

DCX-MC210

PWM Servo Motor Drive Module

User's Manual Addendum
Revision 1.0a

SIGNAL DESCRIPTIONS:

PWM Motor Drive - / Motor Drive + -These module outputs provide the PWM drive signal for a DC servo motor. The PWM frequency is 31.25 KHz. The resolution of the PWM is a full eight bits, resulting in .0390625 volts per DAC unit. Rotational direction is determined by connecting the Motor Drive signals (Motor - and Motor +) to the appropriate terminals on the DC servo motor.

COARSE HOME - This module input is used to determine the proper zero position of the servo. In servo systems that use rotary encoders with index outputs, an index pulse is generated once per rotation of the encoder. While this signal occurs at a very repeatable angular position on the encoder, it may occur many times within the motion range of the servo. In these cases, a Coarse Home switch connected to this module input can be used to qualify which index pulse is the true zero position of the servo. By setting this switch to be activated near the end of travel of the servo, and using DCX motion commands to position the servo within this region prior to searching for the index pulse, a unique zero position for the servo can be determined.

AMPLIFIER FAULT - This module input allows the user to stop an axis due to an external axis specific fault condition. While no amplifier is used with the DCX-MC210 module, the signal name was retained to remain consistency with other DCX-MC2XX modules. The state of this signal will appear as a status bit in the servo's status word. Using the **Fault oN** command, this signal can be enabled to shut the axis off if the input goes active low. In this condition, no further servo motion will occur until the fail signal is deactivated and the **Motor oN** command is issued. The **Fault oFf** command can be used to disable this signal.

AMPLIFIER ENABLE - This TTL level module output signal can be used to indicate to the external system that the DCX-MC210 is enabled. When the DCX motherboard is turned on or reset, this signal will immediately go to its' inactive high level. When the **Motor oN** command is issued to the DCX, this signal will go to its' active low level. Anytime there is an error on the respective servo axis, including exceeding the following error, a limit switch trip or the amplifier fault input is activated, the Amplifier Enable signal will be deactivated. This signal can also be deactivated by the **Motor oFf** command.

LIMIT POSITIVE and LIMIT NEGATIVE - The limit switch inputs are used to cause the DCX to stop a servo's motion when it reaches the end of travel. If the servo is in position mode, the axis will only be stopped if it is moving in the direction of an activated limit switch. In all other modes, the servo will be stopped regardless of the direction it is moving if either limit switch is activated. There are three modes of stopping the can be configured by the **Limit Mode** command. The limit switch inputs can be enabled and disabled with the **Limits oN** and **Limits oFf** commands respectively. See the section on limit switches for full details on limit switch functions.

ENCODER 1 SIGNALS (PHASE A+, PHASE A-, PHASE B+, PHASE B-, INDEX+, INDEX-) - These input signals should be connected to an incremental quadrature encoder that supplies position feedback information for the servo. The plus (+) and minus (-) signs refer to the two sides of differential inputs. The modules are shipped configured for single ended inputs. To configure the module for differential inputs cut the traces on the bottom side of the module the between jumpers **JP2** and **JP3**.

ENCODER 2 (auxiliary encoder) SIGNALS (PHASE A+, PHASE B+, INDEX+, INDEX-) - When a second (auxiliary) encoder is used, these input signals should be connected to an incremental quadrature encoder that supplies position feedback information for the servo. The plus (+) and minus (-) signs refer to the two sides of differential inputs (Index inputs only). The modules are shipped configured for differential Auxiliary Encoder Index inputs. To configure the module for a single ended Index input consult the factory.

ENCODER POWER - This module pin provides a convenient supply voltage connection for the encoders. The module is shipped configured for a +5 volt encoder supply. To configure the module for +12 volt encoder, cut the trace on the bottom side of the board between JP4 pins 2 and 3.

SUPPLY CONNECTIONS (+5, +12, -12, GROUND) - These module pins provide access to the DCX supply voltages.

