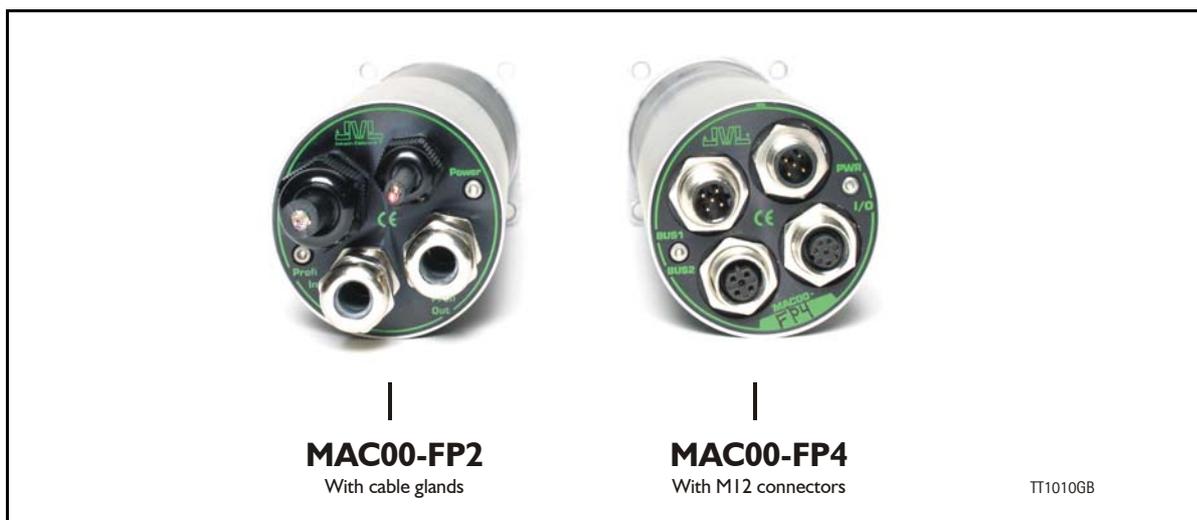


4.5 Expansion Module MAC00-FP2/FP4



4.5.1 Profibus module MAC00-FP2 and FP4 Introduction

The MAC00-FP2 and FP4 are Profibus-DP slaves. They are capable of running at baud-rates up to 12Mbit.

All the registers¹ of the MAC motor can be read and written.

The modules includes 6 inputs, 2 of which are end-limit inputs. These can be read from the Profibus-DP. The end-limit inputs can automatically halt the motor. The other inputs can be used to activate different movements.

The MAC motor is controlled by writing to the input data (9 bytes).

The expansion modules MAC00-FP2 and FP4 can be mounted on the standard MAC motors MAC50, MAC95, MAC140, MAC141, MAC400 and MAC800.

Both modules offer the same functions but with the following hardware differences:

Type	Protection class	Connectors		
		I/O and interface	Power supply	Bus interface
MAC00-FP2	IP67	Cable glands (Mini crimp connectors internally)	Cable glands (Screw terminals internally)	Cable glands x 2 (Screw terminals internally)
MAC00-FP4	IP67	M12	M12	M12 B-coded (x2)

Both modules are delivered without any cables as standard.

Optional the MAC00-FP2 module can be delivered with cable in selected lengths. Also cables for the MAC00-FP4 with M12 connectors is available.

The pages in the first part of this section concern the common features of both modules. Please consult the last pages in this section to see specific information about each module such as example connection diagrams.

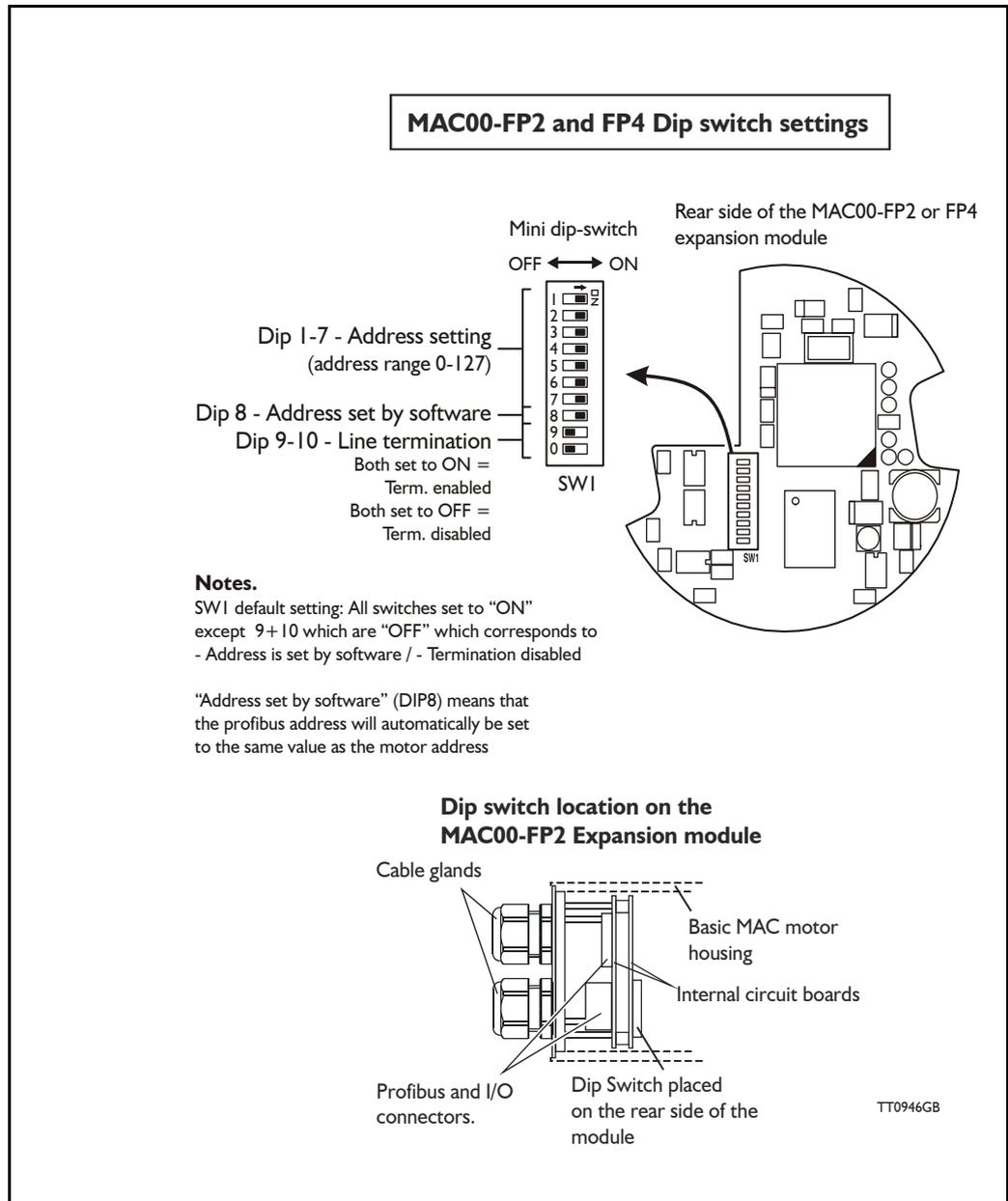
¹ A list of the typical used registers can be found in *Serial Quick Guide (MacTalk protocol)*, page 165.

