



# Hytec Electronics Ltd

## DC and Stepper Motor Control

### Advanced Information—**MDS-8** Motor Drive System



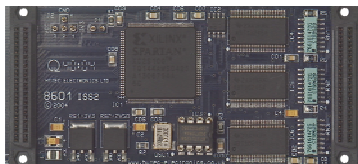
Hytec provide a flexible modular approach to motion control requirements with solutions ranging from simple single axis drives through to sophisticated multi-axis systems for stepper, DC servo, and DC brushless motors.

The MDS-8 system consists of two main parts. An **Industry Pack controller**, which is housed in either: -

- a Hytec 8002 VME64x carrier card
- a Hytec 6335 PCI express IP carrier card
- inside a Hytec 9010 IOC unit

A standard SCSI-2 cable connects to a separate 3U rack-mounting enclosure housing the **MDS-8 motor driver system**. Looking at each part in more detail:

The **Hytec 8601 controller** has four independent channels of motor control; each has four outputs and eight inputs. The outputs are STEP, DIRECTION and two Auxiliaries, which can be used, for example, to control motor current.



8601 IP Controller Card

The inputs are three limit switches (home, positive limit and negative limit); quadrature encoder signals (phase A, phase B and INDEX), drive system fault and one spare.

Each channel of the controller features programmable START/STOP speed, programmable HIGH speed and programmable acceleration / deceleration RATE. Each has a 32-bit STEP register for the current move and a 32-bit accumulator, which follows all movements. Moves can be

either fully programmed, i.e. move the specified number of steps, or JOG, where the channel steps until the control bit is reset. Soft stop and hard abort are supported, along with stop on limit and stop at HOME. The accumulator can count step pulses issued or pulses from an incremental encoder.

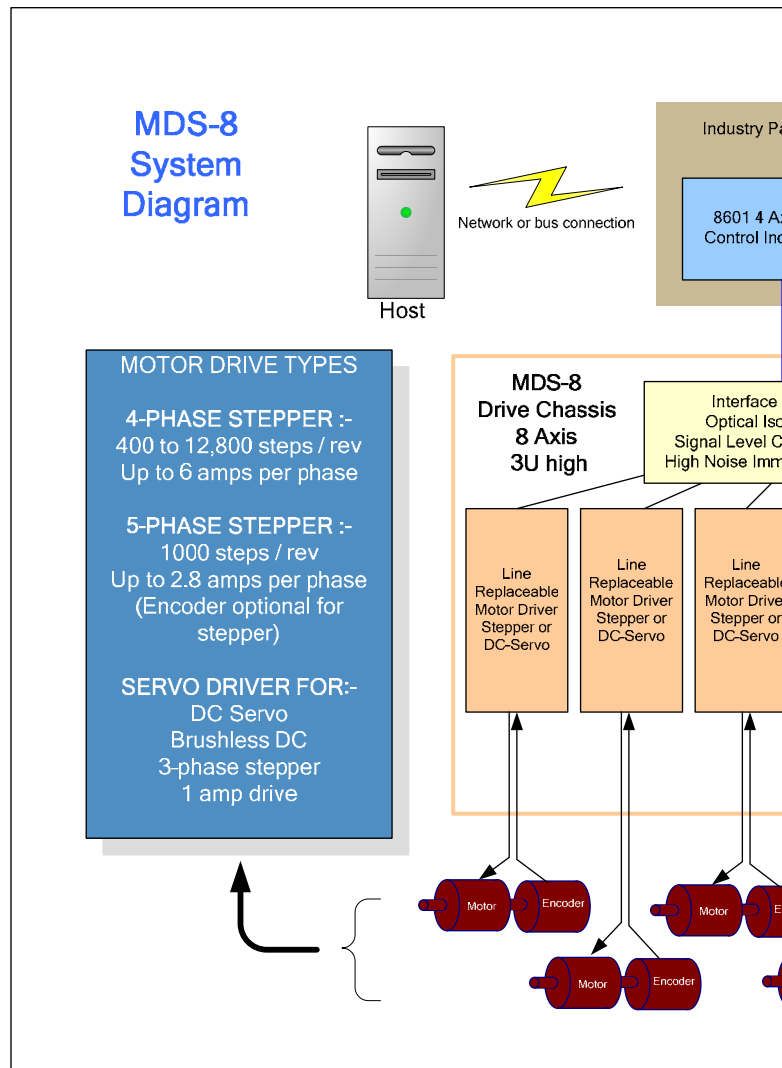
The control bits for all channels are directly mapped into registers accessible by the host.

A **COMMON START** facility is included so you always have direct control over when a given channel or channels will start.