DCX-MC210 MODULE CONNECTOR J3

J3	01	PWM MOTOR DRIVE + (OUTPUT, 500ma max.)
J3	02	ENCODER POWER
J3	03	ENCODER 1 PHASE B+ (INPUT)**
J3	04	ENCODER 1 PHASE A+ (INPUT)**
J3	05	GROUND
J3	06	PWM MOTOR DRIVE - (OUTPUT, 500ma max.)
J3	07	EXT. MOTOR POWER + (Optional) ****
J3	08	ENCODER 1 INDEX+ (INPUT, ACTIVE HIGH) / *** EXT. MOTOR POWER - (Optional) ****
J3	09	COARSE HOME (INPUT, ACTIVE LOW, 4.7K OHM PULL-UP)
J3	10	AMPLIFIER FAULT (INPUT, ACTIVE LOW, 4.7K OHM PULL-UP)
J3	11	AMPLIFIER ENABLE (OUTPUT, ACTIVE LOW, TTL LEVEL)
J3	12	RESERVED
J3	13	RESERVED
J3	14	LIMIT POSITIVE (INPUT, ACTIVE LOW, 4.7K OHM PULL-UP)
J3	15	LIMIT NEGATIVE (INPUT, ACTIVE LOW, 4.7K OHM PULL-UP)
J3	16	ENCODER 1 PHASE A+ (INPUT)**
J3	17	ENCODER POWER*
J3	18	ENCODER 2 INDEX- (INPUT, ACTIVE LOW)
J3	19	ENCODER 1 PHASE A- (INPUT)
J3	20	ENCODER 1 PHASE B- (INPUT)
J3	21	ENCODER 2 PHASE A (Aux. Encoder is optional)
J3	22	ENCODER 2 PHASE B (Aux. Encoder is optional)
J3	23	ENCODER 1 PHASE B+ (INPUT)**
J3	24	ENCODER 2 INDEX+ (INPUT, ACTIVE HIGH)
J3	25	ENCODER 1 INDEX- (INPUT, ACTIVE LOW)
J3	26	GROUND

* ENCODER POWER is +5VDC or +12VDC, jumper selectable

** Use A+ and B+ for single-ended ENCODER INPUTS

*** Selected by JP5

**** For use when +12VDC supplied to DCX motherboard is not used for motor supply

Mating Connector: 26-pin dual-row IDC female, Circuit Assembly P/N CA-26IDS2-F-SPT or equivalent

DCX-MC200 MODULE CONNECTOR J4 (JOYSTICK INTERFACE)

J4	01	ANALOG INPUT 1
J4	02	ANALOG INPUT 2
J4	03	5 VOLT REF. OUTPUT
J4	04	ANALOG GROUND

DCX-MC200 MODULE JUMPERS

JP1 ENCODER INPUTS, DIFFERENTIAL VERSUS SINGLE ENDED

Connect pins 1,2 and 3 for single ended inputs, leave open for differential inputs

JP2 ENCODER INDEX ACTIVE LEVEL SELECT

Connect pins 1 and 2 for single ended, active high index on J3-8 (Default setting)
Connect pins 2 and 3 for single ended, active low index on J3-25
Leave jumper pins open for differential index input on J3-8 and J3-25