² The FlexMac commands are described in *FlexMac commands*, page 114.

4.5 Expansion Module MAC00-FP2/FP4

4.5.2 MAC00-FP2 and FP4 Address and termination setup.

Each unit connected to the Profibus must be set up with a unique address. The illustration above shows how the address and termination can be set on the internal dip switch. The dip switch is located on the internal circuit board.



4.5 Expansion Module MAC00-FP2/FP4

4.5.3 Output data (Master->Slave)

The MAC00-FP2/FP4 module contains 9 bytes of output data.

Address	Name	Description
0	Write data 3 (MSB)	Data to write to register
1	Write data 2	--- " ---
2	Write data 1	--- " ---
3	Write data 0 (LSB)	--- " ---
4	Write register selector	The register to write
5	Read register selector	The register to read
6	Direct register	Direct FlexMac command
7	Command	Bits for commanding reads/write
8	Input setup	Bits for input setup

Write data

For 16 bit registers, the data must be placed in Write data 0 and Write data 1.

For 32 bit registers, the data must be placed in Write data 0-3.

Write register selector

The number of the register to write to should be placed here. The register must be in the range 1-255.

Read register selector

The number of the register to read from should be placed here. The register must be in the range 1-255.

Direct register

This register can be used to execute a FlexMac² command. When writing to this Register, the command will be executed immediately. The bit 0-6 is the command, and bit 7 is not used. If the same command is to be executed twice, bit 7 can be toggled. The command is accepted when the "Last direct register", in the output data, has the same value as this register.

4.5 Expansion Module MAC00-FP2/FP4

Command

Bit	7	6	5	4	3	2	1	0
Function	Write Toggle	Read Toggle	Write 32 bit	Read 32 bit	Auto write	Auto read	Reserved	Reserved

Bit 7 (Write toggle) is used for writing data to the selected register (Write register selector). When this bit is toggled, writing is executed. The write command is accepted when Bit 7 in the command status (output data byte 7) is equal to this bit.

Bit 6 (Read toggle) is used for reading data from the selected register (Read register selector). When this bit is toggled, reading is executed. The read command is accepted when Bit 6 in the command status (output data byte 7) is equal to this bit.

Bit 5 (Write 32 bit) Set this to 1 if writing to a 32 bit register and 0 if writing to a 16 bit register.

Bit 4 (Read 32 bit) Set this to 1 if reading from a 32 bit register and 0 if reading from a 16 bit register.

Bit 3 (Auto write) When this bit is 1, the data written in write data 0-3, is transferred to the MAC motor immediately, regardless of the write toggle bit.

Bit 2 (Auto read) When this bit is 1, the data in read data 0-3 is updated all the time, regardless of the read toggle bit.

Bit 1 and Bit 0 should be 0.

Input setup

Bit	7	6	5	4	3	2	1	0
Function	-	Reset end limit	PL Enable	NL Enable	Input mode			

Bit 6 (Reset end-limit) When this bit is 1, the end limit condition is reset, if no end limits are activated.

Bit 5 (PL Enable) When this bit is 1, the positive end-limit is enabled.

Bit 4 (NL Enable) When this bit is 1, the negative end-limit is enabled.

Bit 3-0 (Input mode) these bits select the current input mode. See section *Input modes*, page 112 for details.

4.5 Expansion Module MAC00-FP2/FP4

4.5.4 Input data (Slave->Master)

The MAC00-FP2/4 contains 8 bytes of input data.

Address	Name	Description
0	Read data 3 (MSB)	Data read from register register
1	Read data 2	--- " ---
2	Read data 1	--- " ---
3	Read data 0	--- " ---
4	Motor status	Status bits for the motor
5	Input status	Status of inputs
6	Last direct register	Last accepted direct FlexMac command
7	Command Status	Status bits for commands

Read Data

For 16 bit registers, the read value will be placed in Read data 0 and Read data 1.

For 32 bit registers, the read value will be placed in Read data 0-3.

