

CANlink 4004: Control Module

EXPANDED CONTROL FOR HIGH DEMANDS

HED's CL-4004 provides expanded I/O options and delivers increased capacity for higher vehicle demands in a compact, flexible design, with high-speed processing, large memory, and configurable I/O.



PRECISION CONTROL

The CL-4004 features 2-wire current control outputs for improved control of hydraulic valves that will not fluctuate over temp and voltage. This is critical for boom control on utility and fire trucks, drum speed control on concrete mixers and track speed control on tracked vehicles.

PROGRAMMABLE + CONFIGURABLE

Configurable I/O allows outputs to be programmed as inputs and inputs to be configured as multiple input types through software configurability - giving you the ultimate flexibility.

RUGGED RELIABILITY

Made for severe-duty mobile applications, these controllers are IP67 and IP6K9K sealed and are resistant to shock and vibration - ensuring performance regardless of the operating environment.

EXPAND WITH EASE

HED's 4000 series I/O controllers share a common architecture and wire pinouts allowing for quicker and lower cost development if expanded I/O is needed in the future.

READY TO GET STARTED?

Connect with our team of experts to discuss your project and discover how HED can provide tailored control solutions for your vehicles.

CL-4004 CONTROL MODULE | Preliminary Product Specifications

HARDWARE	
Overview	Arm™ Cortex-M7 Microcontroller running at 240 MHz
MCU	S32K328
Flash	8MB
RAM	1152KB
INTERFACES	
CAN	up to 5x CAN-FD ports
Bluetooth™	Bluetooth™ 5.1 Compliant - <i>optional</i>
Accelerometer	3-axis (2g to 16g selectable range)- <i>optional</i>
Real-Time Clock	Internal Battery Backup (15-year typical life)- <i>optional</i>
MECHANICAL	
Housing Material	Nylon 6/6 15% glass filled
Installation	Panel mount
Connectors	up to 5x Deutsch 18-pin DT
Dimensions	9.00 x 6.24 x 2.20 in, 228.60 x 158.50 x 55.75 mm
Weight	TBD
Contacts	16-18 AWG: 0462-201-16141 14-16 AWG: 0462-209-16141
Plugs	Non-locking: 114017, Locking: 0413-217-1605
Wire Size	14-16 AWG or 16-18 AWG
Mounting & Torque	1/4-20" or M6 Fastener 50-55 in-lbs
Indicators	1x Blue Power, 2x RGB Indicators (user configured)
OPERATING SYSTEM	
Operating System	FreeRTOS
Bootup Time	150msec (approximate)
SOFTWARE FRAMEWORK & TOOLS	
Development	NXP Design Studio
Programming	C / C++
CAN Protocol	J1939 and CANopen networks ¹

¹ Capable of interfacing with J1939 devices but HED does not currently offer a standard J1939 Client.

ELECTRICAL	
Operating Voltage	8-32VDC
Key Switch	Standard for Start/Shutdown
Max Total I/O Available	68 (<i>varies by configuration - see below</i>)
Inputs	up to 68 (<i>varies by configuration - see below</i>)
Outputs	up to 46 (<i>varies by configuration - see below</i>)
5V Sensor Supply	500mA (max)
Current Draw (No I/O active)	115mA (13.8VDC) (typ) 95mA (28VDC) (typ)
Total Maximum Output Current	15A per +Battery Pin feeding bank of outputs (see pinout)
Standby Current	<0.6mA (12VDC), <1.7mA (24VDC)
Suspend Mode Current	contact us for details
PRODUCT RATINGS	
IP Class	IP67 and IP6K9K
EU/CE Compliance	CE 2014/30/EU
Vibrations	ISO 16750-3, ISO 19014-3
Shock	ISO 16750-3, ISO 19014-3
Solar	ISO 16750-4
Salt Fog	ISO 16750-4, ISO 19014-3
Chemical	ISO 16750-5, ISO 19014-3
Electrostatic Discharge	ISO 10605, ISO 13766-1, ISO 14982
Conducted Transient Immunity	ISO 13766-1, ISO 7637-2, ISO 14982
Starting Profile	ISO 16750-2
Reverse Polarity	ISO 16750-2
EMC	ISO 13766-1, ISO 14982, CISPR 25
Temperature Range	Operating:-40C to +85C (Output current limits may require moderate derating for temperatures above +70C) Storage:-40C to +85C
FCC / ISED Compliance	FCC Part 15 (b) and ISED Canada