JP3 ENCODER POWER SELECT

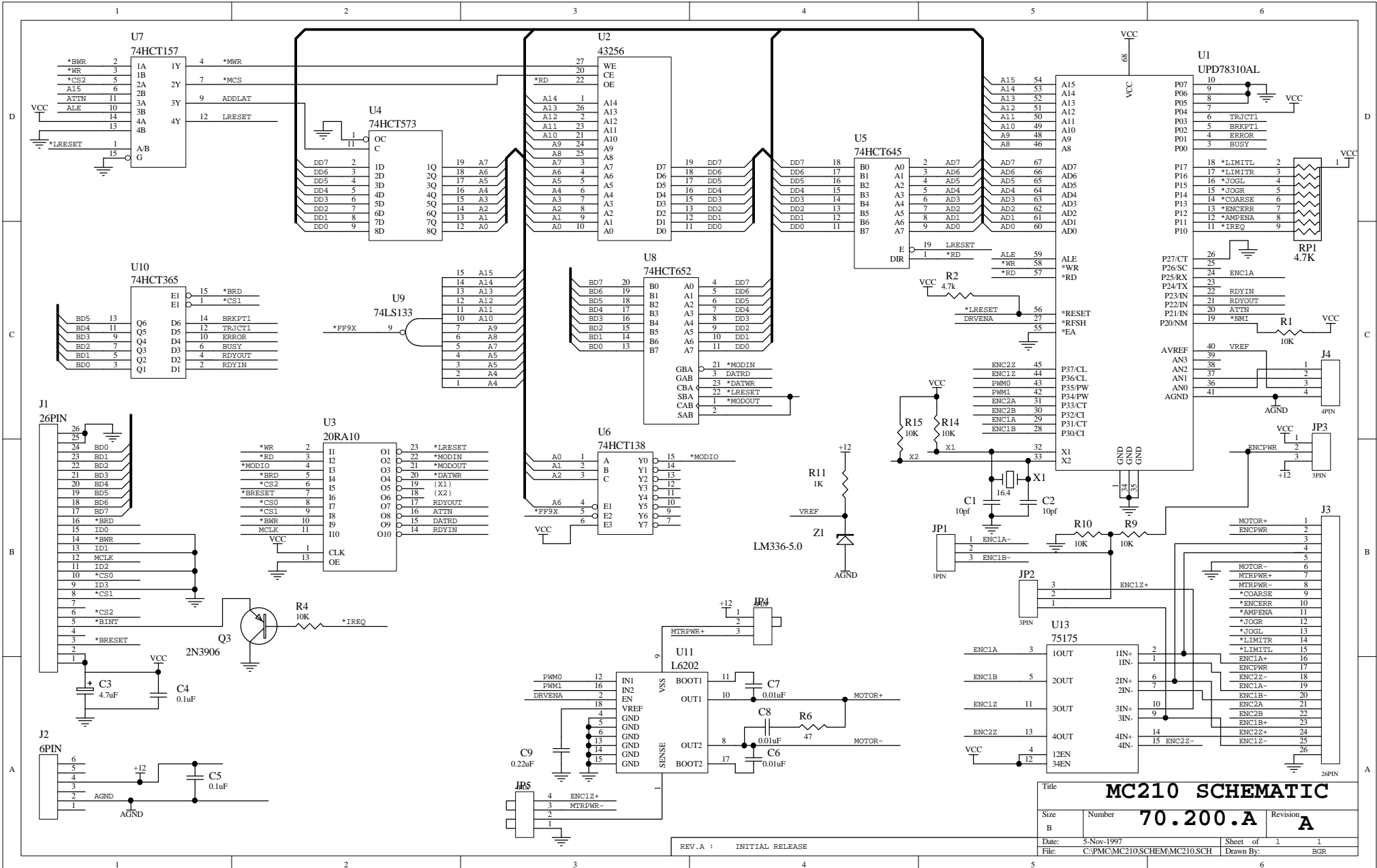
Connect pins 1 and 2 for +5 VDC encoder power on J3-17 (Default setting)
Connect pins 2 and 3 for +12 VDC encoder power on J3-17

JP4 MOTOR SUPPLY + SELECT

Connect pins 1 and 2 for +12VDC (Default setting)
Connect pins 2 and 3 (and cut trace JP4 1 to 2) to use external supply connected to J3 connector pin 7

JP5 MOTOR SUPPLY - / ENCODER INDEX 1 + SELECT

Connect pins 1 and 2 for system ground (Default setting)
Connect pins 2 and 3 (and cut traces JP5 1 to 2 and JP5 3 to 4) to use external supply connected to J3 connector pin 8
Connect pins 3 and 4 for ENCODER INDEX 1 + input on connector J3 pin 8



Title MC210 SCHEMATIC		
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REV. A : INITIAL RELEASE