TC HUB Connected to MXL – EVO User manual





Racing Data Power



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Chapter 1 – Characteristics, part number and installation



TC Hub is a thermocouples multiplier that can support up to four thermo couples ("K" type only) and cascade connection of more **TH** Hub is possible. It communicates through the CAN protocol increasing available channels without occupying any analog channel of the logger and minimizing wiring overall. **TC** Hub can be connected to: **MXL Pista**, **MXL Pro05**, **Evo3 Pro**, **Evo3 Pista** and **EVO4** and is waterproof IP 65.

TC Hub can monitor any temperature like, exhaust gas of all cylinders, water and oil temperature. It correctly support also infrared sensors that simulate thermocouples working mode ("K" type only).

1.1 – Part number

TC Hub (with 150 cm CAN cable) part number is:

X08UTCCTC

1.2 – Installation

To install **TC Hub** use the proper lateral holes and install it far from heat sources or from electromagnetic interference sources. Pay attention not to let cables pass near to heat sources.

1.3 – Connection with MXL and EVO



TC Hub can be connected as any CAN peripheral as shown here below.

Warning: connect TC Hub and MXL/EVO when both devices are OFF.



Chapter 2 – Configuration on MXL – EVO

At the very first installation, **TC Hub** is to be configured as **MXL** and/or **EVO** expansion using **Race Studio 2** software. After this it will be automatically recognised at each network start. In this example **TC Hub** is connected to **MXL Pro05**.

To configure **TC Hub** run **Race Studio2** software, press "AIM System Manager" (1) and select the proper logger (2) as shown here below.



"System Manager" window appears showing "Select configuration" layer (1). Select the configuration **TC Hub** is to be added to (it will be highlighted in yellow as here below) or create a new one and then select "CAN Expansions configurator" (2) layer.

📓 Sys	tem manag	jer																	(- C	
	Transmit Receive CAN-Net info Set acquisition system Setting																				
Install	Jurrent configuration																				
RSC		MXL PIST/	۹ :	SUZUKI - GSXR	by GP	s 🙆	DEFAU	JLT	14.15.26 (h.	n.s)	4.47.30) (h.	.m.s) 81	(Hz)	81 (H	lz)	0	(Hz)		0	
		_				2															
Selec	t configuration	Channe	els Syster	m configuration	AN-Exp	ansions conf	igurator				_	_					_	_		_	
A	Nou		~	Delete	6	C lo	ne		Import		Ţ		Evport								
v	ine n		M	Delete		.	inc.		Import				CAPOIC								
Ν	Installation r	name	Logger			ECU Manufa	acturer	ECU Model		Lap Tim	er	١	Vehicle nam	ne Obs	Split	Speed	Temp		Created	-	[ol
1	RSC		MXL PIST/	A SUZUKI GSX	<u>-</u>	SUZUKI		GSXR_K5_K	5	by GPS	_	- [DEFAULT	8	1	km/h 💌	l °⊂	_	April 23, 201	0 0	
2	DEFAULT		MXL PRO	05	-	BOSCH	•	MS3	•	Opt. or	M 📘	- 0	DEFAULT	8	1	km/h 💌	°C	-	May 05, 201	0 0	1
3	DEFAULT		MXL STRA	ida	-	None	-	None		Opt. or	M	- 0	DEFAULT	8	1	km/h 👱	°C	-	May 06, 201	0 3	1
4	DEFAULT		MXL PISTA	а, 	-	None	•	None		Opt. or	M	- 0	DEFAULT	8	1	km/h 💌	°⊂	-	July 28, 201	0 2	<u>-</u>
5	DEFAULT		MXL PIST	A YAMAHA-R6	💌	YAMAHA		R6_04_05	_	Opt. or	M		Daidegas	8	1	km/h 💌	°⊂	-	September 0	9, 0	<u>, </u>
6	DEFAULT		MXL STRA	DA YAMAHA-RE) I	YAMAHA		R6_06_07_0	18	Opt. or	M	- 0	Jaidegas	8	1	km/h 💌	°C	-	September 0	9, 0	1
7	TC HUB		MXL PRO	05	-	None	-	None		Opt. or	M	- 0	DEFAULT	8	1	km/h 💌	°C	-	September 1	5, 2	-
8	DEFAULT		MXL PRO		•	None	•	None		Opt. or	M	- 0	DEFAULT	8	1	km/h 💌	°C	-	September 1	5, 0	'
1			_		_	_	_	_		_	_	-	_		_		_	-			



In case of very first configuration the layer will show up empty, press "Add expansion" (or "Delete Expansion" to eliminate an expansion and then confirm the choice) and the window here below appears:



Press "TC Hub" (1) and the fields below the images enables.

Fill in the configuration name (2) and press "Get serial number from a connected expansion" (3) button or type the serial number printed on the label placed under **TC Hub** in the proper field (left of "3" button).

Repeat this operation for all connected TC Hub.

So many layers as many **TC Hub** have been added appear under "Add expansion" and "Del. expansion" buttons.

