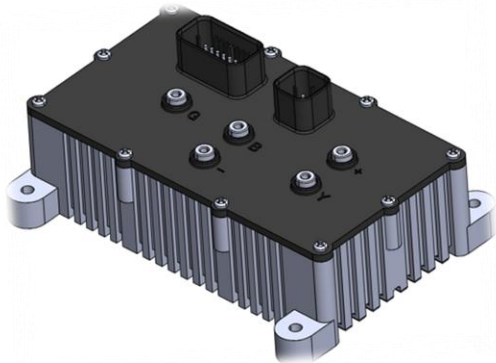




SRM Nikki Auto Systems Motor Drive Unit (MDU)

Motor Drive Unit (MDU)



- System voltage: 48 VDC and 72 VDC
- Rated Power - 4kW
- Peak Power - 6kW
- EMI/EMC – As per AIS 004-3

Application

- Two Wheelers
- Three Wheelers
- Agri-equipment
- Off-road vehicles



Specifications

Power Supply

Voltage range	40 - 59 VDC (48V) / 60 - 85 VDC (72V)
System voltage	48 / 72 VDC
Rated current	73 A _{rms}
Peak current	216 A _{rms}
Peak current Duration	30 Sec

CAN Communication

CAN & version	CAN 2.0B (500kbps)
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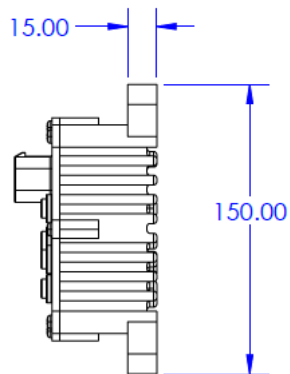
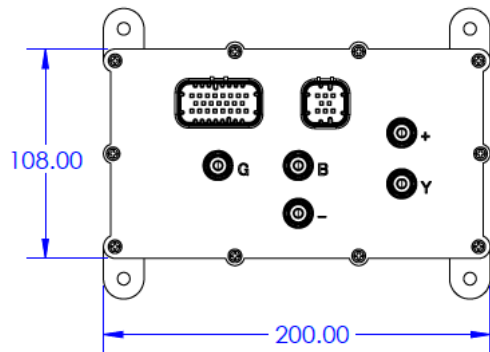
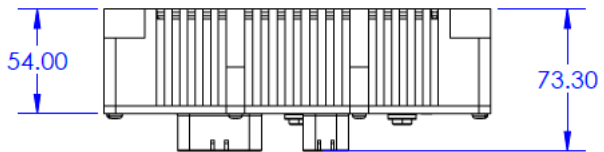
Mechanical parameter

Weight	2.5 kg
Dimension	(L X W X H) - 200 X 150 X 78 (all in mm)

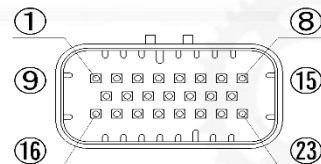
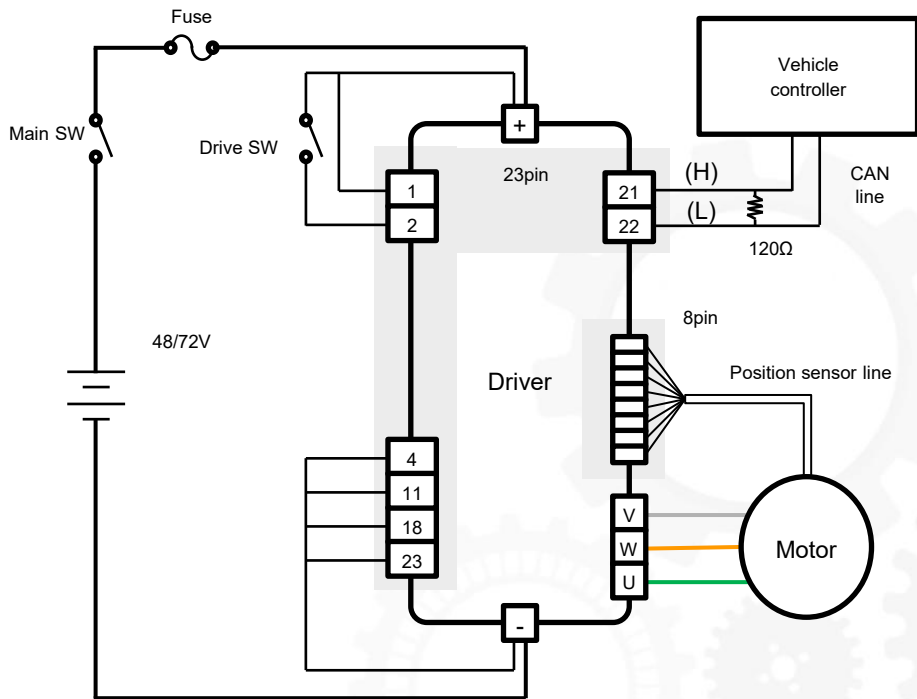
Ambient