Motor status

Bit	7	6	5	4	3	2	1	0
Function	-	Decelerating	Accelerating	In position	-	-	-	Error

Bit 6 (Decelerating) this bit is 1 when the motor is decelerating.

Bit 5 (Accelerating) this bit is 1 when the motor is accelerating.

Bit 4 (In position) this bit is 1 when the motor has reached its commanded position.

Bit 0 (Error) this bit is 1 when a motor error has occurred.

Input status

Bit	7	6	5	4	3	2	1	0
Function	-	-	PL	NL	IN4	IN3	IN2	IN1

Bit 5 (PL) Positive limit input.

Bit 4 (NL) Negative limit input.

Bit 3-0 (INx) user inputs.

Last direct register

See *Direct register*, page 109 for details.

4.5 Expansion Module MAC00-FP2/FP4

Command status

Bit	7	6	5	4	3	2	1	0
Function	Write Toggle	Read Toggle	-	-	Status			

Bit 7 (Write Toggle) this bit indicates when writing is completed. See *Command*, page 110 for details.

Bit 6 (Read Toggle) this bit indicates when reading is completed. See *Command*, page 110 for details.

Bit 3-0 (Status) These bits indicate the status of the MAC00-FP2/FP4. The following status codes are possible:

Code	Description
0	OK – Idle
1	Executing Input
2	Executing Output
3	Limit switch active
4	Profi error
5	Connecting to MAC motor

4.5.5 Input modes

The 4 user inputs can be used to execute different move commands. The following input modes can be selected:

Mode	Description
0	Passive
1	Absolute+Relative
2-14	Reserved
15	Custom

Passive mode (0)

When this mode is selected, the user inputs are ignored. The inputs can be read in output data 5 for other purposes.

Absolute + Relative mode (1)

When this mode is selected, the inputs have the following functions:

IN1: Selects the absolute position in position register 1.

IN2: Selects the absolute position in position register 2.

IN3: Moves relative the distance in position register 3.

IN4: Moves relative the distance in position register 4.

The action is executed when an inactive-to-active transition is detected on the input.

Custom mode (15)

When this mode is selected, the action of each input can be selected with the slave parameters. See “Slave parameters” on page 113.

4.5 Expansion Module MAC00-FP2/FP4

4.5.6 Slave parameters

When configuring the profibus, it is possible to set some parameters for the slave. These parameters are setup during startup and cannot be changed during operation.

XX Input level

Using these parameters, the input level of the inputs IN1, IN2, IN3, IN4, NL and PL can be selected.

Possible values:

- Active high : The input will be active, when a signal is applied.
- Active low : The input will be active, when no signal is applied.

End-limit action

With this parameter, the action when an end limit is activated can be selected.

Possible values:

- Velocity = 0 : When the end-limit is activated, the velocity will be set to 0, and the motor will decelerate and stop. If the motor should run again, the user must manually set a new velocity.
- Passive mode : When the end-limit is activated, the actual mode will be changed to passive. In passive mode the motor is short-circuited and can be rotated.

In firmware version 1.4 or higher the "end-limit action" is also active if the Profibus is going off-line but it needs to be online before it goes off line before the feature is enabled.

Input debounce

Using this parameter, an input filter can be activated.

Possible values:

- Disabled : No filtering will be done on the inputs.
- Enabled : The inputs are filtered, resulting in better noise immunity but slower response. When the filter is enabled, there will be a delay at the input of about 5ms.

Input x action

Using these parameters, up to 3 actions can be assigned to each input.

These action are used when the custom input mode is selected. See "Input modes" on page 112.

The action is defined by a FlexMac command. See "FlexMac commands" on page 114.

Possible values are 0-127, where 0 represents no action.

4.5 Expansion Module MAC00-FP2/FP4

4.5.7 FlexMac commands

Using the FlexMac commands, it is possible to activate a set of registers and set the mode of the motor using a single command. The command is composed of two parts. The first part is mode that the motor should use.

The following 4 modes can be selected:

Value	Motor mode after command	Format
0	Passive	Command = 0 + Register N
32	Velocity	Command = 32 + Register N
64	Position	Command = 64 + Register N
96	<No change>	Command = 96 + Sub-command N

The second part of the command is a register number or sub-command number.

The following table shows the register numbers:

N	Register	N	Register	N	Register	N	Register
0	P1	8	V1	16	A1	24	L1
1	P2	9	V2	17	A2	25	L2
2	P3	10	V3	18	A3	26	L3
3	P4	11	V4	19	A4	27	L4
4	P5	12	V5	20	T1	28	Z1
5	P6	13	V6	21	T2	29	Z2
6	P7	14	V7	22	T3	30	Z3
7	P8	15	V8	23	T4	31	Z4

The following table shows the sub-commands:

N	Command	N	Command
0	No operation	16	Start search zero
1	Reset error	17	No operation
2	P_SOLL = 0	18	No operation
3	P_IST = 0	19	Reserved
4	P_FNC = 0	20	Select absolute position mode
5	V_SOLL = 0	21	Select relative position mode using P_SOLL
6	T_SOLL = 0	22	Select relative position mode using P_FNC
7	Reset IN_POS, ACC,DEC	23	No operation
8	$P_FNC = (FLWERR - P7) * 16$	24	No operation
9	$P_FNC = (FLWERR - P8) * 16$	25	No operation
10	Reserved	26	No operation
11	Reserved	27	No operation
12	Activate P0,V0,A0,T0,L0,Z0	28	No operation
13	Activate P1,V1,A1,T1,L1,Z1	29	No operation
14	Activate P2,V2,A2,T2,L2,Z2	30	Reserved
15	Activate P3,V3,A3,T3,L3,Z3	31	Reserved