The Hytec **MDS-8 drive system** is a 3U high rack-mounting motor drive chassis containing line replaceable unit (LRU) drive cards and interfacing logic for eight stepper or DC servo motors or any combination of both.

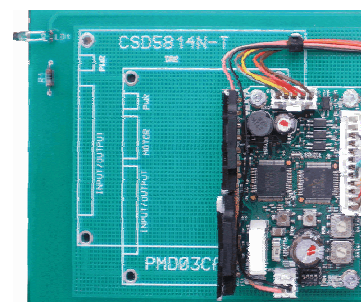
The drive chassis will contain four main components: -

- Eight interchangeable drive cards, which will be either DC servo or stepper driver cards; all with healthy / fault status indication.
- Eight companion rear-mounted 'personality cards', which will be fitted with a rear-facing panel-mounted motor connector—a range of connector types are available.
- Two logic interface cards providing optical isolation

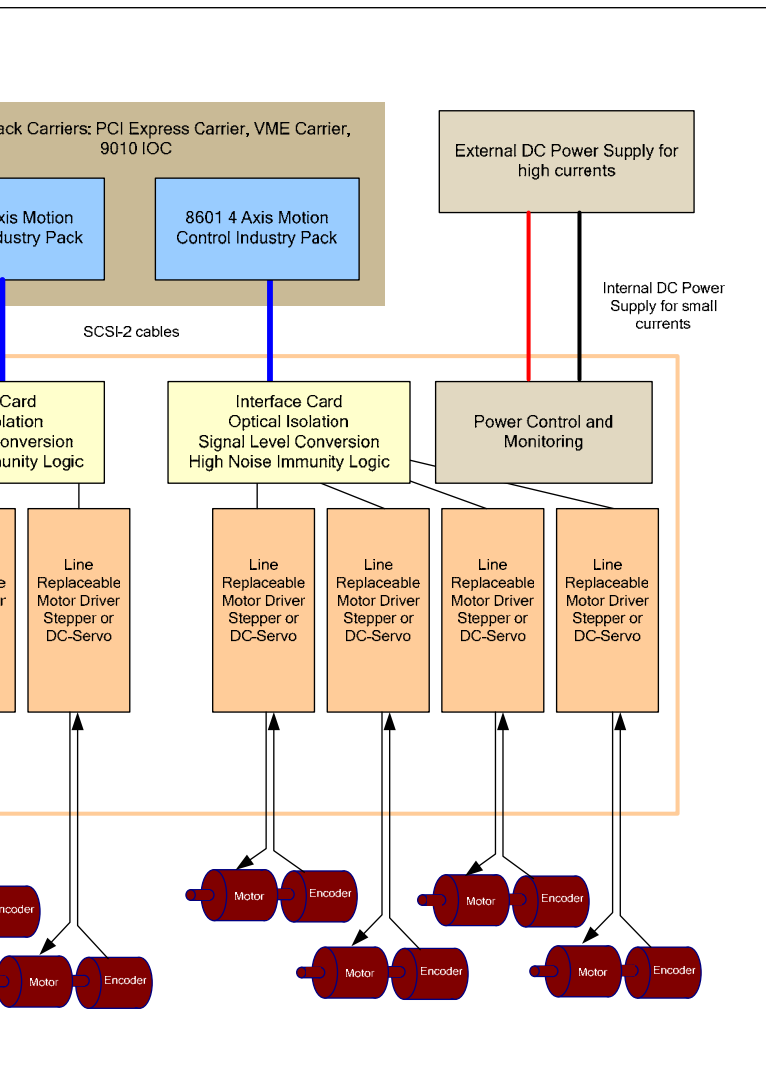


and signal conditioning between the 8601 I/O signals (from the 9010 IOC) and the drives.

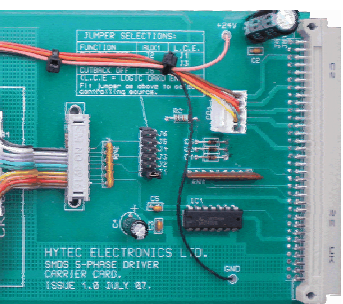
- A backplane motherboard into which all the other cards connect, providing power and signal interconnections for the system.



All motor and limit switch connections are from the rear of



the unit, typically on D-type connectors.



DC power is supplied either for high drive currents from an external PSU or, for lower drive currents (< 2amps), from an internal PSU.

The LRU plug in drive units support:

- 4 Phase Steppers at 400 to 12800 steps per revolution and up to 6 amps per phase.

- 5 Phase Steppers at 1000 steps per revolution and up to 2.8 amps per phase.
- Servo Motor driver. Supporting DC Servos, Brushless DC and 3 phase steppers, all up to 1 amp drive.

