

RACCORDEMENT MAC00-CS02

USER I/O

Connecteur 8 points 'User I/O' et câble code couleur libre		
BORNES	Signaux	couleurs des fils
1	Gnd - OV	Blanc/orange
2	AIN - entrée analogique	Orange
3	O1 - sortie 'en position'	Blanc/Vert
4	O2 - sortie 'defaut'	Vert
5	A+ - A codeur	Blanc/Bleu
6	A- - A/ codeur	Bleu
7	B+ - B codeur	Blanc/Brun
8	B- - B/ codeur	Brun

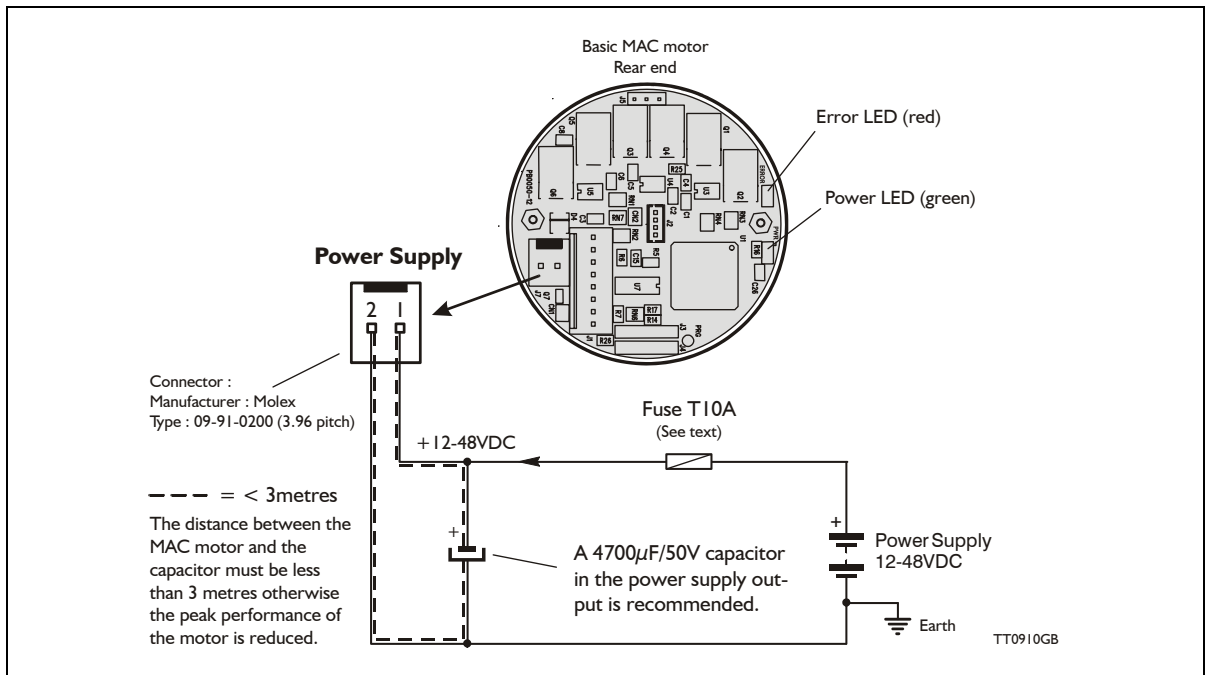
Note : Le blindage général du câble doit être relié à la masse.

Pour le raccordement et l'utilisation, se rapporter à la notice utilisateur, pages 33,38,39,....,44 (Ci-jointes)

3.2

Power Supply

Only MAC050 to 141

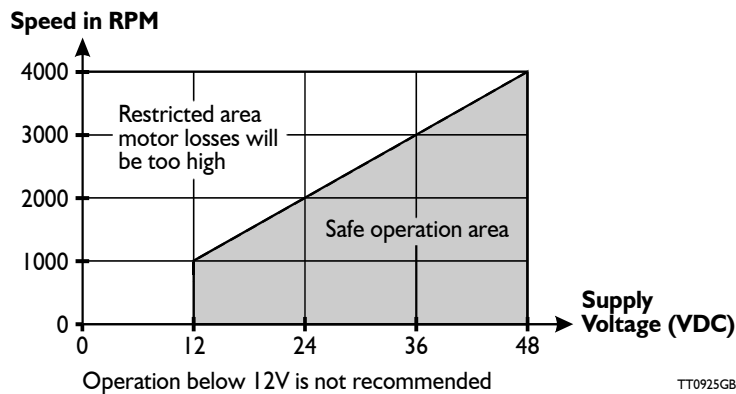


3.2.1 Power supply (only MAC050 to 141)

The power supply must be connected to the terminals marked +48V and GND.

