



DATA SHEET

Adaptive Technology

Commercial Door Operator

DAVE's Adaptive Technology is designed for versatility and high performance, offering class leading advanced features for powerful driving, precise control and reliable operation across a wide range of industrial/commercial door types with curtain weights up to 2200lbs (1000kg). Below are the key features and specification:

Key Features

Standard Application

Recommended for most commercial door types including:

- Rolling slatted/grille steel doors
- Rolling sheet doors
- Sectional Doors
 - Standard lift
 - High lift
 - Vertical lift
- Bi-fold doors

Single Operator SKU

The DAVE operator simplifies inventory with a single operator SKU. It seamlessly integrates with a modular power cartridge that will suite the sites available mains power.

Modular Power Cartridge

The modular power cartridges available below can provide 1000W of power to drive the operator drive assembly:

1. A single phase 230V to 240Vac, 50/60Hz power cartridge (AU/NZ only)



2. A single phase 120V to 240Vac, 50/60Hz with Power Factor Correction (PFC) (North America)
3. A three-phase 400Vac to 480Vac, 50/60Hz power cartridge (AU/NZ/North America)

Operator Drive Assembly

The Dave drive assembly is the engine room of the operator, and it comes with many features.

The main assemblies are:

- PMSM motor – 1HP (0.75kW)
- Worm gear reducer – 1” bore, reduction 50:1
- Motor drive electronics PCBA and the main controller electronics PCBA
- Manual chain hoist
- Supplied accessories
 - Wall Console with LCD & 3 control buttons + 1 menu button
 - Chain Hoist with hauling chain
 - 12T #50 (10B) sprocket and drive chain
 - 1” drive shaft
 - Safety Beam (USA only)

Wireless/Wired Wall Controller Console

All programming, setup and editing are done from the floor level wall controller using the LCD screen and panel buttons. The wall console can be set up in two ways:

- Wireless Mode – in this mode the wall console is pre-paired to the operator. The power is supplied to the wall console via batteries or an AC Power Adaptor with a power Jack. All data is communicated via a Bluetooth link and door control commands are sent via RF during operator setup and normal control commands to open, close and stop the door.
 - User settable power savings modes to extend battery life
 - Average battery life for each selectable battery uses modes:
 - Power Saver Mode: In this mode the LCD is asleep and can only turn on if the Menu button is pressed, battery life is 10yrs
 - Hold to Close Mode (Dead Man Mode): This mode behaves the same as power saver mode, battery life is 6yrs



- **Notify Mode:** In this mode the LCD will light up every time a command is given to move the door or when the menu button is pressed, battery life is 1.5yrs
- 2 x 1.5V D size Lithium can be used to further extend the
- **Wired Mode** – an optional four core cable can be used to connect the wall controller console to the operator to supply power to provide door status information and enable control commands to be sent to the operator.
- Added security with removable key switch for disabling access to menus

Powerful Drive Motor

The use of a Permanent Magnet Synchronous Motors (PMSM) offers exceptional features and advantages. Here are the key benefits and characteristics:

- **High Efficiency:** Highly efficient at 85% or even higher at certain speed conditions
- **High Power Density:** PMSMs can deliver more power per unit weight, this means they are smaller and lighter for a given power output, making them ideal for applications where space and weight are critical
- **High Power Factor:** PMSMs have a very high-power factor, this reduces the immediate power drawn from the supply with less stress on the electrical system.
- **Excellent Torque Characteristics:**
 - **High Torque at Low Speeds:** PMSMs can generate constant and full torque at any speed. This is crucial for applications requiring precise control and high starting torque.
 - **Smooth Torque Production:** With sinusoidal waveforms the motor produces very smooth torque, resulting in reduced vibrations and acoustic noise.
 - **High Overload Capacity:** Can handle sudden increases in load without significant performance degradation.
- **Good Dynamic Performance:** Excellent dynamic response, allowing for fast acceleration and deceleration.
- **Low Maintenance and High Reliability:** PMSMs eliminate the need for brushes and commutators, which are common wear-and-tear components in DC motors. This reduces maintenance requirements, increases reliability, and extends the motor's lifespan.
- **Low Heat Generation:** Most of the heat in a PMSM is generated in the stator coils, which are easier to cool than the rotor. This allows the motor to run cooler, further enhancing reliability and lifespan.
- **Quiet Operation:** The smooth torque production and lack of brushes contribute to quieter operation compared to many other motor types.



- **Precise Control:** When coupled with our advanced control techniques the motor offers highly accurate speed and precise door position control.

