

Syvecs KT8 V3

8 Ch EGT Module

This document is intended for use by a technical audience and describes a number of procedures that are potentially hazardous. Installations should be carried out by competent persons only.

Syvecs accepts no liability whatsoever for any damage caused by the incorrect installation or configuration of this equipment.

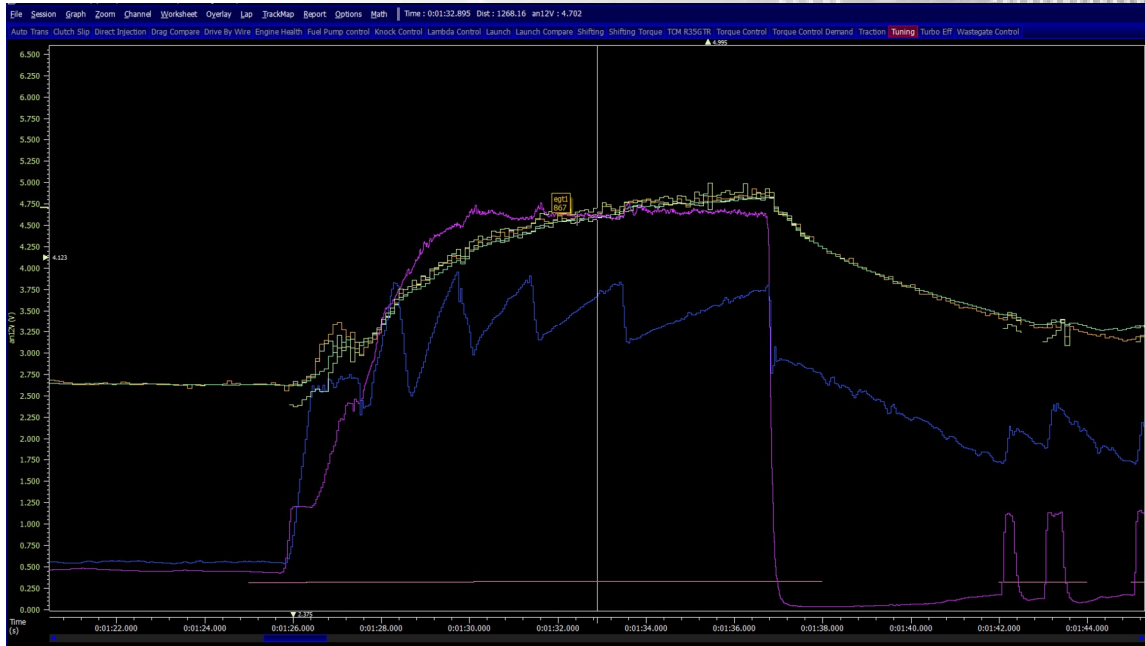
Note: Due to regular firmware development, images shown might not be the same as more recent firmware versions, please check our forums for updated manuals and changes. Support can be obtained by contacting your Syvecs dealer.

Syvecs KT8 V3
Manual Version 0.20
SCal Software Version 2.17.11
Hardware Version 24
Firmware Version 1.1.1
2/6/2025

Table of Contents

Introduction.....	3
Specifications / Maximum Ratings.....	3
Inputs.....	3
Outputs.....	3
Communication Interfaces.....	3
Power Supply.....	3
Physical.....	3
Pinout - Connector A.....	4
Connections.....	5
Power.....	5
Connections - Outputs.....	5
Connections - Inputs.....	5
EGT/Thermocouple Wiring.....	5
Connections - CAN Bus.....	6
Default CAN Data Stream.....	6
S-Cal Connection and Configuration.....	7
SCal Tips:.....	7
Receive Setup - S7Plus / S8 / S12.....	7
Receive Setup - S6-I & S6Plus / S7-I & S7Plus.....	8
Defining Custom Receive Data & Triggering PWM outputs.....	9
Define what CAN data to receive.....	9
Defining custom sensors.....	9
Controlling outputs based on incoming or internal sensor data.....	10

Introduction



The KT8 V3 Can Module is designed to provide even more data to our engine control units with accurate K Type thermocouple sensor readings over Can-bus. The V3 module now adds USB Scal Support, 2 x Configurable inputs and 2 x Configurable Outputs.

Temperature range from 0-1250c

Packaged in a lightweight CNC billet aluminium case with a 26 Position TE Connector.

