

HEAD RUSH TECHNOLOGIES WHITE PAPER

INSTALLATION AND OPERATION OF CONTINUOUS AND SMART BELAYS WITH TRUBLUE AUTO BELAYS

May 2018

Smart and continuous belay systems can mitigate risk and reduce the number of employees required to staff an adventure course. For these reasons, along with the ease of integration with Head Rush products, we allow the use of smart and/or continuous belay systems with the TRUBLUE, QUICKjump and zipSTOP*.

The information in this paper is meant to help qualified persons when designing a smart or continuous belay system that interacts with a TRUBLUE or TRUBLUE XL on an ascending or descending element and should not be applied to other Head Rush Technologies devices. Each smart and continuous belay system has unique requirements, therefore a qualified person should always design and ensure compatibility of the system prior to use, even those shown in this paper. Confirm that the installation, operation and maintenance of all equipment follows its respective user's manual and that all parties are suitably trained in the use of the equipment to ensure proper function.

**Head Rush has not evaluated any of the products listed in this white paper. Testing by a qualified person is required to confirm compatibility. The products shown in this paper are provided as representative of the existing technology available at time of publication.*

CONTENT

Introduction.....	1
Description of Systems.....	3
Smart Belays.....	3
Continuous Belays.....	3
Smart and Continuous Belays as the Primary vs Secondary Connector.....	3
Smart and Continuous Belays as the Primary Connector.....	4
Installation of Smart Belay Systems.....	4
Installation of Continuous Belay Systems.....	5
Operation.....	6
Considerations.....	7
Smart and Continuous Belays as the Secondary Connector.....	8
Installation of Smart Belay Systems.....	8
Installation of Continuous Belay Systems.....	10
Operation.....	11
Considerations.....	12

DESCRIPTION OF SYSTEMS

Each smart and continuous belay system has its own unique features and can mitigate risk in different ways. The systems can be used with the TRUBLUE and TRUBLUE XL Auto Belay so long as they meet the requirements of the authority having jurisdiction and the system is designed and installed by a qualified person.

Smart Belays

Smart belays generally consist of lanyards with communicating connectors that help to reduce the likelihood of accidental detachments from a safety system. Examples of smart belays include, [Bornack SSB](#), [ISC SmartSnap](#), [CLiC-iT Adventure System](#) and [Edelrid Smart Belay](#).

Continuous Belays

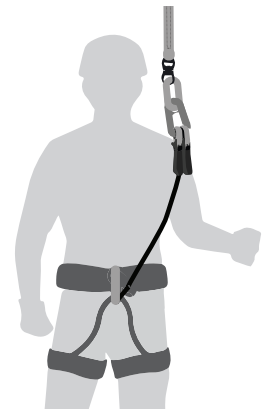
Continuous belays consist of lanyards with connectors that remain attached to the life safety system throughout the entirety of the course. Examples of continuous belays include [Kanopeo SAFEROLLER](#) and [SPEEDRUNNER](#), [Kong COUDOU PRO](#) and [Vertical Trek Innovations QuickTrekker](#).

Smart and Continuous Belays as the Primary vs Secondary Connector

When implementing a smart or continuous belay system in conjunction with the TRUBLUE or TRUBLUE XL, an important decision must be made by a qualified person during the design: will the smart or continuous belay act as the primary or secondary connector when attached to the TRUBLUE webbing?

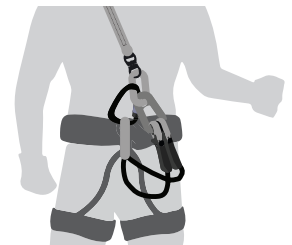
Primary Connector

Using a smart or continuous belay as the primary connector means the smart or continuous belay will be in series with the TRUBLUE webbing and in tension during ascent or descent. When a smart or continuous belay is used as the primary connector, a secondary, unloaded attachment may be implemented but may not be necessary.



Secondary Connector

Using a smart or continuous belay as the secondary connector means the smart or continuous belay will be connected to the TRUBLUE webbing but will not be under tension during use. Instead, a suitable carabiner or connector that meets the requirements of the authority having jurisdiction, will be the primary connector and hold the weight of the participant during use. When installed as a secondary connector, the smart or continuous belay system should only be loaded in the event of an improper attachment to the primary connector or carabiner.