Operator Drive Braking Suite with Energy Harvesting

The use of new “braking” technologies delivers on more precise door behaviors control:

- **Regenerative Braking:** When the main controller senses a closing door “free-falling,” the motor generates kinetic energy. The operator intelligently harvests and converts this kinetic energy into electrical energy, using it to apply precise braking. This ensures smooth, controlled door travel and prevents “doors from racing.”
- **Zero Vector Braking:** This system provides precise stopping by employing a Zero Vector brake that acts on the motor's stator windings via the motor driver. It guarantees the motor and door stop instantly and exactly at the commanded end position.

Automatic Technology Toolbox

A Smartphone APP tool can be used to connect wirelessly via Bluetooth to the wall console/operator with available functions:

1. OTA (Over the air upgrades): New Firmware for the operator can be uploaded to the operator via the Smartphones APP, **no internet** required.
2. Download EZYPLOT data for diagnostics

Operator Speed Control

The DAVE operator allows you to adjust the open and close travel speed directly from the wall console menu, ranging from 2.5” to 18” per second This wide, adjustable speed range significantly reduces the need to match door and operator sprockets, as the motor delivers consistent torque regardless of the selected speed.

The travel speed is variable from:

- Max speed for Overhead doors – up to 18” (475mm) sec (4,500rpm)
- Rolling steel doors – up to 10”(265mm) sec (3000rpm)



Door Type Selector

The door type can be selected in the Wall Controller Console Menu, and the operator will load the default opening and closing travel speeds (see below) which can be adjusted to suit your speed requirements, the door types selectable are listed in the chart below.

Door Type	Default Opening Speed RPM	Default Closing Speed RPM	Min Speed RPM	Max Speed RPM
Standard Sectional Door***	3,000	2,000	700	3,500
	13"/sec. 340mm/sec.	10.5"/sec. 275mm/sec.	4"/sec 100mm/sec	14.5"/sec. 370mm/sec
Vertical Lift/Hi-Lift Sect. Door	3,300	2,000	700	4,000
	13.8"/sec 350mm/sec	10.5"/sec. 275mm/sec.	4"/sec 100mm/sec	16"/sec. 410mm/sec
Rolling Steel Door**	1,700	1,500	700	2,200
	6"/sec 160mm/sec	5.5"/sec 140mm/sec	2.5"/sec 65mm/sec	8"/sec 195mm/sec
Custom User	1,500	1,500	700	4,500
	5.5"/sec 140mm/sec	5.5"/sec 140mm/sec	2.5"/sec 65mm/sec	18"/sec 470mm/sec

** Speed calculated when using a 12T operator sprocket and a 38T door sprocket for a rolling steel door with 6" drum

***Speed calculated with direct coupling or 1 to 1 ratio operator & door sprockets and a 5" drum wheel



Duty Cycle

The Operator duty cycle depends on the door type and door curtain weight; the door needs to be well balanced. Below is a reference guide:

Sectional Door, Hi-Lift Door and Vertical Lift Door well balanced:

Door curtain weight: 700lb to 1200lb, duty cycle 60%

Door curtain weight: 1201lb to 1500lb, duty cycle 40%

Door curtain weight: 1501lb to 2000lb, duty cycle 10%

Rolling Steel, well balanced:

Door curtain weight: 700lb to 1200lb, duty cycle 60%

Door curtain weight: 1201lb to 1500lb, duty cycle 40%

Door curtain weight: 1501lb to 2000lb, duty cycle 10%

Limits Setting

The operator uses an Electronic 12 Bit magnetic absolute position encoder to control the door travel limits, with the door travel limits set electronically using the LCD menus and control buttons in the wall console

Manual Operation – Chain Hoist

The manual chain hoist automatically engages with the operator drive mechanism when the hauling chain is pulled. The manual chain hoist has an electromechanical safety interlock switch which will disable the operator from working during manual operation.



Safety Devices – primary entrapment protection devices

There are several types of safety devices we offer which are listed below. Up to five safety beams can be installed – two by wireless and three wired.

Optical Infra-Red Devices

Wired/Wireless Safety Device

UPE-1V1 is a safety sensor device that can be configurable to be:

Wired

Two-wire modulated safety sensor device with an infrared receiver and infrared transmitter

IR Detection Range: 30' (9m)

Wireless

It is a wire free safety edge sensor with a wireless receiver, transmitter and base station. The base station attaches to the operators control board to enable communications with the wireless receiver and transmitter. Two sets of wireless beams can be installed with the one base station if required.

