Enable	BOOL	IN		Set to 0, otherwise the function is inhibited
I_Enable_QC	BOOL	IN		Set to 1, otherwise the function is inhibited
IO_W_Parameters	BOOL	IN	User sets FB clears	Starts automatic commissioning. FB clears once the function has ended.
O_Data_transfer_running	BOOL	OUT		1 during commissioning
O_Data_fault	BOOL	STAT	Display	Error when commissioning the system
I_RESET_Error	BOOL	IN	Pulse	Commissioning errors are acknowledged

Comment:

If an error occurs, commissioning is interrupted at the incorrect parameter.

4.3.4.2 Prerequisites

- The correct Profibus address must be set at the MM4.
- It is not permissible that the FB outputs a DP error.
- Any parameter settings are possible in the MM4.
  This also applies to Profibus parameters.
- The version of the MM4 must correspond to the above specified data.
- Automatic commissioning must be enabled.
- The valid version of the MM4 must be located in the instance DB.
  I_RESET_Error reads-out the valid version.

4.3.4.3 Automatic commissioning procedure

- Establish (restore) the factory setting
- Carry-out the fast (quick) commissioning
- Transfer the technology data
- Save parameters in the EEPROM

4.3.4.4   Starting the control (open-loop)

- If the control (open-loop) is disabled during the automatic commissioning procedure, then after a restart/new start, the automatic commissioning procedure must be interrupted with I_RESET_Error.

4.3.5   Motor identification routine and saturation characteristic

A motor identification routine should always be executed after the automatic commissioning procedure has been completed. If the automatic commissioning procedure was not completed error-free, then it is not permissible to start the motor identification routine. Reason: the function was not ended as the MM4 did not correctly respond. Remedy: interrupt (abort) the motor identification routine with I_RESET_Error and carry-out an automatic commissioning procedure. The motor data identification routine may only be carried-out with the motor in the cold condition as otherwise the drive could oscillate.

The saturation characteristic can only be identified for MM440 drive inverters.

4.4   Parameter transfer

Using PKW communications, this application can read and write all of the MM 4 parameters. A parameter is transferred using a read / write request.
The first three requests are available for the application.

Several requests can be simultaneously started.
The requests are executed one after the other, starting with request 1.

Application example:
If two requests are to be transferred one after the other in a certain sequence, then they are managed in two requests that immediately follow one another. Both of these requests are started together. A step sequence is not required.

A request can manage an individual parameter or a parameter with several sub-parameters.

The following belong to a request:
- 1 request bit to start data transfer
- 1 error bit
- 1 request data block in which the request is described and the value is saved

There is a common error display for all of the requests

4.4.1.1   Structure of request blocks Job_1 to Job_3:

Parameter	Type	Initial value	Description
Job_1.Parameter_Nr	INT	0	Parameter No. from the parameter table
Job_1.Index	INT	0	No. sub-parameter / for List No. of the last parameter
Job_1.Identifier	Byte	B#16#0	1/11: read 2/12: write 3/13: write to EEPROM
Job_1.Identifier_internal	Byte	B#16#0	Is automatically set
Job_1.Value_0	DINT	L#0	Value to be transferred
Job_1.Value_1	DINT	L#0	Value to be transferred
Job_1.Value_2	DINT	L#0	Value to be transferred

Example

Parameter	Type	Initial value	Description
Job_1.Parameter_Nr	INT	1002	Fixed frequency 2
Job_1.Index	INT	0	P 1002 has no sub-parameters
Job_1.Identifier	Byte	B#16#2	2: write
Job_1.Identifier_internal	Byte	B#16#0	Is automatically set
Job_1.Value_0	REAL	L#0	Value to be transferred
Job_1.Value_1	DINT	L#0	Not used here
Job_1.Value_2	DINT	L#0	Not used here

Rules:

- Not all Value_n have to be used.
- The texts of the error bits associated with the request bits can be modified.
- The texts Job_1 to Job_16 in the request blocks may not be changed.
- For requests that are always the same, initial values can be set in the instance DB.

4.4.1.2   Initializing the request block:

Parameter_Nr.:   Parameter No.

Index: If an individual parameter is to be transferred print

0 (for Parameter has no sub-parameters)

the **No.** of the sub-parameter

If several sub-parameters of a parameter are to be transferred, print the **No.** of the last sub-parameter to be transferred.

Identifier:	1: Reading an individual parameter	
	2: Writing an individual parameter into the RAM	
	3: Writing an individual parameter into the EEPROM	
	11: Reading several sub-parameters of a parameter	
	12: Writing several sub-parameters of a parameter into the RAM	
	13: Writing several sub-parameters of a parameter into the EEPROM	
	The IDs do not correspond to the PKW IDs.	
Identifier_internal:	Here, during data transfer, the block automatically enters the PKW IDs.	
Value_0 to Value_2:	The value is entered that is to be written. When required, the data type can be adapted.	

