

The Synchronous Junction Unit (SJU) is a high performance expansion IO module that works in conjunction with a CLU Data Logger to provide synchronised high precision logging of high speed analogue and digital inputs.

24 independent 16bit Delta-Sigma ($\Delta\Sigma$) ADCs each sample simultaneously at 50kHz and incorporate multi-stage FIR filters to provide filtered samples at 1kHz; perfect for advanced chassis and suspension analysis.

Up to 5 SJU devices can be connected and synchronised together using a single EtherCAT network; so that every SJU in the system samples its high resolution inputs at exactly the same point in time. This is critical when analysing the relationship between signals collected from different sensors around the vehicle.

SJU's offer the flexibility of locating the acquisition close to sensors, reducing the weight and complexity of wiring.

Plus supports many different types of sensors, including



amplified strain gauges, linear potentiometers, PT100, PT1000, hall effect, VRS and DF11i wheel speed sensors.

High power sensors or low power actuators maybe powered from any of the 6 HSD outputs, which are capable of pulse width modulation (PWM).

Specifications

Electrical Data	
Supply Voltage	6-32V
Supply Current	296mA* ¹ @ 13.8V
Data Transmission	All channels available at 1Khz
Digital Inputs	Digital Inputs 4x High Frequency (10kHz) supports hall effect/VRS/DF11i speed sensor Supports IR lap timing & switches Selectable 3k3 pull-up to 5V or level shift for passive sensors
Analogue Inputs	24x Analogue Inputs* ² 0 to 5V 16 bit resolution 2.2M Ω input impedance Synchronous sampling 8x Analogues (AIN1-8)* ² Selectable 330R Pull Up for PT100 Sensors Multi-stage FIR filter
Excitations	8x 5V \pm 0.25% supply @ 100mA _{max} 4x software selectable 5V/12V 5V \pm 0.25% @ 100mA _{max} 12V \pm 0.5V @ 700mA _{max} 2.9A total max current for all 4 excitations
PWM HSD's	6x HSD/PWM Battery voltage +0/-0.5V @ 700mA 400Hz Maximum PWM Frequency

*1 Supply current based on unit only, with all excitations connected this could be up to 3.1A

*2 Only analogue inputs 1 to 8 have software selectable 330R pullups for use with PT100 sensors

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Electrical Data	
Serial Debug Port	1x Bi-directional RS232 Fixed at 115200 BAUD rate
EtherCAT	2x EtherCAT Ports (1x IN 1x OUT)
LED's	4x Status LED's for Power and EtherCAT
Internal Monitoring	Battery Voltage Box Temp HSD Voltage and Current Sensor Excitations Internal PSU's

Mechanical Data	
Material	6082-T6
Dimensions	95x 102 x 34 mm
Weight	349 grams
Connectors	Deutsch Autosports
Fixings	4x M4 AV Mounts
Temperature Rating	Operating -20 to +70°C Storage -30 to +80°C
IP Rating	IPX6, IPX7

