



OPERATION AND MAINTENANCE MANUAL

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OBJECTIVE

The objective of this document is to cover all aspects required for safe use, operation and maintenance of the Blue Logic 50W Subsea-USB System. Relevant technical aspects for information and familiarization shall be covered as well as required technical data.

ABSTRACT

The Blue Logic 50W Subsea-USB system is based on the WPC/ Blue Logic inductive technology for transfer of electrical power and communication subsea. The 50W connector system is part of the complete "Subsea-USB" system covering power range from 50W to 2000W with communication speeds up to 80Mbps.

In general, each Subsea-USB system consists of a Primary and a Secondary side installed in a Male and Female housing. The power is transferred from the Primary side to the Secondary side whilst communication acts in both directions.

The Male and Female Subsea-USB Connectors can be configured in the following alternatives:

1. Manually operated by hand
2. ROV operated
3. Bulk head installation
4. Combined with hydraulic connector thus allowing for electrical power, communication and hydraulic connections to be made up using the same connector assembly.

The Blue Logic/WPC Subsea-USB System transfers 24VDC input voltage to 24VDC voltage from primary to secondary side over a galvanic isolated interface.

REVISION CHANGE/RECORD

REV	REASON FOR REVISION/ DESCRIPTION OF CHANGES
01	
02	
04	
05	

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1. INTRODUCTION

The Blue Logic inductive connector system is designed for subsea connection and transfer of electrical power and communication. Due to the plug and play functionality of the wireless connectors, Blue Logic has given them the brand name Subsea-USB. In addition, the inductive connectors can be mounted onto hydraulic connectors thus allowing for simultaneous connection of electrical power, communication and hydraulic power.

The Subsea-USB Connectors are intelligent units which automatically detects when it is mated and immediately enables power and communication transfer.

In general, a Subsea-USB connector consist of a mechanical housing which houses required electronic PCB's and coils for transmission of power and communication.

Electrical alternatives with respect to power, voltage, current and communication set-up can be delivered upon request.

1.1. SAFETY



WARNING: The equipment to which this manual applies must only be used for the purpose for which it was designed. Improper use or maintenance may cause damage to the equipment and/or injury to personnel. All users must be familiar with the contents of the appropriate manuals before attempting to install, operate, maintain or in any other way work on the equipment.

Blue Logic AS disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment

1.2. DOCUMENT USE

This document shall be used as general information for all aspects related to safe use, installation, removal, maintenance and storage of the 50W Type A Subsea-USB Connectors

1.3. ABBREVIATIONS

ROV: Remotely Operated Vehicle

2. TECHNICAL DESCRIPTION

2.1. SYSTEM OVERVIEW

The Blue Logic 50W Subsea-USB System can be delivered with a variety of mechanical configurations and interfaces as illustrated in below figure.



Figure 1 - USB - A system

2.2. MATING INTERFACES

The 50W Subsea-USB connector is a ROV friendly and compact inductive connector system designed primarily for intervention purposes suitable for all types of ROV tools where electrical power and electronic communication is required.



Figure 2 - Mating interface

The connector system is available with either a mechanical installation interface, or with a guiding system that locks the primary and secondary unit together. The guiding system is equipped with a friction lock solution which is specially designed for ROV use.

The guide system can be delivered with or without a mechanical flange for panel installation or ROV handle as shown in Figure 2.



Figure 3 - Typical Male Stab



Figure 4 - Typical Female Receptacle

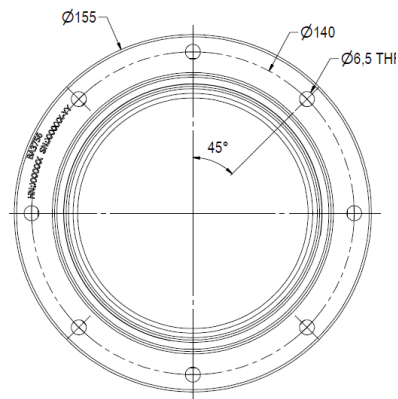


Figure 5 - Installation flange

Installation flange interface is 8 x Ø6.5 on PCD 140mm as shown on above figure.

