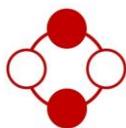


# KCU-04

## *CAN Bus J1939 Decoder Module*



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## SECTION 1 : INTRODUCTION

KCU-04 CAN Bus J1939 Decoder Module. Is an optional add-on device for the Kutai Electronics generator control units GCU-3000, (More compatible Kutai Electronics generator controller will be available at a later time) to decode CAN Bus J1939 digital signals from new generation engines and enabling generator controllers to maximum protections and operation.

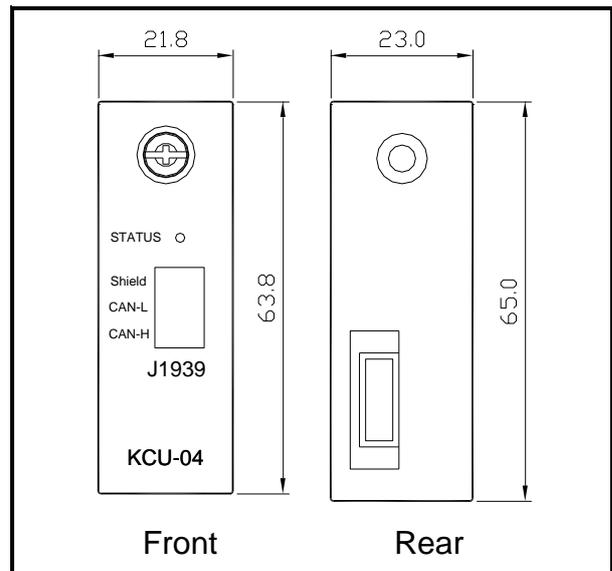
The KCU-04 helps to eliminate the needs for temperature, pressure and speed (MPU) sensors in a digital controlled system. The J1939 protocol from the CAN bus network are interpreted instantly and pass onto the generator controller.

CAN Bus Protocol : SAE-J1939

CAN Bus J1939 decode item :

- Engine coolant temperature  
Range : -40 ~ 210°C (Once per 1.0 Second)
- Engine oil Pressure  
Range : 0 ~ 1000kPa (Once per 0.5 Second)
- Engine Speed  
Range : 0 ~ 8031RPM (Once per 0.5 Second))
- Warning Message List :
  - Engine over Speed
  - Engine low Speed
  - Engine low oil pressure
  - High coolant temperature
  - Low fuel level
  - Low battery voltage
  - Other warning message (Once per 1.0 Second)

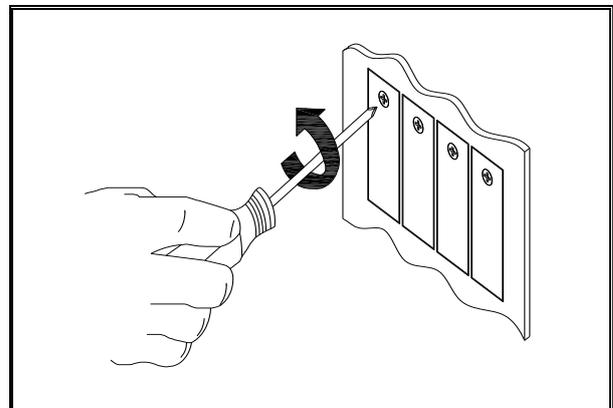
## SECTION 2 : DIMENSION



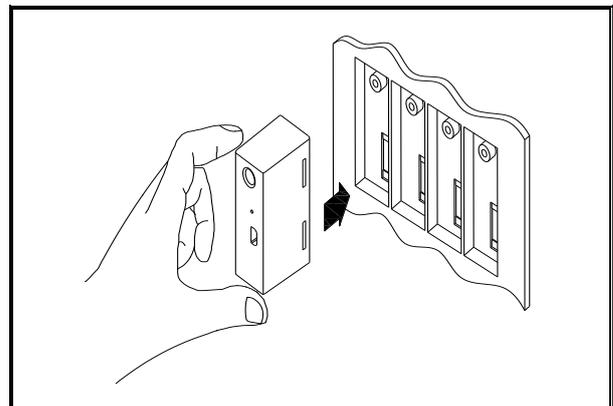
## SECTION 3 : INSTALLATION

Disconnect controller power source and follow the below illustrations to complete the installation of KCU-04.

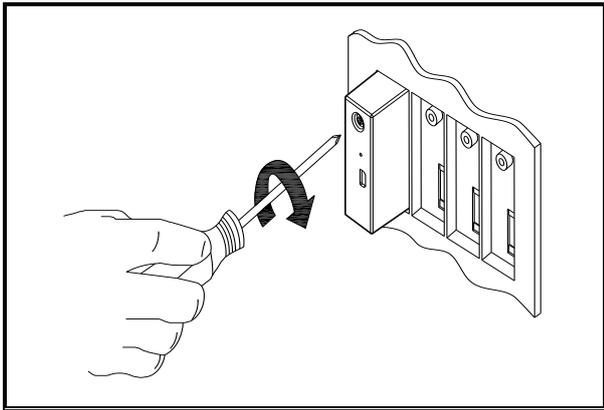
Step 1 : Remove slot cover from the back of controller.



Step 2 : Insert KCU-04 into the designated slot.



Step 3 : Tighten the screw.



Step 4 : Connect to CAN Bus network. The CAN Bus transmitting device and the KCU-04 connection must follow CAN-High connect to CAN-H, CAN-Low connect to CAN-L and shielded line connect to Shield.

Step 5 : After powering up the controller, enter the system setting to select whether to retrieve information through KCU-04 or not.

