WaterLinked

Installation Guide

Modem M16

Part number	**WL-21048-1**
Classification	**Public**

Document history

V	Date	Prepared by	Checked by	Approved by	Description
1	2023-09-22	E.Hidle, A.Valmarsen, G.Sivertsen	A. Tesaker	S. McLay	Initial revision
2	2024-01-26	G. Sivertsen	E. Hidle	S. McLay	Added Flange version

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Introduction

This is the installation guide for the Modem M16, a robust, compact underwater communication device delivering 16-bit transmissions per package. Engineered for the harshest aquatic conditions, the M16 guarantees reliable and efficient underwater communication despite environmental unpredictability.

The Modem-16 comes in three variants:

- **OEM**: 5x30 cm loose wires, 3.0-4.2 V input voltage, 3.3 V TTL level UART, mechanical interface required
- **Standard**: 3 m twisted-pair cable, 3.0-4.2 V input voltage, 3.3 V TTL level UART
- **Extended**: 15 m twisted-pair cable, 10-30V input voltage, full-duplex RS422
- **Flange**: 5x30 cm loose wires, 3.0-4.2 V input voltage, 3.3 V TTL level UART

The upcoming sections of this guide detail the termination procedure and setup instructions, assisting in the basic operation of the Modem M16.

Electrical connection

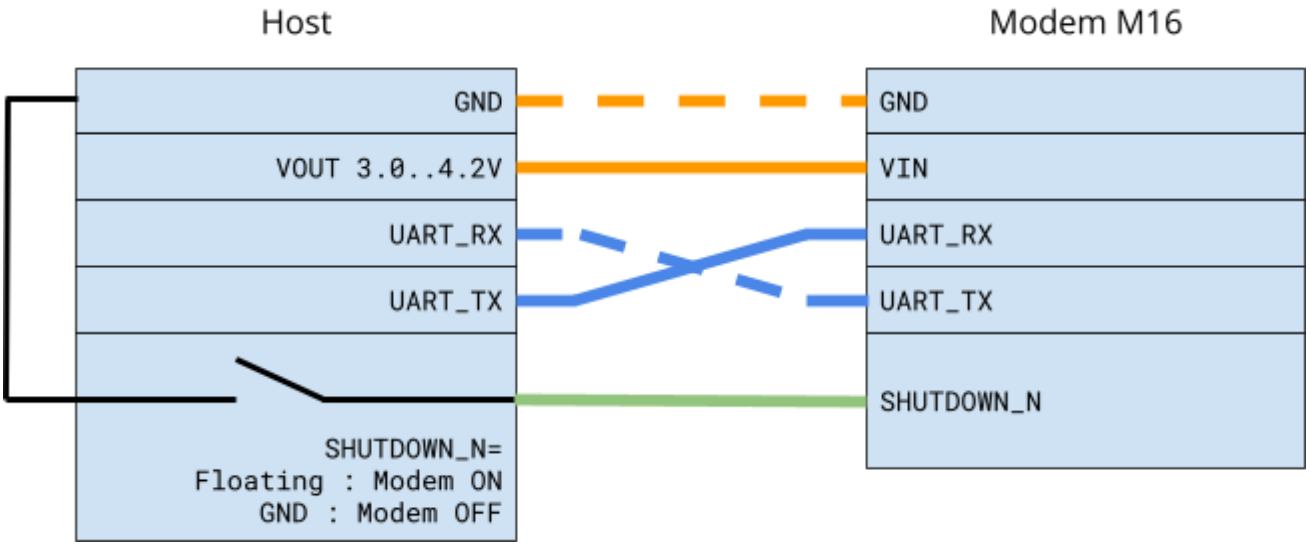
Pinout

Function	Versions			
	OEM (UART)	FLANGE (UART)	STANDARD (UART)	EXTENDED (RS422)
GND				
VIN	3.0..4.2V 	3.0..4.2V 	3.0..4.2V 	10..30V 
UART_RX (in)				NA
UART_TX (out)				NA
*SHUTDOWN_N				NA
RS422_RX+ (in)	NA	NA	NA	
RS422_RX− (in)	NA	NA	NA	
RS422_TX+ (out)	NA	NA	NA	
RS422_TX− (out)	NA	NA	NA	