SMART AND CONTINUOUS BELAYS AS THE PRIMARY CONNECTOR

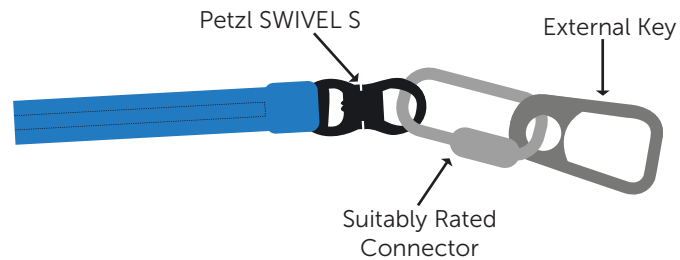
When using a smart or continuous belay with a TRUBLUE or TRUBLUE XL, the TRUBLUE Adventure Webbing, which includes a Petzl SWIVEL S attachment, is recommended. The Adventure Webbing allows for greater connection point variability while maintaining the swivel function of the webbing, which prevents the webbing from twisting during ascent.



TRUBLUE Adventure Webbing with Petzl SWIVEL S

Installation of Smart Belay Systems

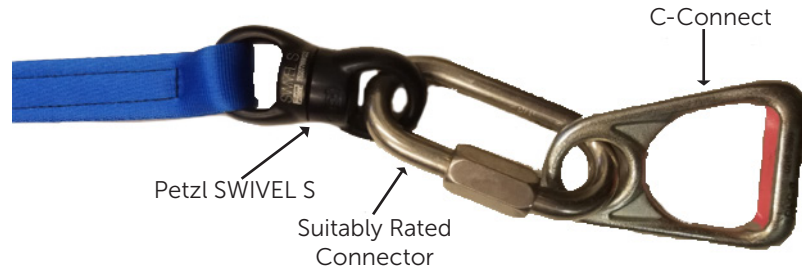
1. Most smart belay manufacturers have an external key for their system that the system manufacturer says should be used when connecting to the TRUBLUE or TRUBLUE XL webbing. These external keys should be evaluated by a qualified person before installation to ensure they're suitable for the application and meet the requirements of the authority having jurisdiction. External keys include but are not limited to:
 - a. [C-Connect](#) and [C-Connect V2](#) for the CLiC-iT system
 - b. [Tweezle 9](#) for the Bornack SSB system
 - c. [Key Ring](#) for the ISC SmartSnap
 - d. Edelrid Smart Belay does not manufacture a specific external key. Instead a suitable connector which is large enough to attach both Smart Belay connectors may be used as the attachment point to the TRUBLUE webbing.
2. Connect the external key to the Petzl SWIVEL S with a suitably rated connector that cannot be removed by a participant.



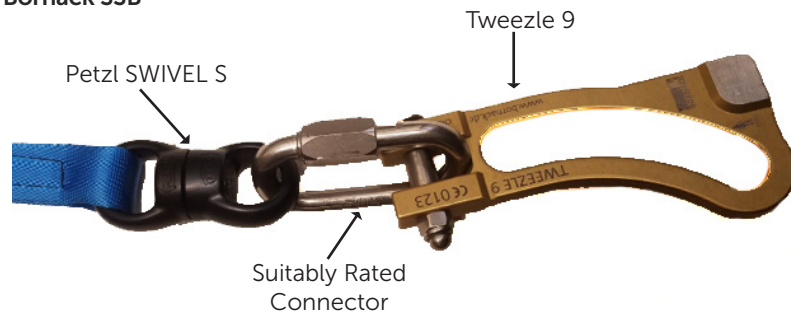
Possible Installations

Below are images of example attachments connected to the Petzl SWIVEL S. The below images may or may not be suitable for a specific installation depending on the system and the authority having jurisdiction's requirements. A qualified person must design and install the system to ensure compatibility and proper function of the devices in use.