Ordering Information

Part Number	
01L-650050	SJU
60L-650060	SJU Bench Loom

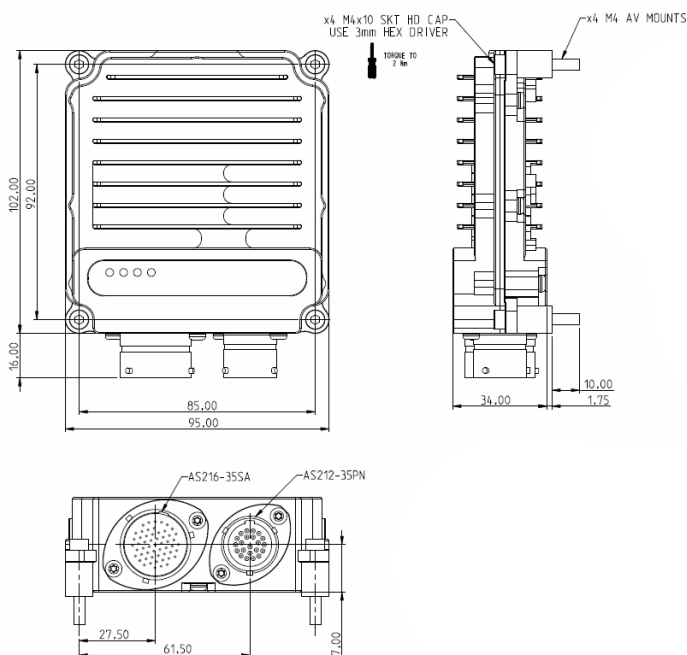
LED Indicator Definitions



Legend	Colour	LED Modes	LED Definition
⏻	Red	Off	No Power to the Unit
		Single Flash	1Hz 250ms On 750ms Off Initialising and looking for clock sync
		Blinking	1Hz 500ms On 500ms Off Sync achieved unit operational
RN	Green	Off	EtherCAT Initialisation
		Blinking	2.5Hz 200ms ON 200ms Off EtherCAT Pre-Operation
		Single Flash	2.5Hz 200ms On 1000ms Off EtherCAT Safe-Operation
		Flickering	10Hz 50ms On 50ms Off EtherCAT Initialisation or Bootstrap
		On	EtherCAT Operational
L/A I	Green	Off	EtherCAT No connection to the preceding module
		On	EtherCAT LINK: Connection to the preceding module
		Flickering	10Hz 50ms On 50ms Off EtherCAT ACT: Communication with preceding module
L/A O	Green	Off	No connection to the following module
		On	LINK: Connection to the following module
		Flickering	10Hz 50ms On 50ms Off ACT: Communication with following module

Dimensions

All dimensions shown in mm



Installation

- Ensure unit is protected against severe vibrations by mounting using supplied AV mounting kit. Also ensure unit is not fouling other structures which may experience severe vibrations.
- Ensure unit is positioned in an area with sufficient cooling air flow to prevent over heating.
- Ensure unit is mounted away from sources of electrical interference.
- Ensure unit is mounted in position where unit will not come into contact with water in excess of the devices IP rating.
- Ensure the case is isolated from the vehicle chassis ground using the supplied AV mounts.

Connector Information

All pin outs are grouped in function order rather than pin order.

C1- Expansion Connector

Connector	Mating connector
AS216-35SA	AS616-35PA

Pinout

Pin	Signal	Description
33	AIN1	
47	AIN2	
34	AIN3	8x Analogue Input with fixed 2M2 pull-down resistor
41	AIN4	Software selectable 330R pull-up to +5V
42	AIN5	Input filter 234kHz
48	AIN6	ADC filter response 22.5kHz
53	AIN7	Adaptive digital filtering dependent upon sample frequency
27	AIN8	0 to 5V input with 16 bit resolution
43	AIN9	
35	AIN10	
44	AIN11	
36	AIN12	
38	AIN13	
37	AIN14	
29	AIN15	16x Analogue Input with fixed 2M2 pull-down resistor
23	AIN16	Input filter 234kHz
15	AIN17	ADC filter response 22.5kHz
14	AIN18	Adaptive digital filtering dependent upon sample frequency
13	AIN19	0 to 5V input with 16 bit resolution
7	AIN20	
20	AIN21	
12	AIN22	
11	AIN23	
4	AIN24	
19	DIGIN1	
18	DIGIN2	4x Digital Inputs
10	DIGIN3	Selectable 3k3 pull-up to 5V or level shift for passive sensors.
17	DIGIN4	

C1- Expansion Connector Continued

Pin	Signal	Description
16	EXT5/12VPSU1	4 x 5V or 12V software selectable excitation 5V @ 100mA, 12V @ 700mA 2.9A total max current for all 4 excitations
9	EXT5/12VPSU2	
8	EXT5/12VPSU3	
3	EXT5/12VPSU4	
54	EXT5VPSU1	8 x 5V Excitation @100mA
55	EXT5VPSU2	
51	EXT5VPSU3	
52	EXT5VPSU4	
46	EXT5VPSU5	
39	EXT5VPSU6	
31	EXT5VPSU7	
24	EXT5VPSU8	
5	PWM4	400Hz maximum PWM frequency Switches between ground and battery voltage @ 700mA
1	PWM5	
2	PWM6	
6	GND	12 x Grounds These are all common connections which can be used for any ground connection
21	GND	
22	GND	
25	GND	
26	GND	
28	GND	
30	GND	
32	GND	
40	GND	
45	GND	
49	GND	
50	GND	

C2- System Connector

Connector	Mating connector
AS212-35PN	AS612-35SN

Pinout

Pin	Signal	Description
8	BATT+	Battery Supply +VE
9	BATT+	
4	BATT-	Battery Supply -VE
5	BATT-	
19	PWM1	400Hz maximum PWM frequency Switches between ground and battery voltage @ 700mA
10	PWM2	
20	PWM3	
7	ECATINTX+	EtherCAT 100BaseT IN
18	ECATINTX-	
17	ECATINRX+	
6	ECATINRX-	
3	ECATOUTTX+	EtherCAT 100BaseT OUT
16	ECATOUTTX-	
15	ECATOUTRX+	
2	ECATOUTRX-	
14	RS232DEBTX	RS232 Debug
21	RS232DEBRX	
22	RS232DEBGND	
1	Unused	Unused pins
11	Unused	
12	Unused	
13	Unused	

