

CON-DSS

BIDIRECTIONAL DC-DC CONVERTER



POSITIVE PROBLEM SOLVING **+=**

The CON-DSS is modular bidirectional DC-DC Converter. This new integrated approach features high dynamics enabling the user to switch quickly between quadrants.

The low side of the converter features a user adjustable input/output, making it extremely versatile for a broad range of applications. As standard each module is built with isolated analogue and RS-232 interfaces. Other available interfaces are detailed in the options table overleaf. A comprehensive software program is provided for operation over the serial or LAN interface.

- + Stack up to 8 Units in Master/Slave**
- + Series Operation up to 1500Vdc**
- + GUI with Built-in Scope Function**
- + Adjustable Internal Resistance**
- + Optional Function Generator**
- + User Controllable Output**

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STANDARD MODELS

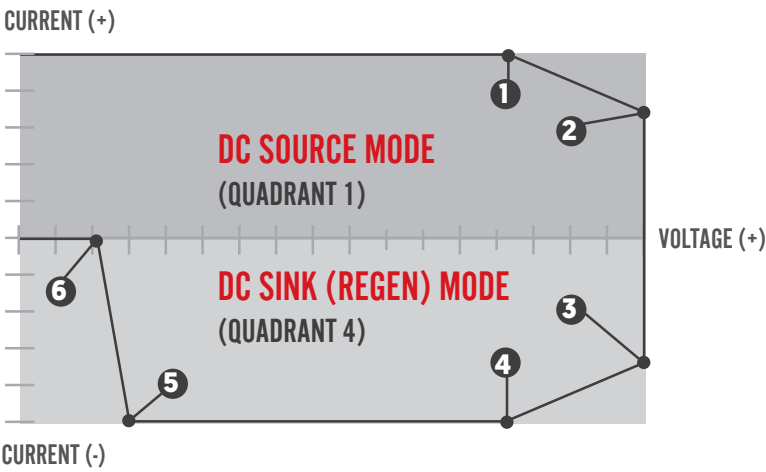
SELECTION TABLE

Part Number	Maximum Power	High Side [Line Side] Voltage*	Low Side [Adjustable Side] Source Voltage	Low Side [Adjustable Side] Sink Voltage	Low Side [Adjustable Side] Current Range	Adjustable Internal Resistance	Switchable Capacitance
CON-DSS 20-58	20kW	735 - 765Vdc	0 - 58.5Vdc	6 - 58.5Vdc**	0 to \pm 385A	0 - 153m Ω	6mF / 17.2mF
CON-DSS 20-65	20kW	800 - 830Vdc	0 - 65Vdc	6 - 65Vdc**	0 to \pm 385A	0 - 170m Ω	6mF / 17.2mF
CON-DSS 20-117	20kW	735 - 765Vdc	0 - 117Vdc	12 - 117Vdc**	0 to \pm 192A	0 - 612m Ω	1.4mF / 4.2mF
CON-DSS 20-130	20kW	800 - 830Vdc	0 - 130Vdc	12 - 130Vdc**	0 to \pm 192A	0 - 680m Ω	1.4mF / 4.2mF
CON-DSS 20-350	20kW	735 - 765Vdc	0 - 350Vdc	50 - 360Vdc**	0 to \pm 63A	0 - 5715m Ω	0.09mF / 0.9mF
CON-DSS 20-400	20kW	800 - 830Vdc	0 - 400Vdc	50 - 400Vdc**	0 to \pm 63A	0 - 6350m Ω	0.09mF / 0.9mF
CON-DSS 20-450	20kW	735 - 765Vdc	0 - 450Vdc	40 - 450Vdc**	0 to \pm 50A	0 - 9000m Ω	0.09mF / 0.9mF
CON-DSS 20-500	20kW	800 - 830Vdc	0 - 500Vdc	40 - 500Vdc**	0 to \pm 50A	0 - 10000m Ω	0.09mF / 0.9mF
CON-DSS 20-540	20kW	735 - 765Vdc	0 - 540Vdc	50 - 540Vdc**	0 to \pm 40A	0 - 13500m Ω	0.09mF / 0.9mF
CON-DSS 20-600	20kW	800 - 830Vdc	0 - 600Vdc	50 - 600Vdc**	0 to \pm 40A	0 - 15000m Ω	0.09mF / 0.9mF
CON-DSS 32-58	32kW	735 - 765Vdc	0 - 58.5Vdc	6 - 58.5Vdc**	0 to \pm 600A	0 - 100m Ω	6mF / 17.2mF
CON-DSS 32-65	32kW	800 - 830Vdc	0 - 65Vdc	6 - 65Vdc**	0 to \pm 600A	0 - 110m Ω	6mF / 17.2mF
CON-DSS 32-117	32kW	735 - 765Vdc	0 - 117Vdc	12 - 117Vdc**	0 to \pm 308A	0 - 380m Ω	1.4mF / 4.2mF
CON-DSS 32-130	32kW	800 - 830Vdc	0 - 130Vdc	12 - 130Vdc**	0 to \pm 308A	0 - 430m Ω	1.4mF / 4.2mF
CON-DSS 32-350	32kW	735 - 765Vdc	0 - 350Vdc	50 - 350Vdc**	0 to \pm 100A	0 - 3600m Ω	0.09mF / 0.9mF
CON-DSS 32-400	32kW	800 - 830Vdc	0 - 400Vdc	50 - 400Vdc**	0 to \pm 100A	0 - 4000m Ω	0.09mF / 0.9mF
CON-DSS 32-450	32kW	735 - 765Vdc	0 - 450Vdc	40 - 450Vdc**	0 to \pm 80A	0 - 5625m Ω	0.09mF / 0.9mF
CON-DSS 32-500	32kW	800 - 830Vdc	0 - 500Vdc	40 - 500Vdc**	0 to \pm 80A	0 - 6250m Ω	0.09mF / 0.9mF
CON-DSS 32-540	32kW	735 - 765Vdc	0 - 540Vdc	50 - 540Vdc**	0 to \pm 66A	0 - 8190m Ω	0.09mF / 0.9mF
CON-DSS 32-600	32kW	800 - 830Vdc	0 - 600Vdc	50 - 600Vdc**	0 to \pm 66A	0 - 9100m Ω	0.09mF / 0.9mF