The supply voltage can be in the range 12VDC up to 48VDC; however the maximum speed of the motor (4000 RPM) is based on 48VDC. A lower voltage will decrease speed performance.

This curve below shows the relationship between voltage and recommended speed.



If a supply voltage lower than 48VDC is used, it will not influence the motor torque unless the corresponding speed at this voltage is overridden. The MAC motor continuously measures the actual supply voltage and optimises the current control filter. This feature ensures that the motor always produces full torque within the safe area of operation.

3.2.2 Power supply grounding (only MAC050 to 141)

No additional grounding/earthing of the motor is necessary since the complete motor housing is connected directly to pin 2 of the Power Supply connector.

The overall earthing of the system must be done at a central point close to the power supply.

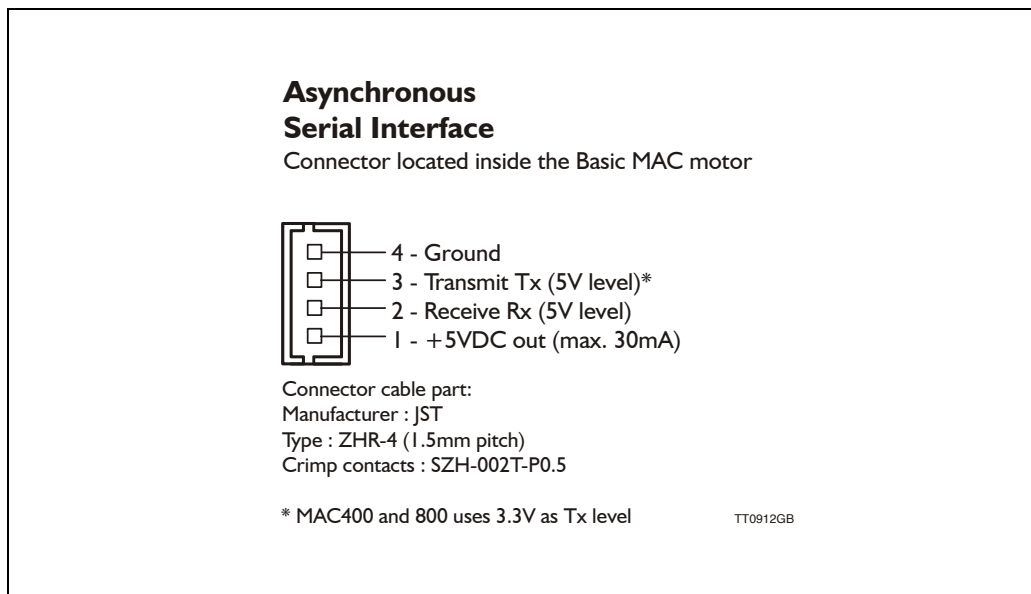
3.3

Serial interface

3.3.1 Interface Connection

The Controller Interface is based on an asynchronous serial interface.

3 interface signals, Rx, Tx and ground are used. The interface can be used directly with the serial COM port of any standard PC or PLC by using the optional cable type RS232-9-I-MAC which has an integrated RS232 converter. Another possibility is to use one of the expansion modules for the MAC motor which also include an RS232 and RS485 converter. See also Accessories, page 153.