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CL-4004 STANDARD CONFIGURATIONS DETAILS

Configuration	Model Name	CAN Ports	QSPI Flash	Suspend	Daughterboard Connectors	LEDs	Configuration Notes
CL-4004-104	Pro	5x	yes	yes	yes	1x Blue Power LED 2x RGB LED User Configured	Full feature with 5x Connectors
CL-4004-105	Plus	4x	yes	yes	yes		Full feature with 4x Connectors
CL-4004-106	Base	3x	no	no	no		Limited features with 5x Connectors
CL-4004-102	Flex	2x	no	no	no		Reduced features with 5x Connectors

Configuration	Max I/O *	Total Inputs	Digital Inputs	Analog Inputs	Frequency Inputs	RTD Inputs	20mA Inputs	Total Outputs	Sourcing Outputs	Sinking Outputs	Analog Outputs
CL-4004-104	66x	66x	66x	32x	8x	8x	8x	46x	36x	10x	2x
CL-4004-105	53x	53x	53x	28x	8x	6x	6x	38x	28x	10x	2x
CL-4004-106	68x	68x	64x	14x	4x	6x	6x	37x	33x	4x	0x
CL-4004-102	66x	66x	62x	6x	2x	0x	0x	36x	33x	3x	0x

*Note: These I/O Type quantities are maximum possible for each type. Actual I/O used for application cannot exceed the Maximum I/O quantity available.

Part Number Details

CL-4004-HHH-FF-IIOODD-CCCN	(HHH)	Firmware Options (FF)		(II)	(00)	Daughterboard(DD)		Custom Suffix (CCCN) ³	
	Hardware Configuration ¹	CANopen Client	BSP Master	# of Inputs ²	# of Outputs ²	None	Optional	Customer	Number
CL-4004-HHH-FF-IIOODD-CCCN	104	50	B0	20	46	00	01	CCC	NNN
CL-4004-HHH-FF-IIOODD-CCCN	105	50	B0	15	38	00	01	CCC	NNN
CL-4004-HHH-FF-IIOODD-CCCN	106	50	B0	31	37	00	n/a	CCC	NNN
CL-4004-HHH-FF-IIOODD-CCCN	102	50	B0	30	36	00	n/a	CCC	NNN

¹ See PINOUT configurations starting on page 4 for additional details.

² Output pins can be configurable in software to a variety of input types, so total inputs can exceed input number listed. Inputs and outputs in part number represent the total number of I/O pins.

³ Custom Suffix added if customer requests HED to pre-program their application into controller prior to shipment.

Standard Part Numbers Available

Standard part numbers available	CANopen Client Part Numbers	BSP Master Part Numbers	Daughterboard Part Numbers & Features	
CL-4004 Pro	CL-4004-104-50-204600	CL-4004-104-B0-204600	CL-4004-104-B0-204601	Includes Bluetooth, Accelerometer, RTC
CL-4004 Plus	CL-4004-105-50-153800	CL-4004-105-B0-153800	CL-4004-105-B0-153801	
CL-4004 Base	CL-4004-106-50-313700	CL-4004-106-B0-313700	n/a	n/a
CL-4004 Flex	CL-4004-102-50-303600	CL-4004-102-B0-303600	n/a	n/a



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18 PIN DEUTSCH - A-Key PINOUT CONFIGURATION DETAILS

