

# SPiiPlus UDMpm-2-320

## EtherCAT Dual & Single Axis Drive Module



- **Universal single and dual axis Drive Modules for EtherCAT networks**
- **85 to 265Vac, up to 7.5A continuous and 15A peak current (~1.6kW/3.2kW@230Vac)**
- **Digital control for easy setup and diagnostics**
- **Dual loop with dual feedback per each axis**
- **20kHz sampling and update rate of all control loops**
- **Supports incremental digital and analog encoders, absolute encoders and resolver**
- **Digital I/O: 8 inputs, 8 outputs**  
**Analog I/O: 4 inputs, 2 outputs, 12 bit resolution**
- **Safe Torque Off (STO)**

The SPiiPlus UDMpm-2-320 is a line of EtherCAT universal dual and single axis drives for AC servo / DC Brushless, AC Induction, and DC brush motors.

The SPiiPlus UDMpm-2-320 operates as an EtherCAT node under any SPiiPlus EtherCAT master Controller including the PC based SPiiPlusSC Soft Controller. It is designed to address high performance applications with demanding move & settle, smooth velocity and stand still jitter requirements with power of up to 1.6kW/3.2kW (continuous/peak) per axis.

The SPiiPlus UDMpm-2-320 is offered with two current levels: 5A/10A (cont./peak) and 7.5A/15A.

Optional Safe Torque Off (STO) module cuts the power to the motor without removal of the power source to comply with SIL-3 and PLe safety levels.

The SPiiPlus UDMpm-2-320 is powered by a single phase 85 to 230Vac and by a separate 24Vdc control supply that keeps all low voltage signals alive during emergency conditions.

**CE, UL**

# Specifications

Part Number Where X represents number of axes and XX represents special options	SPiiPlus UDMpm X-320- 005-XX	SPiiPlus UDMpm X-320- 007-XX
Number of Axes	1 or 2	
Input voltage range [Vac]	85 to 265	
Phase Current Cont./Peak, sine amplitude [A]	5 / 10	7.5 / 15
Phase Current Cont./Peak, RMS [A]	3.6 / 7.1	5.4 / 10.8
Peak current time [sec]	1	
Max. output voltage	Vdc x 1.4	
Max. Input cont. power per axis @ 230Vac [kVA]	1.6	2.5
Max. output power (Cont./Peak) per axis @ 230Vac [kW]	1.1/2.2	1.6/3.2
Minimum load Inductance, at maximum motor voltage [mH] With a lower voltage the minimum inductance value can be reduced proportionally.	0.05	
Max. Heat dissipation per axis @ 230Vac [W]	50	75
Weight without / with additional heat sink [gram]	2,000 / 2,750	
Dimensions without / with additional heat sink [mm]	270 x 157 x 67 / 270 x 157 x 78	
Standards	CE, UL (pending)	

Note: Cooling by forced airflow is required. For maximum power at elevated temperature the additional heat sink option is required. See manual.

## Drives

Type: digital current control with field oriented control and space vector modulation.  
 Current ripple frequency: 40 kHz Current loop sampling rate: 20 kHz  
 Programmable Current loop bandwidth: up to 5 kHz  
 Commutation type: sinusoidal. Initiation with and without hall sensors  
 Switching method: advanced unipolar PWM  
 Protection: Over voltage, Phase-to-phase short circuit, Short to ground, Over current, Over temperature

## Supply

The module is fed by two power sources. A motor AC supply and a 24Vdc control supply.  
 During emergency conditions there is no need to remove the 24Vdc control supply.

## Motor Supply

Range: 85 to 265Vac  
 Current rating should be calculated based on actual load.

