

1. Software for EA450 RS232 communication, Version 1.6, Oct 17, 2013
  - 1.1. Voltage levels: +/- 12 volts (see MAX3232 spec).
  - 1.2. Baud: 115,200 bps, N, 8, 1
  - 1.3. Frame Structure

2 Bytes	1 Byte	N Byte(s)	1 Byte
Frame header	Command	DATA	CRC
Byte <sub>1</sub> Byte <sub>2</sub>	Byte <sub>3</sub>	Byte <sub>4</sub> : Byte <sub>N+3</sub>	Byte <sub>N+4</sub>

Table 1

- 1.4. CRC = SUM(Byte<sub>1</sub> : Byte<sub>N+3</sub>) only report last Byte. i.e. AA 75 55 40 0D 01 15 0E 20 05.  
 Converting Hex to Decimal , summing Decimal, Converting back to Hex
  - 1.4.1. (Hex) AA+75+55+40+0D+01+15+0E+20 = (Decimal) 170+117+85+64+13+01+21+14+32 = (Decimal) 517.
  - 1.4.2. 517 converts to **205** in Hex. Report **05** has the CRC
- 1.5. All values below are listed in Hex, 0xNN
- 1.6. Frame Header: AA 75
- 1.7. Commands:

Direction	Command	Data	CRC	Description
To host	51	00 04 51 51 51 51	B8	Fatigue Alarm has triggered.
To camera	55	Speed Year Month Date Hour Minute	calc	Send current time & speed data (every 10 seconds). Do not send while retrieving images. <b>Speed:</b> 00-FE, Km/hr, FF=no GPS <b>Year:</b> 00-FF, 2000+Year, 2013=0D <b>Month:</b> 01-0C, Feb=02 <b>Date:</b> 01-1F, 18 <sup>th</sup> =12 <b>Hour:</b> 00-17, 24 hour clock, 5 PM = 11 <b>Minute:</b> 00-3B
To host	55	04 05 Idle MaxSpeed MinSpeed Status	calc	<b>Idle:</b> 00-FF, minutes without detecting the driver <b>MaxSpeed:</b> 00-FF km/hr. i.e. 0x3C=60km/hr. A speeding warning is spoken when the speed received is above this level. <b>MinSpeed:</b> 00-FE, Minimum speed to start Fatigue monitor. Echo data from 0x85 command back to host. <b>Status:</b> Status byte Bit0: Dormant Bit1: Alarm blocked by MinSpeed Bit2: Alarm triggering, up to 15 sec. Bit3: Driver not detected, use to determine of camera is blocked or mis-directed. Bit4: Sensitivity, 0 = 2.5 sec, 1 = other Bit[6:5]: {Any, 20, 30, 45} km/hr min speed

				default. Set to 11 = 45 Km/hr. Hardware default is used, only if MinSpeed=FF Bit7: Voice alarm sent for no driver detected
To camera	56	56 56 56 Type 00 00	calc	<b>Type</b> =0xF5 for Immediate image (CRC=6C), 0xF6 for last Alarm image (CRC=6D)
To host	56	Total PicSize 00 00 Type 0D Image	calc	<b>Total</b> : Two Bytes: total file size, 5+16+PicSize <b>PicSize</b> : Two Bytes: i.e. 0A 0C = 2572 bytes <b>Type</b> : 0xF5 for Immediate image, 0xF6 for Alarm image <b>Image</b> : Image data, JPEG, 160x120, compressed, < 4KB
To camera	8A	8A 8A 8A 8A 8A 8A	E5	Prepare camera for data
To camera	83	83 83 83 83 83 Sensitivity	calc	Alarm Sensitivity Control. Preceded by 8A <b>Sensitivity</b> : approximate delay time to alarm 02: 2.2 seconds 03: 2.9 04: 3.7 05: 4.5 06: 5.3 07: 6.1 08: 6.9 09: 7.7 0A: 8.5 0B: 15 seconds FF: Factory default
To camera	84	84 84 84 84 84 Volume	calc	Volume Control. Preceded by 8A <b>Volume</b> : 00: Speaker Off 01: Low 02: High FF: Factory default
To camera	85	85 85 85 85 85 MinSpeed	calc	Set minimum speed to alarm. Preceded by 8A <b>MinSpeed</b> : 00-FE, km/hr. i.e. 0x14=20km/hr
To camera	86	86 86 86 86 86 MaxSpeed	calc	Set maximum speed (speeding) alarm. Preceded by 8A <b>MaxSpeed</b> : 00-FF km/hr. i.e. 0x3C=60km/hr

Table 2