* Other voltage ranges are available on request. For more information, please contact ETPS Ltd.

** The maximum current that can be taken derates as the voltage reduces beneath the lower level. Please see the operating range table below.

OPERATING RANGES



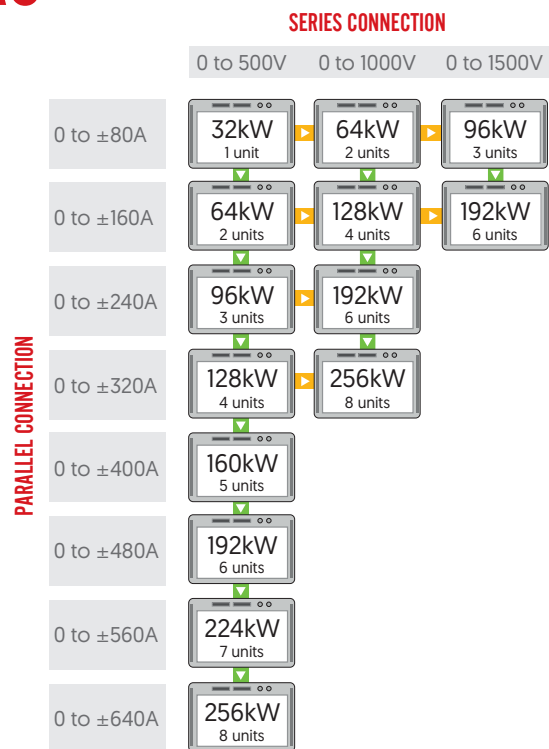
OPERATING RANGE

Part Number	Point 1 [Q1]	Point 2 [Q1]	Point 3 [Q4]	Point 4 [Q4]	Point 5 [Q4]	Point 6 [Q4]
CON-DSS 20-58	53V / 385A	58.5V / 308A	58.5V / -308A	53V / -385A	6V / -385A	2V / 0A
CON-DSS 20-65	53V / 385A	65V / 308A	65V / -308A	53V / -385A	6V / -385A	2V / 0A
CON-DSS 20-117	104V / 192A	117V / 154A	117V / -154A	104V / -192A	12V / -192A	4V / 0A
CON-DSS 20-130	104V / 192A	130V / 154A	130V / -154A	104V / -192A	12V / -192A	4V / 0A
CON-DSS 20-350	317.5V / 63A	350V / 63A	350V / -50A	317.5V / -63A	50V / 63A	20V / 0A
CON-DSS 20-400	317.5V / 63A	400V / 63A	400V / -50A	317.5V / -63A	50V / 63A	20V / 0A
CON-DSS 20-450	400V / 50A	450V / 40A	450V / -40A	400V / -50A	40V / -50A	15V / 0A
CON-DSS 20-500	400V / 50A	500V / 40A	500V / -40A	400V / -50A	40V / -50A	15V / 0A
CON-DSS 20-540	500V / 40A	540V / 40A	540V / -33.3A	500V / -40A	50V / -40A	30V / 0A
CON-DSS 20-600	500V / 40A	600V / 40A	600V / -33.3A	500V / -40A	50V / -40A	30V / 0A
CON-DSS 32-58	53V / 600A	58.5V / 492A	58.5V / -492A	53V / -600A	6V / -600A	2V / 0A
CON-DSS 32-65	53V / 600A	65V / 492A	65V / -492A	53V / -600A	6V / -600A	2V / 0A
CON-DSS 32-117	104V / 308A	117V / 246A	117V / -246A	104V / -308A	12V / -308A	4V / 0A
CON-DSS 32-130	104V / 308A	130V / 246A	130V / -246A	104V / -308A	12V / -308A	4V / 0A
CON-DSS 32-350	320V / 100A	350V / 80A	350V / -80A	320V / -100A	50V / -100A	20V / 0A
CON-DSS 32-400	320V / 100A	400V / 80A	400V / -80A	320V / -100A	50V / -100A	20V / 0A
CON-DSS 32-450	400V / 80A	450V / 64A	450V / -64A	400V / -80A	40V / -80A	15V / 0A
CON-DSS 32-500	400V / 80A	500V / 64A	500V / -64A	400V / -80A	40V / -80A	15V / 0A
CON-DSS 32-540	477.6V / 66A	540V / 53.3A	540V / -53.3A	477.6V / -66A	50V / -66A	30V / 0A
CON-DSS 32-600	477.6V / 66A	600V / 53.3A	600V / -53.3A	477.6V / -66A	50V / -66A	30V / 0A