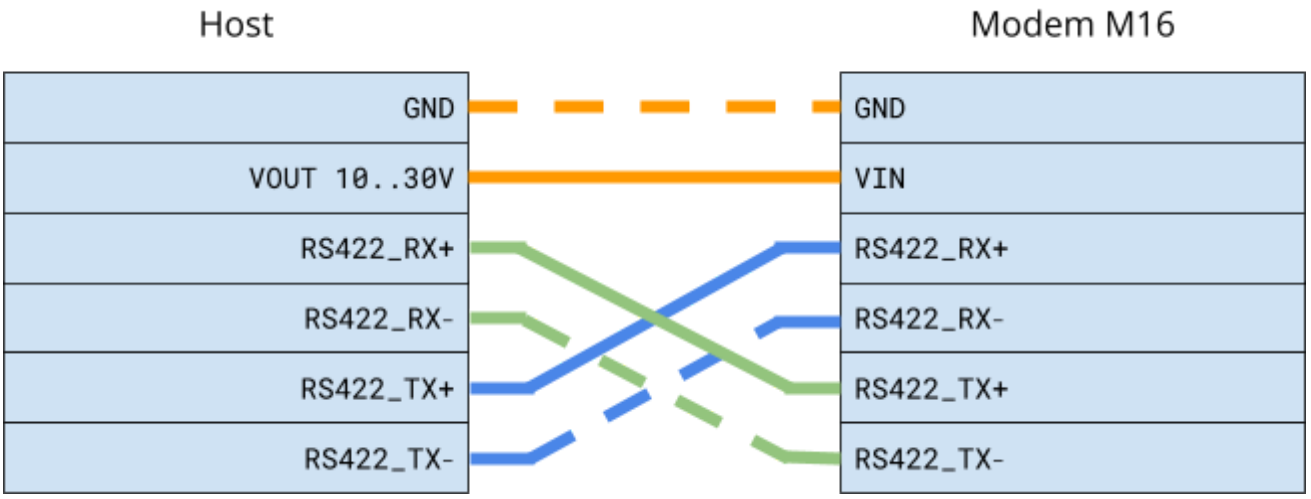
* SHUTDOWN_N line can be used to control the ON/OFF state of the Modem.
If SHUTDOWN_N left floating, the Modem is ON. If SHUTDOWN_N is short to GND, the modem is OFF.
SHUTDOWN_N line can be controlled by an external open-drain, open-collector or relay device.
DO NOT apply voltage to SHUTDOWN_N line.

Wiring

OEM/FLANGE/STANDARD (UART)



EXTENDED (RS422)

