

MOSS - PAMS

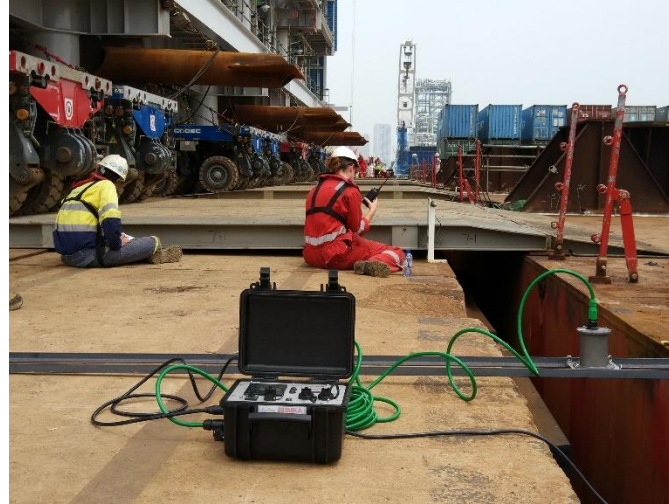
PORTABLE ANGLE MEASUREMENT SYSTEM FOR LOAD-IN / LOAD-OUT

DIFFERENT SETUPS
BASED ON THE TARKA-SYSTEMS MOSS UNIT
(Multi-Operation-Survey-System)

BY : TARKA-SYSTEMS
August 2017 - version 3

MONITORING OPTIONS DURING LOAD-IN/OUT

- **ROLL & PITCH ANGLE OF BARGE**
- **FULL MOTION MONITORING (6 DEGREES OF FREEDOM) OF BARGE**
- **RAMP ANGLE MONITORING**
- **TANK LEVEL MONITORING**
- **DRAFT/FREEBOARD MONITORING FROM BARGE**
- **REMOTE READOUT BY WIRELESS DATA TRANSFER**
- **TIDE LEVEL MONITORING**



Left :

**Loadout in Belgium
Barge roll & Pitch**

Right

**Ramp angle monitoring
Human ruler readout (analogue)
and
Digital readout by sensor & MOSS**

MAIN ITEMS & OPTIONS

- **ANGLE SENSOR**
 - **Single or double axis (X/Y)**
 - **Range, accuracy and data format**
- **MOTION SENSOR**
 - **Accuracy**
 - **Water-resistance version (depth 50 meters)**
 - **Data format**
- **MOSS unit**
 - **Software specification**
 - **Hardware specifications**
- **WIRELESS DATALINK TO REMOTE LOCATION**
 - **Transmitter unit, antenna, cable**
 - **Receiver unit, antenna, cable**
- **REMOTE SOFTWARE**
 - **Visualization software (Dongle + program)**
 - **Laptop**

ANGLE SENSOR

BASIC ANGLE SENSOR FOR SINGLE AXIS OR DOUBLE AXIS



Sensor box containing two sensors and two signal conditioners with 4...20mA, 2-wire outputs

Type	NG2I	NG3I	NG4I
Measuring range	±10 degrees	±30 degrees	±80 degrees
Resolution	<0.001degrees	<0.003degrees	<0.01degrees
Standardized sensitivity (other standardizations on request)	0.8mA/degree	0.266mA/degree	0.1mA/degree
Linearity deviation	<1-10-3F.S.		
Transverse sensitivity	<0.5% at 45° tilt		
Settling time	approx. 0.3 seconds (1s, 2s or 3s optional)		
Temperature drift of sensitivity	approx. ±0.01% / K		
Temperature drift of zero point	approx. ±10 ⁻³ degrees / K		
Terminal voltage	10V ... 30V either polarity!		
Output current offset for sensor zero position	12mA		
Degree of protection	IP65		
Operating temperature	-40°C ... +85°C		
Lagertemperatur	-45°C ... +90°C		
Weight (without clamping ring or cable)	approx. 110 grams		
Standard electrical connection	0.5m cable Ø4.6 mm, 2-wires different cable lengths optional		

Options:
Waterproof housing

MOTION SENSOR XSENS

Overview



MTi 10-series	Gyro bias stability	Roll/Pitch	Yaw	Position / velocity
		Static Dynamic		
MTi-10 IMU	18°/h	✗	✗	✗
MTi-20 VRU	18°/h	0.2° 0.5°	Unref.	✗
MTi-30 AHRS	18°/h	0.2° 0.5°	1.0 deg	✗
MTi 100-series	Gyro bias stability	Roll/Pitch	Yaw	Position / velocity
		Static Dynamic		
MTi-100 IMU	10°/h	✗	✗	✗
MTi-200 VRU	10°/h	0.2° 0.3°	Unref.	✗
MTi-300 AHRS	10°/h	0.2° 0.3°	1.0 deg	✗
MTi-G-710 GNSS	10°/h	0.2° 0.3°	1.0 deg	✓

