Requirements for the ergonomic crutch design

Number of Criteria	Criteria	Solution of July 2nd
	Must have Criteria	
1.1	Step can be triggered	Given by Go Button
1.2	Modus can be changed	Given by Modus Wheel
1.3	Freeze Button is always accessible	Given by Position in the thumb radius
1.4	The pilot can change the step size	Given with step size button
1.5	The pilot knows which step size he is currently using	Given through the 7-segment display, default step size is sometimes unclear
1.6	The Pilot knows which mode he is currently in	Given with 7 segment display
1.7	The crutch can be used to keep balance	Given
1.8	The crutch can be used to shift weight from one side to the other	Given
1.9	The crutch holds a load of 80kg	Given by manufacturer
1.10	The crutch holds the electronics needed for controls	Given by electronic box
1.11	The pilot cannot accidentally lose the crutch and trigger a step	Given by closed cuff
1.12	The pilot does not get any skin injuries while intensively using the crutch	Given
1.13	No sharp edges	Given
1.14	User control interface withstands the forces of pressing buttons intensively	Partly Given
1.15	The signal transmission is robust	Given with cable
1.16	The crutch length is adjusted to the pilot	Given
1.17	Cuffs of Crutch are large enough for the pilot's arms	Given
	Optimization Criteria	
2.1	Weight of the crutch is light as possible	Given
2.2	The crutch foot provides enough grip for the CYBATHLON obstacles	Given with flexy foot
2.3	As small amount of modes as possible	Not given, 9 modes needed
2.4	Modes are intuitive to use	Partly given with number, but requires time to learn the numbers
2.5	The handle is adjusted to the form of the hand	Given by the form
2.6	Electronics box is as small as possible	Partly given, electronic box is as small as possible, it could be reduced if cables are reduced
2.7	The LED provides useful information	Partly given, could be improved
2.8	The crutch is easy to maintain	Not given
2.9	The Buttons are intuitive to use	Partly given, the wheel is intuitive, Colors could improve the situation for the other buttons
2.10	Minimal amount of buttons	Given

2.11	Easy changing between the modes	Partly given, because the modes can only be adjusted in one direction
Nice to have Criteria		
3.1	The crutch is communicating wireless and can be used without cables	Not possible yet
3.2	Buttons are placed in a way they can be reached while the pilot is supporting himself with the crutches	Given
3.4	It is possible to store one crutch while using one hand to stack cups or hold a railing	The crutch hangs on the arm with a cushioned closed cuff.
3.5	The exoskeleton can be controlled with just one crutch in order to have one hand free	Only one crutch is instrumented
3.6	Buttons are placed so it is very unlikely to accidentally press the wrong button	Partly Given
3.7	It is very unlikely to switch the mode by accident	Given, in order to change mode the GO button must be pressed for three seconds
3.8	The pilot can trigger the next movement before the previous is finished	Not Given
3.9	Electronics box is placed in a way it does not interfere with the pilot or the exoskeleton	Given
3.10	The exoskeleton can be controlled without looking at the crutch, so the pilot can stand upright	Given with the buttons, pilot has to look down see the 7-segment displays