Specifications / Maximum Ratings

Inputs

8x K Type thermocouple inputs.
2x AN 0-5v inputs with software available pull-up.

Outputs

2x Low current lowside outputs. Max 2Amps.

Communication Interfaces

USB For Updates and Configuration
2 x CAN 2.0B interface for communication with other controllers or logging systems. Software termination available.
1 x Kline Interface

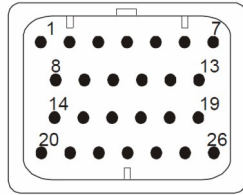
Power Supply

6 to 26V input voltage range

Physical

IP67 Sealed Automotive Spec -40c to 125c.
26 way Superseal 'B' 1.0 connector
L/W/H 87mm x 67mm x 41mm

Pinout - Connector A



B Type Connector	DESCRIPTION	CONNECTOR B	
	PART NUMBER	3-1437290-8	
	NOTES:	26 Way - Key1	
Syvecs Abbreviations	Pinout	Scal Assignment	Description
Ground	B1		Main Power Ground
KT1+	B2		+ K Type Connection
KT1-	B3		- K Type Connection
KT2+	B4		+ K Type Connection
KT2-	B5		- K Type Connection
Low Side Output 1	B6		Low Side Output Max 2A
12V	B7		12v Switched Ignition Supply
KT3+	B8		+ K Type Connection
KT3-	B9		- K Type Connection
KT4+	B10		+ K Type Connection
KT4-	B11		- K Type Connection
KT5+	B12		+ K Type Connection
KT5-	B13		- K Type Connection
Can0 Low (1mb)	B14		CAN0 Low 1mb
Can0 High (1mb)	B15		CAN0 High 1mb
Low Side Output2	B16		Low Side Output Max 2A
Can1 Low (500kb)	B17		CAN0 Low 500kb
Can1 High (500kb)	B18		CAN0 High 500kb
AN Input 1	B19		AN input 1
KT6+	B20		+ K Type Connection
KT6-	B21		- K Type Connection
KT7+	B22		+ K Type Connection
KT7-	B23		- K Type Connection
KT8+	B24		+ K Type Connection
KT8-	B25		- K Type Connection
AN Input 2	B26		AN input 2

KT8 V3 Low Side Outputs are for low current tasks only, max of 2amp.
AN Inputs have 5v Pull up Option also for Thermistor Sensors.

Please note! If upgrading V2 to V3, CAN H/L pins have switched between KT8 V2 and KT8 V3

Connections

Power

The power connections are as follows:

Syvecs Description	Pin	Notes
Power Ground	B1	Main ECU power Ground
12v Ignition Supply	B7	Ignition Switched 2A fuse protected 12V supply

Connections - Outputs

The low side outputs pull to ground when 'on'. They offer full pulse width modulation control. The outputs can be used to drive up to 2A Peak / 0.5A Continuous. These are suitable for small solenoids/lights etc, and both have software switchable 5v pull-up.

Pin Number	Function	Scal Assignment
B6	LSO1	LOW SIDE 1
B16	LSO2	LOW SIDE 2

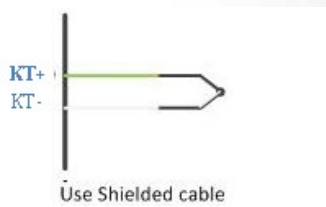
Connections - Inputs

The **KT8 V3** has 2 programmable analogue inputs available both with software switchable 5v pull-up.

Pin Number	Input	Scal Assignment	Notes
B19	AN1	AN1 (5V) : C1-18	0-5v
B26	AN2	AN2 (5V) : C1-09	0-5v