PIN	CL-4004-104 Configuration (Pro)	CL-4004-105 Configuration (Plus)	CL-4004-106 Configuration (Base)	CL-4004-102 Configuration (Flex)
Pin 1	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 / Output DOUT/PWM(-) (2A) (Bank 1)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 / Output DOUT/PWM(-) (2A) (Bank 1)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 1)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 1)
Pin 2	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 / Output DOUT/PWM(-) (2A) (Bank 1)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 / Output DOUT/PWM(-) (2A) (Bank 1)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 1)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 1)
Pin 3	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1/VTD2/ FREQ/20mA/RTD1 (Bank 1)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1/VTD2/ FREQ/20mA/RTD1 (Bank 1)"	Input STB/STG/TRI/VTD1/20mA/RTD1	Not used
Pin 4	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1/VTD2/ FREQ/20mA/RTD1 (Bank 1)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1/VTD2/ FREQ/20mA/RTD1 (Bank 1)	Input STB/STG/TRI/VTD1/20mA/RTD1	Not used
Pin 5	Battery (-)	Battery (-)	Battery (-)	Battery (-)
Pin 6	Battery (+) CPU- Unswitched and Output Pins 1-4 (Max 15A) with VTD	Battery (+) CPU- Unswitched and Output Pins 1-4 (Max 15A) with VTD	Battery (+) CPU- Unswitched and Output Pins 1-4 (Max 15A) with VTD2	Battery (+) CPU- Unswitched and Output Pins 1-4 (Max 15A) with VTD2
Pin 7	CAN1-L / Wake-up from Suspend	CAN1-L / Wake-up from Suspend	CAN1-L	CAN1-L
Pin 8	CAN1-H / Wake-up from Suspend	CAN1-H / Wake-up from Suspend	CAN1-H	CAN1-H
Pin 9	CAN2-L / Wake-up from Suspend	CAN2-L / Wake-up from Suspend	CAN2-L	CAN2-L
Pin 10	CAN2-H / Wake-up from Suspend	CAN2-H / Wake-up from Suspend	CAN2-H	CAN2-H
Pin 11	Key switch STB (Switched +Battery) with STB / Controlled Shutdown	Key switch STB (Switched +Battery) with STB / Controlled Shutdown	Keyswitch STB (Switched +Battery) with STB / Controlled Shutdown	Keyswitch STB (Switched +Battery) with STB / Controlled Shutdown
Pin 12	Battery (+) Outputs Pins 15-18 (Max 15A) with STB Diagnostic	Battery (+) Outputs Pins 15-18 (Max 15A) with STB Diagnostic	Battery (+) Outputs Pins 15-18 (Max 15A) with STB Diagnostic	Battery (+) Outputs Pins 15-18 (Max 15A) with STB Diagnostic
Pin 13	Input STB/STG/TRI/VTD1/VTD2/ FREQ/20mA/RTD2 / 5V Sensor Supply / Output Analog (0-10V)	Input STB/STG/TRI/VTD1/VTD2/ FREQ/20mA/RTD2 / 5V Sensor Supply / Output Analog (0-10V)	5V Sensor Supply (w VTD1 Diagnostic)	5V Sensor Supply (w VTD1 Diagnostic)
Pin 14	Input STB/STG/TRI/VTD1/VTD2/ FREQ/20mA/RTD2 / 5V Sensor Ground / Output Analog (0-10V)	Input STB/STG/TRI/VTD1/VTD2/ FREQ/20mA/RTD2 / 5V Sensor Ground / Output Analog (0-10V)	5V Sensor Ground (w VTD1 Diagnostic)	5V Sensor Ground (w VTD1 Diagnostic)
Pin 15	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 2)
Pin 16	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 2)
Pin 17	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 2)
Pin 18	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG/TRI/VTD1 (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 2)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 2)
Note 1	Return(-) pins must be paired with Sourcing Output on B-Key Connector			
Note 2	Return(-) pins must be paired with Sourcing Output on C-Key Connector			
Note 3	"/" means software configurable			
Note 4	Distribute inductive loads evenly across all connectors (Flyback Grounds)			
Bank 1, 2	Each pin within bank can be independently configured as Output or any Input type.			
Bank 3, 4, 9	All 4x pins must be configured as Inputs or Outputs. When configured as Inputs, each pin can independently be STB or STG. When configured as Inputs, do not wire BAT(+) pin to Battery, leave unconnected.			
Bank 5, 6, 7, 8	All 4x pins must be configured as Inputs or Outputs. When configured as Inputs, all 4x pins must be all STB or all STG. When configured as Inputs, do not wire BAT(+) pin to Battery, leave unconnected.			

