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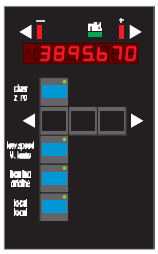
# Section 3
# Local Front Panel Operation

## 3.1 Description of Front Panel

The MM2500 is equipped with either a blank front panel, or a numeric front panel display including local push-buttons that allow manual control of each axis.



Blank Front Panel



Display + Manual Control

The following applies to MM25000 with front panel and manual motor controls only. If your MM25000 is equipped with the blank front panel, you may skip to section 3.3.

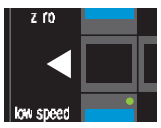
## 3.2 Push-button Functions




**Position clear**

To perform a position reset, press and release this switch located beneath the display you wish to reset.

Activating this button resets the position display readout to zero.




**Move in negative direction**

To move a single step at a time (or a fraction of step depending on the type of motor board), press and release this switch.




**Move in positive direction**

To move a single step at a time (or a fraction of step depending on the type of motor board), press and release this switch.

To move continuously (jog) at low speed, press and hold this switch (more than 300 ms).



**High speed**

While this button is pressed in combination with either jog button, the motor moves at high speed. The motor slows down and stops when either button is released.




**Low speed** (locking type button)

Activating this button lowers speed values for jogging and homing by a factor of 10. A green LED located above the upper right corner of this switch indicates when this function is active.

To disactivate the "low speed" function, press this switch again. The green LED shuts off.




**Home Search**

When this button is pushed, the stage returns to the home position.

A yellow LED located above the upper rigth corner of this switch indicates that a home search is in progress.

**NOTE**

**The home position is permanently fixed inside the stage. This home position can be sensed by any controller and used as an absolute position reference.**




**Local**

Pressing this button enables front panel push-buttons when the priority of the host-computer is disabled (MC1 command). If this command is not sent and you push on this button, LED light come on the front panel, but buttons do not permit displacements. This function avoids accidental displacements at the time of a program accomplishment.

When the "local" button is pushed, functions of other push-button are authorized. A red LED located in the upper right corner of the switch indicates that local mode is enabled.

**NOTE**

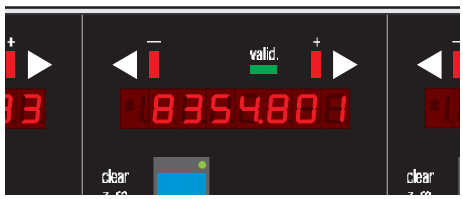
**However local position is only enabled if not superseded by the Host Computer Mode.**

## 3.3 Display

Each optional front panel display is capable of displaying up to 8 digits, from -19999999 to +19999999, showing the motor position.

Also located above each axis display are three LEDs whose meanings are described below:

- Two red limit of travel LEDs, labeled "+" and "–". Indicate the positioning stage has reached either its positive limit ("+" LED on), or its negative limit ("–" LED on).
- One green LED indicates stage power is ON and is labeled "valid". When a stage is powered, the closed loop control, servo, will hold the stage in position until commanded to move.




*Display and LEDs.*

# Section 5
# Programming by Host Computer

## 5.1 EZ_COMM Program

The EZ_COMM program permits to communicate with all the controllers equipped with an IEEE-488 or RS-232-C interface. The software supports the Hewlett Packard HP_IB 82990 or 82335 and National Instrument NI GPIB-PCII/IIA cards.

## 5.2 Principle

Each command involves:

- an axis number:
  01 or 1 for axis 1,
  02 or 2 for axis 2,
  0a or a for axis "a",
  00 or 0 a blank for all the axes.
  "a" may be upper to 2 only in RS-232-C daisy chain mode.
- a 2-character mnemonic code for each command (may be in upper case or lower case).
  Example: AB or VE or PR or TS, etc.
- possibly an argument in the form of a whole number (without comma), preceded by the "-" sign if necessary (but not by the "+" sign):
  Example: 20000 or -100000
- A "CR" or "LF" end of line character (terminator; 13 or 10 ASCII code).

**Example**: "02PA20000"

Request for a displacement of axis 2 to the absolute position "+20,000".

Several commands may be included in the same sequence as long as this does not exceed 250 characters and the commands are separated by commas.

Example: "01PR2000,02PR1000,TS":

- Relative displacement of 2000 steps on axis 1;
- Relative displacement of 1000 steps on axis 2;
- Demand for status on the 2 axes.