MODULAR DC-DC CONVERTERS

Up to 64 CON-DSS modules can be arranged in series, parallel or matrix array configurations. Each module is able to operate independently, so that systems can be reconfigured, expanded or broken up as needs dictate. Inbuilt system comms allow users to switch between various set-ups.

The modular approach is useful for test houses and research labs who regularly test different sized power devices. Individual modules can be used for the day to day testing of multiple small devices, then grouped together for larger projects. The diagram shows all the possible combinations with eight 500V modules.



CABINET OPTIONS

Units can be treated to a laboratory rack or flight case integration. Common options include passive indication of any residual DC voltage, isolation monitoring of DC cables and a panel mounted emergency stop. Switch panels with removable DC links can be fitted for modular systems. This simplifies the reconfiguration between series, parallel or independent use. Simple wheeled cabinets are also available.

Having a programmable power system mounted into a flight case on castors is often advantageous, especially when several departments or test cells share the same equipment. Multiple power systems can be fitted into the same flight case. Door hangers are fitted for convenience. Existing ETPS systems can also be retrospectively integrated into new flight cases where requested.



STANDARD FEATURES

TECHNICAL DATA	
DC Line Connection Type	DC+, DC-, PE [no neutral]
Touch Current	Unweighted: <20mA / weighted: <2mA [According to IEC60990: For weighted touch current: measured for perception/reaction, protection with earth leakage circuit breaker possible. An additional PE connection is necessary.]
Operating Modes	Constant Voltage [0 to 100% of V_{MAX}] Constant Current [0 to $\pm 100\%$ of I_{MAX}] Constant Power [0 to $\pm 100\%$ of P_{MAX}]
Internal Resistance Range	Adjustable $\Omega_{MAX} = [V_{NOM} / I_{NOM}]$
Interfaces	Analogue & RS-232
Remote Sense	0 - V_{MAX}
Efficiency	Up to 94%
CV Load Regulation and Set Tracking	1.1ms [Typical recovery time to within <5 % band of set value for a load [or set value] step 10-90 %, ohmic load, at constant line input and temperature.]
Set Value Tracking CC [With Quadrant Change]*	<2ms [models $V_{NOM} \leq 130Vdc$]; <3ms [models $V_{NOM} \geq 350Vdc$]
Set Value Tracking CC [Without Quadrant Change]*	<2ms
Over Voltage Protection [Programmable]	0 - 110% of V_{MAX}
Over Voltage Protection [Response Time]	50 μ s - 1600ms
Over Current Protection [Programmable]	0 - 110% of I_{MAX}
Over Current Protection [Response Time]	50 μ s - 1600ms
Output Ripple [300Hz Vpp]	<0.5% [Typical value at nominal ohmic load, line asymmetry < 1 Vrms]
Output Ripple [300Hz Vrms]	<0.1% [Typical value at nominal ohmic load, line asymmetry < 1 Vrms]
Output Noise [40kHz-1MHz]	<1Vpp / <0.2Vrms [Typical value at nominal ohmic load, line asymmetry < 1 Vrms]
Stability [CV, CC]	< $\pm 0.05\%$ [Maximum drift over 8 hours after 30 minute warm-up time, at constant line input, load and temperature conditions]
Temperature Coefficient [CV]	<0.02% of full scale value per°C [Typical change of output values versus ambient temperature, at constant line input and load conditions]
Temperature Coefficient [CC]	<0.03% of full scale value per°C [Typical change of output values versus ambient temperature, at constant line input and load conditions]

* Rise/ fall time for 10%-90% of a set step.