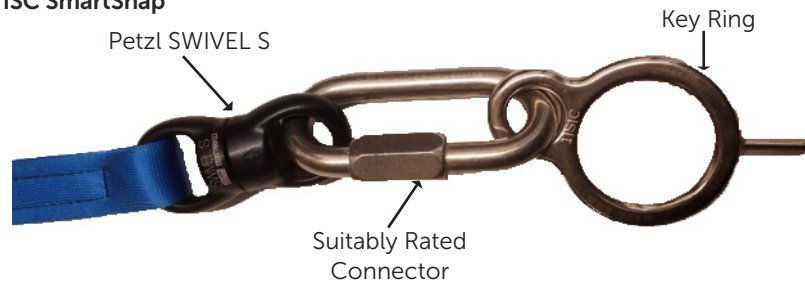
CLiC-iT



Bornack SSB



ISC SmartSnap

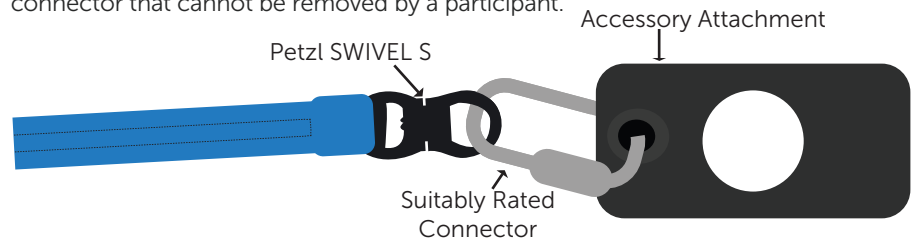


Installation of Continuous Belay Systems

1. Most continuous belay manufacturers have an accessory attachment for their system that the manufacturer says should be used when connecting to the TRUBLUE or TRUBLUE XL webbing. These accessory attachments should be evaluated by a qualified person before installation to ensure they're suitable for the application and meet the requirements of the authority having jurisdiction. The accessory attachments include, but are not limited to:

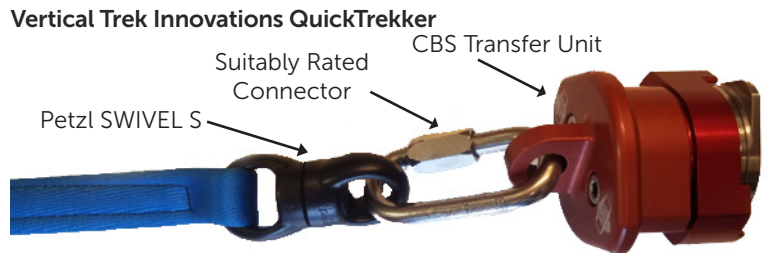
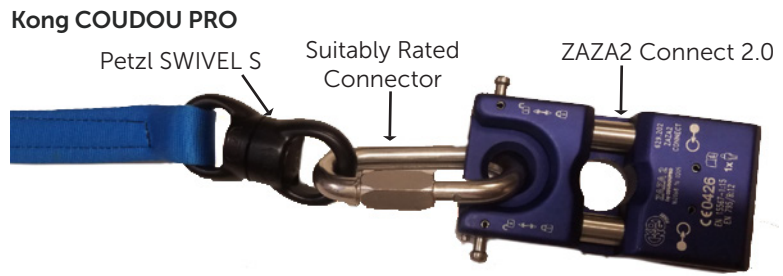
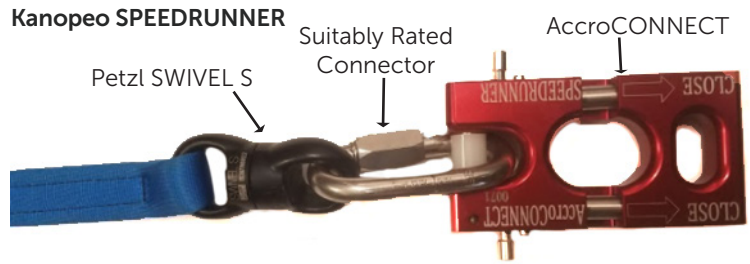
- a. [AccroCONNECT](#) for Kanopeo SPEEDRUNNER
- b. [ZAZA2 Connect 2.0](#) for Kong COUDOU PRO
- c. [CBS Transfer Unit](#) for Vertical Trek Innovations QuickTrekker

2. Connect the accessory attachment to the Petzl SWIVEL S with a suitably rated connector that cannot be removed by a participant.



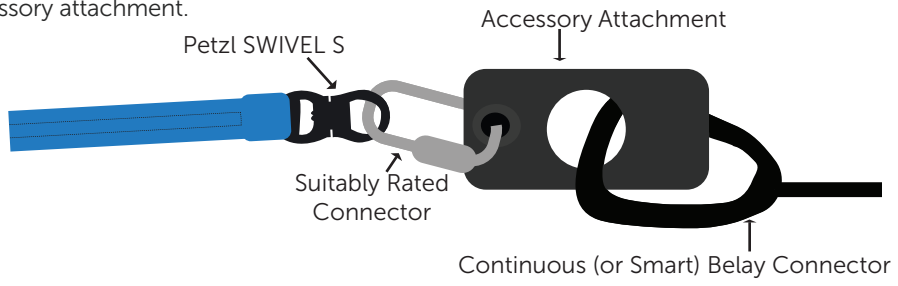
Possible Installations

Below are images of example attachments connected to the Petzl SWIVEL S. The below images may or may not be suitable for a specific installation depending on the system and the authority having jurisdiction's requirements. A qualified person must design and install the system to ensure compatibility and proper function of the devices in use.