4.5 Expansion Module MAC00-FP2/FP4

Examples of FlexMac commands

Activate register A4 without changing the mode:

0 + 19 = FlexMac command 19

Activate register P5 and change to position mode

32 + 4 = FlexMac command 36

Activate register T3 and change to velocity mode

64 + 30 = FlexMac command 94

Activate P0,V0,A0,T0,L0 and Z0 without changing the mode:

96 + 12 = FlexMac command 108

4.5 Expansion Module MAC00-FP2/FP4

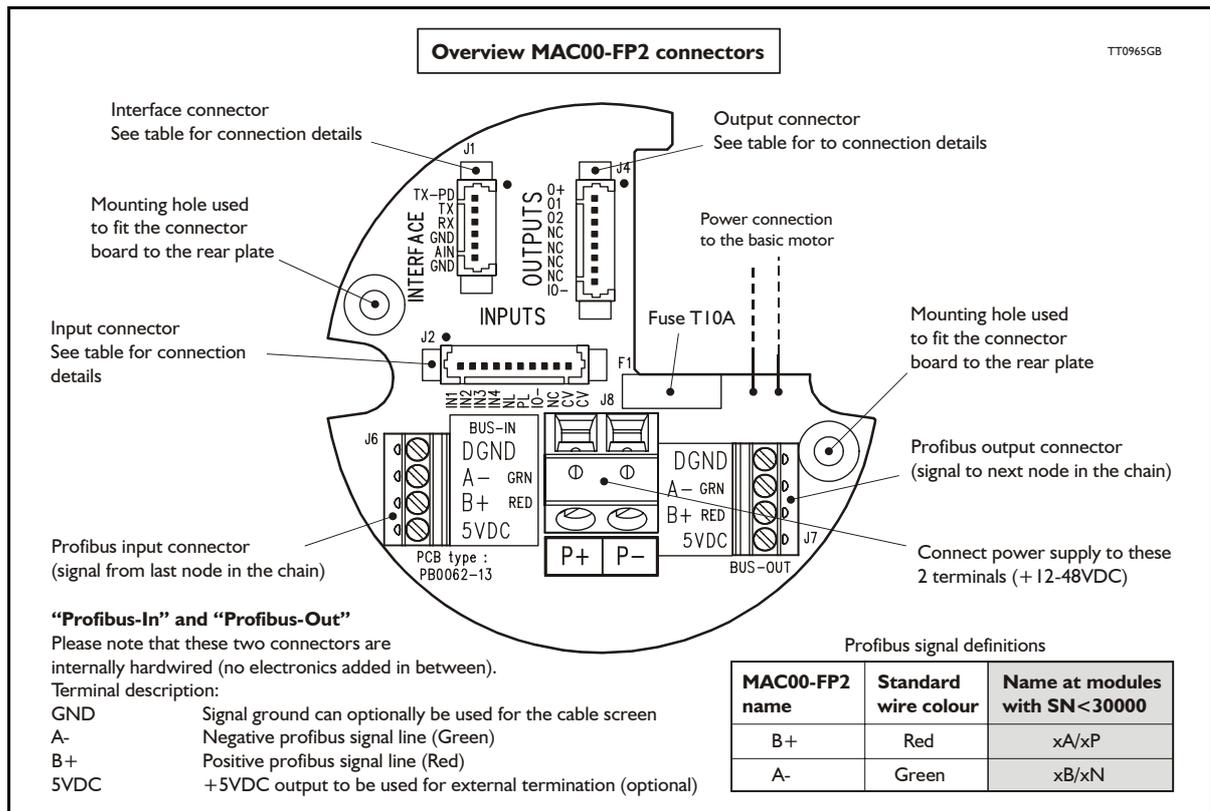
4.5.8 MAC00-FP2 and FP4 description of connections.

The following pages describe the different aspects in connecting the modules MAC00-FP2 and FP4.

4.5.9 MAC00-FP2 Connectors.

MAC00-FP2 rear plate layout:

The illustration below shows all the internal connectors in the module. The profibus and power connectors are easy to use screw terminals. If the I/Os are used, they require a JVL cable type WG0402 (2m), WG0410 (10m) or WG0420 (20m). See also the appendix for cable and connector accessories.



4.5 Expansion Module MAC00-FP2/FP4

4.5.10 MAC00-FP2 option with cables (optional)

The MAC00-FP2 type number only covers the basic module without any cables. If a number is added after the basic type number, for example MAC00-B2-10, this suffix indicates that the module is fitted with 10 m of cable in the I/O. The I/O cable covers all the signal lines, which means RS232, Digital input 1-4, Limit inputs NL and PL and the Digital outputs 1-4.

Please note the WG0420 table below is not valid for cables delivered before 1.10.2002. See WG0420 (old versions delivered before 1.10.2002), page 174