HIGHLIGHTED FEATURES



SENSE COMPENSATION

Sense plus terminals are built into the CON-DSS for the connection of sense wire which compensates for voltage drops in the load lines. This has a number of advantages over traditional sense. It is permitted to interrupt the load line during operation [voltage on]. The maximum voltage drop compensation is adjustable. The voltage difference between CON-DSS output and sensing point is monitored. If a set limit is exceeded, the CON-DSS unit shuts off. This is particularly useful for applications with long cables often prone to unwanted voltage drops.



INTERNAL RESISTANCE RANGE

Each module is built with a user programmable internal resistance range as standard. This makes the power systems ideal for simulating the output of energy storage devices such as battery packs, fuel cell stacks and super capacitors. The exact range varies by module and can be viewed in the selection table. An extended programming range is available on request by selecting the /IRXTS option below.

OPTIONS

CODE	DESCRIPTION
/IRXTS	Maximum adjustable internal resistance range extended to 32,000mΩ
/CANCABLE	Connecting cable for multi-unit operation
/RMB	Remote Measure Box for higher dynamics in multi-unit operation
/EMIFILTER	EMI filter for DC output
/FILTER	Front panel air filter and frame arrangement

SOFTWARE/SOFT TOOLS

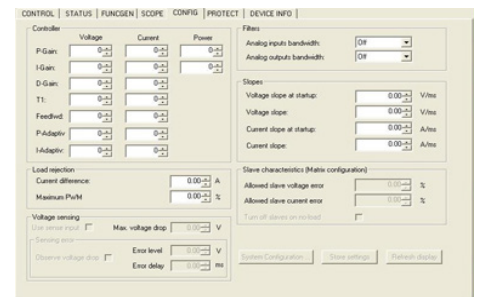
STANDARD TOP CONTROL GUI

All CON-DSS units come with a simple and intuitive TopControl operating GUI as standard. Live values of the power system are displayed graphically along with any warning and error messages. The software provides a variety of second level parameters, ideal for users who like to optimise their test processes. In standard user mode the operator can remotely program set values, enable voltage output as well as the ability to analyse different variables including set and actual values via the integrated scope.

The scope function can simultaneously record up to 8 system variables. Recording can be started manually or by a defined trigger event from any variable of the system. All actual and set values [currents/voltages/power/internal resistance] can be recorded. Other recordable items include system temperatures, intermediate DC circuit, low voltage auxiliary power supplies, error related values and variables from the controller section.

A password protected section is available to the advanced user and service technician. In addition to the standard functions the authorised user is able to:

- + Program linear ramp functions at start up and set value steps during operation
- + Configure multi-unit operation
- + Program the PID controller parameters
- + Program the unit's limit values
- + Calibrate and adjust values as necessary
- + Update the firmware



OPTIONAL SOFTWARE

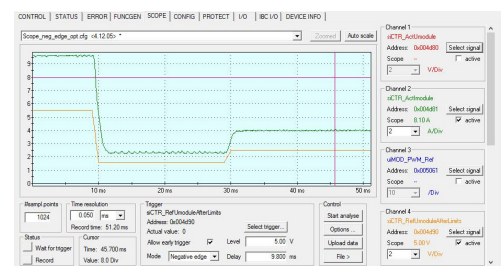
CODE	DESCRIPTION
/TFE	Integrated function generating engine with application area [parametric] programming
/SAS	Solar array simulation GUI (includes TFE option)
/BATSIM	GUI simulating battery characteristics with adjustable parameters
/CAPSIM	GUI simulating the electrical characteristics of capacitors with adjustable parameters
/BATCONTROL	Energy storage and drive cycling GUI

HIGHLIGHTED OPTION

FUNCTION GENERATOR (/TFE)

Complex DC waveforms can be implemented through an optional embedded function generator. The highly programmable nature of the function generator allows users to plot out exact waveforms. This is often advantageous when emulating a power device with a very specific behaviour profile. For example, when quality testing fuel cell powered equipment, the specific behaviour of a discharging fuel cell can be programmed and replicated.

As well as custom shapes, standard square, sawtooth and sine waveforms can be plotted against time. Voltage/current and voltage/power relationships can also be programmed where necessary. Parametric programming is possible, where instead of the time axis, an input variable (V_{IN} , I_{IN} or P_{IN}) can be selected.



APPLICATION GUIS

An application GUI can be used to program hardware to replicate real world behaviour of a power component. This allows specific sections of a circuit to be isolated and researched. Hard to replicate conditions, such as cranking curve from a cold start, can also be programmed and repeated.