📓 System manag	ger									
Transmit Receive CAN-Net info Set acquisition system time SmartyCam Functions setting										
Current configuration	I	1				1	1			
Installation name	Data logger type	Ecu	Lap Timer	Vehicle name	Available time	Time with GPS	Total frequency	Master frequency	Expansions fre	Tot. Expa
TC HUB	MXL PRO 05	None - None	Optical or Magn	DEFAULT	9.14.33 (h.m.s)	5.38.40 (h.m.s)	251 (Hz)	171 (Hz)	80 (Hz)	2
Add Expansion Sector 2 Del. Expansion GF - TC HUB PB - TC HUB Responsion configuration (6 characters max.) Name of expansion configuration (6 characters max.) PB Image: Constraint configuration (6 characters max.) PB Image: Constraint configuration (6 characters max.) PB Image: Constraint configuration (6 characters max.) PB										
Enabled/disable	ed Channel na	ame	Sa	mpling frequency	Sensor type		Measure u	nit Low scale	High sc	ale
	PB_TC_1		10	Hz 💌	Thermocouple		•⊂	<u> </u>	1000	
I✓ Enabled	PB_TC_2		10	Hz 🗾	Thermocouple		°C	0	1000	
Enabled	PB_TC_3		10	Hz 👤	Thermocouple		°C	- 0	1000	_
Enabled	PB_TC_4		10	Hz 💌	Thermocouple		°⊂	• 0	1000	
4										•

To configure each **TC Hub** select the related layer, as shown here below and enable/disable the channels connected to the thermocouples, name the channels, set their sampling frequency, unit of measure and low/high scale values.



2.1 – Configurations of MXL and EVO displays

TC Hub channels can be shown on **MXL** display setting them in "System Configuration" layer as shown here below.



TC Hub channels visualisation can be set like the visualisation of any other channel (see **MXL** user manual for further information). In the example here below **TC** Hub enabled channels to be shown are TC_1, TC_2 e TC_3. Each of them can be shown in a field of the display.

In case, on the contrary, **TC Hub** is connected to an **EVO**, data visualisation is only possible if the logger is connected to a **Formula Steering Wheel** display or to a **MyChron3 Dash** and shown channels are set in the display configuration as shown here below.

Race Studio 7	version: 2.38.06	System manager		A							-88
Tran	namit	Receive		CAN Not info	Set a	ensors manager see		smartyCam Functions setting]		
Installation name	Data logger type	Ecu	Lop Timer	Vehicle name	Available 1	ine Time with	OPS	Total frequency	Master frequency	Expansions frequency	Tot. Expansions
Select configuration A - Shift Lights Led 1 0 (n Chonnels System co walable displays M3-Da Led 2 Led 3 0 0	viguation Ditplay CAY	I Expansions cor	figurator				-			
LED 1 2	SHIFT LIGH		Field 2 Field 2 Field 1 Field 1 LOW	Vage 1 - Otemetic and dams: GF_C_1 LED Value None IED Value IED Value None IED Value None Value None 0	Pield 2 Pield 2 Pield 1 Pield 1 Pield 1 H0GH LOW	LED V None 0 Channel_3 LED LED V None 0 Ohannel_3 V LED V None 0	alarms alue alue				



When all parameters have been fixed and the field have been associated with the respective channel the configuration is to be transmitted to the logger. Just press "Transmit" button on **Race Studio 2** top keyboard. When the configuration has been transmitted a confirmation message appears.

In case PC-logger USB connection is not ok or one or more peripherals have not been correctly recognised by the logger one of the following messages appears:



USB error:

unplug the USB cable from both the PC and the logger, re-plug it and retry to transmit the configuration.

RaceStudioConf									
1	Sorry, some of expansion configurations have no ID number or an ID number that doesn't match with those of connected expansions. Please, check the ID numbers of expansion configurations and retry to transmit.								
	ОК								

The expansion has not been recognised by the logger: check that the expansion ID number is correct and retry transmitting the configuration to the logger.



Chapter 3 – Data visualisation and analysis

3.1 – Data visualisation on MXL

TC Hub channels visualisation on **MXL** works exactly like the visualisation of any other **MXL** channel and display pages are scrolled pressing "Quit/VIEW". Refer to **MXL** user manual for any further information. In the image here below Temperature channel sampled through **TC Hub** value is **70**° and channel name is **OIL T**.



Powering on MXL, TC Hub is automatically recognised.

3.2 – Data visualisation on EVO

TC Hub channels visualisation on EVO works exactly like the visualisation of any other channel and is thereby possible only if the logger is connected to a display. The only display that allows the visualisation of TC Hub channels are MyChron3 Dash and Formula Steering wheel. Refer to EVO3 Pro/Pista or EVO4 user manual for further information. In the image here below Temperature channel sampled through TC Hub value is 70 and channel label is "°C".



Powering on EVO, TC Hub is automatically recognised.

3.3 – Data analysis with Race Studio Analysis

TC Hub does not influence data analysis views made through **Race Studio Analysis** because of **TC Hub** only adds four temperature channels that can be viewed like any other temperature channel.





Appendix – Technical drawings