VTD1 = 0-5.5VDC
VTD2 = 0-35VDC
RTD1 = 0-500ohms
RTD2 = 0-2Kohms



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18 PIN DEUTSCH - B-Key PINOUT CONFIGURATION DETAILS

PIN	CL-4004-104 Configuration (Pro)	CL-4004-105 Configuration (Plus)	CL-4004-106 Configuration (Base)	CL-4004-102 Configuration (Flex)
Pin 1	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)
Pin 2	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)
Pin 3	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)
Pin 4	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 3)
Pin 5	Input STB/STG/TRI/VTD1/VTD2 (Wake-Up STB/STG)	Input STB/STG/TRI/VTD1/VTD2 (Wake-Up STB/STG)	Input STB	Input STB
Pin 6	BAT(+) Outputs Pins 1-4 (Max 15A) with STB Diagnostic	BAT(+) Outputs Pins 1-4 (Max 15A) with STB Diagnostic	BAT(+) Outputs Pins 1-4 (Max 15A) with STB Diagnostic	BAT(+) Outputs Pins 1-4 (Max 15A) with STB Diagnostic
Pin 7	Battery (-) for Sourcing Output(+) Flyback & Out(-) pins B8,B9,B13,B14	Battery (-) for Sourcing Output(+) Flyback & Out(-) pins B8,B9,B13,B14	Battery (-) for Sourcing Output(+) Flyback	Battery (-) for Sourcing Output(+) Flyback
Pin 8	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG/TRI/ VTD1 (Note 1)	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG/TRI/ VTD1 (Note 1)	Input STB	Input STB
Pin 9	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG/TRI/ VTD1 (Note 1)	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG/TRI/ VTD1 (Note 1)	Input STB	Input STB
Pin 10	CAN3-L / Wake-up from Suspend	CAN3-L / Wake-up from Suspend	Input STB	Input STB
Pin 11	CAN3-H / Wake-up from Suspend	CAN3-H / Wake-up from Suspend	Input STB	Input STB
Pin 12	BAT(+) Outputs Pins 15-18 (Max 15A) with STB	BAT(+) Outputs Pins 15-18 (Max 15A) with STB	BAT(+) Outputs Pins 15-18 (Max 15A) with STB Diagnostic	BAT(+) Outputs Pins 15-18 (Max 15A) with STB Diagnostic
Pin 13	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG/TRI/ VTD1 (Note 1)	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG/TRI/ VTD1 (Note 1)	Input STB	Input STB
Pin 14	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG/TRI/ VTD1 (Note 1)	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG/TRI/ VTD1 (Note 1)	Input STB	Input STB
Pin 15	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)
Pin 16	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)
Pin 17	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)
Pin 18	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)	Output DOUT/PWM/ECC(+)(5A) / Input STB/STG (Bank 4)
Note 1	Return(-) pins must be paired with Sourcing Output on B-Key Connector			
Note 2	Return(-) pins must be paired with Sourcing Output on C-Key Connector			
Note 3	"/" means software configurable			
Note 4	Distribute inductive loads evenly across all connectors (Flyback Grounds)			
Bank 1, 2	Each pin within bank can be independently configured as Output or any Input type.			
Bank 3, 4, 9	All 4x pins must be configured as Inputs or Outputs. When configured as Inputs, each pin can independently be STB or STG. When configured as Inputs, do not wire BAT(+) pin to Battery, leave unconnected.			
Bank 5, 6, 7, 8	All 4x pins must be configured as Inputs or Outputs. When configured as Inputs, all 4x pins must be all STB or all STG. When configured as Inputs, do not wire BAT(+) pin to Battery, leave unconnected.			