**NOTE**

**In RS-232-C daisy chain mode, command sent to the first MM2500 unit and separated by commas, are transmit to the following MM2500 units, in separated command strings.**

The responses obey the same rules but may occasionally be doubled ("n" responses for "n" axes).

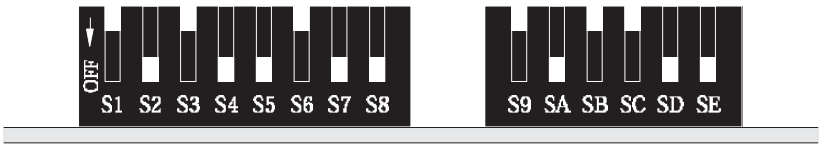
The responses to "TK" command (Tell blocK: reading the memory block) obey to a different syntax:

- As much strings as memorized positions (max 2500).
- The command consists of two numbers spaced by ":".

## 5.3 RS-232-C Interface

### 5.3.1 Configuration

There are 8 switches at the top of the board for programming the series connection. For accessing them, remove the upper cover of the MM2500:






| | *RS-232-C Configuration* | *IEEE-488 Configuration* |
|---|---|---|
| **S1** : | Off: IEEE-488 | On: RS-232-C |
| **S2** : | Off: 1 stop bit | On: 2 stop |
| **S3** : | Off: 7 bits | On: 8 bits |
| **S4** : | Off: Odd Parity | On: Even Parity |
| **S5** : | Off: Zero Parity | On: Parity according to S4 |

| **S6** | **S7** | **S8** | : Transmission Baud Rate |
|---|---|---|---|
| Off | Off | Off | : 19200 bauds |
| Off | Off | On | : 1200 bauds |
| Off | On | Off | : 4800 bauds |
| Off | On | On | : 300 bauds |
| On | Off | Off | : 9600 bauds |
| On | Off | On | : 600 bauds |
| On | On | Off | : 2400 bauds |
| On | On | On | : 38400 bauds |

| **S9** | to | **SD** | : IEEE-488 Configuration. |
|---|---|---|---|
| **SE** : | Off: terminator = "CR" | | On: terminator = "LF" |

**NOTE**

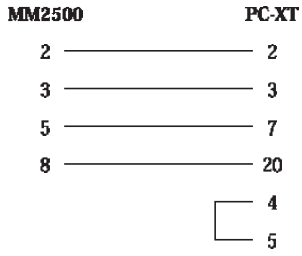
**The configuration is scanned when the system is started up (or when the "Reset" button on the rear panel is pressed).**

### 5.3.2 Examples of RS-232-C cable links

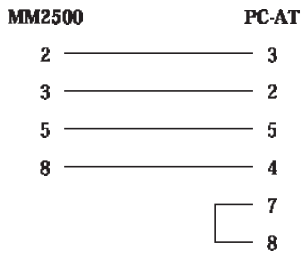
**NOTE**

**Refer to appendix A for pinouts of the RS-232-C connector.**

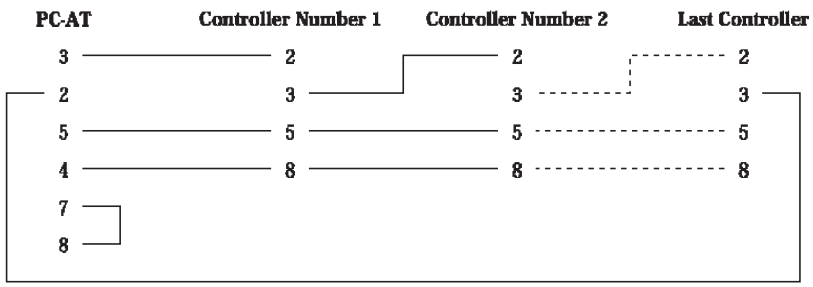
**Cable for 25-pin connector (PC-XT)**




**Cable for 9-pin connector (PC-AT)**




**Cable for PC-AT in daisy chain mode**



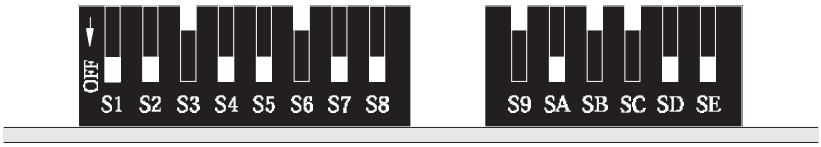

**NOTE**

**If one of the connectors is unused, you must connect the free location by a plug with a link between the pins 2 and 3.**

