UDI*HP/LT*

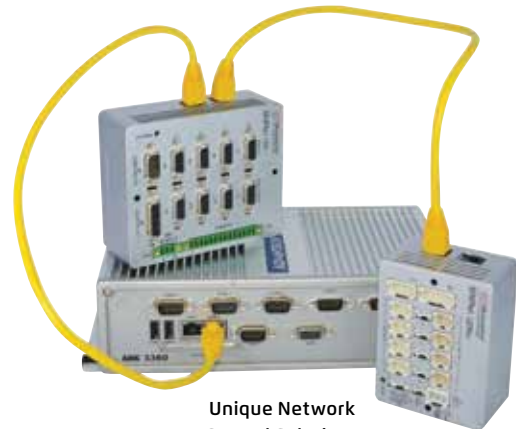# EtherCAT® dual/quad Motor Drive interface with ±10V commands

- Commanding Motor Drives with ±10V Interface, such as linear drives and piezo motor drives

- Outstanding performance
  ServoBoost, powerful control algorithms
  20kHz sampling and update rate
  Sinusoidal commutation

- Feedback
  Two or Four channels
  Standard: Digital incremental
  Optional: Absolute (up to two), Sin-Cos (up to four)

- Digital I/O: 4 Registration MARK inputs, 1 PEG and 4 motor brake (24V, 0.2A) outputs 4 dedicated general purpose inputs

- Analog I/O: 2 inputs, 1 output

- Compact footprint: 121x100x48 mm³

The UDI (UDI - Universal Drive Interface) is a compact EtherCAT module that controls up to 4 motor drives with industry standard ±10V interface. Now you can also use peizo-ceramic motor drives and linear drives when using any of ACS EtherCAT motion controllers, to achieve the ultimate position and velocity accuracy as required by demanding applications, such as wafer inspection. It supports both single torque command and two sinusoidal commutation current commands.

It includes up to 4 incremental encoders (digital or Sin-Cos), and up to 2 absolute encoders, four registration inputs, four 24Vdc/0.2A motor brake outputs and one PEG (Position Event Generator) output.

Unique Network Control Solutions

The UDI is available in two versions: UDI*HP* a high performance version and UDI*LT* economical version. The UDI*LT* utilizes a 10 bit DAC to generate the ±10V commands and supports digital encoders only, incremental and absolute. The UDI*HP* utilizes a 16 bit DAC supports also Sin-Cos encoders with raw frequencies up to 10MHz. This enables controlling positioning stages using high resolution laser encoders with sub-nanometer resolution at more than 1 meter/second. For PC based systems that utilize motor drives with analog ±10V commands, the combination of the SPiiPlusSC and the UDI is a superior solution when compared to solutions that are based on a PC plug-in controller. It is simpler, more powerful, scalable, and provides better performance at a lower cost. The UDI is panel or din rail mountable.

CE

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ACS
MOTION CONTROL

Specifications

Drive Interface

Commands
Four, +/-10V differential (or +/-5V single ended). For torque command drives, one command is used per axis. For commutated current command drives, two commands are used per axis (maximum of 2 drive axes).
UDI_{LT}: 10-bit resolution, UDI_{HP}: 16-bit resolution Unused drive commands can be used as general purpose analog outputs

Enable
Opto-isolated, two-terminal output, up to 24V

Drive Fault
Two-terminal, opto-isolated input, 24V

Servo
A standard comprehensive set of powerful algorithms to enhance accuracy, move & settle time, smooth velocity, stability and robustness.
• Advanced PIV cascaded structure
• Loop shaping filters
• Gain Scheduling
• Gantry MIMO control
• Dual feedback / loop control
• Disturbance rejection control

Feedback

Digital Incremental Encoder
Two/four, A&B,I; Clk/Dir,I, RS-422 or single ended TTL level, max. rate (RS-422): 50 million encoder counts/sec., (Single-ended): 2 million encoder counts/sec
Protection: Encoder error, not connected
On-board supply: 5.1-5.25V, 1A total