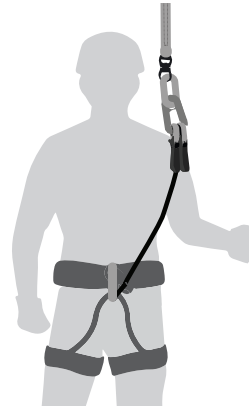


Operation

1. Participant or guide connects themselves directly to the external key or the accessory attachment.



2. The smart or continuous belay is the primary attachment to the TRUBLUE.



3. The participant must not be able to descend or ascend the element unless they're suitably attached to the TRUBLUE.

4. Once the participant reaches the end of their ascent or descent, the smart or continuous belay connectors can be detached from the TRUBLUE and if necessary connected to a suitable lifeline.

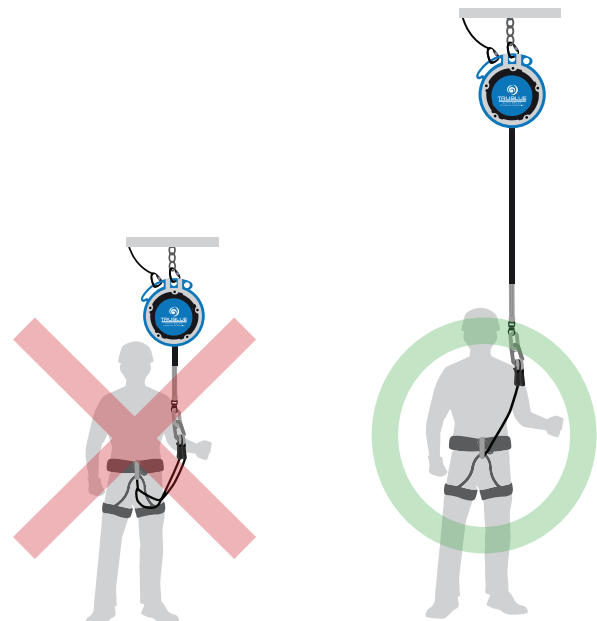
Considerations

Ascending Element

- Ensure the TRUBLUE or TRUBLUE XL has adequate retraction strength to appropriately retract the webbing with the smart or continuous belay attached.

Descending Element

- The added length of the smart or continuous belay lanyards may create slack in the system. If unaccounted for, the slack can result in a jolt during initial descent and may cause the connectors to collide with a participant.
 - o An option to combat this is, the TRUBLUE can be mounted such that the lanyard is in tension prior to participant descent.
 - o Ensure the connectors cannot collide with a participant during descent. If this is not possible, use the smart or continuous system as the secondary connector.



- Smart and continuous belay manufacturers may not allow for impact loading beyond a certain point on their systems. If there is a chance of overloading the system, use the smart or continuous system as the secondary connector.
- Ensure participant cannot become entangled in the smart or continuous belay lanyards during descent.
- Never permit the webbing line to wrap around legs, arms, neck other body parts or loose clothing of the participant.
- Ensure participant's hands are free and clear of connectors during descent. Loading may cause a pinch hazard.
- Never descend from alongside or above the TRUBLUE Auto Belay.
- Prior to descent, ensure descent path and landing area are free of people and obstructions.
- Always descend feet first and straight down using feet to fend off obstacles and prepare for landing.