2.3. TECHNICAL DATA

Overall dimensions	See Assembly Drawing
Design Water Depth	3000 m
Input Voltage Primary Side	22-50 VDC
Output Voltage	24 VDC
Max Power Transfer	50 W
Communication Protocol	RS485, RS232+ Ethernet *
Communication speed RS232	230 kbps
Communication Speed Ethernet	80 Mbps
Electrical Connector, Primary Side	SubConn Power Ethernet Circular - 13 contacts
Electrical Connector, Secondary Side	SubConn Power Ethernet Circular - 13 contacts

** Connector system can be configured for RS485 upon request.

2.4. PIN CONFIGURATION

The Standard 50W Subsea-USB Connectors is equipped with Subconn Power Ethernet Circular - 13 contacts Connectors. Other connectors are however available upon request as special deliveries.

Primary side Subsea-USB Connectors are equipped with Male Subconn Connectors while Secondary Side are equipped with female connectors.

Primary Side with RS232 and RS485	
Connector: Power Ethernet Circular - 13 contacts	
Pin #	Signal
Pin 1	+V IN
Pin 2	CHASSIS
Pin 3	-V IN
Pin 4	TX_p
Pin 5	TX_n
Pin 6	RX_p
Pin 7	RX_n
Pin 8	
Pin 9	RS232 + RX*
Pin 10	RS232 + TX**
Pin 11	RS232 GND
Pin 12	RS485A
Pin 13	RS485B

*Data going in to unit.

** Data going out of unit.

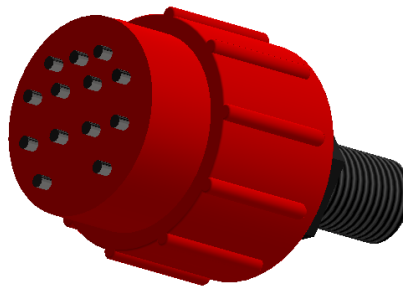


Figure 6-Power Ethernet Circular - 13 contacts (male)

Secondary Side with RS232 and RS485	
Connector: Power Ethernet Circular - 13 contacts	
Pin #	Signal
Pin 1	+V OUT
Pin 2	CHASSIS
Pin 3	-V OUT
Pin 4	TX_p
Pin 5	TX_n
Pin 6	RX_p
Pin 7	RX_n
Pin 8	
Pin 9	RS232 + RX*
Pin 10	RS232 + TX**
Pin 11	RS232 GND
Pin 12	RS485A
Pin 13	RS485B

***Data going in to unit.*

**** Data going out of unit*

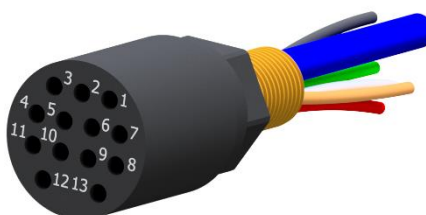


Figure 7 - SubConn Power Ethernet Circular - 13 contacts (female)



2.5. IP ADDRESS CONFIGURATION

All Subsea-USB systems are delivered with a fixed IP address. The used addresses are listed in table below. It is recommended to avoid having other equipment in the same network using the same IP address. Other IP configurations of the Subsea-USB system are however available upon request as special deliveries. The IP addresses of the Subsea-USB system do not affect the transmission of data and it is not required that the IP address of the Subsea-USB system lies within the IP range of the network.

Unit	IP Address
Primary side	192.168.1.253
Secondary side	192.168.1.254

2.6. LED INDICATOR LIGHTS

Some 50W connectors have LED indicator lights visible for ROV showing status of the Subsea-USB connector during use and connecting.



Figure 8: LED Indicator lights

Name	LED Status	Description
POW (Primary side)	On	Start-up voltage limit passed*
	Blinking	Alarm state
POW (Secondary side)	On	Output voltage activated
	Blinking	Alarm state
ETH	On	Ethernet connection made
	Blinking	Data transmitted or received
RX	On	System ready to receive data
	Blinking	System receiving data
TX	On	Primary and Secondary side connected System ready to send data
	Blinking	System sending data

* Turned on "Pow" LED Primary side does not verify that the input voltage is within the specified range.



2.7. 50W SUBSEA-USB COMBINED WITH HYDRAULIC CONNECTORS

Blue Logic Subsea-USB systems can be combined with hydraulic connectors to form a combined multifunctional connectors system allowing for both hydraulic and electrical connection in the same interface. Installation brackets are available for most types of Blue Logic delivered stab systems, both Hot Stabs and Valve stabs. Installation of the Subsea-USB units onto hydraulic stab's is performed in accordance with the dedicated assembly drawings. Mating/ de-mating of the combined system shall be performed in accordance with the manual for the hydraulic connector system (Hot Stab or Valve Stab).

