

DEWE-ORION-1624-20X

- 16 simultaneous sampled channels
- 204.8 kS/s per channel
- 24 bit resolution
- 4 input ranges (from ± 1.25 V to ± 10 V)
- Synchronous digital inputs
- 8 digital I/Os, e.g. alarm output
- 32 bit synchronous counter/encoder
- 2 synchronous CAN interfaces



Model Overview

Model	Analog input channels	Max. sampling rate / channel	Digital input channels	Digital I/O	Ext. Clock	Ext. Trigger	Counter Encoder TTL	Counter Encoder ADJ	CAN
DEWE-ORION-1624-200	16	204.8 kS/s	2 (8*)	8	-	1	2	-	-
DEWE-ORION-1624-201	16	204.8 kS/s	2 (8*)	8	-	1	2	-	2
DEWE-ORION-1624-202	16	204.8 kS/s	10 (40*)	8	-	1	2 + 8	-	-
DEWE-ORION-1624-203	16	204.8 kS/s	10 (40*)	8	-	1	2 + 8	-	2
DEWE-ORION-1624-204	16	204.8 kS/s	10 (40*)	8	-	1	2	8	-
DEWE-ORION-1624-205	16	204.8 kS/s	10 (40*)	8	-	1	2	8	2

* Without using counter inputs

Analog Input Specifications

Analog input	
Channel characteristics	
Number of channels	16, simultaneously sampled
Input configuration	Symmetric, differential
Resolution	24 bit, nominal
Type of ADC	Delta-sigma
Sampling rate	204.8 kS/s per channel
Data throughput	3.2 MS/s
Oversampling, for sample rate (fs)	
Frequency accuracy	± 25 ppm
$1 \text{ kS/s} \leq f_s \leq 51.2 \text{ kS/s}$	$256 f_s$
$51.2 \text{ kS/s} < f_s \leq 102.4 \text{ kS/s}$	$128 f_s$
$102.4 \text{ kS/s} < f_s \leq 204.8 \text{ kS/s}$	$64 f_s$
Input signal range	± 10 V peak
FIFO buffer size	4096 samples
Data transfers	DMA
Transfer characteristics	
DC accuracy; range ± 10 V	% of reading % of range
$1 \text{ kS/s} \leq f_s \leq 51.2 \text{ kS/s}$	± 0.058 % ± 0.005 %
$51.2 \text{ kS/s} < f_s \leq 102.4 \text{ kS/s}$	± 0.058 % ± 0.007 %
$102.4 \text{ kS/s} < f_s \leq 204.8 \text{ kS/s}$	± 0.058 % ± 0.015 %
Gain drift	± 15 ppm/K
Amplifier characteristics	
Input impedance (ground referenced)	
Positive input	10 M Ω in parallel with 60 pF
Negative input	10 M Ω in parallel with 60 pF
Overvoltage protection	
Positive input	± 30 V
Negative input	± 30 V

Common mode rejection ratio (CMRR) $f_{in} < 1 \text{ kHz}$	> 60 dB, typ.
Flatness digital filter $1 \text{ kS/s} \leq f_s \leq 51.2 \text{ kS/s}$ $51.2 \text{ kS/s} < f_s \leq 102.4 \text{ kS/s}$ $102.4 \text{ kS/s} < f_s \leq 204.8 \text{ kS/s}$	-0.035 dB to +0.01 dB, DC to $0.475 f_s$ -0.035 dB to +0.01 dB, DC to $0.45 f_s$ -0.035 dB to +0.01 dB, DC to $0.246 f_s$
-3 dB bandwidth digital filter $1 \text{ kS/s} \leq f_s \leq 51.2 \text{ kS/s}$ $51.2 \text{ kS/s} < f_s \leq 102.4 \text{ kS/s}$ $102.4 \text{ kS/s} < f_s \leq 204.8 \text{ kS/s}$	$0.494 f_s$ $0.49 f_s$ $0.38 f_s$
Analog bandwidth -1 dB bandwidth -3 dB bandwidth	200 kHz 320 kHz
Maximum working voltage	
Channel-to-ground, channel-to-channel	10 V, installation category I
Max. working voltage refers to the signal voltage plus common-mode voltage.	

Dynamic Characteristics

Dynamic characteristics	
Alias-free bandwidth (passband) $1 \text{ kS/s} \leq f_s \leq 51.2 \text{ kS/s}$ $51.2 \text{ kS/s} < f_s \leq 102.4 \text{ kS/s}$ $102.4 \text{ kS/s} < f_s \leq 200 \text{ kS/s}$	DC (0 Hz) to $0.42 f_s$ DC (0 Hz) to $0.32 f_s$ DC (0 Hz) to $0.22 f_s$
Alias rejection $1 \text{ kS/s} \leq f_s \leq 51.2 \text{ kS/s}$ $51.2 \text{ kS/s} < f_s \leq 102.4 \text{ kS/s}$ $102.4 \text{ kS/s} < f_s \leq 200 \text{ kS/s}$	-95 dB -92 dB -97 dB
Signal to noise $1 \text{ kS/s} \leq f_s \leq 51.2 \text{ kS/s}$ $51.2 \text{ kS/s} < f_s \leq 102.4 \text{ kS/s}$ $102.4 \text{ kS/s} < f_s \leq 200 \text{ kS/s}$	108 dB 105 dB 80 dB
Spurious free dynamic range 1kS to 51.2 kS/s 51.2kS to 102.4 kS/s 102.4kS to 200 kS/s	140 dB 137 dB 106 dB
THD ($1 \text{ kS/s} \leq f_s \leq 102.4 \text{ kS/s}$)	0 dB _{FS} input < -90 dB -20 dB _{FS} input < -100 dB -60 dB _{FS} input < -60 dB
Crosstalk (channel separation) f_{in} 0 to 10 kHz f_{in} 10 to 50 kHz	120 dB 105 dB
Typical interchannel gain mismatch	$\pm 0.002 \text{ dB}$
Filter delay through ADC $1 \text{ kS/s} \leq f_s \leq 51.2 \text{ kS/s}$ $51.2 \text{ kS/s} < f_s \leq 102.4 \text{ kS/s}$ $102.4 \text{ kS/s} < f_s \leq 200 \text{ kS/s}$	$12 / f_s$ $9 / f_s$ $5 / f_s$
Inter channel phase mismatch	$0.01^\circ * f_{in} \text{ (kHz)}$

