COMPETITOR BULLETIN 12-2025

RaceLink and CAN Project Club Units

Description & Technical Specifications

Versions			
v1.0	01-Jan-2022	Scott Smart	Document Creation
V1.1	08-Feb-2022	Scott Smart	Update Pro > Club
V1.2	12-Feb-2022	Scott Smart	Clarifications
V1.3	18-Feb-2022	Scott Smart	Where to buy spares
V2.0	20-Mar-2025	Scott Smart	MotoAmerica Club Revisions

UPDATED 10/8/24

Contents

1.-Introduction

RaceLink is a technology developed by MyLaps improving current two-way communication's and adding new features like GPS tracking.
The new RaceLink technology consists of a RaceLink Club ('**RL**') (device installed the vehicles) and BaseLinks '**BL**' (fixed transceivers placed around the circuit to communicate with the RaceLink Club). Data transmission is via radio frequency utilising the 2.4GHz band.

RaceLink Pro
(Club used in Supersport)

BaseLink

2.-Main Purpose

The RaceLink technology improves the current bi-directional communication between the Timing Servers and the vehicles CAN bus and the connection covers the complete circuit instead of just the moments whilst passing the timing loops. This allows Race Control and Timing messages (possibly later Team messages) sent to the bike to be received immediately, at any point of the circuit, opening new opportunities to new types of messages i.e. yellow flags by 'dynamic' sectors and timing messages like session time remaining.

The GPS on the **RL** will provide live data on the real position of every vehicle (bikes, medical and safety cars) with a **RL** installed. It is used for timing purposes and allows Race Control to see the live position of all vehicles at any moment - especially in the case of an interrupted session when is difficult to control all the vehicles on the track. During the races, even if the X2 transponders fail, it is possible to check if bike is stopped and where is it, if it is still on track or if it is being transported back to pit boxes. This will help Race Direction with the automatization of crash detection and procedure. It is also useful for an easy view of a long lap penalty or shortcuts traces and potentially defining virtual crossing points (no timing point) instead of installing a new loop.

The **RL** is NOT used for official timing – the X2 Transponder must remain correctly fitted and operating at all times.

This new system can also provide crash data, speed, position, etc… which will be a great assistance in developing run-off areas, injury statistics and develop rider' protective clothing and so-on.

Live data could later also be used to generate on screen graphics for bikes that are not carrying the onboard camera system.

Having this live communication with all the vehicles simultaneously transmitting data through the bike's CAN bus to the RaceLink Pro, new data analysis can be performed in order to, for example, clarify incidents between riders. TPMS messages and another new data (G forces in an accident) also can be sent using this new technology.

The system has been used since the 2018 season in WSBK. MotoAmerica is the first domestic series to embrace the technology and there will be a staged roll out of the features. We are working closely with Scott Smart of Dorna and MyLaps to ensure we get the best from the system.
Having all the bikes equipped simultaneously but still having coverage all around the track which will permit improving the communications with the bike in terms of Teams, Race Control and Timing messaging, as well as tracking all the bikes and safety/medical cars in real time.

In 2026 we plan to implement this technology in all classes.

As a developing technology updates may be required to equipment and its installation throughout 2025. With the knowledge already gained we aim to disturb teams as little as possible and hope that teams understand this process.

3.-RaceLink Bike Installation

The setup installed on the bike consists in 3 components.

- RaceLink Club **'RL'**
- RF Antenna is integrated into the Club unit, an external unit may additionally be fitted if needed.
- GPS Antenna is integrated into the Club unit, an external unit may additionally be fitted if needed.
- You should data log the signal strength and connection information as it will be the teams responsibility to ensure there is always a connection.
- We will confirm if it becomes mandatory to use external antenna's

The **RL** should be mounted according to the following points:
The unit should be fitted in the seat of the bike as far from the rider as possible

- Make sure the unit has a clear view to the sky at all times during racing conditions, it can be placed behind fibreglass (but NOT Carbon) seat units. Thin fibreglass does not significantly impact the signals used by the RL. However if the installation on any particular machine does not have a reliable signal then the unit will need to be moved and/or external antennas used.
- Neither GPS not RF aerials can be mounted lower or shielded by other metal objects such as the subframe, consider that metal or carbon blocks the signal. If no external aerials are used then the unit must be above all metallic components. A ground plane can be installed.
- Do not place the RF antenna next to other RF antennas. Keep at least 1m distance (for example the onboard camera system)
- You should aim to keep the RF cables as short as possible for both the RF aerial and GPS antenna if they are used.
- Place the device in an area of the vehicle where the temperature does not exceed 60 °C

It is responsibility of the team to ensure that the system is installed on the bike according to these guidelines. If there is no connection to the device or the signal is bad it will be considered in the same way as a transponder that is not functioning.
We will work with you but not define the exact mounting position (eg the front may be a better solution in some cases).

