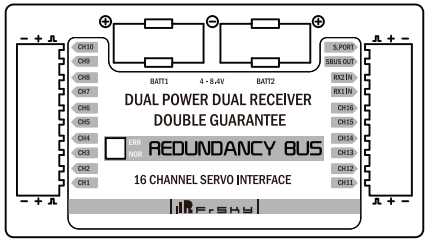
NOTICE: All instructions, warranties and other collateral documents are subject to change at the sole discretion of FrSky Electronic Co., Ltd. For further information, please visit www.frsky-rc.com.

Overview:



- **CH1~CH16 –** connect up to 16 servos (PWM)
- **S.PORT** - connect to the S.Port of X series receiver and feedback integrated S.Port values (including voltage, current, capacity, overload indication, etc)
- **SBUS OUT** - SBUS output, max overload current of 2.6A
- **RX1 IN** - connect to the SBUS port of X series receiver and supply power directly to the connected receiver, max overload current of 2.6A
- **RX2 IN** - connect to the SBUS port of X series receiver and supply power directly to the connected receiver, max overload current of 2.6A
- **BATT1** and **BATT2** - MPX connectors for batteries or BEC connection, supply power to the Redundancy Bus and connected receivers

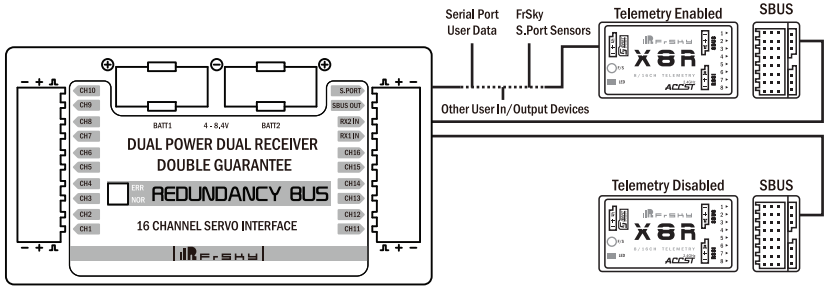
Features:

- Overload protection on each channel
- Dual power dual receiver double guarantee (connect up to 2 batteries and 2 receivers)
- 50Hz mode of servo outputs (20ms period) or equal to the input of SBUS cycle
- Integrated S.Port telemetry feedbacks (including voltage, current, capacity, overload indication, etc)
- Servo signal output period settable
- High voltage servos supported
- Hot plug supported
- Compatible with both positive and negative SBUS signals (SBUS signal on FrSky receivers is negative)
- Compact size and firmware upgradable

Specifications:

- Recommended input voltage range: 4-8.4V (1~2 Lipos or 4~6 NiMH)
- Number of servos: up to 16
- Operating temperature range: - 20~75°C
- Weight: 37g
- Dimension: 77x43x22mm

Connection:



Instruction Manual for FrSky Redundancy Bus

The Redundancy Bus is a switchboard connected to the power supplies, receivers, servos and S.Port sensors. The Redundancy Bus does not contain circuitry to stabilize or regulate voltage to the servos. The level of the input voltage is equal to the level of (output) supply voltage to the servos. Be sure to match the proper type of servos with your selected power supply (for example: when using 2 LiPo cells without a regulator, it is necessary to use servos labeled “High Voltage”).
Do not connect more than one Redundancy Bus to one servo.
Do not use Y harness to connect more than one servo to each servo output.

Note: The Redundancy Bus could be daisy-chained with FrSky Smart Port sensors via S.PORT. Use it as the last item in the chain, or use Y lead if it is between the FrSky Smart Port sensors and the receiver.

Power Supply:

Power supply of Redundancy Bus could be provided from either one battery/BEC (connect via BATT1 or BATT2), or two (connect to BATT1 and BATT2). When two power supplies are used, make sure both supply a 15A continuous and 90A peak current, otherwise the overload protection feature could not function efficiently.
If the voltages of two power supplies are the same, the power can be used from both supplies at the same time; if the voltages of two power supplies are different, the power comes from the one with the higher voltage, and each supply is isolated from each other instead of shared.
Use of different capacity, number of cells and chemistry type batteries is allowed.

Caution: Do not connect power supplies to CH1~16, S.PORT, SBUS OUT, RX 1IN or RX 2 IN.

Overload Protection:

The Redundancy Bus has an overload protection function by PPTC through a circuit inside on each servo output. If overload current happens, the affected servo output will be disconnected from the power supply while the remaining servo outputs are still powered.

Performance Specification:

Model	V_{max} (V dc)	I_{max} (A)	I_{hold} @25°C (A)	I_{trip} @25°C (A)	Pd Typ. (W)	Maximum Time To Trip		Resistance	
						Current (A)	Time (Sec)	Ri_{min} (Ω)	R1 max (Ω)
SMD1812R260SF	12.0	100	2.60	5.00	0.8	8.0	2.50	0.015	0.050

V max = Maximum operating voltage device can withstand without damage at rated current (Imax).
I max = Maximum fault current device can withstand without damage at rated voltage (V max).
I hold = Hold Current. Maximum current device will not trip in 25°C still air.
I trip = Trip Current. Minimum current at which the device will always trip in 25°C still air.
Pd = Power dissipation when device is in the tripped state in 25°C still air environment at rated voltage.
Ri min/max = Minimum/Maximum device resistance prior to tripping at 25°C.
R1max = Maximum device resistance is measured one hour post reflow.
CAUTION : Operation beyond the specified ratings may result in damage and possible arcing and flame.