BLE Transmission Range: 60' (18m)

IR Detection Range: 30' (9m)

Battery Type: 4 x 1.5V AA size Alkaline batteries or 4 x 1.5V AA

Average Battery Life: 4+ yrs (depending on usage and environmental factors)

OG-T-K10 is a safety sensor device with a 10K sensing resistor and an infrared receiver and infra transmitter

Detection Range: 6' to 100' (2m-30m)

Operating Voltage: 24Vdc

TGR-10K is a safety sensor device with 10K sensing resistor and an infrared transceiver and reflector

Detection Range: 6' to 30' (2m to 9m)

Operating Voltage: 24Vdc

MLC-K36/MLC-K72 are 3' and 6' light curtain safety sensor device with sensing resistor and an infrared curtain receiver and infrared curtain transmitter

Detection Range: 8' to 32' (2m to 10m)

Operating Voltage: 24Vdc



Door Bottom Rail Edge Sensor

The main control board has input terminals for the wiring of bottom rail edge sensors

Expansion Board (Optional)

The expansion board is an optional accessory that has four programmable relays with dry contacts to drive external accessories like traffic lights, flashing lights, sirens, docking stations, etc. Each relay has a common, normally open and normally closed terminals and are programmable via the Wall Console Menu. An external power supply of 24V is required to drive the accessories.

The four default relay modes are: Light, Open, Aux, Movement and there are nine relay mode options:

Off, Light, Open, Closed, Movement Warn, Movement, Unattended Warn, Aux Output, Alert Status,

Uninterrupted Power Supply (UPS)

The operators with a single-phase power cartridge can be powered from a UPS

With an input voltage of 120v to 240Vac at 2000W output power for North America or 230V-240Vac at 2000W output power for AU/NZ.



Other features

- Auto-close programmable from wall console
- Partial open/close, height programmable from wall console
- Inputs for three safety devices
- Input for a cable derailing sensor with 10K monitoring resistor
- 2 x general purpose programmable inputs can be used as a fire input or smoke baffle input
- Open, close and Normally Closed stop inputs
- Stop input can be used with a dock leveler
- Interlock input for a wicket door
- External antenna input



Specifications

Operator

Model	CDO-1000V1
Voltage Connections	Single Phase 120Vac to 240Vac – PFC 1,000W Three Phase TBC
Motor Type & Rating	PMSM 1HP – 0.75kW
Maximum Motor Speed	4500 RPM
Gear Reducer Ratio	50:1
Standard Operator Sprocket	12T- #50 (10B) with 1" bore size
Drive shaft Diameter	1" diameter
Door Travel Speed	Sectional Door: up to 18"/sec (475mm/sec) Rolling Steel Door: up to 10"/sec (265mm@3000rpm)
Duty Cycle	Based on lifting a 1200lb balanced sectional door: 60% Based on lifting a 1200lb balanced rolling steel door: 60%
Motor Brake	Regenerative Braking, Zero Vector E-Brake
Manual Chain Hoist	Auto engagement when pulled with microswitch safety interlock
Accessory Power	24Vdc 20W (800mA)
Radio Receiver	Anti Code Grabbing Transmission with AES128 Encryption
Receiver Memory Capacity	63 transmitters



Modular Power Cartridge

	Input Voltage: Single phase 120 to 240Vac with PFC, 50/60Hz	Input Voltage: Single phase 230-240Vac, 50/60Hz	Input Voltage: Three Phase 400Vac to 480Vac, 50/60Hz
Model	PC – 100V1	PC – 200V1	PC – 300V1
Output Power	1000Watts	1000Watts	1000Watts
Max Current	10A@120V, 5A @240V	5A@240V	

Wall Controller Console

Wireless wall console range	Bluetooth range: 130' (40m) for two-way data communication. RF range: 195' (60m) for Button Commands
Power Source – wireless mode	2 x 1.5V D size Alkaline batteries or optional Lithium 2 x 1.5V D size, or DC power pack 120Vac/240Vac – 5Vdc @ 0.5 to 1 amp
Battery Life	Battery save mode: 10yrs, Hold to Close mode: 6 years, Notify mode: 1.5 years
Wired wall console	Connected to operator by optional 4 wire cable
Power Source – wired mode	Power and communications through the 4-wire cable connected to the operator
Display	LCD x 4 lines with backlighting
Key switch	Can be used to lock out the menus
Control Buttons	Three x control buttons Open, Stop, Close used during setup, with the LCD and menus to configure the operator. After setting up the three buttons can be used to control the door
Menu button	When pressed will display the menu options on the LCD
Battery power saves modes	Selectable Battery Save Mode, Notify Mode, Hold to close mode



Transmitter (optional accessory)

Transmitter	Anti Code Grabbing technology with AES128 Encryption
Multi Format	Anti Code Grabbing, TrioCode & TriTran compatible
Transmitter Battery	1 x 3V CR2032 Lithium Coin Cell
Receiver Memory Capacity	63 transmitters