The Servo Motor plug-in has a front-panel mounted 9-way Cannon connector for controller/driver parameter setup. This is a once only configuration and is normally factory set.

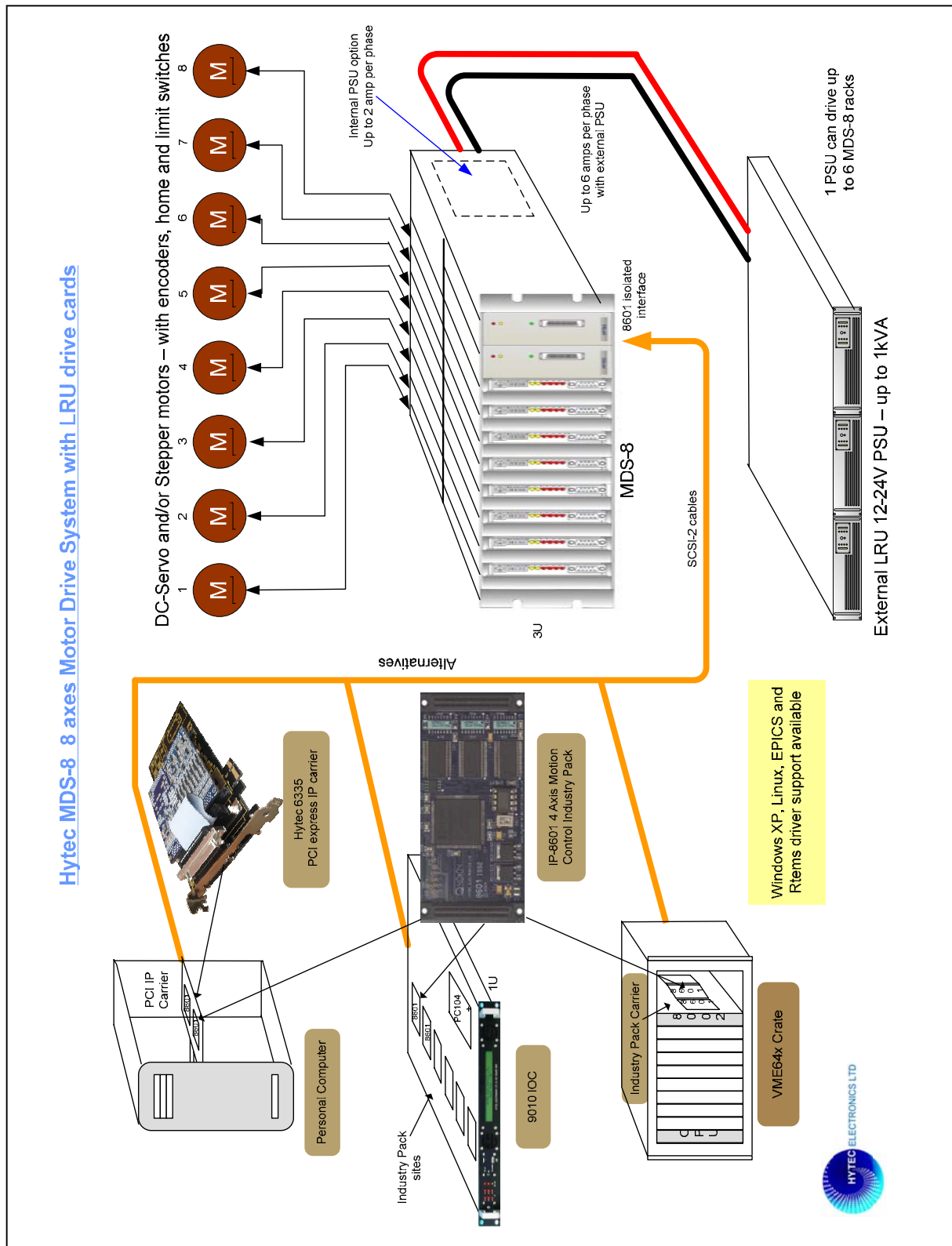
Stepper Motor drive card set-up is via front card-edge-mounted switches for selecting drive current and operating modes.

All MDS-8 drive card types are driven from Hytec's 8601 motor controller Industry Pack (IP) card that supplies step and direction signals via a SCSI-2 cable and a connector on the MDS-8 front panel.

The 8601 Industry Pack format controller can be mounted on Hytec's 8002 VME64x carrier, on Hytec's 6335 PCI express two slot IP carrier or inside the Hytec 9010 IOC.

Software to drive the MDS-8 drive system via the 8601 stepper controller is available for Linux, Windows, EPICS, Rtems and OPC server.

**Hytec MDS-8 8 axes Motor Drive System with LRU drive cards**



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