Ambient Temperature(°C)	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
Recommended Hold Current(A)	3.90	3.42	2.96	2.60	2.33	2.07	1.94	1.35	1.00

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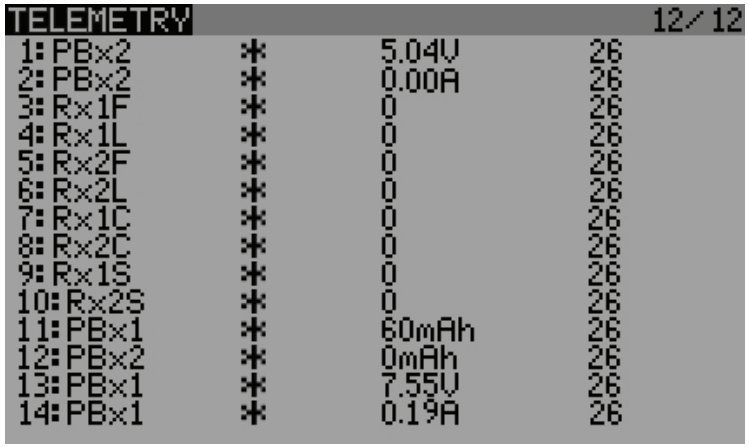
Values:

- Voltage - actual voltages of both inputs
- Current - actual current flowing from the power supply to the output
- Capacity - consumed capacity of each power supply
- Over-I Monitor - indication of servo status – good or overloaded; indication of receiver status, numbers of detected channels and output period of signal
- All of the above values will be transmitted to FrSky radio systems in real time.



		Definition for Value	unit
1	PBx2	live voltage of battery 2	V
2	PBx2	live amps drawn off battery 2	A
3	Rx1F	0:normal 1:RX1_Failsafe	
4	Rx1L	0:normal 1:RX1_Frame lost	
5	Rx2F	0:normal 1:RX2_Failsafe	
6	Rx2L	0:normal 1:RX2_Frame lost	
7	Rx1C	0:normal 1:RX1_Disconnect	
8	Rx2C	0:normal 1:RX2_Disconnect	
9	Rx1S	0:normal 1:RX1_NO_SIGNAL	
10	Rx2S	0:normal 1:RX2_NO_SIGNAL	
11	PBx1	total power usage of battery 1	mAh
12	PBx2	total power usage of battery 2	mAh
13	PBx1	live voltage of battery 1	V
14	PBx1	live amps drawn off battery 1	A

Instruction Manual for FrSky Redundancy Bus

Setting for Servo Signal Output Period:

The default period for the signal output is 20ms, and it could be set to receiver synchronized.
Analog servos are not recommended to set to receiver synchronized.

Follow steps below to set the signal output period:
Step 1, Connect signal pins of CH1 and CH2 by a jumper;
Step 2, Connect the power supply to BATT1 or BATT2;
Step 3, The Green LED flashes quickly, indicating the setting process of setting the signal output period from default 20ms to receiver synchronized is completed;
Step 4, Disconnect the jumper from CH1 and CH2, disconnect the power supply.

How to distinguish between 20ms and receiver synchronized
Connect a receiver to RX1 IN or RX2 IN, connect power supply to BATT1 or BATT2, if GREEN LED flashes quickly, it is receiver synchronized output; if stay on, it is 20ms output.

When working in the synchronous mode, the period of the PWM output is the same to that of the SBUS input. For example, if the period of the SBUS input is 9ms, the period of the PWM output is 9ms as well. If the SBUS input period of RX1 IN is different with that of RX2 IN but both receivers are powered on at the same time, the period of the PWM output is the same to the one receiver with longer period; but if both receivers are not powered at the same time, the period of the PWM output is the same to the one receiver that is powered on first. For example, the SBUS input period of RX1 IN is 9ms, while that of RX2 IN is 18ms. If both receivers are powered on at the same time, the period of the PWM output is 18ms. If RX1 is powered on before RX2, the period of the PWM output is 9ms. In synchronous mode, the signal delay is 3.05ms.

How to change the SBUS signal from negative to positive for RX1 IN and RX2 IN

The SBUS signal from FrSky Redundancy Bus is negative. Follow the steps below to change it from negative to positive. Take RX1 IN for example.

Step 1: Connect the signal pins of CH11 and CH12 by a jumper;
Step 2, Connect the power supply to BATT 1 or BATT2, Green LCD will be on;
Step 3: Remove the jumper and disconnect the power supply.

Note:
Connect the signal pins of CH13 and CH14 by a jumper, and follow step 2 and 3 to change the SBUS signal from negative to positive for RX 2 IN.
Connect the signal pins of CH11 and CH12, as well as CH13 and CH14 by jumpers, and follow step 2 and 3 to change the SBUS signal from negative to positive for RX 1 IN and RX 2 IN at the same time.
Follow step 1 to step 3 to switch back the SBUS signal from positive to negative.

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