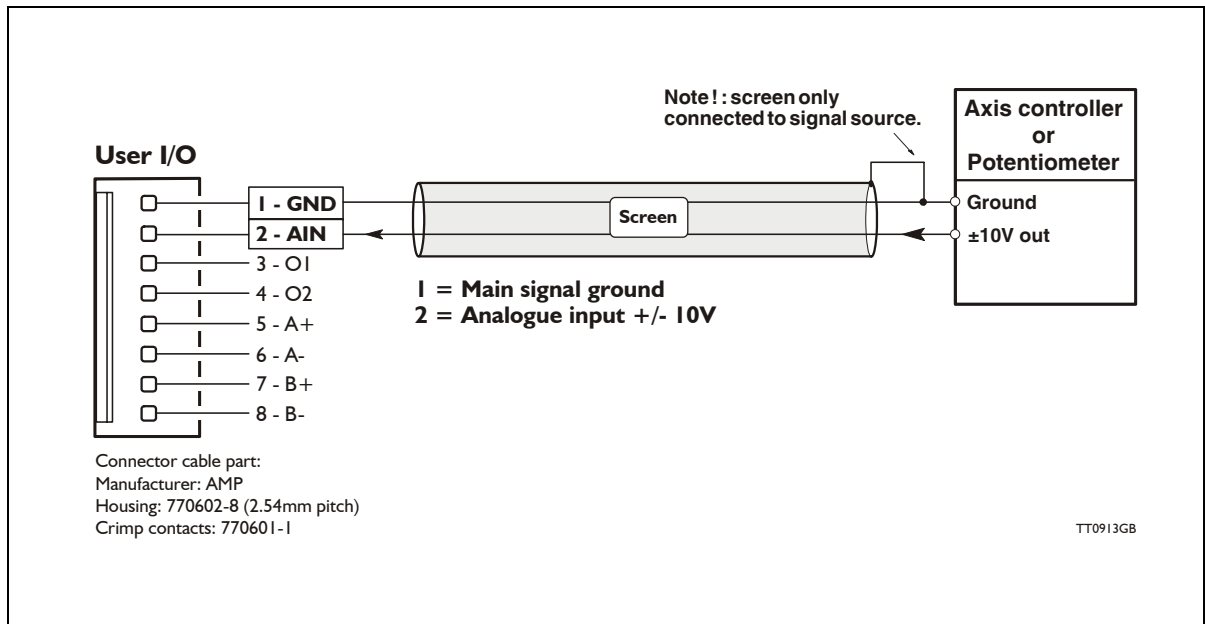
3.3.2 RS232 Interface signal levels

Please note that the signal levels are 0 to +5V(3.3V)DC and are thus not according to the RS232 standard which requires +/-12V nominal at the RX and TX signals. However the protocol used is equivalent to the RS232 protocol.

If the Basic MAC motor is implemented in an OEM application where an internal processor communicates with the MAC motor, the TX and RX terminals can normally interface directly.

3.4

User I/O

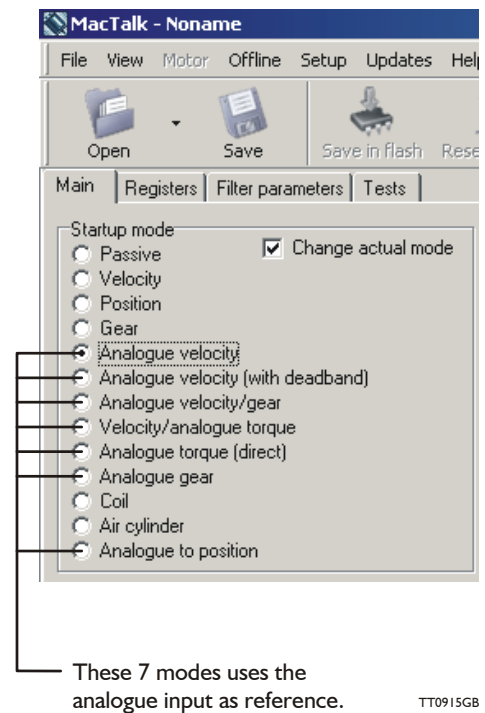


3.4.1 Analogue input.

The analogue input can be used for two purposes in the basic MAC motor.