SMART AND CONTINUOUS BELAYS AS THE SECONDARY CONNECTOR

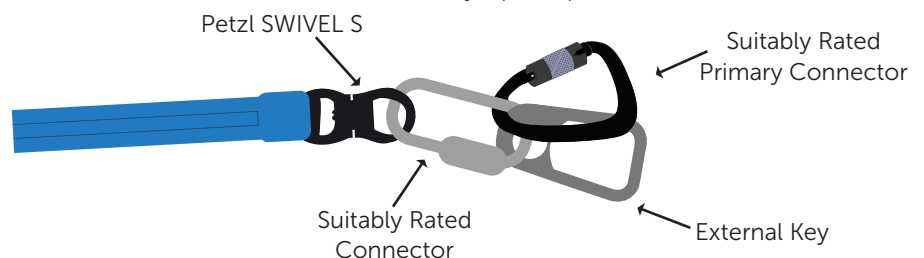
When using a smart or continuous belay as a secondary connector with a TRUBLUE or TRUBLUE XL Auto Belay, the TRUBLUE Adventure webbing which includes a Petzl SWIVEL S attachment is recommended. The Adventure Webbing allows for greater connection point variability while maintaining the swivel function of the webbing, which prevents the webbing from twisting during ascent.



TRUBLUE Adventure Webbing with Petzl SWIVEL S

Installation of Smart Belay Systems

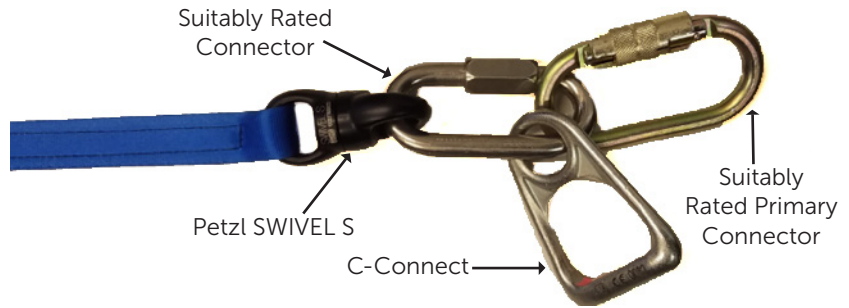
1. Many smart belay manufacturers have an external key for their smart belay system that the system manufacturer says should be used when connecting to the TRUBLUE or TRUBLUE XL webbing. These external keys should be evaluated by a qualified person before installation to ensure they're suitable for the application and meet the requirements of the authority having jurisdiction. External keys include but are not limited to:
 - a. [C-Connect](#) and [C-Connect V2](#) for the CLiC-iT system
 - b. [Tweezle 9](#) for the Bornack SSB system
 - c. [Key Ring](#) for the ISC SmartSnap
 - d. Edelrid Smart Belay does not manufacture a specific external key. Instead, a suitable connector, large enough to attach both Smart Belay connectors to, may be used as the attachment point to the TRUBLUE webbing.
2. Connect the external key and a suitable carabiner to the Petzl SWIVEL S with a suitably rated connector that cannot be removed by a participant.



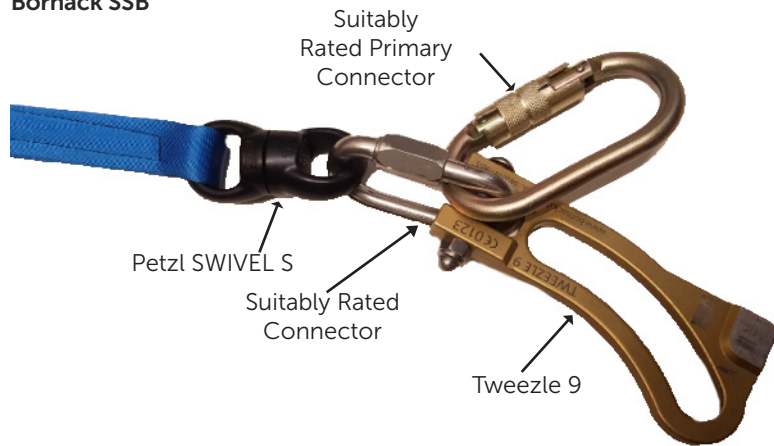
Possible Installations

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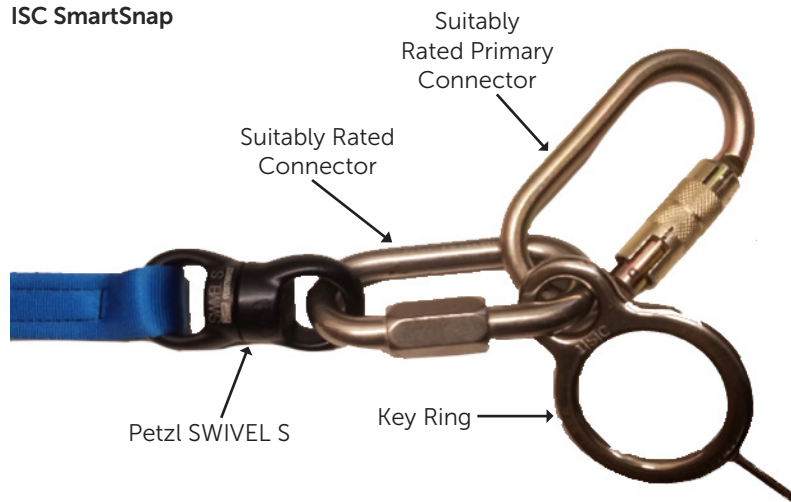
CLiC-iT



