



## Positioning systems made to measure.

OEM Machines

Positioning Systems

Modules

Components



Hydra CM



Hydra RM for rack mounting



Hydra TT Table Top Version



Hydra DT with Joystick

# Hydra Series

The controllers of the Hydra series are optimally designed to control the positioning systems from ITK. A new motor design ensures maximum performance in the smallest space. The controllers achieve high dynamics with minimal heat generation thanks to ITK's power stage

technology. Stepper motor, servo motor, torque motor or DC motor can be combined with a linear motor on the Hydra. Axis output stages can be specifically switched off for manual or motorised displacement of the axes.

### Key Features .

- Control for linear, stepper and servo motors up to 500 W (each axis individually configurable)
- Vectorial and individual movement of the axes
- Stepper motor operation: 2 or 3 phases
- Linear motor operation: 2 or 3 phases
- Interfaces: RS-232, Ethernet 10/100 MBit, USB
- Measuring system interfaces: NanoStar (absolute measuring), optional: MiniStar (magnetic incremental) or optional: DeltaStar (1 Vss sin/cos signal or TTL) with trigger input and output
- Digital inputs/outputs
- Analogue outputs
- CAN bus for I/O extensions (handwheel, joystick, etc.)
- ASCII command language Venus 3

### Your Advantages .

- High performance requiring smallest space
- Up to 500 W for each axis
- Max. 15 Ampere for each phase
- All-rounder in communication
- Supports different motor types from piezo motor (with an analogue output stage) to dynamic linear motor
- Automatic commutation on power-up – eliminates the need for Hall sensors on torque, servo or linear motors
- 24 or 48 volt power supply, output stages galvanically decoupled
- Emergency stop support
- Digital inputs and outputs
- Table-top version TT with 500 W power supply unit or for rack mounting as CM version
- Motionscript programs can be executed directly on the controller without PC coupling



# Highlights

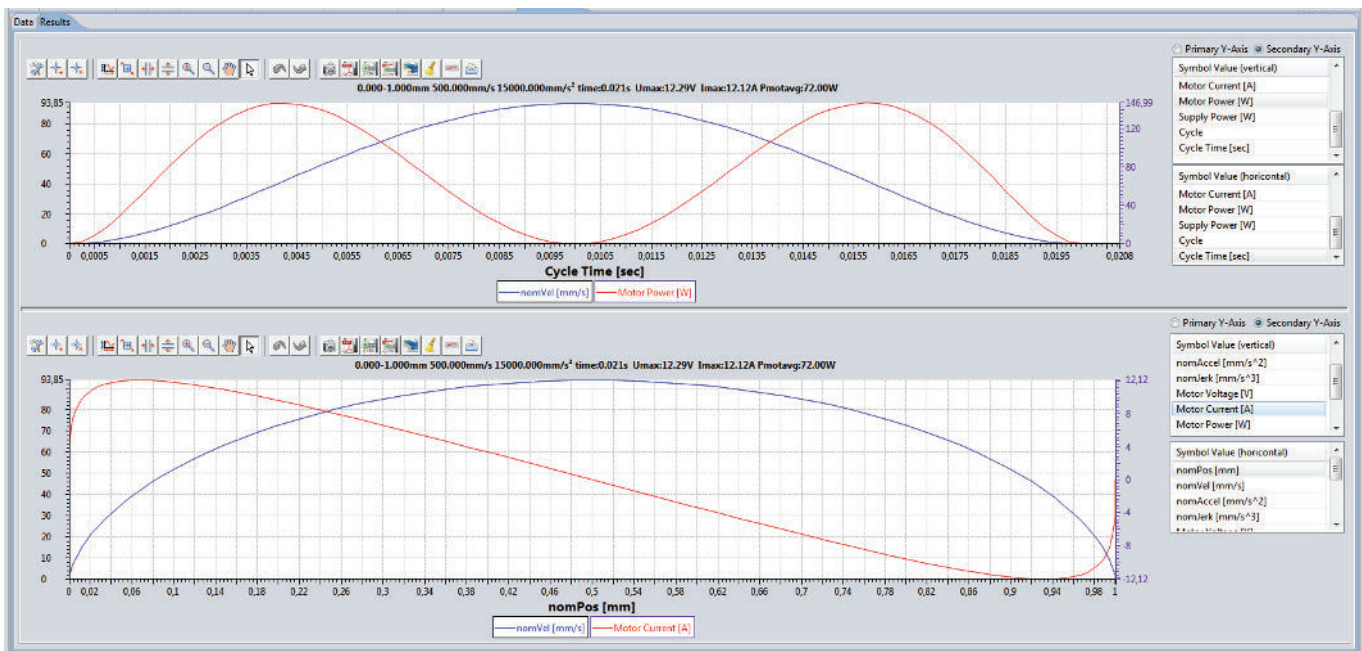
## Realtime data capture

Motion sequences can be simulated in the MotionManager. Currents, power, voltage and travel profiles are displayed. In interaction with the MotionManager, the Quicklog function in the Hydra controller allows the real-

time data to be displayed as in the simulation shown. This provides a direct comparison between target and actual values. This is the prerequisite for optimally adjusting the servo controller.



MotionManager 2



## Fast Response Technologie (FRT)

FRT defines a package of diverse measures for highly dynamic positioning while reducing mechanical vibrations and power requirements. The vibration time and amplitude at the target location has been reduced by a factor of 5 - 10 compared to conventional PID controllers.