## Control supply

Range: 24Vdc ± 10% Maximum input current / power: 4A / 100W  
 Note: The module consumes 2A (50W). Additional 2A are needed when the motor brake feature is used

## Motor Type

3 and 2 phase AC synchronous, AC Induction and DC brush motor

## Feedback

**Incremental Digital Encoder:** Four, two per axis, A&B,I; Clk/Dir,I  
 RS-422. Max. rate: 50 million encoder counts/sec., Protection: Encoder error, not connected  
**Sin-Cos Analog Encoder (optional):** Two, one per axis. 1Vptp, differential.  
 Multiplication factor: 4x to 16,384x. Usable: x4,096. Maximum frequency: 250kHz  
 Automatic compensation of Offset, Phase and Amplitude  
 Maximum acceleration: 10<sup>8</sup> million sine periods/sec<sup>2</sup>. Protection: Encoder error, not connected  
**Hall inputs:** Two sets of three per axis. Single-ended, 5V, source, opto-isolated.  
 Input current: <7mA.  
**Resolver:** 12b resolution (4,096 counts/rev)  
**Absolute encoders (optional):** EnDat 2.2, Smart-Abs, Panasonic, BiSS-C, Hiperface.  
 Consult ACS for availability  
**5V feedback supply:** Total current available for feedback devices: 250mA.

## Digital I/O

**Safety Inputs:** Left + right limit per axis. Single-ended, 24V±20%, opto\_isolated, source. (Consult ACS for 5V & sink)  
 Input current: 14mA. E-Stop: Opto-isolated, floating two-terminal.  
 Motor Brake outputs: Two. 24V, 1A, opt\_isolated. Powered by the 24V Control Supply.  
 STO: Two pairs of inputs. (Optional)  
**General Purpose Inputs:** Eight, Single-ended, 24V±20%, opto-isolated, source. (Consult ACS for 5V and sink)  
 Input current: 14mA.  
**Registration Mark:** Four. Two are RS422 with dedicated inputs and can be used as GP inputs. Two share General Purpose Inputs 6,7.  
**General Purpose Outputs:** Eight. Single-ended, 24V±20%, opto-isolated, source. 0.5A per output with up to 3A for all outputs.  
 Position Compare Outputs (PEG): Two PEG\_Pulse and two PEG\_State, RS422. Flexible axis assignment. Can be used as GP outputs.  
 Two GP opto-isolated outputs can be programmed to be used as the PEG Pulse outputs.  
 Pulse width with RS422 outputs: 26nSec to 1.75mSec. Maximum rate with RS422 outputs: 10MHz.  
 Pulse width with GP outputs: 0.75mSec to 1.75mSec. Maximum rate with GP outputs: 1kHz  
**HSSI:** One channel. RS422.

## Analog I/O

Four inputs, Two outputs, ±10V, differential, 12 bit resolution. 20kHz sampling rate. The inputs can be used as feedback to the servo loops.

## Environment

Operating: 0 to + 50°C.  
 Storage : -25 to +70°C  
 Humidity: 5% to 90% non-condensing

## Communication

EtherCAT: Two, In & Out, RJ45 connectors

Ordering Options	Field	Example	Values
Number of axes	1	2	1,2
Continuous Current (Peak is double)	2	7.5A	005 - 5A, 007 - 7.5A
Number of SIN-COS encoder interface	3	2	0,1,2
Digital quad encoders per axis <sup>1</sup>	4	2	1,2
Absolute encoders type	5	None	E - EnDat 2.2, S - Smart-Abs, P - Panasonic, B - BiSS-C, H - Hiperface. Consult ACS
Number of Absolute encoders interface	6	0	0,1,2
STO	7	Yes	Yes, No
EtherCAT Master	8	Any	0-SPIiPlusNTM or SPIiPlusSC-LT, 1-Any
Additional heat sink installed	9	No	Yes, No

**Example: UDMpm200722N0Y1N**

Field		1	2	3	4	5	6	7	8	9
PN	UDMpm	2	007	2	2	N	0	Y	1	N

(1) The unit can be provided with one or two digital quadrature encoder interfaces per axis. For example, if dual loop is needed, then it should be ordered with two encoders per axis. When a unit is ordered with two encoders per axis, it occupies additional axis per each axis with two encoders and reduces the maximum number of axes that can be connected to the EtherCAT master accordingly.