Digital Inputs - Internal connector J2			
Signal name	Pin no.	Description	Wire colour
IN1	1	Digital input 1	Red/black
IN2	2	Digital input 2	Green/black
IN3	3	Digital input 3	Violet
IN4	4	Digital input 4	Violet/white
NL	5	Negative limit input - If not used, do not connect.	Grey
PL	6	Positive limit input - If not used, do not connect.	Grey/black
IO-	7	I/O ground. Shared with the output ground (O-)	Pink/black
NC	8	(Reserved)	Black/white
CV	9	Secondary supply. Used during emergency stop *	Light green **
CV	10	Secondary supply. Used during emergency stop *	White
Digital Outputs - Internal connector J4			
Signal name	Pin no.	Description	Wire colour
O+	1	Supply for outputs - Must be connected to an ext. supply.	Red/white
O1	2	Digital output 1 - PNP output - Max. 25mA	Green/white
O2	3	Digital output 2 - PNP output - Max. 25mA	Yellow/black
NC	4	(Reserved)	Blue/white
NC	5	(Reserved)	Orange/white
NC	6	(Reserved)	Brown/white
NC	7	(Reserved)	Pink
IO-	8	I/O ground. This ground is shared with the input ground	Black
Interface - including analogue input - Internal connector J1			
Signal name	Pin no.	Description	Wire colour
TXPD	1	Transmit pull-down (Connect to TX if addr. not used)	Red
TX	2	RS232 Transmit (Connect to TXPD if addr. not used).	Green **
RX	3	RS232 Receive (connect to GND if not used).	Yellow
GND	4	Ground for RS232	Blue
AIN	5	Analogue input +/-10V or Zero sensor input	Orange
GND	6	Ground for AIN	Brown
Cable Screen			
The cable-screen is internally connected to motor housing. Externally it must be connected to earth.			
Unused wire			
Orange/Black - is not used internally. It must be left unconnected.			

* : The VC terminals is only available at modules with serial number >25000

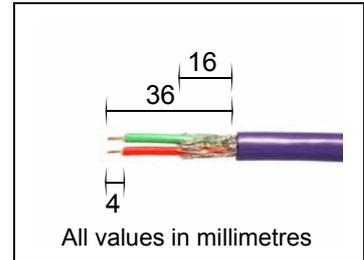
** : The light green wire (CV) can be difficult to determine from the green wire (TX) at some cables.

Important: Please notice that the cables are a standard type. It is not recommended to be used in cable chains or where the cable repeatable are being bended. If this is required use a special robot cable (2D or 3D cable).

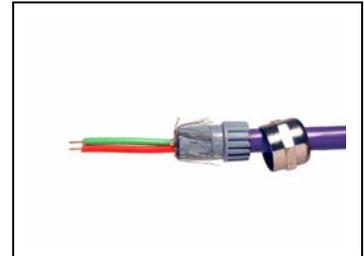
4.5 Expansion Module MAC00-FP2/FP4

4.5.11 Assembly instructions for profi cables

Remove the insulation from the cable, as shown in the accompanying picture.



Fit the plastic part of the gland on the cable, and fold the screen around it. Remember to feed the cable through the nut in the first place.



Feed the cables through the cable glands in the rear plate of the module, and tighten the nuts.



Screw the wires into the module. The red wire must go into the B+ terminal, and the green must go into the A-terminal.

The input and output terminals can be swapped if required. There is no difference between input and output on the board which means that it is purely hard-wired.



Attach the circuit board to the rear plate with the two screws. **REMEMBER** to use the spring washers included.



The table below shows the difference between Siemens naming conventions and the naming on the MAC00-FPx.