4.-Installation Connections

As stated in the regulations the **RL must** be connected to the main CAN bus with the following items: ECU, TPMS system, dashboard and preferably a data logging system.

RL must be powered by the bike and remain powered throughout the whole session (this also includes the RevLogger, MyLaps X2 Transponder and TPMS system). It must not be switched off by the engine kill switch.
The **RL** contains a small backup battery – which is in case of crash, it is not to be used for general operation.

For Supersport 300, twins and all SoloEngineering Supplied Supersport Next Generation harnesses an adaptor cable will be required to connect to one of the rear 'CAN' connectors.
For all other Supersport harnesses that don't have the connection specified in the 2025 regulations the teams will have to create their own adaptor. The power supply 12v/Battery must be switched by MAIN switch.

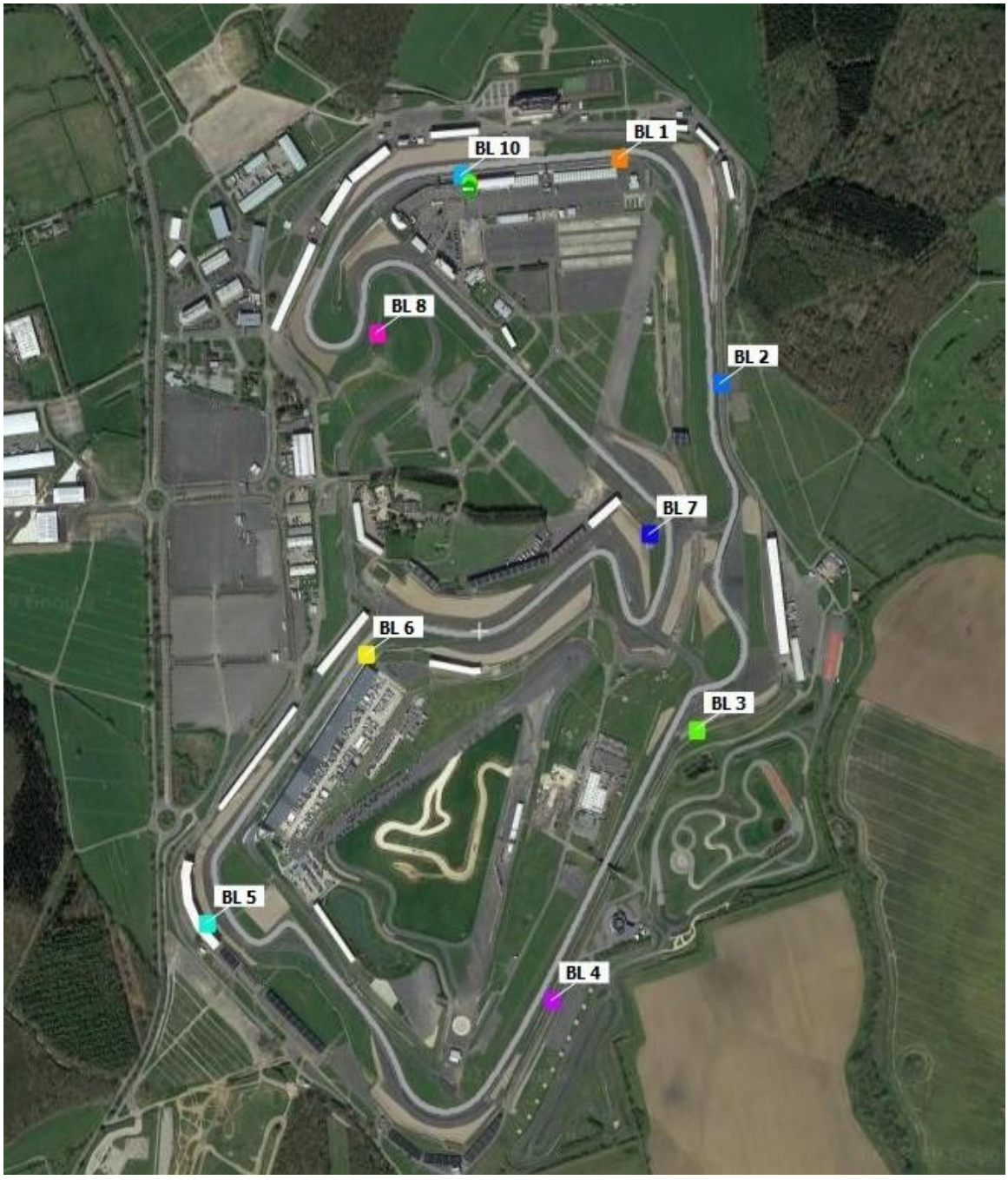
Do not overtighten the RF connections (take care if using a spanner) you WILL break the unit internally.