Using a GUI allows a great deal of control, monitoring and reporting to be done remotely. Other advantages include reduced operator errors and preparation time, as well as increased reproducibility and elimination of result variations.

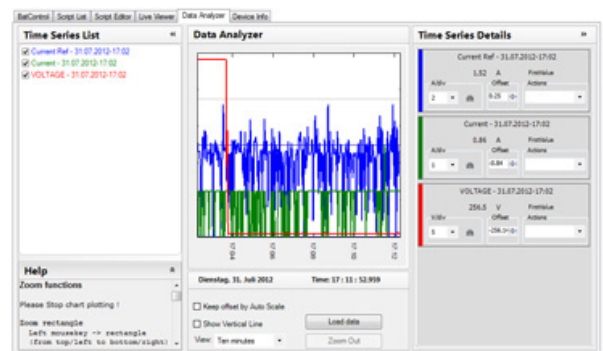
BATTERY EMULATION (/BATSIM)

BatSim provides a convenient method for the CON-DSS to emulate different sized battery stacks. Nearly all relevant electrical characteristics are programmable, including the number of cells, energy capacity, cut off limits, chemistry type and nominal voltage.



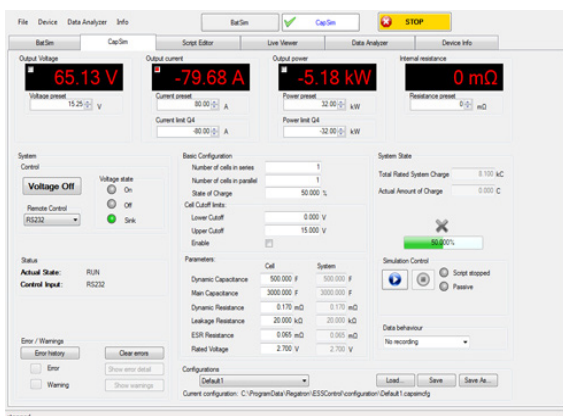
ELECTRIC DRIVE CYCLING (/BATCONTROL)

Drive cycle tests can be implemented using BatControl. Previous data obtained from a test track can be imported and recreated, allowing the CON-DSS to simulate a real world driving test inside a lab environment. Battery and capacitor charge/discharge profiles can also be implemented through the GUI.



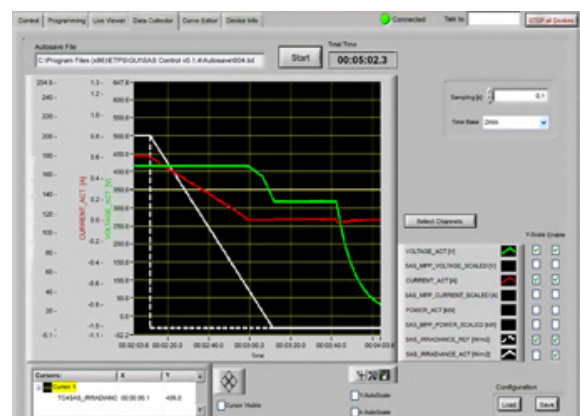
CAPACITOR SIMULATION (/CAPSIM)

The bidirectional characteristics of a real capacitor stack can be emulated when CapSim is installed with CON-DSS modules. Number of cells in series/parallel, state of charge, cell cut off limits, dynamic capacitance and resistance are programmable.



SOLAR ARRAY SIMULATION (/SAS)

SASControl software has all EN 50530 tests pre-installed. The GUI allows users to edit irradiance, temperature and amplitude values. Previous tests have been conducted using over 400,000 individual data points, with more possible.



INTERFACES



STANDARD RS-232 INTERFACE

The RS-232 interface is configured as a Sub-D 9 pin connector (female) and is located on the front panel. This interface can be optionally moved to the rear panel. The graphical user interface, TopControl is operated via RS-232. The software runs on Windows and allows the user to control, measure and configure the power system.

TECHNICAL DATA

Isolation to Electronics and Earth Configuration	125 Vrms
Baud Rate	38,400 baud
Resolution (programming & readback)	0.025% FS (for V & I), 0.1% FS (for P & Ri)

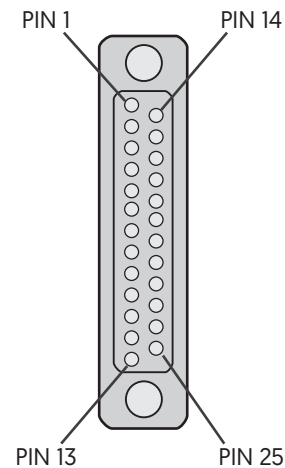


STANDARD ANALOGUE INTERFACE

The control port is configured as a Sub-D 25 female connector and is located on the rear panel. It allows output values to be set and read proportionally using a 0-10Vdc analogue signal. Digital inputs and outputs enable various functions such as the interlock and output ON/OFF. A 10Vdc reference is provided for analogue control. Digital functions are switched via a high/low signal. A 24Vdc supply voltage is provided for these functions. The control port is labelled X105.