MAC00-FPx name	Siemens name	Standard wire colour
B+	B	Red
A-	A	Green

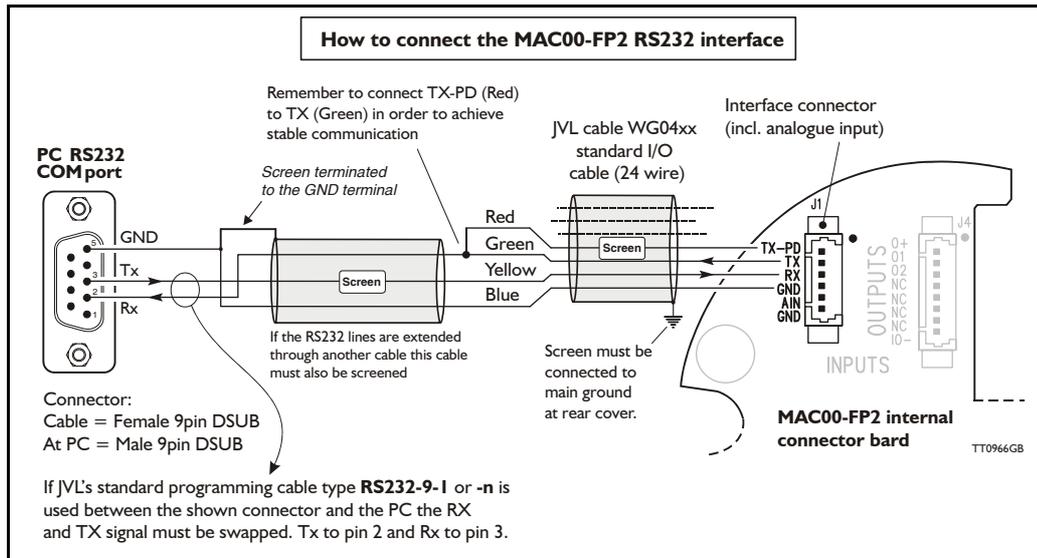
IMPORTANT:
use spring washer



4.5 Expansion Module MAC00-FP2/FP4

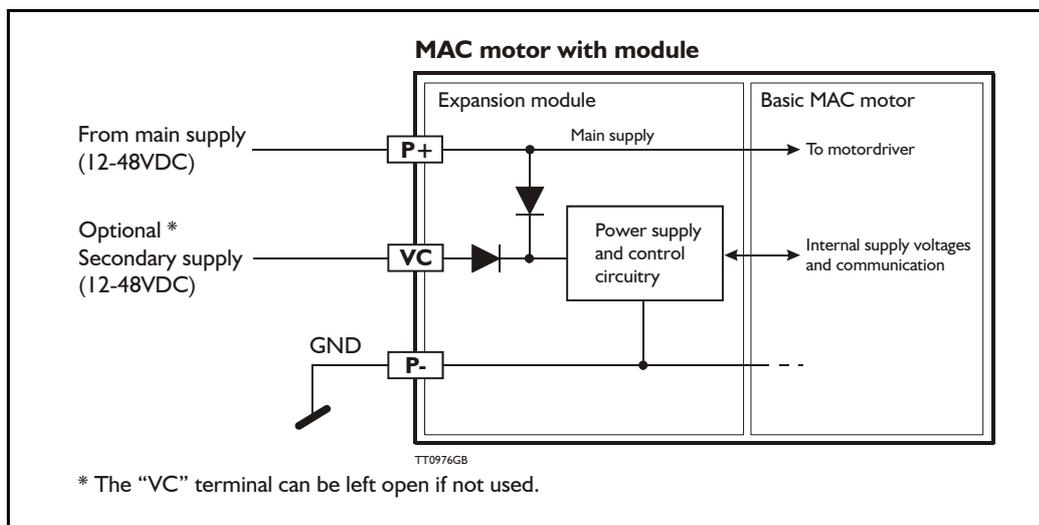
4.5.12 MAC00-FP2 - How to connect the RS232 interface.

The illustration below shows how to connect the MAC00-FP2 directly to a PC COM port. The drawing is based on the standard cables from JVL type WG0402, WG0410 or WG0420. See also *Accessories, page 172* for a complete list of cables and connectors. If the MAC motor is connected to the same RS232 line as other motors, the terminal TX-PD should only be connected at one of the motors. If one of JVL's standard RS232 cables (RS232-9-1 or -n) is used between the shown DSUB connector and the PC com port the RX and TX pins must be swapped since they are crossing in these standard cable.

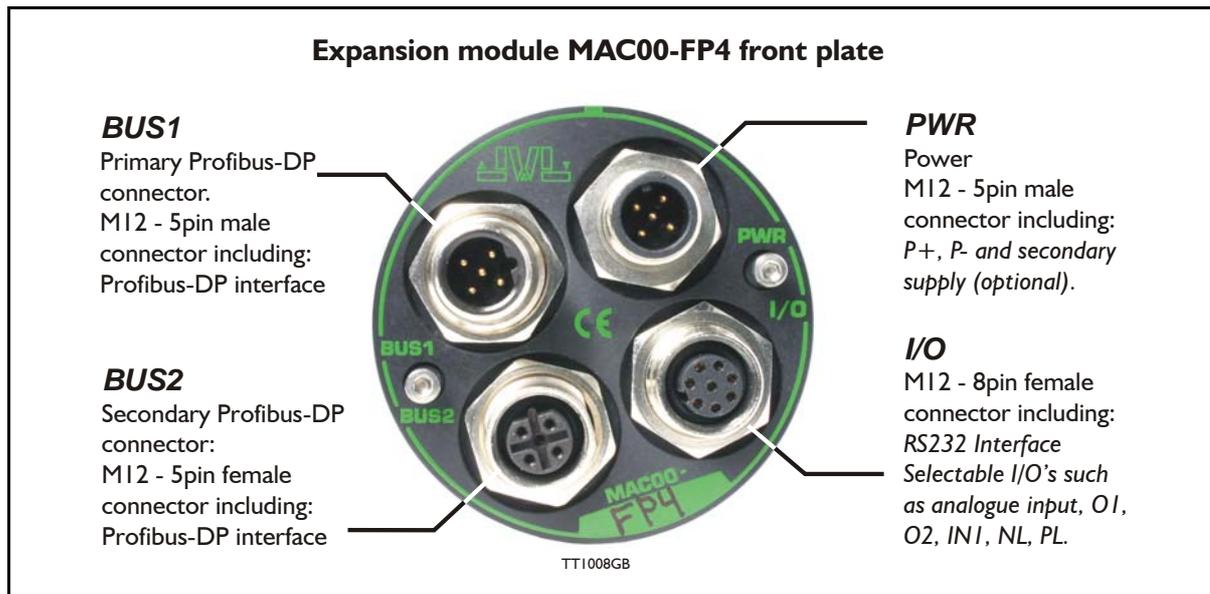


4.5.13 Operation with dual supply for emergency situations.

In many applications it is intended that the position data and other setup information is kept during a emergency situation. It is however also required by law in many countries that the main power for energizing the motor is removed in such a situation. To meet both of these requirements the MAC motor equipped with a MAC00-FPx module offers a secondary supply input called "VC". If the main supply at the P+ terminal is removed the internal control circuitry can be kept "alive" by keeping a supply at the "VC" terminal.



4.5 Expansion Module MAC00-FP2/FP4



4.5.14 Expansion MAC00-FP4 hardware description

The MAC00-FP4 offers a IP67 protection and M12 connectors which makes it ideal for automation applications where no additional protection is desired. The M12 connectors offers a solid mechanical protection and are easy to uplug compared to the FP2 module with cable glands. The available signals are a bit restricted compared to the FP2 module since only 4 I/O terminals are available. The I/O's connected to these 4 terminals must be selected by a small dipswitch.