Do not put excessive side force on the connector – the plastic part of the connector must NOT BE DISTORTED and the unit should be isolated from vibration. The contacts in the wiring are delicate and get damaged if your distort the rubber/plastic connectors.

UPDATED 10/8/24

5.-BaseLink

The BaseLink will receive the data from those RaceLink Pro's moving around the circuit. A set of BaseLinks will be installed the previous days of a Grand Prix around the circuit. The number will vary depending on the track layout. The target is to achieve a 100% coverage of the track and boundary / run off areas. They are installed by our official timekeeping before the event.



6.- CAN Messages

For 2025 the RaceLink messaging system will become principal communications between the Timing Servers and the vehicles. A software development will oversee the message delivery, so there will be no duplicated messages.

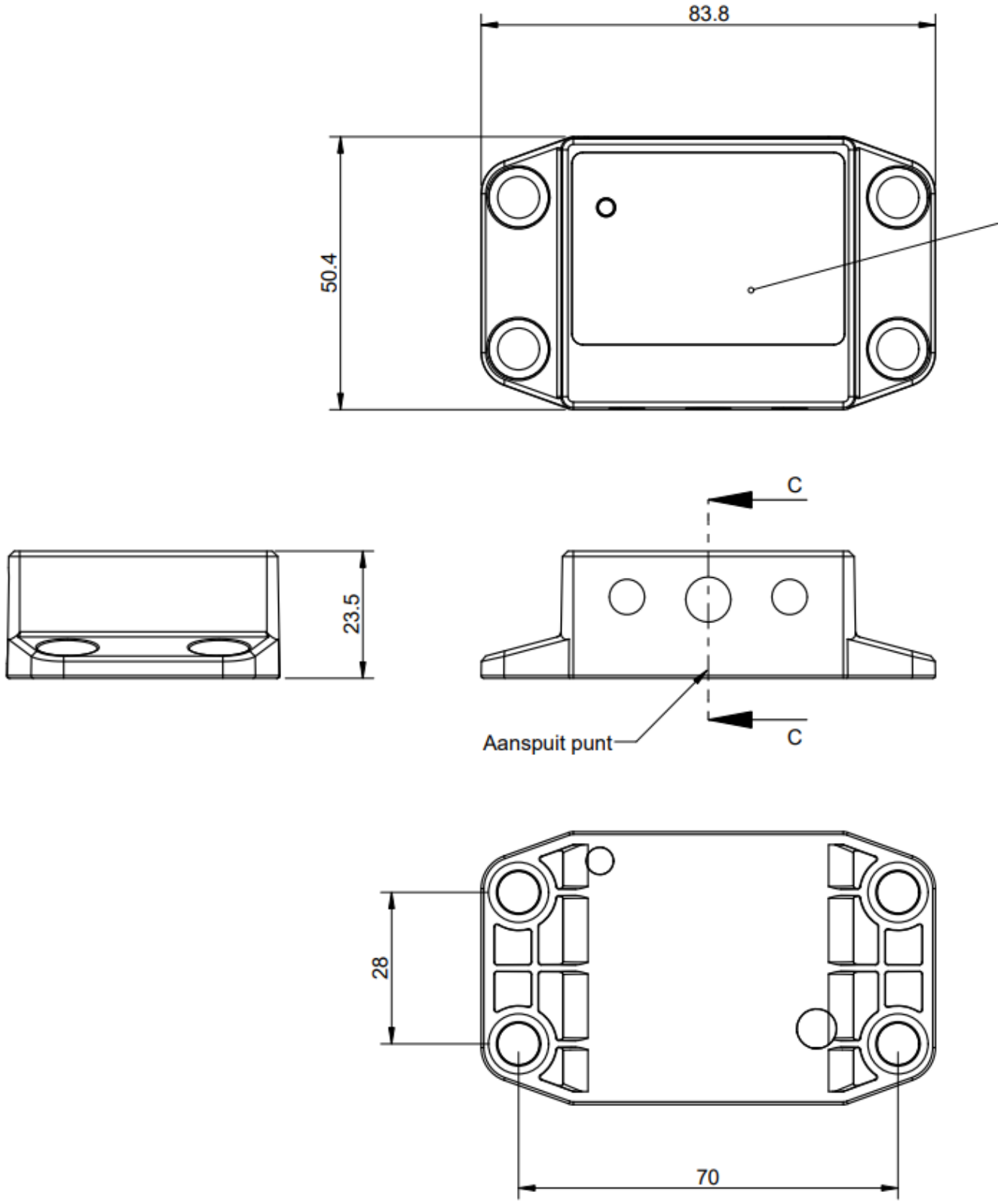
See Appendix for CAN message Info

7.-Appendix 1: Technical Specifications

Link to 3D Model of the Unit: contact bsbtechnical@msvracing.co.uk

RaceLink Club: (CLUB TBC)