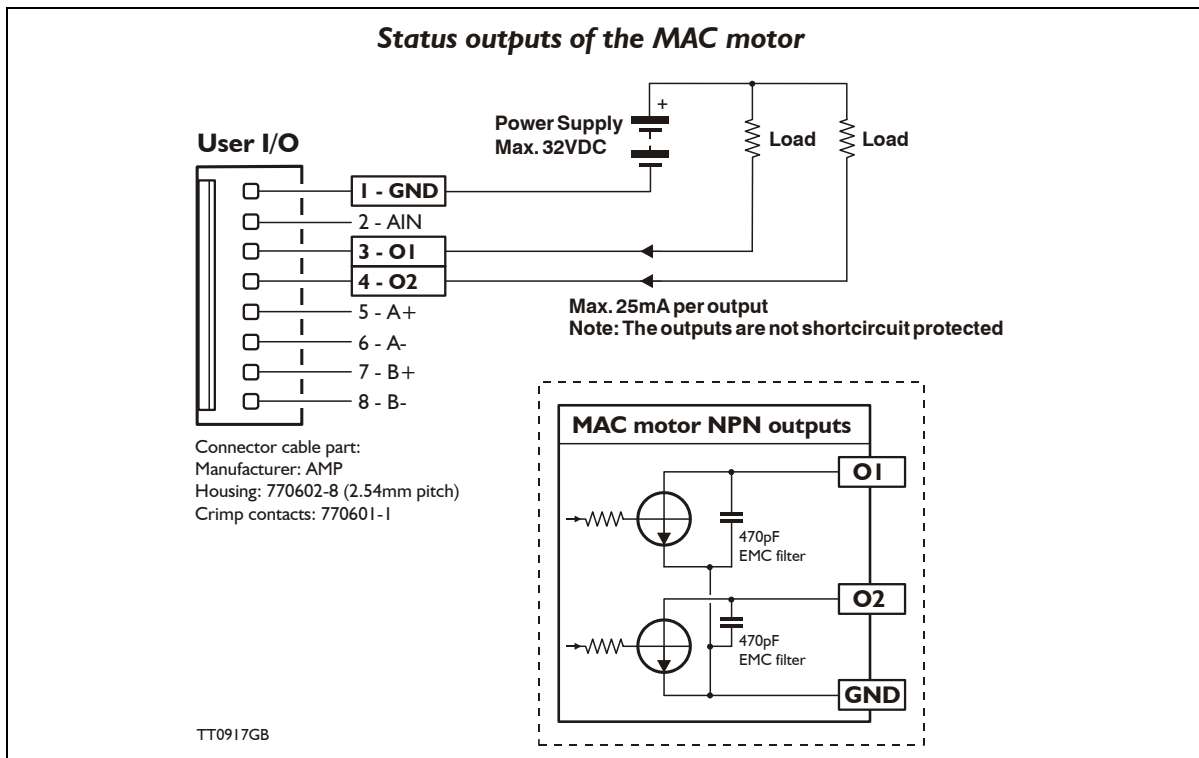
1. As an analogue control input when the MAC motor is used for either velocity control or torque control.
2. As a Zero Sensor input when the MAC motor is used in position or gear mode.
For further information see Mechanical zero search, page 24

The input is automatically used as an analogue $\pm 10V$ input when the Start-up mode in the MacTalk main window is set to one of the 7 modes such as Analogue Torque, Velocity or Velocity/Gear as shown in the accompanying illustration.



