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"Solutions for Motion Control"

## Technical Specification for Model SMA9915 SynqNet Digital PWM Servo Amplifier

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<b>Electrical</b>	
Bus Voltage	24-370 VDC for Amplifier modules. All stand-alone and multi-axis versions can be ordered for operation from either 110-130 VAC or 208-240 VAC (single or 3-phase, 50/60 Hz).
Continuous Output Current	Low Power: 10 amps, standard power: 15 amps, high power: 20 amps.
Peak Output Current	Low Power: 20 amps, standard power: 30 amps, high power: 40 amps for 2 seconds.
Switching Frequency	24 kHz PWM standard.
Bandwidth	Current loop bandwidths up to 3 kHz.
Commutation	Sinusoidal from a quadrature encoder or linear scale.
Input Command Signal	SynqNet Bus, Current(torque) or Velocity mode
Software Configurable	Glentek's Windows™ based MotionMaestro™ software provides ease of set-up and tuning. This software is Windows™ 95/98/2000 and NT compatible.

<b>Controller I/O</b>	
Optically Isolated Inputs: Dedicated (4): Pos Limit, Neg Limit, Node Disable, Home General Purpose (2): In0, In1	All optical inputs are referenced to Opto_In_Com which can be connected to the positive or negative optical supply to configure the inputs as sourcing or sinking. All signals are directly connected to the SynqNet Node controller. Input voltage 12-28 VDC referenced to Opto_In_Com Input current 3 mA min, 8 mA max, built in 3.3K series resistor.
Optically Isolated Outputs: Dedicated (2): Node Alarm, Brake (-C/E) General Purpose (2): Out0, Out1 (-C/E)	The collector and emitter terminals of each optical output are available at the I/O connector allowing the ability to configure each output as sourcing or sinking. All outputs are controlled by the SynqNet controller. VCE(max) = 35V Iout(max) = 30mA
High Speed Differential Line receiver Inputs Dedicated (3): Aux Encoder A,B,I +/- General Purpose (2): Rx0, Rx1 +/-	Uses industry standard 26LV32 or equivalent RS422 line receiver. All signals directly connected to SynqNet Node controller. Includes Broken wire detection on Aux Encoder A & B channels.
High Speed Differential Line Driver Outputs Dedicated (0): General Purpose (2): Tx0, Tx1 +/-	Uses industry standard 26LV31 or equivalent RS422 line drivers. All outputs are controlled by the SynqNet controller. Iout(max) = 20mA
Analog Out	0-5V Analog output referenced to Common for monitoring DSP signals, output source selectable using MotionMaestro™ setup software.
Power (+5V) – Do Not use at this time, reserved for future Auxiliary 5V supply.	Currently connected to the on board 5V power supply, future amplifiers will use this as optional auxiliary 5V supply input to keep the controller logic section alive when the main DC bus is removed.

<b>Motor Feedback, encoder, commutation, and motor temp switch</b>	
+5V	5VDC +/-10%, 200 mA max Encoder/Hall supply voltage (output)
Common	5V supply return and return for Motor Temp switch
Encoder A, B, Z +/-:	26LV32 or equivalent RS422 line receiver inputs with 150 ohm differential line termination. Supports incremental, differential, TTL encoders. Broken wire detection on A & B channels.
Hall 1, 2, 3 +/-	26LV32 or equivalent RS422 line receiver inputs. Compatible with differential or single-ended commutation tracks or Hall sensors. Single-ended connections should be made to the "+" input while leaving the "-" input unconnected.  Power-on phase-finding routines available for operation without commutation tracks or Hall sensors.
Mtr Temp	Motor thermal switch input referenced to Common, amplifier can be configured to fault on normally open or normally closed switch (active high/low)
<b>Other Supported Encoders</b>	
Yaskawa reduced wire incremental encoder	Commutation information and Index multiplexed on encoder C channel. Connect Encoder A, B, C to amplifier A, B, Z inputs. No connection to Hall inputs.
Sanyo Denki & Tamagawa reduced wire incremental encoder	Commutation data multiplexed with Encoder A, B, Z channels. Connect Encoder A, B, C to amplifier A, B, Z inputs. No connection to Hall inputs.

<b>7 Segment Status Display</b>	
decimal point - Amplifier power indicator	Amplifier logic section is powered.
None (except decimal point) – Reset	The Controller is holding the Node in reset
1 - EEPROM Fault	Drive detected a checksum error in the user NVRAM. Typically only occurs during firmware updates in which the user parameter memory map has been altered due to the addition of new parameters. To clear this fault, the user parameters must be re-saved to NVRAM and the drive must be reset.
2 - RAM Fault	Drive External RAM read/write failure
3 - CPLD Fault	Drive CPLD read/write failure
b - Bus Overvoltage	Bus supply exceeded the Max Voltage for this drive
C – Clamp	Drive is Inhibited, outputs are in high impedance state
E - Encoder Fault	Primary Encoder A or B channel broken wire detected
F – Foldback	Measure Current has exceeded Foldback trip threshold and current limit is being reduced.
H - Heatsink Overtemp	Amplifier heatsink exceeded 65C
h - Motor Overtemp	Motor Thermal switch input activated
L – Low Speed Electronic Circuit Breaker	RMS over current fault, trip current and time configurable in drive.
O - Normal Operation (No Comm tracks)	Amp is enabled, only displayed when not using Comm tracks/Halls
S – High Speed Electronic Circuit Breaker	Short circuit detected or current exceeded operating limit of outputs
U – Bus Under Voltage	DC Bus supply voltage below minimum threshold for this drive
- Hall Fault	Invalid Hall State
- Commutation Fault	Phase Finding routine failed
Single outer segment only – Hall State	Amplifier is enabled. The six outer segments correspond to the six possible Hall/comm track states. The lit segment corresponds to the current active Hall state. Hall commutation mode only.

<b>SynqNet Ports</b>	
Connectors	Shielded Cat-5 RJ-45
In/Out Port LED Indicators	The In and Out port each have two LED indicators as follows:
Link LED On Off	Physical Link is Active Physical Link is Inactive
Network Activity LED On Blink Off	Tx and Rx Active, Cyclic mode Tx only Active, Discovery mode Idle, Shutdown mode

<b>Environmental</b>	
Operating Temperature	0°C to +60°C
Storage Temperature	-40°C to +80°C
Humidity	5% to 95% non-condensing

<b>Packaging Options and Mechanical Dimensions: L x W x H (inches)</b>	
Module	7.13 x 1.50 x 5.51
Stand Alone (without regen clamp or fan)	7.16 x 3.78 x 6.45
Stand Alone (with regen clamp and fan)	9.00 x 4.00 x 6.63
2-axis chassis	9.00 x 10.75 x 6.83
4-axis chassis	13.00 x 10.75 x 6.83