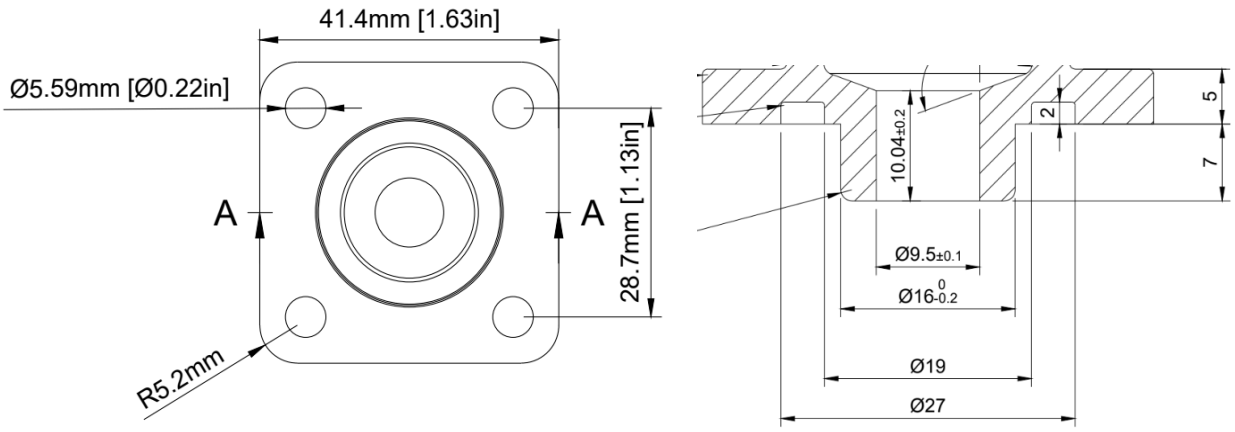


FLANGE

Included in the box

- Modem-M16, FLANGE version (compatible with Burton "Shell Size 16" hole pattern)
- 1x O-Ring 18.72 X 2.62 NBR 70
- 4x M5 x 12mm, Screw, Torx Pan Head (ISO 14583) - Marine Stainless Steel (A4)

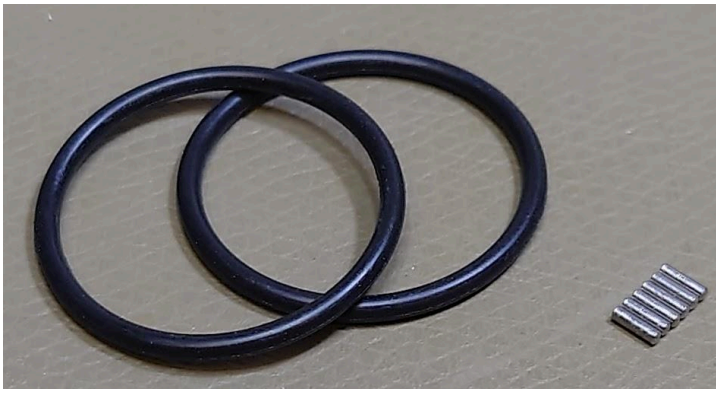
Mechanical drawing



OEM

Included in the box

- Modem-M16, OEM version
- 2x o-rings (standard size: AS568-020)
- 6x dowel pins (DxL: 1x3mm)



Only one o-ring and three dowel pins are required for secure installation, the rest are spares.

OEM mechanical interface

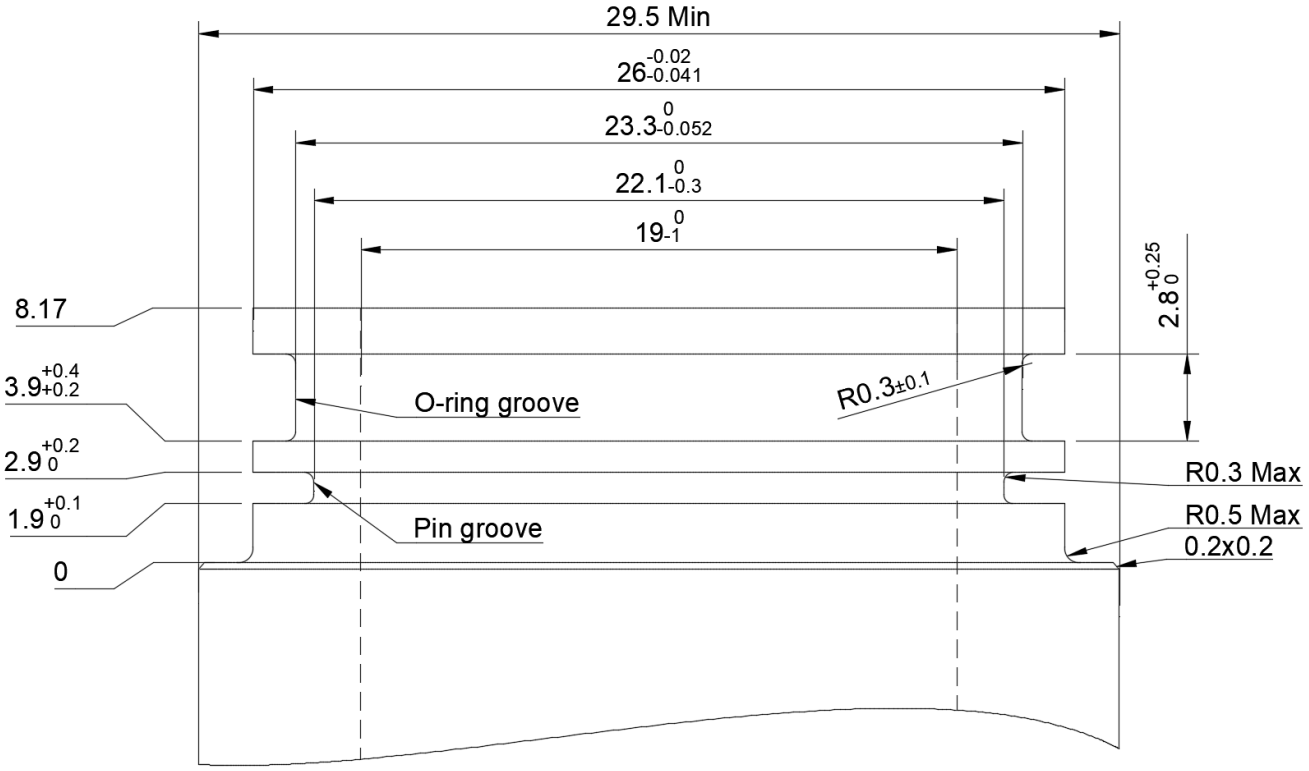
The OEM version of the Modem M16 *must* have an appropriate mechanical interface ensuring no water ingress. Use the mechanical drawing below to construct an appropriate mechanical interface for the OEM version of the Modem-M16, and follow the assembly instructions.