3.4

User I/O



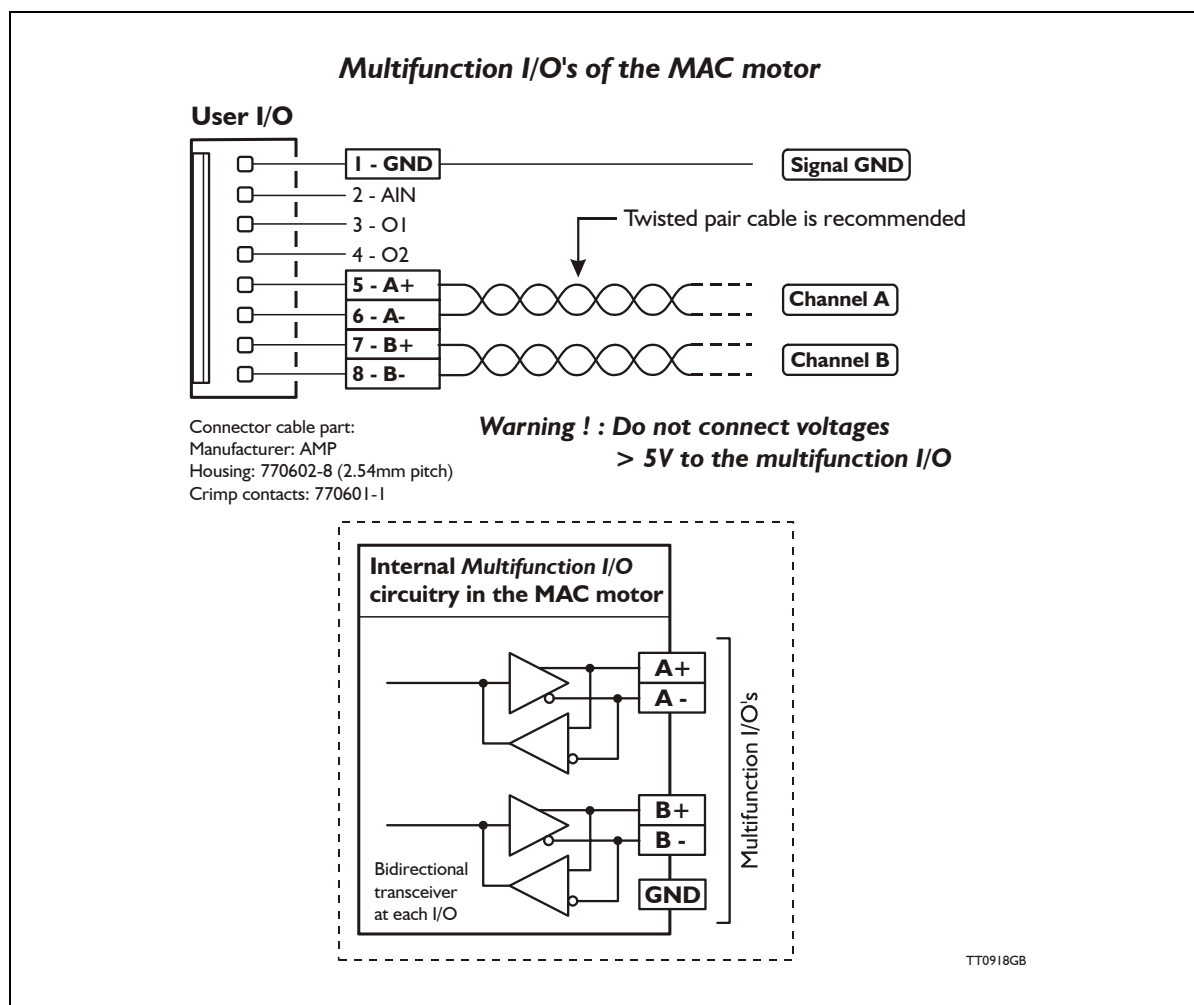
3.4.2 Status Outputs

The status outputs O1 and O2 indicate the actual status of the MAC motor. Each output is an NPN type, which means that the load must be placed between the output and a positive supply. Note that several of the expansion modules for the MAC motor offer PNP output (source output). For further details about a specific expansion module, please see other sections of this manual.

- O1** This output functions as an “In Position” or “at velocity” output depending on which mode is selected. The position interval can be setup using the MacTalk program.
- O2** This output is normally passive but if a fatal error occurs, it will be activated to indicate that normal operation of the motor has been interrupted and no further operation is possible until a reset or power down has been made. A fatal error can be one of the following conditions:

3.4

User I/O



3.4.3 Multifunction I/O general description

The Multifunction I/O can be set up for different purposes depending on the actual mode of operation of the MAC motor.

- Pulse inputs
When the motor is set to Gear mode, it will follow pulses at the A and B inputs. 2 input formats can be selected: pulse and direction or quadrature.
- Encoder output
The internal encoder-pulses are output as a quadrature signal.
- RS422 communication
A master controller can send commands, for example velocity or position commands. This interface is intended for permanent connection.

3.4

User I/O

3.4.4 Multifunction I/O used as pulse inputs

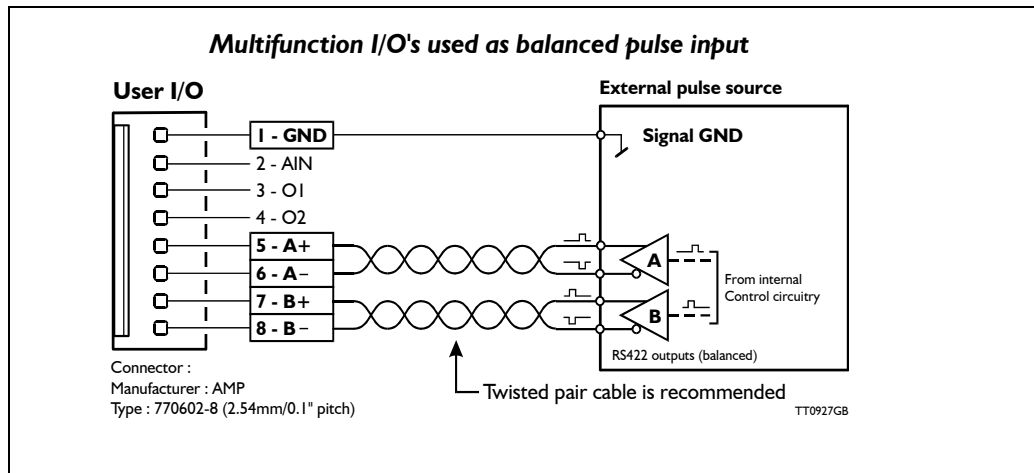
The Multifunction I/O can be setup as pulse inputs, which is necessary to run the MAC motor in *Gear mode* or *Analog velocity/gear mode*.