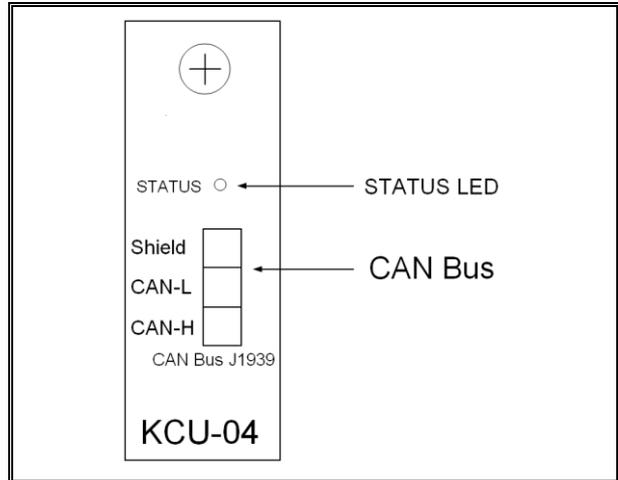
Currently the KCU-04 only support GCU-3000 generator controller. Listed below are the related settings. For details information, please refer to the controller user manual.

GCU-3000	
ITEM	DESCRIPTION
21	Equipped with oil pressure sender 00 → No 01 → Yes 02 → KCU-04

Note : If KCU-04 is disabled from system setting, the coolant temperature, oil pressure and engine speed (Frequency) values must be obtain by the sensors installed.

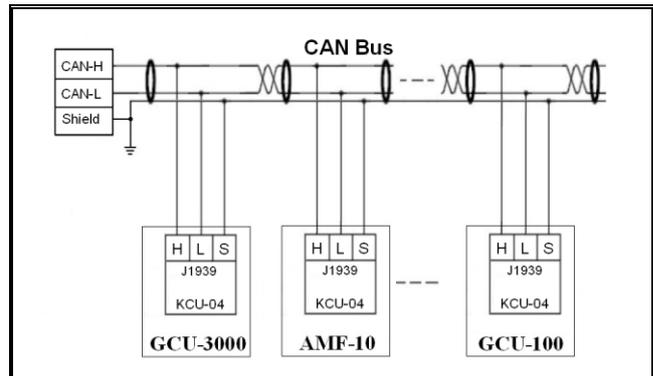
## SECTION 4 : OPERATION

For more information on KCU-04 Data link status LED indicator, please reference from chapter 5.



It is strongly suggested to use shielded dual-core braided harness for CAN Bus wiring connection with shielded grounding harness on one side.

CAN Bus Network connection example :



## SECTION 5 : STATUS INDICATOR & TROUBLESHOOTINGS

5.1 Through the KCU-04 LED status indicator user can understand the current operating status

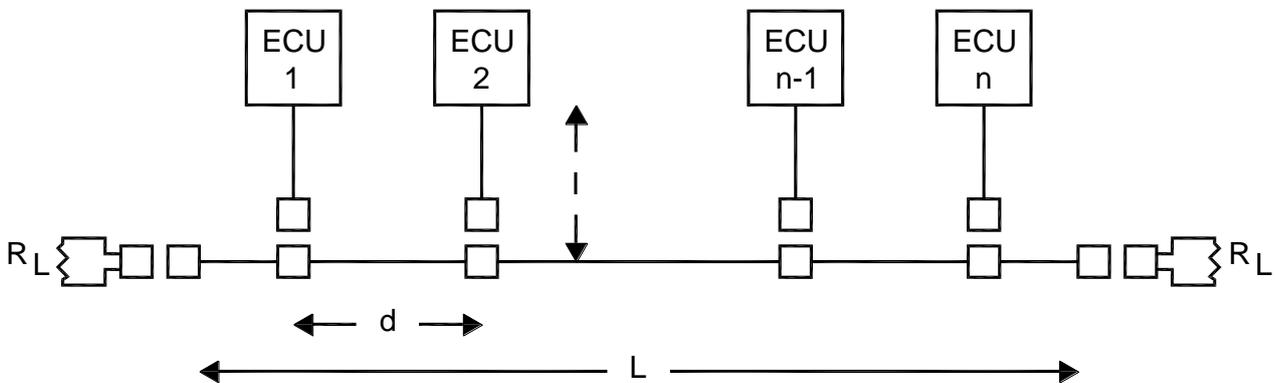
STATUS	DESCRIPTION
 Flash	KCU-04 communicating with Controller at link status
 On	KCU-04 disconnect with CAN Bus & can't decode J1939 information
 Flash	KCU-04 communicating with Controller in normal

5.2 Trouble shootings

STATUS	CAUSE OF FAILURE	TROUBLESHOOTING
 Flash	CAN Bus J1939	Contact the nearest dealer. Check controller version if firmware to support KCU-04.
 On	CAN Bus J1939	1. Check CAN Bus J1939 communication if normal. 2. Check for correctly connected CAN Bus network.

## SECTION 6 : J1939 NETWORK TOPOLOGY

SAE-J1939-11 protocol document defines the J1939 network topology and related provisions. For example from the following illustration, the number of ECU controller (n) is based and limited to the length of the main network. In a 40 meter network, the maximum number of nodes (ECUs) is 10 and if the network within 10 meters in length then maximum number of nodes (ECUs) is 30.



J1939 Network Topology

- Network to Node ECU Distance  $l$  :  $<1m$
- Node to Node ECU Distance  $d$  :  $0.1m\sim40m$
- Network Distance  $L$  :  $<40m$
- Terminating Resistor  $R_L$  : Standard  $120\Omega$ ,  $110\Omega\sim130\Omega$  (400mW)