## 5.4 IEEE-488 Interface

### 5.4.1 Configuration

The IEEE 488 link is configured by means of 5 switches on top of the board. For accessing them, remove the upper cover of the MM2500.






| | | | | | *RS-232-C Configuration* / *IEEE-488 Configuration* |
|---|---|---|---|---|---|
| **S1 :** | Off: IEEE-488 | | | | On: RS-232-C |
| **S2** | to | **S8** | | | : RS-232-C Configuration |
| **S9** | **SA** | **SB** | **SC** | **SD** | : Adress IEEE-488 |
| Off | Off | Off | Off | Off | : Adress 31 |
| On | Off | Off | Off | Off | : Adress 30 |
| Off | On | Off | Off | Off | : Adress 29 |
| On | On | Off | Off | Off | : Adress 28 |
| Off | Off | On | Off | Off | : Adress 27 |
| On | Off | On | Off | Off | : Adress 26 |
| Off | On | On | Off | Off | : Adress 25 |
| On | On | On | Off | Off | : Adress 24 |
| Off | Off | Off | On | Off | : Adress 23 |
| On | Off | Off | On | Off | : Adress 22 |
| Off | On | Off | On | Off | : Adress 21 |
| On | On | Off | On | Off | : Adress 20 |
| Off | Off | On | On | Off | : Adress 19 |
| On | Off | On | On | Off | : Adress 18 |
| Off | On | On | On | Off | : Adress 17 |
| On | On | On | On | Off | : Adress 16 |
| Off | Off | Off | Off | On | : Adress 15 |
| On | Off | Off | Off | On | : Adress 14 |
| Off | On | Off | Off | On | : Adress 13 |
| On | On | Off | Off | On | : Adress 12 |
| Off | Off | On | Off | On | : Adress 11 |
| On | Off | On | Off | On | : Adress 10 |
| Off | On | On | Off | On | : Adress 9 |
| On | On | On | Off | On | : Adress 8 |
| Off | Off | Off | On | On | : Adress 7 |
| On | Off | Off | On | On | : Adress 6 |
| Off | On | Off | On | On | : Adress 5 |
| On | On | Off | On | On | : Adress 4 |
| Off | Off | On | On | On | : Adress 3 |
| On | Off | On | On | On | : Adress 2 |
| Off | On | On | On | On | : Adress 1 |
| On | On | On | On | On | : Adress 0 |
| **SE :** | Off: terminator = "CR" | | | | On: terminator = "LF" |

## 5.5 Command Set

### 5.5.1 Configuration of ramps

**RV** Ramp slow Velocity

**RW** Ramp Width

**RX** Ramp eXecute calculation

**XV** maX Velocity

### 5.5.2 Configuration origin search cycles

**OH** Origin High speed

**OL** Origin Low speed

**OT** Origin Tempo

### 5.5.3 Displacement

**AB** ABort

**OR** Origin Research

**OW** Origin and Wait

**PA** Position Absolute

**PR** Position Relative

### 5.5.4 Inputs/Outputs

**CB** Clear Bit

**DO** Desired Outputs (1)

**RB** Read Bit (1)

**SB** Set Bit

### 5.5.5 Positions

**DH** Define Home

**DP** Desired Position (2)

**SL** Set Left limit

**SR** Set Right limit

**TL** Tell Left limit (2)

**TP** Tell Position (2)

**TR** Tell Right limit (2)

### 5.5.6 Speed control

**DV** Desired Velocity (2)

**SV** Set Velocity

### 5.5.7 Encoders

**ID** Init Divisor

**IM** Init Multiplier

**SC** Set enCoder

### 5.5.8 Memorization

**CG** Command triGger

**MK** Mode blocK

**TK** Tell blocK

**TN** Tell Number

**RK** Reset blocK

### 5.5.9 Output pulses

**PB** Pulse Begin

**PE** Pulse End

**PI** Pulse Increment

**PS** Pulse Start

### 5.5.10 Speed mode

**CA** Command hAlt

**CS** Choise Sign

**MV** Modify Velocity

### 5.5.11 Miscellaneous

**CH** CHain

**MC** Host computer priority

**SY** SYnchronize (1)

**TS** Tell Status (2)

**VE** VErsion (1)

**WP** Wait for Plus

**WM** Wait for Minus

**WS** Wait for Stop

**NOTES**

**1) These commands provok a response from the MM2500 controller.**

**2) These commands provok as much responses as concerned motor axes.**

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