When the motor is set to Gear mode, it will follow pulses at the A and B inputs.

2 input formats can be selected.

Pulse and direction. The A input must be applied with the pulses and the B input must be applied with the direction signal.

Quadrature. Also called encoder format. The pulses at the A and B channel are 90 degree phase-shifted to determine direction.



The Multifunction I/O's must be set up in MAC-Talk to function as inputs. Also, an input filter and the preferred direction of movement can be selected.

The pulse inputs are only used in *Gear* and *Analog Velocity/Gear* mode.

The pulse input can be set to fast or slow bandwidth which means 2.5MHz or 150kHz. Also, the direction of movement can be inverted.

The input format quadrature or pulse and direction can be selected here.

The Multifunction I/O's are setup as inputs

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See also the descriptions of *Gear* and *Analog Velocity/Gear* modes for further details about functionality.

3.4

User I/O

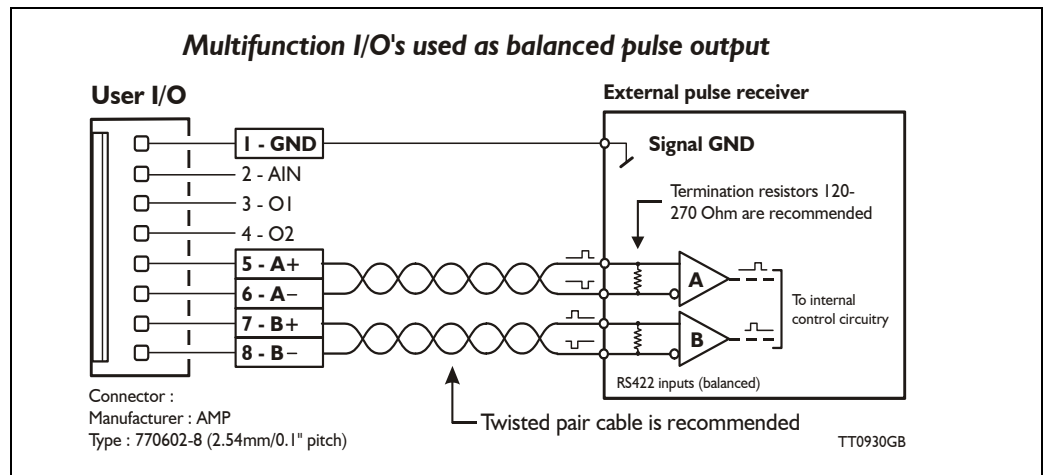
3.4.5 Multifunction I/O used as pulse outputs

The Multifunction I/O can be set up as pulse outputs. When this configuration is selected, the internal encoder signal will be available at the outputs.

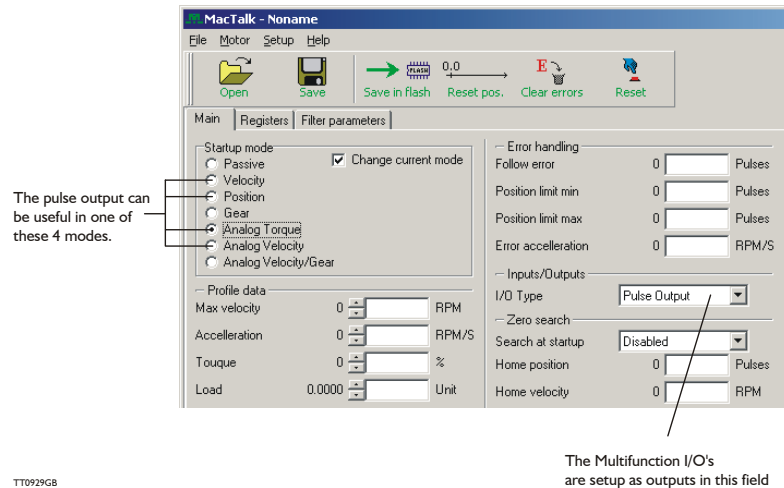
This can be useful in modes in which the internal encoder signal must be used as feedback to external electronics for monitoring the real-time position, or as a part of a closed-loop regulation.