VTD1 = 0-5.5VDC
VTD2 = 0-35VDC
RTD1 = 0-500ohms
RTD2 = 0-2Kohms



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18 PIN DEUTSCH - C-Key PINOUT CONFIGURATION DETAILS

PIN	CL-4004-104 Configuration (Pro)	CL-4004-105 Configuration (Plus)	CL-4004-106 Configuration (Base)	CL-4004-102 Configuration (Flex)
Pin 1	BAT(+) Outputs Pins 2-5 (Max 15A) with STB Diagnostic (Bank 5)	BAT(+) Outputs Pins 2-5 (Max 15A) with STB Diagnostic (Bank 5)	BAT(+) Outputs Pins 2-5 (Max 15A) with STB Diagnostic (Bank 5)	BAT(+) Outputs Pins 2-5 (Max 15A) with STB Diagnostic (Bank 5)
Pin 2	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)
Pin 3	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)
Pin 4	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)
Pin 5	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 5)
Pin 6	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)
Pin 7	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)
Pin 8	Battery (-) for Sourcing Output(+) Flyback & Out(-) pins D15-D18	Battery (-) for Sourcing Output(+) Flyback & Out(-) pins D15-D18	Battery (-) for Sourcing Output(+) Flyback & Out(-) pins D15-D18	Battery (-) for Sourcing Output(+) Flyback & Out(-) pins D15-D18
Pin 9	Input STB/STG/TRI/VTD1/FREQ	Input STB/STG/TRI/VTD1/FREQ	Input STB/STG/TRI/VTD1/FREQ	Input STB
Pin 10	Input STB/STG/TRI/VTD1/FREQ	Input STB/STG/TRI/VTD1/FREQ	Input STB/STG/TRI/VTD1/FREQ	Input STB
Pin 11	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)
Pin 12	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)
Pin 13	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)
Pin 14	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)
Pin 15	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 7)
Pin 16	BAT(+) Outputs Pins 7, 13-15 (Max 15A) with STB Diagnostic (Bank 7)	BAT(+) Outputs Pins 7, 13-15 (Max 15A) with STB Diagnostic (Bank 7)	BAT(+) Outputs Pins 7, 13-15 (Max 15A) with STB Diagnostic (Bank 7)	BAT(+) Outputs Pins 7, 13-15 (Max 15A) with STB Diagnostic (Bank 7)
Pin 17	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 6)
Pin 18	BAT(+) Outputs Pins 6,11,12,17 (Max 15A) with STB Diagnostic (Bank 6)	BAT(+) Outputs Pins 6,11,12,17 (Max 15A) with STB Diagnostic (Bank 6)	BAT(+) Outputs Pins 6,11,12,17 (Max 15A) with STB Diagnostic (Bank 6)	BAT(+) Outputs Pins 6,11,12,17 (Max 15A) with STB Diagnostic (Bank 6)
Note 1	Return(-) pins must be paired with Sourcing Output on B-Key Connector			
Note 2	Return(-) pins must be paired with Sourcing Output on C-Key Connector			
Note 3	"/" means software configurable			
Note 4	Distribute inductive loads evenly across all connectors (Flyback Grounds)			
Bank 1, 2	Each pin within bank can be independently configured as Output or any Input type.			
Bank 3, 4, 9	All 4x pins must be configured as Inputs or Outputs. When configured as Inputs, each pin can independently be STB or STG. When configured as Inputs, do not wire BAT(+) pin to Battery, leave unconnected.			
Bank 5, 6, 7, 8	All 4x pins must be configured as Inputs or Outputs. When configured as Inputs, all 4x pins must be all STB or all STG. When configured as Inputs, do not wire BAT(+) pin to Battery, leave unconnected.			