Dimensions
75x45x24mm / 3x1.8x1in
Weight
85g / 0.19lb
Operating voltage range
7 to 18VDC typical 12V
Power consumption
1.3W, 110mA@12V
Back up battery lifetime
Up to 8 hours
Back up battery charging
1:2 ratio, 4 hours for full charge
Operating temperature range
0 to 60 °C / 32 to 140F
Humidity range
10% to 90% relative
Positioning
3 concurrent GNSS reception
Sensitivity
-167dBm, 72 channels
Update rate
5Hz
GNSS antenna connection
SMA(F), 3.0V active antenna
RF Antenna connection RP-SMA(F)
RF output
+20dBm@2.4GHz ISM


83.8
50.4
23.5
C
C
Aanspuit punt
28
70

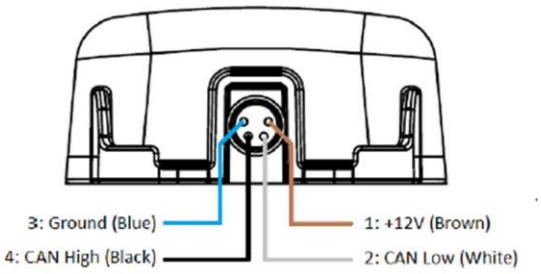
8.-Appendix 2: Pinout Detail

Mylap X2 RF Link Club		
Connector Harness		**M8**
Connector X2		NA
Boot		NA
1	Vbat (8-18v)	Brown
2	CAN_Lo	White
3	Gnd	Blue
4	CAN_Hi	Black

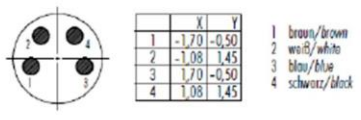
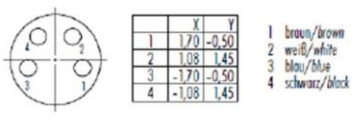
Mylap X2 RF Link Club late 2025		
Connector Harness		**M8**
Connector X2		NA
Boot		NA
1	Vbat (8-18v)	Brown
2	CAN_Lo	White
3	Gnd	Blue
4	CAN_Hi	Black
5	5v Out	Grey

CAN bus connectors and pinout

The devices on the X2 CAN bus are interconnected using M8 sensor connectors where pin 1 and 3 are used to provide the power to the connected devices and pin 2 and 4 are used for the CAN bus data communications.



Binder M8 Circular Sensor Connectors 718 Series

Transponder side (Male)	Cable side (Female)
	

9.-Appendix 3: CAN Message Detail

FLAGS_MSG_WSBK

Type Received Message
Source X2 Link (Race Control)
ID 0x0DB
Length 8
RTR Capable NO
Align Little Endian
Rate This message will be repeated at 2hz
Note **Flags and messages should occupy different areas and one flag and one message can be simultaneously active.**

0	1	2	3	4	5	6	7
FLAGS 1	**FLAGS 2**	**PENALTY**	**POSITION**	**TIME**			

Race direction sends this message. Only the messages marked as compulsory (Byte 0-4) MUST be displayed to the rider.

In the message any bit set to 1 indicates that the related flag or penalty is active. Any previous active flag or penalty must be deactivated when receiving a message with its specific bit set to 0.

The following groups of flags are grouped as flags that are track sector based and flags that specific to one or more riders.

As with trackside lightboards the aim is to only need one 'light' active at a time. In the case where two flags could be used trackside only the more important flag signal will be transmitted. For example, Red with Double Yellow when the riders are returning to the pits. In this case only the Red Flag will be transmitted - the double flags will still be used in the relevant sectors trackside.