TECHNICAL DATA

Isolation to Electronics and Earth	125 Vrms
Unit Ready/Error	Relay Contact
Output Voltage ON / Warnings	Relay Contact
Actual Voltage Readback 0 - 100%	0 to 10V
Actual Current Readback -100% to 100%	-10V to 10V
Resolution (programming & readback) for V, I, P, Ri	0.2% FS
Output Voltage Off/On	0/24VAC/DC
2 Digital Application Inputs	0/24VAC/DC
Interlock Circuit	0/24VDC
Voltage Setting 0 to 100%	0 to 10V
Current Setting -100% to 100%	-10V to 10V
Power Setting 0% to 100%	+10V to 0V
Internal Resistance Setting 0% to 100%	0V to 10V



PIN	SIGNAL	I/O	DESCRIPTION
1	AGND	I	Analogue ground for pins 2–4, 14–16
2	VREF	I	Voltage setpoint input 0–10 V
3	IREF	I	Current setpoint input 0–10 V
4	IACF	O	Current feedback output 0–10 V
5	0 VDC	O	0 VDC I/O ground for pin 25 ¹
6	+10 VDC	O	Analogue reference voltage
7	COM	I	(connected to pin 17) 0VDC DigIn; common ground for pins 8–9, 18–20, 24
8	APP_DIGITALIN_4; CLEAR_ERROR	I	Digital input 0-2V /10-24V DC
9	VOLTAGE_ON	I	Digital input 0-2/10-24V DC
10	OK/ALARM_b ²	O	Relay output 1 normally open
11	OK/ALARM_a ²	O	Relay output 1 common
12	RUN_b ²	O	Relay output 2 normally open
13	RUN_a ²	O	Relay output 2 common
14	PREF	I	Power limit analogue input 0–10 V
15	RREF	I	Ri-simulation analogue input 0–10 V

PIN	SIGNAL	I/O	DESCRIPTION
16	VACT	O	Voltage feedback output 0–10 V
17	COM	I	(connected to pin 7) Common ground to pins 8–9, 18–20, 24
18	APP_DIGITALIN_1	I	Digital input (low) 0-2 VDC/(high) 10–28 VDC
19	APP_DIGITALIN_2	I	Digital input (low) 0-2 VDC/(high) 10–28 VDC
20	APP_DIGITALIN_3; ANAOG_REFERENCE_SELECT	I	Digital input ((low) 0-2 VDC/(high) 10–28 VDC Analogue reference select
21	WARN_a ²	O	Relay output 3 normally open
22	WARN_b ²	O	Relay output 3 normally closed
23	WARN_c ²	O	Relay output 3 common
24	INTERLOCK_IN_+	I	Input Interlock +
25	+24 VDC	O	24VDC I/O Aux power output 24 VDC, max. 0.2 A

¹ Pin 5 (0 VDC) is used as the reference earth for pin 25 (24 VDC) and is connected internally to the equipotential bonding via a 1 kΩ resistor to earth.

² Maximum switching current: 1 A; maximum switching voltage: 24 V.

OPTIONAL INTERFACES

CODE	DESCRIPTION
/HMI	This provides front panel control and measurement via a menu driven LCD screen. Most users prefer their units to be fitted with HMI. For systems comprised of multiple units or where only remote control is required, cost can be saved by not including front panel controls and display.
/RS232REAR	RS-232 on front and rear panel (time shared mode with RS-232 on front).
/RS422	Differential serial interface (time shared mode with RS-232).
/IEEE	When specified, an integrated IEEE 488.2 interface is built into the rear panel (RS-232 only possible on rear panel). The programming terms employed are compliant with Standard Commands for Programmable Instrumentation (SCPI), making the CON-DSS ideal for system integration.
/CANOPEN	On request an additional serial interface built to the CAN/CANopen standards can be integrated into the rear panel (RS-232 only possible on rear panel).
/CANMP	Integrated CANmp interface (RS-232 only possible on rear panel).
/OPTOLINK	Rear panel integrated fibre optic interface (RS-232 only possible on rear panel).
/USB	Integrated USB interface. (RS-232 only possible on rear panel). The graphical user interface, TopControl can be operated over the USB port. RS-232 and USB cannot be used at the same time.
/ETH	Ethernet interface with listener and talker functions over a LAN (RS-232REAR required).
/CAN+USB	Combined CAN and USB interface.

