Optical RS232 to RS485 Converter
Firmware V1.6

The board is a converter from optical RS232 to copper RS485 to communicate with secondary port of the CMS MC daisy chain (half wheel).
The board baud rate and parity can be set by switch from 1200 baud to 115200 baud (115200 in actual firmware not work) .
In the CMS experiment the board must be set with 38400 baud an parity bit (SW3 with 0xA value), the parity bit is used in mark/space parity mode to send address and data packets (see Mini Crate commands descriptions document).
The address of the board can be set from 0xFF00 to 0xFF0F by a switch on the front panel.
See Mini Crate commands description document for the packets format.
At power on or after a reset the board send code 0xD4 followed by arguments firmware version (two byte little-endian order), address (two byte little-endian order), current (two byte little-endian order) used in the transmitter laser.
On the front panel is present a test button that verify the integrity of the daisy chain and show interrupted chain by flashing green led of the corresponding output with also red led error on.

Reset Return value:

0xD4;	
int version;	Firmware version. Byte order is **LITTLE_ENDIAN**.
int addr;	Address of the board. Byte order is **LITTLE_ENDIAN.**
int current;	Optical laser corrent I(A)=current*5/(1024*25ohm). Byte order is **LITTLE_ENDIAN**

The command that board accept are:

Current Set, code 0xD0:

Set the transmitter laser current.
Argument:

int current;	DAC value to set current (little-endian order) . I(A)=DAC*5/(1024*25ohm). Maximum value 600=117mA.

Return Value:
0xFC;
0xD0;

Sel Output, code 0xD3:

Select one of the four output (the daisy chain have four access point).
Argument:

char out;	select output, from 0 to 3;

Return Value:
0xFC;
0xD3;

Status, code 0xD1:

Return all analog signal measured, optical input signal, amplified signal ect.

Argument:

Return Value:

0xD2;

int Vmax[10];	Maximum optical signal measured on max peak amplifier. Element from 0 to 7 are the last eight measure, element 8 is the sum of the measures, element 9 is the average. Byte order is **LITTLE_ENDIAN**.
int Vmin[10];	Base of the optical signal measured on min peak amplifier. Element from 0 to 7 are the last eight measure, element 8 is the sum of the measures, element 9 is the average. Byte order is **LITTLE_ENDIAN**.
int Vamp[2];	Minimum and Maximum value read on the amplifier output. The value is an average of 8 value. Byte order is **LITTLE_ENDIAN**.
int Vopt[2];	Minimum and Maximum value read on the optical receiver. Byte order is **LITTLE_ENDIAN**.
int Vthr;	Threshold value read on DAC output. Byte order is **LITTLE_ENDIAN**.
int Vofs;	Offset value read on DAC output. Byte order is **LITTLE_ENDIAN**.
int OfsCal;	Value to eliminate amplifier output offset. Byte order is **LITTLE_ENDIAN**.
char iVmax;	index of the next write element on the array Vmax (the array is a circular buffer);
char iVmin;	index of the next write element on the array Vmin (the array is a circular buffer);
int Vcur;	Transmitter current laser value read on DAC output. Byte order is **LITTLE_ENDIAN**.

Read Vamp min data, code 0xD5:

Return all analog signal measured, optical input signal, amplified signal ect.

Argument:

Return Value:

0xD6;

int Vamp_min[10];	Minimun optical signal value read on the amplifier output. Element from 0 to 7 are the last eight measure (the array is a circular buffer), element 8 is the sum of the measures, element 9 is the average. Byte order is **LITTLE_ENDIAN**.
char i;	Index of the next write element.

Read Vamp max data, code 0xD8:

Return all analog signal measured, optical input signal, amplified signal ect.

Argument:

Return Value:

0xD9;

int Vamp_max[10];	Maximum optical signal value read on the amplifier output. Element from 0 to 7 are the last eight measure (the array is a

	circular buffer), element 8 is the sum of the measures, element 9 is the average. Byte order is **LITTLE_ENDIAN**.
char i;	Index of the next write element.