EGT/Thermocouple Wiring

Example Schematic

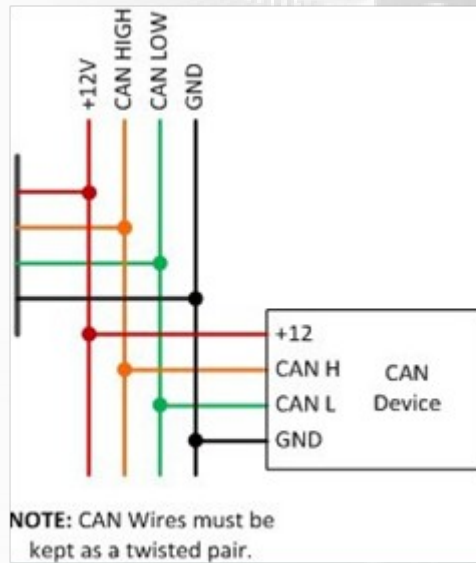


Pin Number	Function	Notes
2	KT1+	PositiveKTypeConnection
3	KT1-	NegativeKTypeConnection
4	KT2+	PositiveKTypeConnection
5	KT2-	NegativeKTypeConnection
8	KT3+	PositiveKTypeConnection
9	KT3-	NegativeKTypeConnection
10	KT4+	PositiveKTypeConnection
11	KT4-	NegativeKTypeConnection
12	KT5+	PositiveKTypeConnection
13	KT5-	NegativeKTypeConnection
20	KT6+	PositiveKTypeConnection
21	KT6-	NegativeKTypeConnection
22	KT7+	PositiveKTypeConnection
23	KT7-	NegativeKTypeConnection
24	KT8+	PositiveKTypeConnection
25	KT8-	NegativeKTypeConnection

Connections - CAN Bus

There are two CAN interfaces, CAN0 and CAN1. CAN1 is CAN FD capable with adjustable FD Rate. Both Can buses have software enabled 120ohm termination available.

Pin Number	Function	Notes
14	CAN0 Low	1 Mbps
15	CAN0 High	1 Mbps
17	CAN1 Low	500 Kbps
18	CAN1 High	500 Kbps



Default CAN Data Stream

The default data streams are compatible with our previous KT8 units. For custom installations the data streams are as follows:

Temperature data values are as follows = 0x0000 = 0deg C, 0x30DC = 1250 deg C

DBC Available here - <https://www.syvecs.com/forum/viewtopic.php?t=1552>

0.1c Resolution and 30ms CAN Transmission rate as default, can be sent up to 10ms rate

CAN Identifier 0xF6 – KT 1-4

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
KT1 (Signed Value) Big Endian – Deg C – Divide by 10		KT2 (Signed Value) Big Endian – Deg C – Divide by 10		KT3 (Signed Value) Big Endian – Deg C – Divide by 10		KT4 (Signed Value) Big Endian – Deg C – Divide by 10	

CAN Identifier 0xF7 – KT 5-8

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
KT5 (Signed Value) Big Endian – Deg C – Divide by 10		KT6 (Signed Value) Big Endian – Deg C – Divide by 10		KT7 (Signed Value) Big Endian – Deg C – Divide by 10		KT8 (Signed Value) Big Endian – Deg C – Divide by 10	

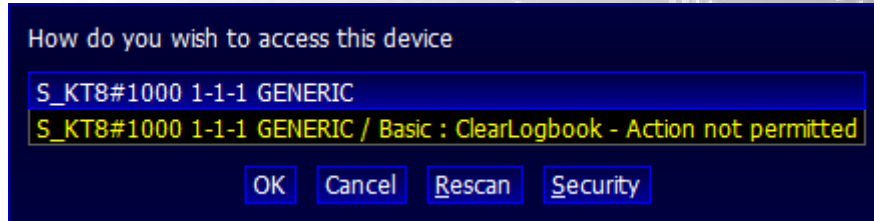
CAN Identifier 0xF8 – AN1-2

Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
AN1 (Signed Value) Big Endian – V– Divide by 10		AN2 (Signed Value) Big Endian – V– Divide by 10					

S-Cal Connection and Configuration

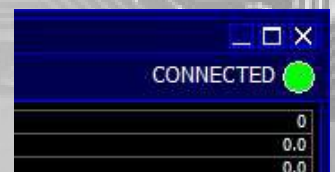
A USB C port is found on the back of the KT8 which is used for calibration changes on the device. The S-Suite software can be downloaded from <https://www.syvecs.com/software/>

After running the SSuite installer, open S-Cal and click Device > Connect. You will be asked "How do you wish to access this device". Click OK.



The KT8 will now connect. This status will be displayed in on the top right hand corner of S-Cal.

All new devices will then connect and display the factory calibration.



S-Cal Tips:

TIP When navigating within S-Cal you will note that some configuration settings are in blue and others are green. All green settings take effect immediately, and do not require programming. Settings highlighted in blue need to be programmed (Device > Program) before the changes take effect.