HIGHLIGHTED OPTION

CAN MP CAN MULTI-PURPOSE INTERFACE (/CANMP)

CANmp is a high speed digital interface operating at 1kHz. The interface gives users the capability to customise the CAN protocol. Up to 50 messages are user configurable. Along with the CAN ID the data length code, byte order, start bit, data type and signal factor can be adjusted by the user. A DBC file is provided and messages can be easily configured within the standard windows software. Messages can be sent cyclically or upon receipt of a sync or syncID signal.

SAFETY & PROTECTION

STANDARD FEATURES

TECHNICAL DATA	
Max. Reactive Load Voltage	≤ 110% Vmax
Mounted In Cabinet	Up to IP 54
Basic Construction	IP 20 (current bars on rear side excluded)
EMC Emission / Immunity	EN 61000-6-4 / EN 61000-6-2
Low Voltage Directive 2014/35/EU	EN 50178

OPTIONS

CODE	DESCRIPTION
/ISR	Integrated safety relay for shutdown to EN 13849-1 Cat 2/3
/PACOB	Protection against accidental contact of DC current bars
/RPP	Automatic voltage matching with reverse polarity protection

HIGHLIGHTED OPTIONS

 **AUTOMATIC VOLTAGE MATCHING WITH RPP (/RPP)**

When researching energy storage devices, Reverse Polarity Protection (RPP) is recommended for devices without an automatic voltage matching circuit. With the CON-DSS energised but output off, the RPP senses the voltage of the connected energy storage device. A contactor is closed after matching the voltage, to prevent large inrush currents and arcing on start up.

 **PROTECTION AGAINST OUTPUT BARS (/PACOB)**

A specially produced cover is available which provides protection against accidental contact of DC current bars.

 **INTEGRATED SAFETY RELAY (/ISR)**

For additional safety, a mechanical interlock is available for the mains input of the CON-DSS. The integrated safety relay provides shutdown safety according to EN 13849-1 category 2/3. The ISR is connected to the external safety switch loop. If the external loop is opened, the DC-output of the power system is powered down immediately.

ISOLATION

STANDARD FEATURES

TECHNICAL DATA	
Line to Case	1670Vdc for 1s
Output to Case	2060Vdc for 1s (models $V_{NOM} \leq 130Vdc$) ; 2540Vdc for 1s (models $V_{NOM} \geq 350Vdc$)
Transformer	4800Vac
Output to Case	10.8 M Ω / high impedance (X109 open)
Per DC Bar	35nF (models $V_{NOM} \leq 130Vdc$) ; 13.6nF (models $V_{NOM} \geq 350Vdc$)
- Bar / + Bar ¹	+680 Vdc / -680Vdc (models $V_{NOM} \leq 130Vdc$) ; +1000Vdc / -1000Vdc (models $V_{NOM} \geq 350Vdc$)

¹ Maximum working voltage including DC output voltage.

MECHANICAL

STANDARD FEATURES

TECHNICAL DATA	
Dimensions	19" x 9U x 634mm (W x H x D), a full cabinet integration service is available on request
Weight (per Module)	97kg
Line Input Connections	Terminal block 4 x 25mm ²
Output Terminals	Nickel-plated copper bars - Length: 40mm, 1 hole 9mm \square in each bar

OPTIONS

CODE	DESCRIPTION
/LCAL	Integrated liquid cooling of the power stage
/RCU	The RCU provides the HMI functions via cable at a distance of up to 40m. The RCU is available in a compact desktop case or as a 19" rackmount unit.
/4111	Ruggedisation specification for vehicle mount projects

HIGHLIGHTED OPTIONS



RUGGEDISATION SPECIFICATION (/4111)

Ruggedisation of units to military standards is possible. Many previous modifications have been carried out for shipborne and vehicle projects. Our design team can work with you to meet specific requirements and standards. This ensures suitability in harsh conditions by providing protection against shock, vibration and humidity.

One previous modification included modifying a CON-DSS system to withstand up to 30g of mechanical shock across X, Y and Z axes. The PSU also could operate from temperatures as low as -10°C all the way up to 55°C. For more information about what ruggedisations have previously been achieved, please contact ETPS.



LIQUID COOLING (/LCAL)

Liquid cooling of the CON-DSS's power stage is available for units which may be subject to naturally hot or uncontrolled environments. This enables operation up to 45°C with no performance derating.

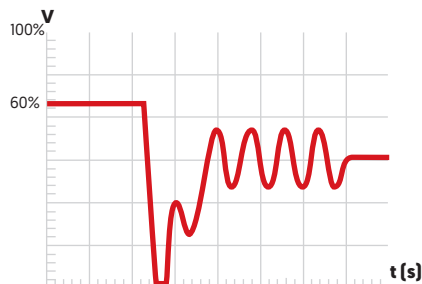


REMOTE CONTROL UNIT (/RCU)

The RCU is an external control unit for controlling multi-module systems, which reduces response times when implementing complex changes. The RCU is available as either a desktop unit or a 19" rackmounting module, with or without an emergency stop.