This feature is especially relevant in the following 4 modes: *Velocity*, *Position*, *Analogue Torque* and *Analogue Velocity*.

A quadrature signal will appear at the A and B channel. Quadrature means that the two channels are 90 degree phase shifted either positively or negatively, which determine the actual direction of movement of the motor.



The Multifunction I/O's must be set up in MAC-Talk to function as pulse outputs.



See also the respective mode descriptions for further details about functionality.

3.4

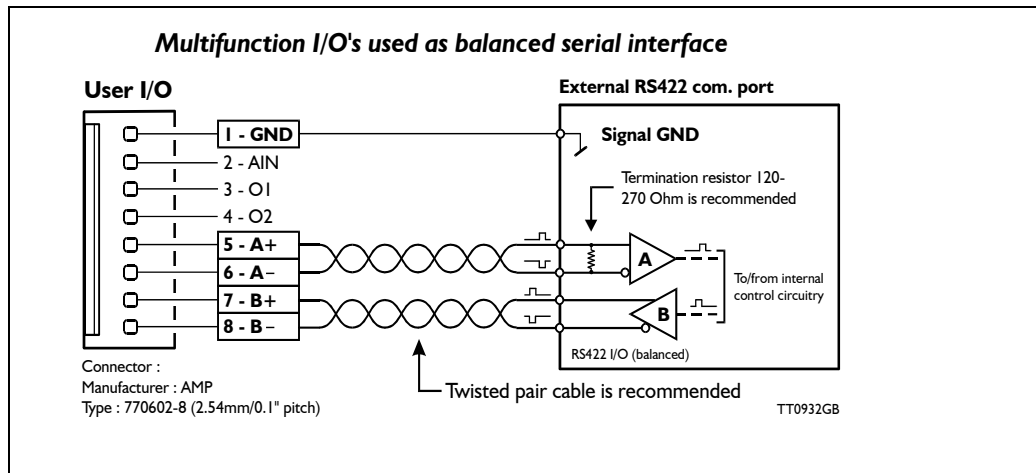
User I/O

3.4.6 Multifunction I/O used as serial communication interface

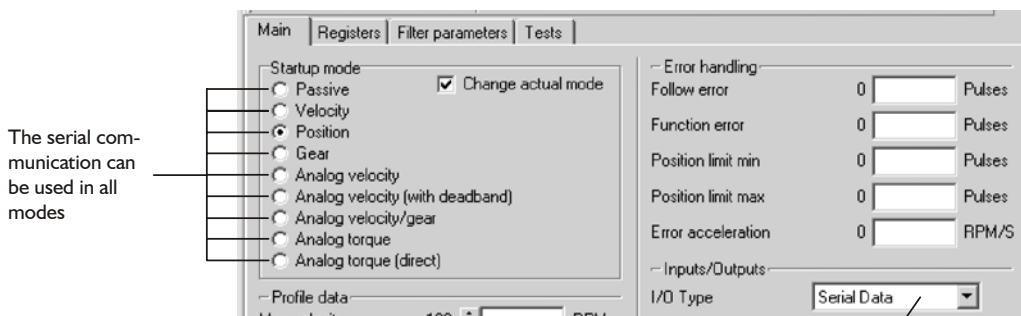
The Multifunction I/O can be set up as a serial communication interface. When this configuration of the Multifunction I/O is selected, the A and B channels function as a receive and transmit channel via which commands to the MAC motor can be transmitted from for example a PC or PLC.

This feature can be used in all modes of operation.

The communication protocol is described in the MAC motor *Technical Reference Guide*, which must be requested separately and is not part of this user manual. See also Serial communication, page 145.



The Multifunction I/O's must be set up in MacTalk to function as a serial communication interface.



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