Note that Valve Stab connectors are rotation dependent, and are not correctly docked before the indicator pin is activated.

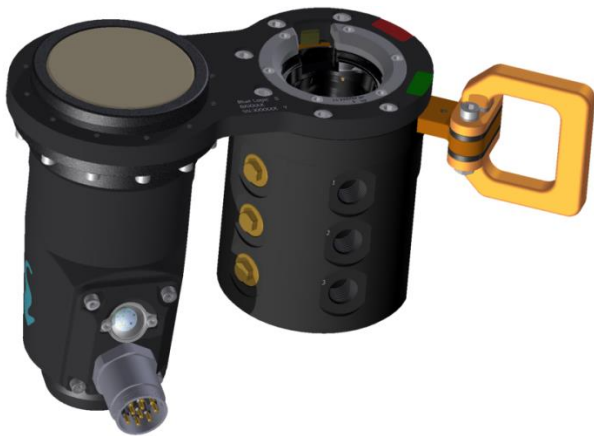


Figure 9 - Subsea-USB installed on a 3-Port Valve Stab receptacle. Illustration picture.



Figure 10 - Subsea-USB installed on a 3-Port Male Valve Stab. Illustration picture.

3. OPERATION

3.1. PRE DIVE CHECK LIST

No.	Description	Chk/Verified
01	Perform a function test by connecting primary and secondary side. <ul style="list-style-type: none"> - Test communication - Test Power transfer 	
02	Perform a visual inspection of primary side connector <ul style="list-style-type: none"> - Housing - Seals - Coil Surface - Connector 	
03	Perform a visual inspection of secondary side connector <ul style="list-style-type: none"> - Housing - Seals - Coil Surface - Connector 	
04	If the Subsea-USB Connector is connected to a hydraulic connector, ensure that the mechanical bracket is undamaged and that the primary and secondary side is connected parallel when the hydraulic connector is fully mated.	

3.2. CONNECTION

No.	Description	Chk/Verified
01	Inspect the stab/receptacles to be mated by ROV visually. Verify that mating surfaces are clean	
02	By use of the ROV manipulator gently mate the male and female (primary/secondary) connectors.	
03	Verify that the connectors are fully mated and that cables are undamaged	
04	Verify that power and communication is transferred between the connectors	