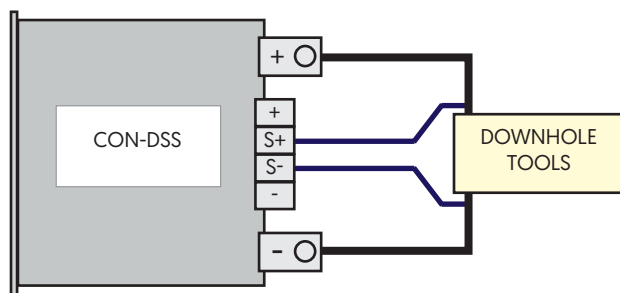
CRANKING CURVE TESTING

Electrical components within a vehicle's subsystem must be able to withstand a wide range of input voltage surges and drops during a start-up. The CON-DSS can accurately recreate these conditions within a lab environment. This increases reproducibility and accuracy of results when compared to using real batteries. Hard to replicate conditions such as voltage cranking during a cold start can be achieved. Voltage/current and voltage/power relationships can be programmed against time where necessary.



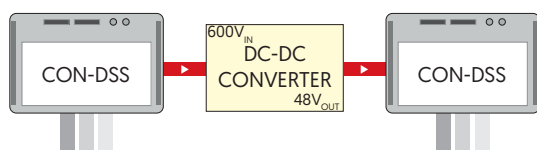
POWERING DOWNHOLE TOOLS

Applications with long load lines often suffer from unintended voltage drops, such as downhole tools used in hydrocarbon exploration. The CON-DSS's sense plus allows voltage drops to be compensated for throughout the entire length of a load line. This feature is also ideal for powering subsea devices.



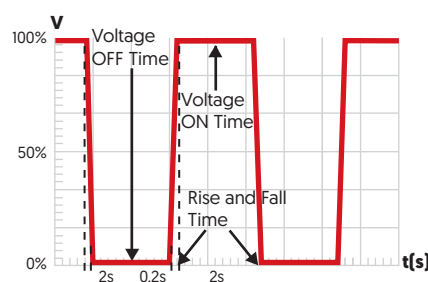
INVERTER/CONVERTER TESTING

The DC input of virtually any power conversion device can be replicated. The influence that variables, such as line voltage variation, have on performance can be isolated and tested. This allows optimum operating conditions to be characterised to improve efficiency and performance.



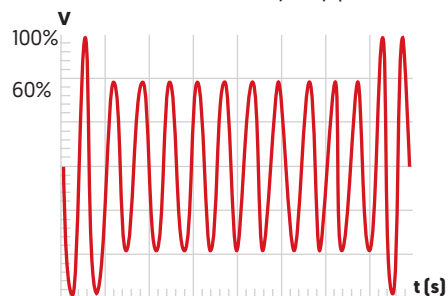
PULSED BATTERY CHARGING

Pulse charging interrupts the traditional DC charging curve with short relaxation periods. The technique is thought to improve battery discharge capacity and help facilitate longer cycle life. Some studies have shown that pulse charging is also helpful in eliminating concentration polarisation. The CON-DSS's embedded function generator allows the PSU to deliver short burst of highly concentrated energy at user defined time intervals. The technique can also be used for powering lasers, electromagnets and plasma generation.



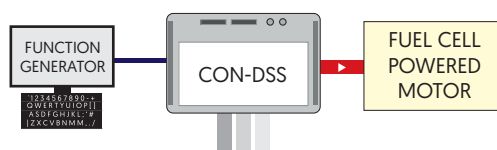
VOLTAGE DROPS & INTERRUPTS

In electronic systems sudden voltage interruptions may cause unexpected behaviour. Supply line disturbances may have several causes, including an additional switch on of large capacitive loads parallel to the supply line or a short circuit caused by loads sharing the supply. The CON-DSS can generate many complex DC waveforms to test devices under realistic conditions to identify any potential issues.



FUEL CELL EMULATION

The discharge behaviour of an FCEV's fuel cell is often irregular. By using the function generator, both conservative and aggressive driver profiles can be replicated. This allows the CON-DSS to perform effective quality testing of fuel cell powered components under all likely operating conditions.



Every effort is made to ensure that the information provided within this technical summary is accurate. However, ETPS Ltd must reserve the right to make changes to the published specifications without prior notice. Where certain operating parameters are critical for your application we advise that they be confirmed at the time of order. ETPS Ltd specialises in modifying its proven platforms to suit your needs. Please contact our office if your requirement is non-standard. Please note that your actual unit may differ from those shown.



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