The connector layout:

"PWR" - Power input. M12 - 5pin male connector				
Signal name	Description	Pin no.	JVL Cable W11000M12 F5A05N	Isolation group
P+	Main supply +12-48VDC. Connect with pin 2 *	1	Brown	1
P+	Main supply +12-48VDC. Connect with pin 1 *	2	White	1
P-	Main supply ground. Connect with pin 5 *	3	Blue	1
CV	Control voltage +12-48VDC.	4	Black	1
P-	Main supply ground. Connect with pin 3 *	5	Grey	1
* Note: P+ and P- is each available at 2 terminals. Make sure that both terminals are connected in order to split the supply current in 2 terminals and thereby avoid an overload of the connector.				
"BUS1" - Profibus-DP interface. M12 - 5pin male connector				
Signal name	Description	Pin no.	Cable: user supplied	Isolation group
-	Reserved for future purpose - do not connect	1	-	2
A-	Terminal A (Siemens syntax) for the Profibus-DP interface	2	-	2
DGND	Profibus-DP interface ground	3	-	2
B+	Terminal A (Siemens syntax) for the Profibus-DP interface	4	-	2
SHIELD	Cable shield. Internally conn. to the motor housing.	5	-	2

(Continued next page)

4.5 Expansion Module MAC00-FP2/FP4

“BUS2” - Profibus-DP Interface. M12 - 5pin female connector					
Signal name	Description	Pin no.	Cable: user supplied	Isolation group	
5VDC	5V output. Can be used for ext. termination (Max 40mA)	1	-	2	
A-	Terminal A (Siemens syntax) for the Profibus interface	2	-	2	
DGND	Profibus-DP interface ground	3	-	2	
B+	Terminal B (Siemens syntax) for the Profibus interface.	4	-	2	
SHIELD	Cable shield. Internally connected to the motor housing.	5	-	2	
“IO” - I/O's and RS232 interface. M12 - 8pin female connector.					
Signal name	Description	Function	Pin no.	JVL Cable WI1000-M12 M8A05N	Isolation group
IOC	I/O terminal C.	DIP 5 = OFF : <i>PL</i> input DIP 5 = ON : <i>O1 (PNP 25mA)</i>	1	White	3
Tx	RS232 interface - transmit output Important !: DIP1 must be turned ON. If addressing is used it must be turned ON at minimum one of the connected motors.		2	Brown	1
Rx	RS232 interface - receive input		3	Green	1
GND	RS232 Ground - also used with analogue input		4	Yellow	1
IOA	I/O terminal A.	DIP 2 = ON and DIP3 = OFF : <i>AIN</i> (Analogue input) DIP2 = OFF and DIP 3 = ON : <i>O2</i> (output 2 / PNP 25mA) (<i>AIN</i> is the analogue input. Remember to use the GND terminal with <i>AIN</i> !).	5	Grey	3 (1 when used as <i>AIN</i>)
IOB	I/O terminal B.	DIP 4 = OFF : <i>IN1</i> (input 1) DIP 4 = ON : <i>O1 (PNP 25mA)</i> (output 1)	6	Pink	3
IO-	I/O ground to be used with <i>IN1, NL, PL, O1, O2</i>		7	Blue	3
IOD	I/O terminal D.	DIP 6 = OFF : <i>NL</i> (negative limit input) DIP 6 = ON : <i>O+</i> (output supply)	8	Red	3
Cable Screen					
Some standard cables with M12 connector offers a screen around the cable. This screen is at some cables fitted to the outer metal at the M12 connector. When fitted to the MAC00-FP4 module this means that the screen will get in contact with the complete motor housing and thereby also the power ground (main ground).					
Isolation groups					
The MAC00-FP4 offers optically isolation at the digital inputs and outputs (<i>IN1, NL, PL</i> and <i>O1-2</i>). In the table is shown a number for each pin. This number refers to which isolation group it is connected to. Isolation group 1 means that the terminal refers to the main ground (<i>P-</i> , <i>GND</i> and the motor housing). Isolation group 2 means that the terminal refers to the Profibus-DP interface ground (<i>DGND</i>). Isolation group 3 means that the terminal refers to the I/O ground (<i>IO-</i>)					

4.5 Expansion Module MAC00-FP2/FP4

4.5.15 Cables for the MAC00-FP4

Following cables equipped with M12 connector can be supplied from JVL.

MAC00-FP4 Connectors				Description	JVL Order no.	Photo
"BUS1" 5pin Male B-coded	"BUS2" 5pin Female B-coded	"I/O" 8pin Female	"PWR" 5pin Male			
		X		RS232 Interface cable. Connects directly from MAC00-FP4 to PC Length: 5m (197 inch)	RS232-M12-1-5-8	
			X	Cable (Ø5.5mm) with M12 female 5 pin 90 degree connector loose ends 0.35mm ² (22AWG) and foil screen. Length: 5m (197 inch)	WI1000-M12F5A05N	
			X	Same as above but 20m (787 inch)	WI1000-M12F5A20N	
		X		Cable with M12 male 8pin 90 degree connector loose ends 0.22mm ² (24AWG) and foil screen. Length: 5m (197 inch)	WI1000-M12M8A05N	
		X		Same as above but 20m (787 inch)	WI1000-M12M8A20N	
	X			Profibus DP cable with M12 male 5 pin connector B-coded, loose ends and screen. Length: 5m (197 inch).	WI1026-M12M5S05R	
	X			Same as above but 15m (591 inch)	WI1026-M12M5S15R	
X				Profibus DP cable with M12 female 5pin connector B-coded, loose ends and screen. Length: 5m (197 inch)	WI1026-M12F5S05R	
X				Same as above but 15m (591 inch)	WI1026-M12F5S15R	
Loose connectors and termination resistor						
	X			Loose Profibus DP male M12 connector. B-coded. Internal screw terminals.	WI1028-M12M5VC1	
X				Loose Profibus DP female M12 connector. B-coded. Internal screw terminals.	WI1028-M12F5VC1	
	X			Profibus DP male M12 termination resistor. B-coded.	WI1028-M12M4STR3	
Protection caps. Optional if connector is not used to protect from dust / liquids.						
	X	X		IP67 protection cap for M12 female connector.	WI1000-M12FCAP1	
X			X	IP67 protection cap for M12 male connector.	WI1000-M12MCAP1	

Important: Please notice that the cables are a standard type. It is not recommended to be used in cable chains or where the cable repeatables are being bended. If this is required use a special robot cable (2D or 3D cable). See also *Accessories*, page 172 where additional M12 connectors are shown.