4.4.1.3   Control signals of the request blocks:

Parameter	Type	Initial value	Description
Job.RW_Request_1	BOOL	False	Trigger request 1 (the name can be modified)
Job.RW_Request_2	BOOL	False	Trigger request 2 (the name can be modified)
Job.RW_Request_3	BOOL	False	Trigger request 3 (the name can be modified)
Data_fault.Job.RW_Request_1	BOOL	False	Error request 1 (the name can be modified)
Data_fault.Job.RW_Request_2	BOOL	False	Error request 2 (the name can be modified)
Data_fault.Job.RW_Request_3	BOOL	False	Error request 3 (the name can be modified)

4.4.1.4   Behavior of the request bit Job.RW_Request_1/2/3

- The user sets it to start data transfer
- The FB resets it if the request was ended with or without error.
- Several bits can be simultaneously set.
- Bits can be set if other bits are already set.
- The requests are executed one after the other starting with JOB_RW_Request_1.
  Example:
      JOB_RW_Request_4 and JOB_RW_Request_5 are started together. While JOB_RW_Request_4 is being processed, JOB_RW_Request_1 is set.

      After JOB_RW_Request_4 has been executed, JOB_RW_Request_5 is processed.
- When required, the user can delete the bits. Requests that have already been started are processed to the end. Under certain circumstances, an error message is also generated.
- If a parameter should be continuously read, then the request bit must be cyclically set.
- If a request was ended with an error, then the appropriate error bit is set.

4.5   Diagnostics

There are several error sources.

1. Fault/disturbance and warning/alarms of the MM4

2. Fault messages of the standard FCs used

3. Fault messages of the block

4. Fault messages of the parameter transfer

4.5.1.1 Control and feedback signals of the diagnostics

Parameter	Type	Sort	Description
O_Warning	BOOL	OUT	1: As long as alarms are present
O_Fault	BOOL	OUT	1: Error from the MM4; data errors are not displayed
O_Data_error	BOOL	OUT	1: Error, parameter transfer / commissioning
I_RESET_Error	BOOL	IN	• Acknowledges errors on the MM4 • Deletes all data error displays • Does not interrupt requests to transfer parameters that are actually running • Interrupts a commissioning procedure that is running
Data errors.			
JOB_RW_Request_	BOOL	STAT	For each request to transfer a parameter, one error bit.
Nr	INT	STAT	Error No. Caution: If Job_Nr <> 0, then a value of 0 is an error.
DP_Add_info	HEX	STAT	Error message from SFC14/15
Job_Nr	INT	STAT	[1..16] indicates the erroneous request
Index	INT	STAT	Task index
Parameter_Nr	INT	STAT	Parameter No. from the erroneous request
Fault_Commissioning	INT	STAT	Error No.

The following displays are only updated if O_Warning or O_Fault are set.

4.5.1.2 Display for faults/disturbances and warnings/alarms

Parameter	Type	Sort	Signal type	Description
Job_13.Value_0	DINT	STAT	Display	Last alarm; alarm 1
Job_13.Value_1	DINT	STAT	Display	Last alarm; alarm 2
Job_13.Value_2	DINT	STAT	Display	Last alarm - 1; alarm 1
Job_13.Value_3	DINT	STAT	Display	Last alarm - 2; alarm 2
Job_14.Value_0	DINT	STAT	Display	Last fault; fault 1
Job_14.Value_1	DINT	STAT	Display	Last fault; fault 2
Job_14.Value_2	DINT	STAT	Display	Last fault – 1; fault 1
Job_14.Value_3	DINT	STAT	Display	Last fault – 1; fault 2
Job_14.Value_4	DINT	STAT	Display	Last fault – 2; fault 1
Job_14.Value_5	DINT	STAT	Display	Last fault – 2; fault 2
Job_14.Value_6	DINT	STAT	Display	Last fault – 3; fault 1
Job_14.Value_7	DINT	STAT	Display	Last fault – 3; fault 2
Job_14.Value_0	DINT	STAT	Display	Last fault; fault value 1 (service info.)
Job_14.Value_1	DINT	STAT	Display	Last fault; fault value 2 (service info.)
Job_14.Value_2	DINT	STAT	Display	Last fault – 1; fault value 1 (service info.)
Job_14.Value_3	DINT	STAT	Display	Last fault – 1; fault value 2 (service info.)
Job_14.Value_4	DINT	STAT	Display	Last fault – 2; fault value 1 (service info.)
Job_14.Value_5	DINT	STAT	Display	Last fault – 2; fault value 2 (service info.)
Job_14.Value_6	DINT	STAT	Display	Last fault – 3; fault value 1 (service info.)
Job_14.Value_7	DINT	STAT	Display	Last fault – 3; fault value 2 (service info.)

4.5.2 Faults/disturbances and warnings/alarms of the MM4

As soon as the MM4 signals a fault/disturbance or warning/alarm, the parameters are read-out of the MM4.
If the FB detects a DP error, then error 1001 Job_14.Value_0 is displayed.

The precise DP error is located in the Data_fault.DP_Add_info. This error corresponds to the error message of the SFC14/15.

Under certain circumstances there is an error value for each fault/disturbance. The fault value contains important information for Siemens service.

4.5.3 Parameter transfer error and automatic commissioning

- The FB implements 16 requests to transfer parameters. If neither DP error nor hardware fault occurs, then only error messages from requests 1 to 3 and from requests 4 and 12 can be expected.