Digital and Counter Input

Digital and Counter input	
Counter resolution	32 bit
Counter time base	80 MHz
Time base accuracy	25 ppm
Maximum input frequency	40 MHz
Input signal characteristic main board	
Compatibility	TTL/CMOS
Configuration	Pull-up with 100 kOhm
Input low level	-0.7 V to 0.8 V
Input high level	2 V to 5 V
Input low current	< -50 μ A
Input high current	< 10 μ A
Input capacitance	< 5 pF
Overvoltage protection (DI 0 to DI 7)	\pm 25 V continuous
Overvoltage protection (DI 8 to DI 15)	-1 to 6 V
Input signal characteristic CLK and Trigger	
Compatibility	TTL Schmitt trigger
Configuration	Pull-up with 100 kOhm
Input low level	-0.7 V to 2 V
Input high level	3 V to 5 V
Input low current	< -50 μ A
Input high current	< 10 μ A
Input capacitance	< 5 pF
Overvoltage protection	-1 to 6 V
Input signal characteristic expansion board with TTL input (used on ORION-1624-202 and -203)	
Compatibility	TTL/CMOS
Configuration	Pull-up with 100 kOhm
Input low level	-0.7 V to 0.8 V
Input high level	2 V to 5 V
Input low current	< -50 μ A
Input high current	< 10 μ A
Input capacitance	< 5 pF
Overvoltage protection	\pm 25 V continuous
Input signal characteristic expansion board with adjustable input (used on ORION-1624-204 and -205)	
Compatibility	Adjustable trigger levels
Configuration	Symmetric differential
Input coupling	DC / AC (1 Hz)
Input impedance (ground referenced)	1 MOhm / 5 pF
Bandwidth (-3dB)	5 MHz
Trigger adjustment range	0 to 40 V
Trigger resolution	40 mV
Trigger level accuracy	\pm 100 mV \pm 1% of trigger level
Common voltage range	-35 to 50V
Common mode rejection ratio	>40 dB
Overvoltage protection	\pm 100 V continuous
Max. DC level @AC coupling	\pm 50 V continuous
Input signal characteristic with isolated inputs (optional external cards)	
Compatibility	CMOS
Configuration	Isolated input
Input low level	$U_{IN} < 1.8$ V
Input high level	$U_{IN} > 3.2$ V
Input high current @ 5 V U_{IN}	< 3.5 mA
Input high current @ 30 V U_{IN}	< 7 mA
Propagation delay	< 160 nsec
Bandwidth	3 MHz
Overvoltage protection	35 V continuous (65 V peak)
Isolation voltage (channel to channel)	100 V
Isolation voltage (input to output)	250 V

Digital and Clock Divider Output

Digital and clock divider out	
Compatibility	TTL/CMOS
Characteristic	
Low voltage level	< 0.4 V @ 4 mA load
High voltage level	> 3 V @ 4 mA load
Output current	
Sink (low level)	-20 mA
Source (high level)	20 mA
Output impedance	50 Ohm

CAN Interface

CAN interface	
Specification	CAN 2.0B
Physical layer	High speed
Listen only mode	Supported
Galvanic isolation	Not isolated
Bus pin fault protection	±36 V
ESD protection	12 kV (HBM)
CAN transceiver	SNHVD235
PCI data transfere mode	DMA with SW pooling

Power Requirements

ORION Type	I_{12V} [mA]	I_{5V} [mA]	$I_{3.3V}$ [mA]	$P_{tot. I}$ [Watt]
ORION-1624-200	---	1300	---	6.5
ORION-1624-201	---	1370	---	6.9
ORION-1624-202	---	1420	---	7.1
ORION-1624-203	---	1490	---	7.5
ORION-1624-204	---	1620	---	8.1
ORION-1624-205	---	1690	---	8.5

General Specifications

General Specifications	
Environmental	
Operating temperature	0 to 50 °C
Storage temperature	-20 to 70 °C
Relative humidity	10 to 90%, non condensing
Maximum altitude	2000 m
Pollution degree (indoor use only)	2
Physical	
Dimensions (not including connectors)	17.5 x 10.7 cm (6.9 x 4.2 in.)
Analog input connector (main board)	68-pin SCSI male (AMP 174341-5)
Counter input connector (expansion)	68-pin SCSI male (Honda PCS-68LMD)
CAN input connector	
SUBD	2 x D-Sub 9-pin male
Lemo	7-pin Lemo connector female (Type: EPG.0B.307.HLN)