Sin-Cos Incremental Analog Encoder (Optional)
Up to four
Type: 1Vptp, differential
Programmable multiplication factor:
x4 to x4096
Maximum frequency: 500kHz or 10MHz
Maximum acceleration with Sin-Cos encoder: 10^8 sine periods/second^2

Absolute Encoder (Optional)
Two, EnDat 2.1(Digital)/2.2, Smart-ABS, Panasonic, BiSS-C

Digital I/O

General Purpose Inputs
Four, Single ended, opto-isolated. Default configuration is 24V (+/-20%) Source type. Other optional configuration (5V, Sink) can be specified in ordering options field 9

Safety Inputs / Limits
Dedicated left and right limit inputs for each axis. Single ended, opto-isolated. Default configuration is 24V (+/-20%) Source type. Other optional configuration (5V, Sink) can be specified in ordering options field 9.
E-Stop: 24V±20%,opto isolated, two-terminal. Unused safety inputs can be used as general purpose inputs

Registration MARK
Four, Two-terminal, 24V±20%, fast opto-isolation. Flexible assignment to any incremental encoder axis. Can be used as general purpose inputs

Motor Brake Outputs
Four, single ended, opto-isolated, 0.2A per output. Default configuration is 24V (+/-20%) Source type. Can be used as general purpose outputs

Position Event Generator (PEG)
One, RS422. Can be used as general purpose output. Pulse width 26nSec to 1.75mSec Maximum rate with RS422 outputs: 10MHz Flexible assignment to any incremental encoder axis

Analog I/O

Inputs
UDI_{LT}: None, UDI_{HP}: Two, ±10V differential, 12 bit resolution, sharing the inputs of a Sin-Cos encoder feedback

Outputs
One, ±10V differential, 10 bit resolution Unused drive commands can be used as general purpose analog outputs

Environment
Operating range: 0 to + 50°C
Storage and transportation range: -25 to +70°C
Humidity (operating range): 5% to 90% non-condensing

Communication
Two EtherCAT ports, In and Out

Dimensions
121x100x48 mm^3

Weight
250 gr

Accessories
UDI-ACC1 Mating connectors for drives, encoders and I/Os
UDI-ACC2 Din-rail mounting kit

Ordering Options

Ordering options	Field	Example user selection	Values
LiTe or High Performance	1	HP	LT, HP
Number of axes (See notes below*)	2	4	2,4
Total number of encoder channels	3	4	2,4
500KHz Sin-Cos encoder interfaces	4	2	0,1,2,3,4 for HP version only
10MHz Sin-Cos encoder interfaces	5	1	0,1,2,3,4 for HP version only
Absolute encoders type	6	5	U- All, N- None, E- EnDat 2.1(digital)/2.2, S- Smart Abs, P- Panasonic, B- BiSS-C
Number of Absolute encoders interface	7	1	0,1,2
EtherCAT Master	8	1	1- Any
I/O configuration	9	N	**N-** Inputs & limits: 24V/SOURCE (PNP), **outputs:** 24V/SOURCE (PNP) **D-** Identical to (N). For compatability reasons **S-** Inputs & limits: 24V/SINK (NPN). **Outputs:** 24V/SOURCE (PNP) **R-** Inputs & limits: 5V/SOURCE (PNP). **Outputs:** 5V/SOURCE (PNP) **T-** Inputs & limits: 5V/SINK (NPN). **Outputs:** 5V/SOURCE (PNP) **U-** Outputs & Inputs: 24V/SOURCE (PNP), **Limits:** 24V/SINK (NPN)

* When dual commutation outputs are needed, the 4 axis version of the product must be ordered, it consumes 4 network axes and the unit supports 2 axes of dual commutation outputs. There is no unit available with a single axis of dual commutation outputs.

Example: $UDI_{HP}4421S11N$

Field		1	2	3	4	5	6	7	8	9
PN	**UDI**	HP	4	4	2	1	S	1	1	N

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