Operating temperature	-20 to 60°C
IP grade	IP65
Cooling method	Natural (air)

Dimensions (in mm)



Block Diagram & PIN Configuration

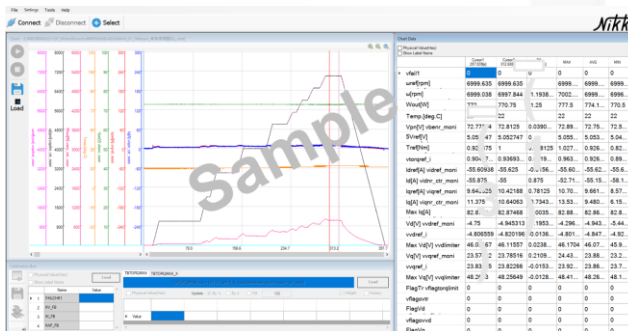


Function	
Pin	Function
1	Main power supply
2	Drive switch (Sub power supply)
3	-
4	GND
5	5V output for sensor (spare)
6	SW input (spare)
7	A/D input (spare)
8	A/D input (spare)
9	SW input (spare)
10	SW input (spare)
11	Sensor GND
12	SW input (spare)
13	SW input (spare)
14	SW input (spare)
15	SW input (spare)
16	A/D input (spare)
17	-
18	Sensor GND
19	Relay signal output (spare)
20	Relay signal output (spare)
21	CAN communication H
22	CAN communication L
23	System GND

Data analysis & monitoring tools

□ Data collection, analysis, adaptation, and reprogramming can be completed with a single proprietary tool running on a Windows PC

- (1) Chart display
 - Data is collected via CAN communication and charts are displayed in real time.
 - Since there is a wide range of data that can be collected, it will be displayed upon request.
- (2) Data analysis
 - During measurement, the real time value is displayed.
 - After the measurement is completed, the minimum, maximum and average values can be analyzed.
 - csv file output is also possible.
- (3) Parameter conformity
 - During measurement, parameters such as the set speed, acceleration / deceleration speed, and torque can be changed.
- (4) Reprograming
 - Changed parameters and updated software can be written via CAN communication.



Data	Unit	Explanation
Fault condition	-	Recording failure determination information
Driver Temperature	°C	Driver thermistor temperature
Battery voltage	V	Input voltage to the driver
Motor speed directive	rpm	Target rotation speed (CAN reception value or set value)
Motor speed	rpm	Current motor speed
Output power	W	Calculated output power
Input power	W	Calculated input power
q-axis current directive	A	Target motor torque current
d-axis current directive	A	Target motor field-weakening current
q-axis current	A	Actual value of motor torque current
d-axis current	A	Actual value of motor field-weakening current

Control Method

□ Depending on the application, one of the following control methods can be selected

- Driven by switch only
 - The system starts at the preset rotation speed with a simple switch ON, and stops safely when switched OFF.
 - The preset speed and acceleration/deceleration can be configured in advance.
- Driven by analog inputs
 - By connecting a potentiometer to the driver, the motor can be driven with speed and torque corresponding to the input voltage.
- Operation according to received CAN data
 - Flexible control is enabled by inputting torque or speed setpoints via CAN communication.
 - Acceleration and deceleration can also be adjusted in real time via CAN communication.
 - Output power, current values, and fault conditions can be also monitored.
 - The CAN ID for data transmission and reception can be decided after consultation.

□ The following fault diagnosis and fail-safe ensure safe use in any situation.

Diagnostic items	Substance	Operation at fail-safe
Battery low voltage anomaly	Detects low voltage	Transition to deceleration or motor shutdown
Battery high voltage anomaly	High voltage detection	Transition to motor shutdown
Low RPM anomaly	Detects a significantly lower rpm than the set rpm	Transition to motor shutdown
High RPM anomaly	Detects a significantly higher rpm than the set rpm	Transition to motor shutdown
Position sensor anomaly	Detects position sensor failure	Transition to motor shutdown
High current anomaly	Detects a significantly higher current	Transition to motor shutdown
CAN communication interruption anomaly	Detects communication interruptions when CAN communication is used.	Transition to deceleration or motor shutdown



THANK YOU



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