**FRT does positioning audibly better!**



## Event Manager.

Internal and external events are managed by the Event Manager and chains of commands associated with the events are instructed to be executed.

**Internal events (e. g.)**

- power up completed (controller ready)
- target position reached
- emergency stop or limit switch activated

**External events (e. g.)**

- switches of manual devices such as joystick or hand wheel
- events of I/O modules via CAN bus. Any Venus commands can be processed in parallel to the normal communication.

The behaviour after power up can be defined, e. g. calibration, move to position, etc. Eight sequencers, each with eight levels are available; each stage can be stored with Venus commands. Each sequencer can be switched to next position from any event (up or down). Events can be defined as „push buttons“, „switches“ or „toggles“ with different polarities (active edges). The switches on the joystick and handwheel can be used as events.

## Technical Data.

| Parameter                          | Value   |
|------------------------------------|---|
| Operating voltage                  | 24 or 48 Volt                                     |
| Motor phase current (peak)         | 15 Ampere   |
| Stepper motor positions/revolution | 600,000   |
| Communication                      | Ethernet 10/100, RS232 (max. 460 Kbaud), CAN, USB |
| Ethernet protocols                 | TCP/IP, UDP, TFTP, FTP, SNMP, HTTP                |
| Firmware update                    | via RS232 or Ethernet                             |

| Parameter                                 | Value  |
|---|--|
| Measurement system interface              | max. 6x SinCos Sensor (12 Bit)<br>max. 3* nanoStar Sensor (16 Bit)<br>max. 3* betaStar Sensor (16 Bit) |
| Input/output                              | via CAN Bus  |
| Processor                                 | 400 MHz Power PC   |
| Memory / Flash memory                     | 64 MByte / 8 MByte   |
| Parameter memory with TFTP and FTP access | Journaling Flash File System   |

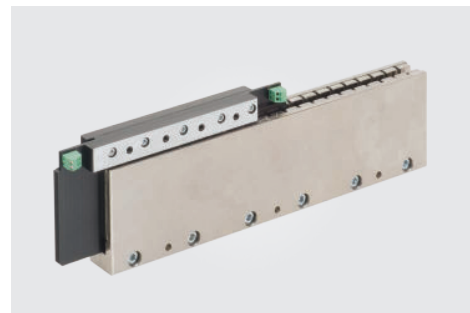
## Supported Motor Types.



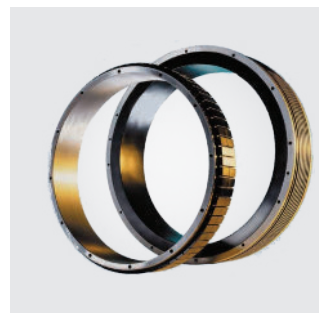
Stepper motors with / without sensors



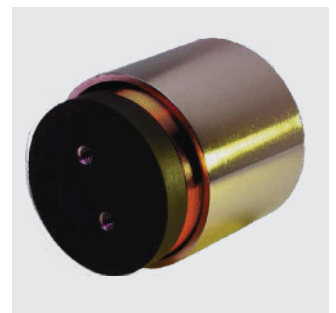
Servo motors & DC motors



Linear motors

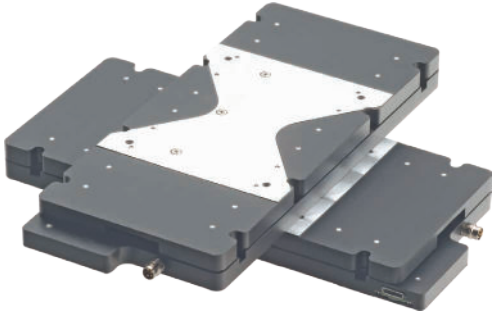


Torque motors

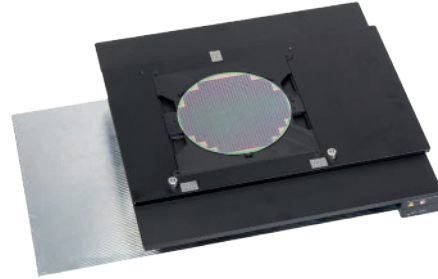


Voice coil motors

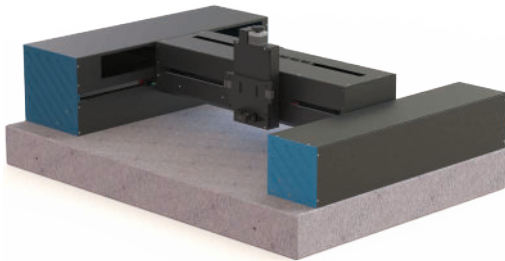
# Typical Applications.



FCS100 very flat cross stages



LMT110 microscope stage, very precise and dynamic



PT15 scanning unit in gantry design



OEM machines (measuring and magnetization machines)

## Accessories.



Hand wheel

- for moving two axes
- ergonomic and dynamic
- sensitive positioning due to high encoder resolution and precision roller bearings



2-axis joystick

- 6 freely programmable buttons
- 8 LEDs
- connected to the CAN bus
- versions available for normal or heavy use



QuickStar Interface

- clock and direction input to control the position
- additional I/O signals for connection to PLC or other controls



DeltaStar Interface

- for Sin/Cos (1 Vss) and RS422 Quadrature signal transmitter
- with trigger input and outputs
- generates position-dependent trigger signals and can also store the current position on external trigger signals

October 2024  
Subject to technical changes.