Bornack SSB



ISC SmartSnap

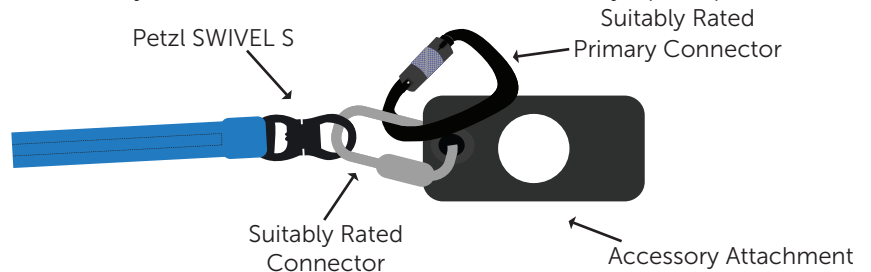


Installation of Continuous Belay Systems

1. Most continuous belay manufacturers have an accessory attachment for their system that the manufacturer says should be used when connecting to the TRUBLUE or TRUBLUE XL webbing. These accessory attachments should be evaluated by a qualified person before installation to ensure they're suitable for the application and meet the requirements of the authority having jurisdiction. The accessory attachments include, but are not limited to:

- a. [AccroCONNECT](#) for Kanopeo SPEEDRUNNER
- b. [ZAZA2 Connect 2.0](#) for Kong COUDOU PRO
- c. [CBS Transfer Unit](#) for Vertical Trek Innovations QuickTrekker

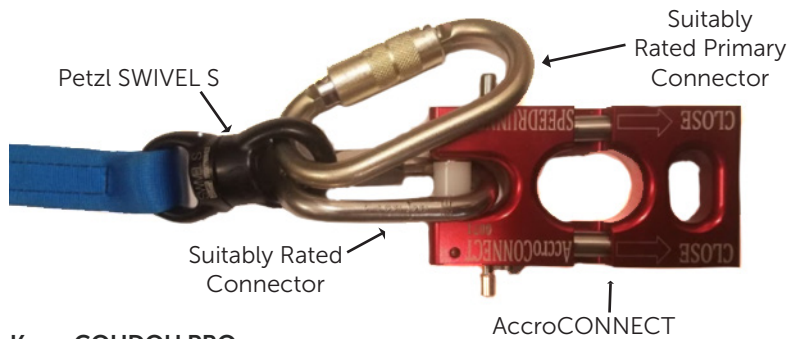
2. Connect the accessory attachment and a suitable carabiner to the Petzl SWIVEL S with a suitably rated connector that cannot be removed by a participant.



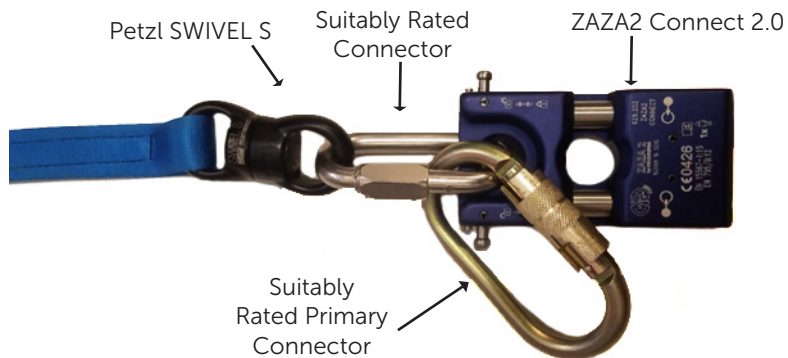
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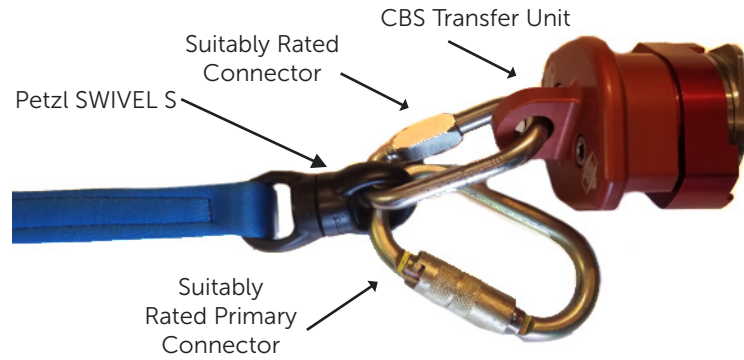
Kanopeo SPEEDRUNNER



