

LUMA

a fast, long-range, optical underwater communication system

Installation Guide

Ver 1.1



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1 Introduction

The LUMA X is an optical modem for fast, reliable underwater communication. Each LUMA X is a full transceiver and thus capable of half-duplex communication (transmission and reception).

2 Operation

2.1 Setup

Attach both modems to their respective host systems using matching female SubConn Ethernet Circular 8 pin connectors such as DIL8F, DBH8F or DOM8F. Please make sure to match the pinout provided in *Electrical and Software Characteristics*.

- Apply a suitable supply voltage (12 V – 36 V).
- When properly aligned and within communication range, the two modems now provide a **half-duplex** communication link.

WARNING:

- **bright LED light source, do not look directly at emitter**
- **a few people may experience epileptic seizures when viewing flashing lights**

2.2 Operation

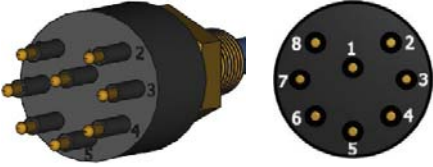
The modem provides a completely transparent connection and it will broadcast all data received from the serial or ethernet interface over the optical interface.

Thermal fold-back: The emitter of the modem consists of 15 high-power LEDs composed of 5 banks of 3 LEDs. During normal operation all 15 LEDs are transmitting in parallel to provide the highest possible transmission range. If the circuit board temperature rises above 60°C the modem will dynamically switch off emitter banks until the temperature returns to a safe level.

3 Maintenance

Please wash the modem with warm water (only) to remove any built-up which could negatively affect its operation. Apply a thin film of silicone grease to the rubber part of the connector pins to protect the connector and to facilitate mating. For maintenance details regarding the connector follow SubConn's instructions.

4 Electrical and Software Characteristics (*)

Supply voltage (Vs)	12 – 36 V	
Power consumption	2 W (active mode, receiving) 2 – 17 W (active mode, transmitting)	
Range	> 50m (164 ft) (depending on turbidity)	
Data rate (optical)	1 Mbit/s – 10 Mbit/s	
Data rate (Ethernet)	10/100 Mbit/s	
Data rate (serial)	Software selectable: 9600, 19200, 38400, 57600, 115200, 204800, 227556, 256000, 512000	
Transmission power	Software selectable: 1, 2, 3, 4 or 5 banks with 3 LEDs each	
Interface	Software selectable: Ethernet RS232 RS485	
Emission wavelength	480 nm	
Beam pattern	120 degree cone	
Connector pinout		1: Vcc 2: GND 3: RS232 RX / RS485 D+ 4: RS232 TX / RS485 D- 5: Ethernet RX- 6: Ethernet RX+ 7: Ethernet TX- 8: Ethernet TX+

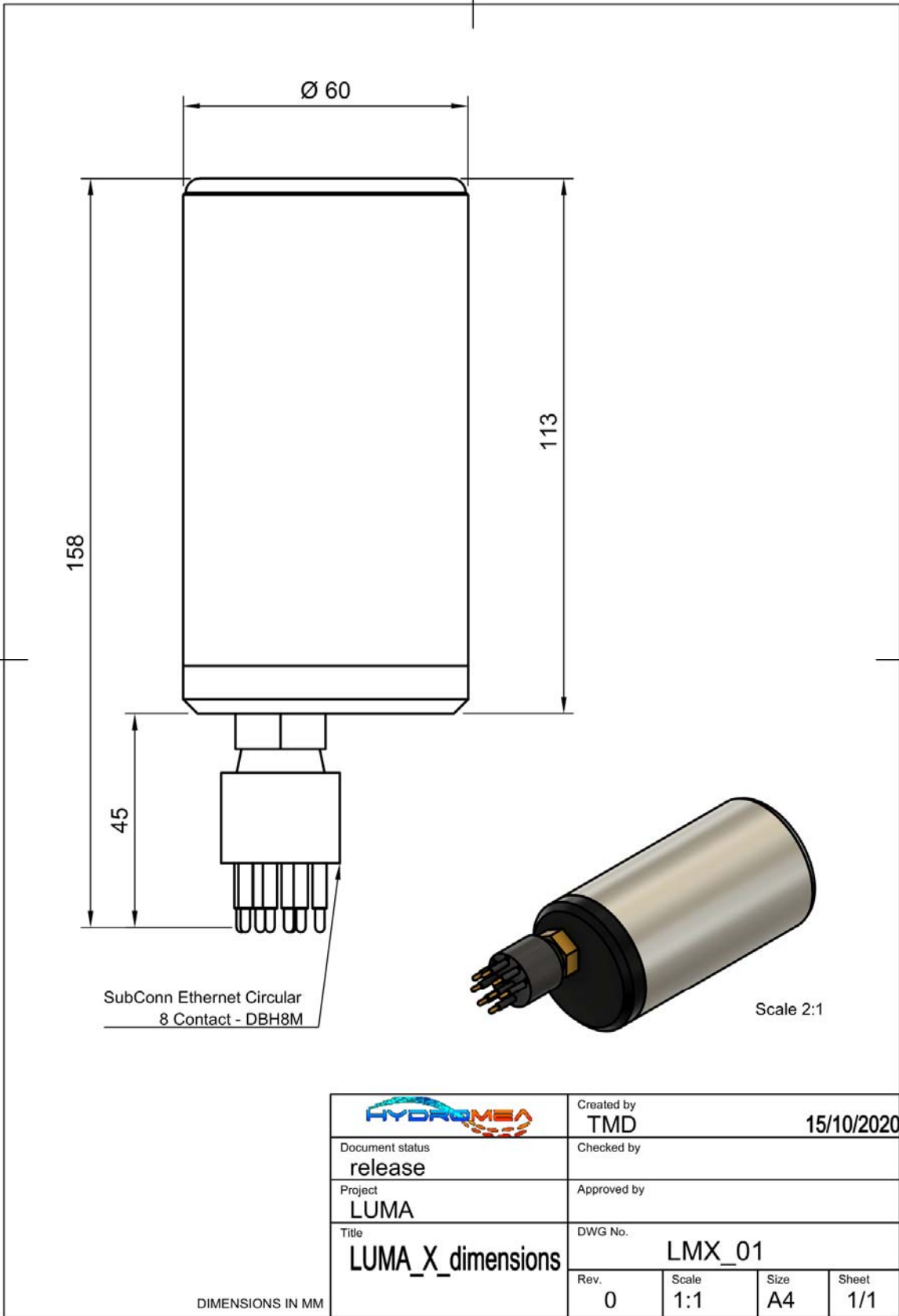
(*) subject to change without notice

5 Mechanical Characteristics (*)

Length x Diameter (Housing)	113 x 60 mm (4.5" x 2.4")
Weight in air	475 g (1 lb 1 oz)
Weight in water	125 g (5 oz)
Connector	SubConn Ethernet Circular 8 – DBH8M
Depth rating	6000 m (19000 ft)

(*) subject to change without notice

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6 Errata

Version	Release date	Errata
1.0	1.3.2021	Original version
1.1	17.6.2021	<ul style="list-style-type: none">• Added version numbers and errata• Updated weight in 5• Updated power consumption 4