4.5 Expansion Module MAC00-FP2/FP4

4.5.16 GSD file for the MAC00-FP2 and FP4.

The GSD file must be used to configure the PLC or master controller used for the Profibus communication. The file is shown here but is also available on disc. Please contact your nearest JVL representative.

GSD file:

```
; COM PROFIBUS V 3.3, GSD1-Xport
; Time Stamp: 01/31/00, 12:36:39
#Profibus_DP
; <Unit-Definition-List>
GSD_Revision=1
Vendor_Name="JVL IND EL"
Model_Name="MAC00-FP"
Revision="0.0"
Ident_Number=0x06BC
Protocol_Ident=0
Station_Type=0
Hardware_Release="1.1"
Software_Release="1.2"
9.6_supp=1
19.2_supp=1
93.75_supp=1
187.5_supp=1
500_supp=1
1.5M_supp=1
3M_supp=1
6M_supp=1
12M_supp=1
MaxTsdr_9.6=60
MaxTsdr_19.2=60
MaxTsdr_93.75=60
MaxTsdr_187.5=60
MaxTsdr_500=100
MaxTsdr_1.5M=150
MaxTsdr_3M=250
MaxTsdr_6M=450
MaxTsdr_12M=800
Implementation_Type="VPC3"
Bitmap_Device="DPLINK_"

; Slave-Specification:
Freeze_Mode_supp=0
Sync_Mode_supp=0
Auto_Baud_supp=1
Min_Slave_Intervall=1
Max_Diag_Data_Len=8
Modul_Offset=0
Slave_Family=0
OrderNumber="MAC00-FPx"
```

4.5 Expansion Module MAC00-FP2/FP4

```
; UserPrmData: Length and Preset:
PrmText=1
Text(0)="Active low"
Text(1)="Active high"
EndPrmText

PrmText=2
Text(0)="Velocity = 0"
Text(1)="Passive mode"
EndPrmText

PrmText=3
Text(0)="Disabled"
Text(1)="Enabled"
EndPrmText

ExtUserPrmData=1 "IN1 Input level"
Bit(0) | 0-1
Prm_Text_Ref=1
EndExtUserPrmData

ExtUserPrmData=2 "IN2 Input level"
Bit(1) | 0-1
Prm_Text_Ref=1
EndExtUserPrmData

ExtUserPrmData=3 "IN3 Input level"
Bit(2) | 0-1
Prm_Text_Ref=1
EndExtUserPrmData

ExtUserPrmData=4 "IN4 Input level"
Bit(3) | 0-1
Prm_Text_Ref=1
EndExtUserPrmData

ExtUserPrmData=5 "NL Input level"
Bit(4) | 0-1
Prm_Text_Ref=1
EndExtUserPrmData

ExtUserPrmData=6 "PL Input level"
Bit(5) | 0-1
Prm_Text_Ref=1
EndExtUserPrmData

ExtUserPrmData=7 "Endlimit action"
Bit(0) 0 0-1
Prm_Text_Ref=2
EndExtUserPrmData

ExtUserPrmData=8 "Input I Action"
Unsigned8 0 0-255
EndExtUserPrmData
```

4.5 Expansion Module MAC00-FP2/FP4

```
ExtUserPrmData=9 "Input 2 Action"  
Unsigned8 0 0-255  
EndExtUserPrmData  
  
ExtUserPrmData=10 "Input 3 Action"  
Unsigned8 0 0-255  
EndExtUserPrmData  
  
ExtUserPrmData=11 "Input 4 Action"  
Unsigned8 0 0-255  
EndExtUserPrmData  
  
ExtUserPrmData=12 "Input debounce"  
Bit(1) 0 0-1  
Prm_Text_Ref=3  
EndExtUserPrmData  
  
ExtUserPrmData=13 "Input noise filter"  
Bit(2) 0 0-1  
Prm_Text_Ref=3  
EndExtUserPrmData  
  
Max_User_Prm_Data_Len=15  
User_Prm_Data_Len=15  
User_Prm_Data=0x0,0x3F,0x0,0,0,0,0,0,0,0,0,0,0,0,0  
  
Ext_User_Prm_Data_Const(0) = 0x0,0x3F,0x0,0,0,0,0,0,0,0,0,0,0,0,0  
Ext_User_Prm_Data_Ref(1)=1  
Ext_User_Prm_Data_Ref(1)=2  
Ext_User_Prm_Data_Ref(1)=3  
Ext_User_Prm_Data_Ref(1)=4  
Ext_User_Prm_Data_Ref(1)=5  
Ext_User_Prm_Data_Ref(1)=6  
Ext_User_Prm_Data_Ref(2)=7  
Ext_User_Prm_Data_Ref(2)=12  
Ext_User_Prm_Data_Ref(2)=13  
Ext_User_Prm_Data_Ref(3)=8  
Ext_User_Prm_Data_Ref(4)=8  
Ext_User_Prm_Data_Ref(5)=8  
Ext_User_Prm_Data_Ref(6)=9  
Ext_User_Prm_Data_Ref(7)=9  
Ext_User_Prm_Data_Ref(8)=9  
Ext_User_Prm_Data_Ref(9)=10  
Ext_User_Prm_Data_Ref(10)=10  
Ext_User_Prm_Data_Ref(11)=10  
Ext_User_Prm_Data_Ref(12)=11  
Ext_User_Prm_Data_Ref(13)=11  
Ext_User_Prm_Data_Ref(14)=11  
  
; <Module-Definition-List>  
Module="MAC00-FP" 0x13,0x10,0x10,0x10,0x10,0x23,0x20,0x20,0x20,0x20  
EndModule
```