VTD1 = 0-5.5VDC
VTD2 = 0-35VDC
RTD1 = 0-500ohms
RTD2 = 0-2Kohms



CL-4004 CONTROL MODULE | Preliminary Product Specifications

18 PIN DEUTSCH - D-Key PINOUT CONFIGURATION DETAILS

PIN	CL-4004-104 Configuration (Pro)	CL-4004-105 Configuration (Plus)	CL-4004-106 Configuration (Base)	CL-4004-102 Configuration (Flex)
Pin 1	CAN4-L	CAN4-L	CAN4-L	Input STB
Pin 2	CAN4-H	CAN4-H	CAN4-H	Input STB
Pin 3	Input STB/STG/TRI/VTD1	Input STB/STG/TRI/VTD1	Input STB	Input STB
Pin 4	Input STB/STG/TRI/VTD1	Input STB/STG/TRI/VTD1	Input STB	Input STB
Pin 5	Input STB/STG/TRI/VTD1/FREQ	Input STB/STG/TRI/VTD1/FREQ	Input STB/STG/TRI/VTD1/FREQ	Input STB/STG/TRI/VTD1/FREQ
Pin 6	Input STB/STG/TRI/VTD1/FREQ	Input STB/STG/TRI/VTD1/FREQ	Input STB/STG/TRI/VTD1/FREQ	Input STB/STG/TRI/VTD1/FREQ
Pin 7	Input STB/STG/TRI/VTD1/VTD2	Input STB/STG/TRI/VTD1/VTD2	Input VTD1/VTD2	Input VTD1/VTD2
Pin 8	Input STB/STG/TRI/VTD1/VTD2	Input STB/STG/TRI/VTD1/VTD2	Input VTD1/VTD2	Input VTD1/VTD2
Pin 9	Input STB/STG/TRI/VTD1/ VTD2/20mA/RTD2	Input STB/STG/TRI/VTD1/ VTD2/20mA/RTD2	Input STB/STG/TRI/VTD1/ VTD2/20mA/RTD2	Not used
Pin 10	Input STB/STG/TRI/VTD1/ VTD2/20mA/RTD2	Input STB/STG/TRI/VTD1/ VTD2/20mA/RTD2	Input STB/STG/TRI/VTD1/ VTD2/20mA/RTD2	Not used
Pin 11	Input STB/STG/VTD1	Input STB/STG/VTD1	Input STB	Input STB
Pin 12	Input STB/STG/VTD1	Input STB/STG/VTD1	Input STB	Input STB
Pin 13	Input STB/STG/VTD2	Input STB/STG/VTD2	Input STB	Input STB
Pin 14	Input STB/STG	Input STB/STG	Input STB	Input STB
Pin 15	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG (Note 2)
Pin 16	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT/ PWM(-)(2.5A) / Input STB/STG (Note 2)
Pin 17	Return(-) for 2-Wire CC / DOUT(-) (2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT(-) (2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT(-) (2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT(-) (2.5A) / Input STB/STG (Note 2)
Pin 18	Return(-) for 2-Wire CC / DOUT(-) (2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT(-) (2.5A) / Input STB/STG (Note 2)	Return(-) for 2-Wire CC / DOUT(-) (2.5A) / Input STB/STG (Note 2)	Input STB
Note 1	Return(-) pins must be paired with Sourcing Output on B-Key Connector			
Note 2	Return(-) pins must be paired with Sourcing Output on C-Key Connector			
Note 3	"/" means software configurable			
Note 4	Distribute inductive loads evenly across all connectors (Flyback Grounds)			
Bank 1, 2	Each pin within bank can be independently configured as Output or any Input type.			
Bank 3, 4, 9	All 4x pins must be configured as Inputs or Outputs. When configured as Inputs, each pin can independently be STB or STG. When configured as Inputs, do not wire BAT(+) pin to Battery, leave unconnected.			
Bank 5, 6, 7, 8	All 4x pins must be configured as Inputs or Outputs. When configured as Inputs, all 4x pins must be all STB or all STG. When configured as Inputs, do not wire BAT(+) pin to Battery, leave unconnected.			