Kong COUDOU PRO

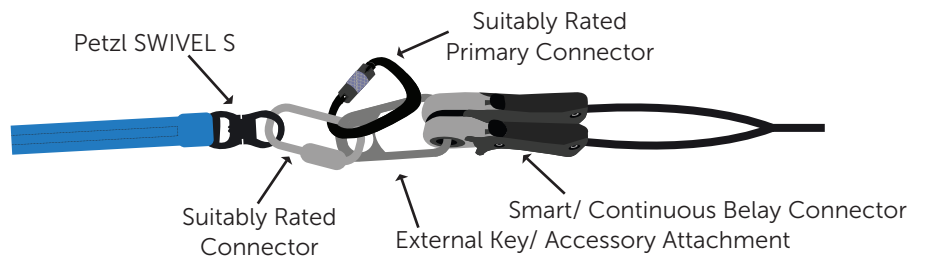


Vertical Trek Innovations QuickTrekker

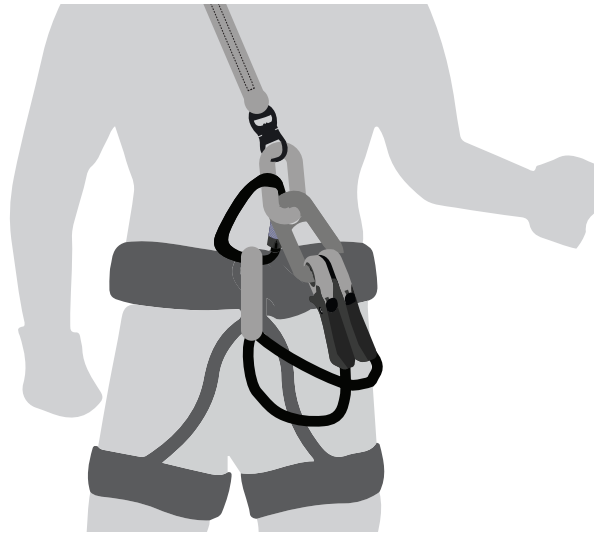


Operation

1. Participant or guide connects themselves directly to the external key or the accessory attachment.



2. Participant or guide connects the primary connector to the harness's hard point.



3. The smart or continuous belay is the secondary attachment to the TRUBLUE and should not be under tension during ascent or descent.

4. The participant must not be able to descend or ascend the element unless they're suitably attached to the TRUBLUE.

5. Once the participant reaches the end of their ascent or descent, the smart belay connectors can be detached from the TRUBLUE and if necessary connected to a suitable lifeline.

6. The participant or guide can then disconnect the primary connector from the harness.

Considerations

Descending Element

- If the secondary attachment is engaged, due to an improper primary attachment, the added length of the smart or continuous belay lanyard may create slack in the system. The slack can result in a jolt during initial descent and may cause the connectors to collide with the participant.
 - An option to combat this is, the TRUBLUE can be mounted such that the lanyard is in tension prior to the primary connector being attached to the harness. Ensure participants are suitably trained on how to properly connect the primary connector.
- Smart and continuous belay manufacturers may not allow for impact loading beyond a certain point on their systems. Ensure operations are within the manufacturers requirements.
- Ensure participants cannot become entangled in the smart or continuous belay lanyards during descent.
- Never permit the webbing line to wrap around legs, arms, neck other body parts or loose clothing of the participant.
- Ensure participants hands are free and clear of connectors during descent. Loading may cause a pinch hazard.
- Never descend from alongside or above the TRUBLUE Auto Belay.
- Prior to descent, ensure descent path and landing area are free of people and obstructions.
- Always descend feet first and straight down using feet to fend off obstacles and prepare for landing.