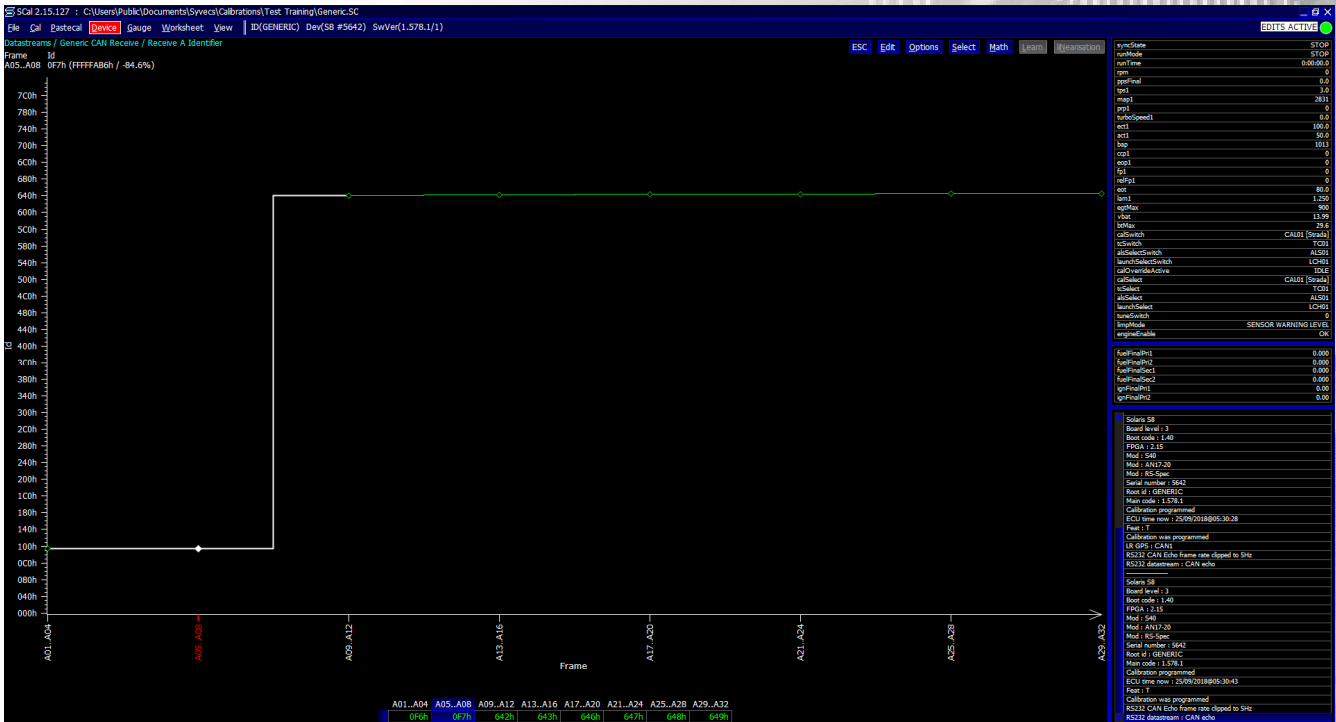


Receive Setup - S7Plus / S8 / S12

The EGT frames can be picked up on any of the Generic Receive A assignments, Below its enabled on A01-A08.

Generic receive is CAN2.0B using 11-bit identifiers. Frames containing less than 8 data bytes will be discarded.
 Receive A frames consist of four 16-bit signed quantities sent high byte first.
 Receive B frames consist of eight signed 8-bit quantities.
 Sensors and switch inputs are connected to these receive frames in IO Configuration / Pin Assignments.

The KT8 data frames are set for A01-A04 as F6h and A05-A08 on F7h



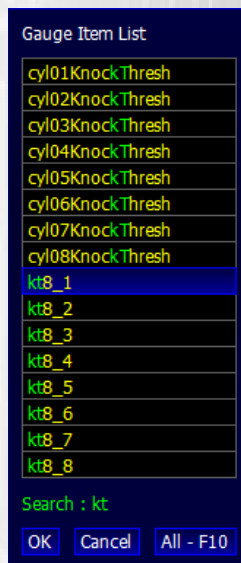
8 User Defined sensors are setup for EGT1-EGT8, a help video on this can be found here:

<https://www.youtube.com/watch?v=IVIdYESOuOQ&t=252s>

An example calibration can also be provided by support@syvecs.com The X:Can Receive items are then set in the pin assignments to the Inputs.