VTD1 = 0-5.5VDC
VTD2 = 0-35VDC
RTD1 = 0-500ohms
RTD2 = 0-2Kohms



CL-4004 CONTROL MODULE | Preliminary Product Specifications

18 PIN DEUTSCH - E-Key PINOUT CONFIGURATION DETAILS

PIN	CL-4004-104 Configuration (Pro)	CL-4004-105 Configuration (Plus)	CL-4004-106 Configuration (Base)	CL-4004-102 Configuration (Flex)
Pin 1	Battery (-) for Sourcing Output(+) Flyback		Battery (-) for Sourcing Output(+) Flyback	Battery (-) for Sourcing Output(+) Flyback
Pin 2	BAT(+) Outputs Pins 3-6 (Max 15A) with STB Diagnostic (Bank 8)		BAT(+) Outputs Pins 3-6 (Max 15A) with STB Diagnostic (Bank 8)	BAT(+) Outputs Pins 3-6 (Max 15A) with STB Diagnostic (Bank 8)
Pin 3	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)		Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)
Pin 4	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)		Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)
Pin 5	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)		Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)
Pin 6	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)		Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 8)
Pin 7	Input STB/VTD1/VTD2		Input VTD1/VTD2	Input VTD1/VTD2
Pin 8	CAN5-L		Input STB	Input STB
Pin 9	CAN5-H		Input STB	Input STB
Pin 10	Input STB		Input STB	Input STB
Pin 11	Input STB/VTD1/VTD2		Input VTD1/VTD2	Input VTD1/VTD2
Pin 12	Input STB/VTD1/20mA/RTD2		Input STB/VTD1/20mA/RTD2	Input STB
Pin 13	Input STB/VTD1/20mA/RTD2		Input STB/VTD1/20mA/RTD2	Input STB
Pin 14	BAT(+) Outputs Pins 15-18 (Max 15A) with STB Diagnostic (Bank 9)		BAT(+) Outputs Pins 15-18 (Max 15A) with STB Diagnostic (Bank 9)	BAT(+) Outputs Pins 15-18 (Max 15A) with STB Diagnostic (Bank 9)
Pin 15	Output DOUT/PWM/ECC(+) (13A) / Input STB/STG (Bank 9)		Input STB	Input STB
Pin 16	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 9)		Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 9)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 9)
Pin 17	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 9)		Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 9)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 9)
Pin 18	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 9)		Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 9)	Output DOUT/PWM/ECC(+) (5A) / Input STB/STG (Bank 9)
Note 1	Return(-) pins must be paired with Sourcing Output on B-Key Connector			
Note 2	Return(-) pins must be paired with Sourcing Output on C-Key Connector			
Note 3	"/" means software configurable			
Note 4	Distribute inductive loads evenly across all connectors (Flyback Grounds)			
Bank 1, 2	Each pin within bank can be independently configured as Output or any Input type.			
Bank 3, 4, 9	All 4x pins must be configured as Inputs or Outputs. When configured as Inputs, each pin can independently be STB or STG. When configured as Inputs, do not wire BAT(+) pin to Battery, leave unconnected.			
Bank 5, 6, 7, 8	All 4x pins must be configured as Inputs or Outputs. When configured as Inputs, all 4x pins must be all STB or all STG. When configured as Inputs, do not wire BAT(+) pin to Battery, leave unconnected.			

VTD1 = 0-5.5VDC
VTD2 = 0-35VDC
RTD1 = 0-500ohms
RTD2 = 0-2Kohms