Byte 0	FLAGS 1	Type = "Flag", for track sector		**CANCEL**
	Bit 0	**Green Flag**		Race Dir
	Bit 1	**Yellow and Red Striped Flag**		Race Dir
	Bit 2	**White Flag with diagonal Red Cross**		Race Dir
	Bit 3	**White Flag**		Race Dir
	Bit 4	**Red flag**		Race Dir
	Bit 5	**Yellow Flag**		Race Dir
	Bit 6	**Yellow Flag Double (can flash)**		Race Dir
	Bit 7	**Safety Car**		Race Dir
Byte 1	FLAGS 2	Type = "Flag", for rider		
	Bit 0	**Black Flag**		Race Dir
	Bit 1	**Black Flag with Orange disk**		Race Dir
	Bit 2	**Blue Flag**		Race Dir
	Bit 3	**Chequered Black/White flag**		<15km/h
	Bit 4	Reserved		
	Bit 5	Reserved		
	Bit 6	Reserved		
	Bit 7	**Rain Light (use to switch light, not as message)***		

Byte 2	PENALTY	Type = "Message", for rider		
	Bit 0	**Ride Through**		Race Dir
	Bit 1	**Drop Position**		Race Dir
	Bit 2	**Exceeding Track Limits Warning**		Race Dir
	Bit 3	**Time Penalty**		Race Dir
	Bit 4	**Long Lap Penalty**		Race Dir
	Bit 5	**Double Long Lap Penalty**		Race Dir
	Bit 6	**Go to position**		Race Dir
	Bit 7	**Enter Pitlane (grid problem or behind safety car)**		Race Dir
Byte 3	POSITION	Type = "Message", for riders		
	Number of positions that must be dropped due to a penalty, for instance, after an overtaking under yellow flag (used on "Drop Position" Penalty)(or used with Go to Position message). AND used by x minutes board - 5 or 3 minutes			
Byte 4	TIME	Type = "Message", for rider		
	10ths of second that will be added at end of session or race			
Byte 5				
Byte 6				
Byte 7				

Safety Car: Not required for MotoAmerica but required in National Championships

X2
Status

Type	Transmitted Message
Source	X2 Racelink
ID	0x0E0
Length	8
RTR	No
Align	Big Endian
Rate	1hz

0	1	2	3	4	5	6	7
X2RL_F RSSI	GPS_X2RL_Sats	Input Volt	Batt Lvl	Flags	GPS_X2RL_HDOP		

Byte	Signal	Multiplier	Base Unit	Signing
Byte 0	RF RSSI	1	dBm	signed
Byte 1	GPS Sat	1		unsigned
Byte 2	Input Voltage	10	Volt	unsigned
Byte 3	Battery Level	1	%	unsigned
Byte 4	Flags	1	b0: GPS Fix Valid b1: RL sees BL b4: RL comms with BL	unsigned
Byte 5	GPS HDOP	10		unsigned

X2 Version

Type	Transmitted Message
Source	X2 Racelink
ID	0x0E1
Length	8
RTR	Yes
Align	Big Endian
Signed	All Signed
Rate	RTR only

0	1	2	3	4	5	6	7
Device ID				Firmware	Hardware	Firmware	

Byte	Signal	Signing
Byte 0-3	Device ID	Unsigned
Byte 4	Firmware Minor	Unsigned
Byte 5	Hardware	Unsigned
Byte 6	Firmware Major	Unsigned

X2 Location (GPS)

Type	Transmitted Message
Source	X2 Racelink
ID	0x0E2
Length	8
RTR	No
Align	Big Endian
Signed	All Signed
Rate	5hz

0	1	2	3	4	5	6	7
GPS_X2RL_Latitude				GPS_X2RL_Longitude			

Byte	Signal		Multiplier	Base Unit	Signing
Byte 0-3	GPS_X2RL_Speed		1.00E-07	Degrees	Signed
Byte 4-7	GPS_X2RL_Altitude		1.00E-07	Degrees	Signed

X2 Time (GPS)

Type	Transmitted Message
Source	X2 Racelink
ID	0x0E3
Length	8
RTR	No
Align	Big Endian
Signed	All Signed
Rate	1hz (on the second)

0	1	2	3	4	5	6	7
GPS_X2RL_Time						None	

Byte	Signal	Multiplier	Base Unit	Notes
Byte 0-5	GPS_X2RL_Time	1	second	unified GPS time

X2 Location (Extended) (GPS)

Type	Transmitted Message
Source	X2 Racelink
ID	0x0E4
Length	8
RTR	No
Align	Big Endian
Signed	All Signed
Rate	5hz

0	1	2	3	4	5	6	7
GPS_X2RL_Speed		GPS_X2RL_Heading		GPS_X2RL_Altitude			

	Signal	Multiplier	Base Unit	Signing
Byte 0-1	GPS_X2RL_Speed	1	1 km/h	Unsigned
Byte 2-3	GPS_X2RL_Heading	1	Degrees	Signed
Byte 4-7	GPS_X2RL_Altitude	100	Metres	Signed