Receive Setup - S6-I & S6Plus / S7-I & S7Plus

The KT8 Data is picked up automatically on the S6-I/S6Plus & S7-I after wiring onto the Can Wires on C8 & C9 which is the 500kb Canbus in PNP Kits. KT1-8 parameters can then be found in Scal with firmware version 1.82+



Please email support@syvecs.com for additional help or custom can requests.

Defining Custom Receive Data & Triggering PWM outputs

This configuration is carried out under the main menu item “Datastream”

1, Connect to desired CAN bus, check matching bus speeds. Ensure correct termination. If “transmit KT8 CAN Data on...” is enabled and using Syvecs ECU, you can verify CAN communications by displaying KT8 sensor values.

Define what CAN data to receive.

2, From the Datastream Submenu “Generic CAN Receive” Enable the “Generic CAN Receive Enable” option.

3, Set the Receive Bus to the desired CAN bus. If using data from your Syvecs ECU, it will be the same as the bus configured in 1, above.

4, Define what receive items you want to receive. These can be custom defined sensors (explained below) or simply the default rx-01 to 04 defaults.

5 Program the frame ID’s to match the items chosen in 4, above. For example if RPM is sent on 0A8h then enter it into the CANRx01 slot, if you want CANRx01 to show RPM.

6 If the CAN data is Big or Little Endian/signed or unsigned that can be configured, along with start bits, bit lengths and scaling all from within the relevant submenu items.

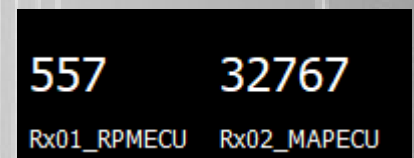
Helpfully, you can view the received data after its scaling on the top right window, as shown on the image on the right.

an01V	0.061
an02V	0.082
Rx01_RPMECU	559
Rx02_MAPECU	32767
Rx03_rx03	1021
Rx04_rx04	32767
KT8	
S_KT8 1.2.1	
09982	
Cal good	

Defining custom sensors.

The power of Syvecs products really comes from its flexibility with creating and defining inputs, and customising maps.

In the image above and right you can see Rx01 and Rx02 have been redefined to be more “human” readable. As such in any logged data or gauges shown will make much more sense.



To redefine a sensor this done by viewing the “View” menu and choosing “Customising options” from the top menu. This will now show all the customising options available.

From the sub heading “Received Sensor 01” choose Rx01. You’ll be presented with something very similar to the image on the right.

First choose a full name, and then its abbreviation. From here you can define the Units, scales, and more.

Received Sensor 01

Full Name: RPM from ECU

Abbreviation: RPMECU

Units and Scalings

Make Like

Units: Angular Speed Revs per Minute Delta Value

Scale / M / C: $y=x/m+c$ 1 0

Min / Max / Dec Places: 0 32767 0

Raw Min / Raw Max: 0 32767

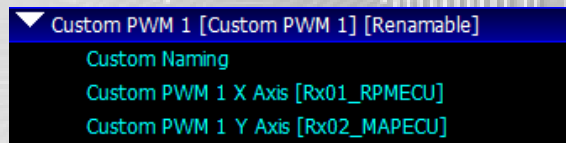
Raw Inc Course / Raw Inc Fine: 1 1

OK Reset F11 Cancel

Controlling outputs based on incoming or internal sensor data

Once the sensors are defined you can now assign if desired these sensors to the axis of the PWM tables.

Each table can be renamed to read something more friendly. In addition each Axis of each table can also be changed. The combination of those two inputs can now be used as a PWM output.



Once the Axis have been defined you will need to save the calibration.

Finally you'll need to reconnect to the KT8 and File > Load the modified calibration you just saved. These steps are always required if you have changed customising options since they are core to the operation of devices with these features.

More information about receiving generic CAN data can be found here: <https://www.youtube.com/watch?v=ZC4VswRzgcA>

Final stage is to assign the pins in the I/O configuration – Pin assignments at the bottom of Scal.

Assign the PWM Function to the Output you want to use and then click **Device - Program**