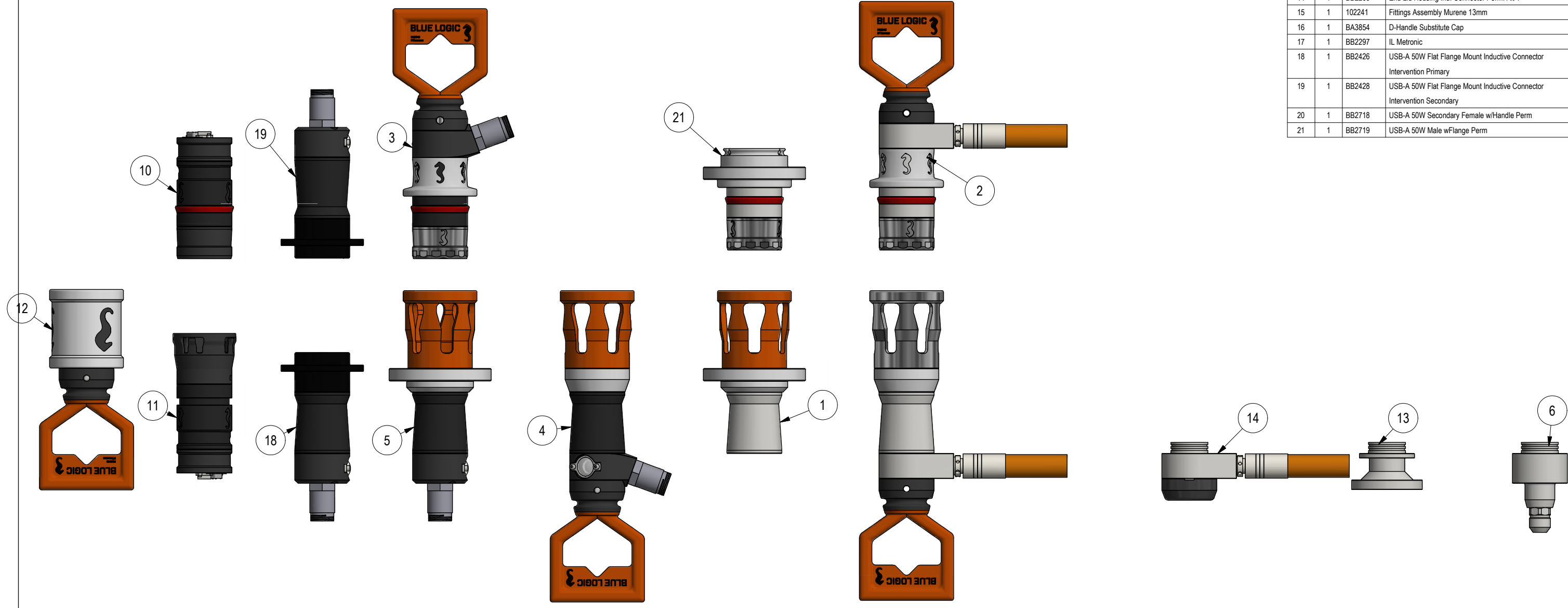
3.3. DISCONNECTION

No.	Description	Chk/Verified
01	Inspect the male/female stab system	
02	Inspect cables and connectors	
03	Gently grab the connector through the ROV handle and pull the stab slowly out from receptacle	
04	Inspect stab, receptacle, cables and connectors	

3.4. POST DIVE CHECK LIST

No.	Description	Chk/Verified
01	Recover system to deck	
02	Inspect all components and parts. Special attention to the following: <ul style="list-style-type: none"> - Housing - Surface treatment - Corrosion - Seal - Coil surfaces - Cables - Penetrators - Connectors - Mechanical interfaces 	
03	Flush all components and parts thoroughly with fresh water	
04	Connect System and perform a full system check	

Parts List			
ITEM	QTY	PART No.	DESCRIPTION
1	1	BB2086	USB-A 50W Female Flange Mount Inductive Connector Perm
2	1	BB2265	USB-A 50W Secondary Male w/Handle Perm Alternative plastic ring
3	1	BB2278	USB-A 50W Secondary Male w/Handle Int. Alt. Plastic Ring
4	1	BB2288	USB-A 50W Primary Female w/Handle
5	1	BB2306	USB-A 50W Female Flange Mount Inductive Connector Interv
6	1	BB2328	End Lid Housing Ind. Connector
7	1	BB2220	IL Metronic
8	1	BB2330	Adapter for PBOF Connector Male JIC 12 1.1/16 12UN-M24x1,5
9	1	BB2331	Ring Ø17,4
10	1	BB2332	USB-A 50W Secondary Test Unit
11	1	BB2336	USB-A 50W Primary Test Unit
12	1	BB2340	Protection Cap Assy 50W
13	1	BB2409	End Lid Housing Ind. Connector Transmark
14	1	BB2266	End Lid Housing Ind. Connector Perm. Alt 1
15	1	102241	Fittings Assembly Murene 13mm
16	1	BA3854	D-Handle Substitute Cap
17	1	BB2297	IL Metronic
18	1	BB2426	USB-A 50W Flat Flange Mount Inductive Connector Intervention Primary
19	1	BB2428	USB-A 50W Flat Flange Mount Inductive Connector Intervention Secondary
20	1	BB2718	USB-A 50W Secondary Female w/Handle Perm
21	1	BB2719	USB-A 50W Male w/Flange Perm



FOR INFORMATION ONLY

Rev.	Date	Reason for issue	Revision change	Made	Chk'd	Appr.
01	15.6.2018	3-IF1 (Issued for Information)			LGH	



Unless Noted Otherwise:	Dwg Scale: NTS
Dim. Tol: NS-ISO 2768-1M	Dwg Proj:
Roughness: Ra3.2	Dwg Format: A3
Fillet Rad: Corner Rmax: 1	Break Edges: (R. Alt. 45°) R= 0,1-0,5

Drawing title: 50W Inductive System	Drawing number: BB2040	Rev: 01
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