- The displays Data_fault.Job. ..... indicate all requests that were aborted with error. In this case, an error bit with the same name is assigned to each request. In practice, generally, only one error occurs.

- The displays Data_fault.Nr., .Job_Nr., .Index and .Parameter_Nr. indicate the first error that was identified.

- SFC 14/15 outputs error messages in DP_Add_info.
  The value is continuously updated as long as there is a DP error.

- Data_fault.Fault_Commissioning indicates error messages associated with the automatic commissioning.
  If there is an error in the parameter DB, then the following display appears:
  O_Data_error = 1
  Data_fault.Job.RW_Request_12 = 1
  Data_fault.Nr = Error description
  Data_fault.Job_Nr = 12 No. of the sub-parameter or motor data set
  Data_fault.Parameter_Nr = Parameter No. from the parameter DB
  Data_fault.Fault_Commissioning = 1002

- If the automatic commissioning was interrupted with error 17 (request was not able to be executed due to the operating state) in request 4, then this error can be acknowledged and the system re-started.

4.6 Version data of Micromaster

The version data are read-out with I_RESET_Error.

Parameter	Type	Sort	Signal type	Description
Job_16.Value_0	DINT	STAT	Display	42: Siemens
Job_16.Value_1	DINT	STAT	Display	Micromaster type
Job_16.Value_2	DINT	STAT	Display	Firmware revision
Job_16.Value_3	DINT	STAT	Display	Date: Year
Job_16.Value_4	DINT	STAT	Display	Date: Day/month

4.7 Adapting the program

- When required, the user can adapt the control program.
  The network "Process parameter request" may not be modified.

- When required, the instance data block can also be adapted. All data areas can be shifted. It is not possible to access absolute addresses. The struct names Job_1 to Job_16 may not be changed as a single entity.

- The name of the request bit and the associated error bit can be adapted.
  Example: JOB.RW_Request_1 can be changed to JOB.R_Output_current

- PCD_send and PCD_receive can be changed.

4.8 Called sub-programs

The standard FCs SFC 14 (DPRD_DAT) and SFC 15 (DPWR_DAT) are used.
If no parameters are transferred, then these blocks are not called.

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5 Error messages

5.1 Data_fault.Nr.

Errors output when transferring parameters and during the automatic commissioning procedure the FB generates errors 21 to 25

No.	Significance	Comment
0	Illegal parameter number (PNU)	Parameter is not present
1	Parameter value cannot be changed	Parameter is a monitoring parameter
2	Minimum/maximum fallen below or exceeded	
3	Incorrect subindex	
4	No array	Access to single parameter with array request and subindex > 0
5	Incorrect data type	Word/double word interchanged
6	No setting permitted (can only reset)	
7	Descriptive element cannot be changed	Description is for MICROMASTER 4 – cannot be changed
11	No control authority (master authority)	Change request but the control authority (master authority) is missing (refer to P0927)
12	Password (keyword) missing	
17	Task cannot be executed due to the operating state	Presently, the drive inverter state doesn't permit the request that has been issued
21	No control authority for the PKW interface	
22	No ID specified	
23	Parameters cannot be written to	
24	Unknown request ID entered	
25	Observe DP error DP_Add_info	Error from SFC 14 DPRD_DAT
101	Parameter number presently de-activated	Dependent on the drive inverter state
104	Parameter value not permissible	Parameter only permits specific values
200/ 201	Modified min./max. fallen below or exceeded (violated)	Minimum/maximum can be further restricted in operation.
204	Parameter cannot be changed due to missing access rights	

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5.2   Data_fault. DP_Add_info

Supplementary information regarding error 25 in the Data_fault.Nr. and error 1001 in Job_14.Value_0

Error code W#16#	Significance
0000	An error has not occurred
8090	A module has not been configured for the specified logical basis address
8093	For the logical address specified under LADDR, there is no DP module from which consistent data can be read
80A0	When accessing the I/O, an access error was identified
80A1	When accessing the I/O, an access error was identified
80B0	Slave failure, external DP interface
80B1	The length of the specified target range is not equal to the net data length configured with STEP 7
80B2	System error for external DP interface
80B3	System error for external DP interface
80C0	The data were still not read from the module
80C2	System error for an external DP interface
80Fx	System error for an external DP interface
87xy	System error for an external DP interface
808x	System error for an external DP interface

5.3   Data_fault. Fault_Commissioning

Error during the automatic commissioning procedure

No.	Significance	Comment
1001	DP error	
1002	Data error during the automatic commissioning procedure	Error in the parameter DB
1006	Not a Siemens drive inverter	
1007	Incorrect MM4 type	
1008	Old, illegal firmware version	
1009	Commissioning function inhibited	Error present, I_Enable set, I_Enable_QC missing

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6   Technical data

Block:	FB	
Block name:	MM4	
Version:	V 2.2	
Language in which it was generated:	STL	
Local data:	36	byte
MC 7 code:	3166	byte
Load memory requirement:	4244	byte
Working memory requirement:	3202	byte