When designing a mechanical interface for the OEM model, take care to meet the following points:

- The Modem-M16 Housing is made of PEEK with a coefficient of thermal expansion of $5x10^{-5}$ 1/K. Make sure that the mating material either has a similar coefficient, or that the operating temperature does not cause the material dimensions to drift beyond those defined in the mechanical drawing below.
- Silicone grease should be added to the o-rings before installation. Make sure that mating material is compliant with silicone grease.
- The inside of the Modem-M16 is potted, and there may be some variance in the potting height. Do not exceed the flange height, i.e. how far inside the Modem-M16 the mechanical interface sits. Max. 8.19 mm flange height (8.17 mm optimal, as shown in the mechanical drawing).

Mechanical drawing

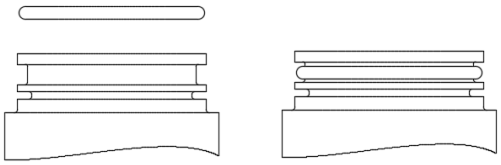
Dimensions in millimeter.
Surface finish: Ra 1.6
NS-ISO 2768-1 medium



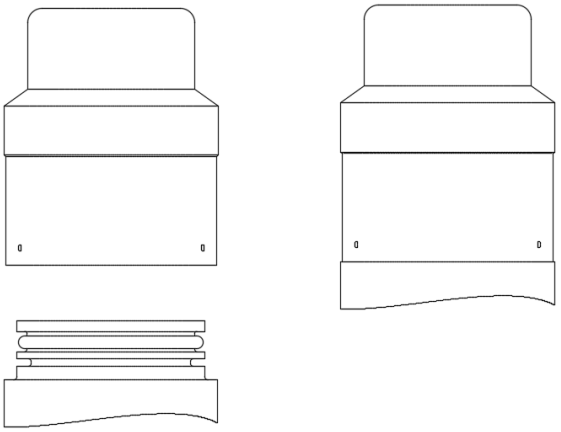
Assembly

The following instructions displays how to mount the Modem M16 OEM to a base. O-ring seals can sometimes fail. It is therefore recommended to pot (fill) the inside of the product with epoxy to protect against water ingress after the modem is installed.

1. Grease the o-ring with silicone based o-ring grease.Put the o-ring in the o-ring groove.



2. Slide the housing onto the base. Make sure that the o-ring does not get pinched, and that the housing is fully seated on the base.



3. Push one dowel pin in each of the three holes in the housing. When the pins are fully inserted, the housing is permanently attached to the base.