MOTION SENSOR IMU-108



SMC IMU Motion Sensors



[Datasheet](#)

Technical Specifications	IMU-106	IMU-107	IMU-108
Roll / Pitch	N/A	Yes	Yes
Accelerations X, Y, Z	N/A	Yes	Yes
Heave	Yes	N/A	Yes
Performance			
Angle Accuracy static	N/A	0.02° RMS	0.02° RMS
Angle Accuracy Dynamic @ ±10° sinusoidal roll and pitch	N/A	0.03° RMS	0.03° RMS
Resolution Angle	N/A	0.001°	0.001°
Resolution Heave	0.01m	N/A	0.01m
Angle range Roll/Pitch	± 30°	± 30°	± 30°
Heave range	±10m	N/A	±10m
Heave Accuracy	5cm or 5%	N/A	5cm or 5%
Acceleration accuracy	N/A	0.01 m/s² RMS	0.01 m/s² RMS
Communications			
IMU Configuration Software	The IMU is shipped with SMC configuration windows software allowing on site setup		
Output Signal Protocol	Multiple, user selectable Output Protocols ASCII NMEA and binary		
Communications Interface	Output RS422 and RS232. Analog with remote converter (optional) 2 x RS232 External inputs, (not available on all models) Velocity input formats RMC, RMA, VTG, VBV, VHW; Heading input formats HDT, HDG		
Physical			
Dimensions for IMU-10x (W x H)	tube Ø89, mounting plate Ø134, flange Ø110) x 127		
Weight	~2 kg		
Housing Material	Titanium		
Environmental			
Temperature (absolute max)	0° to +55° Celsius (-10° to +65°); Storage Temperature -40° to +65° Celsius		
Mounting Orientation	Vertical or Horizontal mounting (Factory set)		
Power requirements	12 - 30 VDC; 2 W		
MTBF (computed)	50 000 hours		
Depth rating	IP64 (standard); IP68 30 meter depth rated (optional)		
Standard	Complies with the IEC 60945		
Warranty & Support			
Warranty	2-year Limited Hardware & Software Warranty		
Support	Free Technical & Hardware support		
Bundled Delivery			
Junction Box	Multiple Input & Output Connection Case, including 10 m cable		

SENSORS

The MOSS (Multi Operations Survey System) is not limited to the sensors mentioned on the previous pages. The MOSS is capable to read many sensors and data types:

Format examples:

- mA
- Volt
- Modbus-RTU / RS485
- Serial / RS232
- CAN
- Digital inputs/outputs
- Ethernet

Sensor examples:

- Angle
- Motions
- Draft
- Tide
- Pressure
- Environmental

MOSS UNIT



MOSS

- Digital inputs
- Digital outputs
- Analog inputs (mA/V)
- CAN
- RS232 or RS485 (Modbus rtu)
- Ethernet
- Internal/External storage

Optional

- Data output to external system
- Data output to transmitter

MOSS UNIT



MOSS SPECIFICATIONS

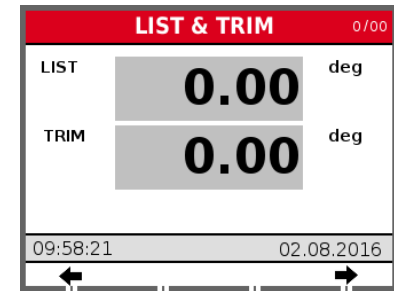
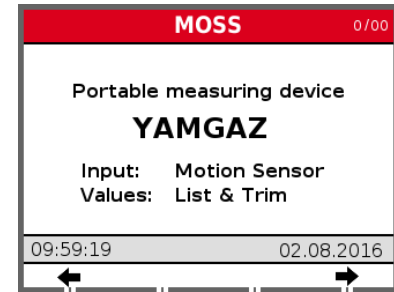
Rugged case	:	305x270x194 mm
Weight	:	approx. 4.5 kg
Battery	:	90Wh
	:	Status display
	:	On/Off switch
	:	Power indicator led
	:	Approx. 20 Hours
	:	operational time
Connectivity	:	see previous page
	:	Ethernet connector
	:	USB connector
	:	Multi purpose connector
Display	:	3.5 inch, 320x240 pixels
Charge	:	12 Vdc
Software	:	Client specific
Specials	:	on request

OPTION 01A

Angle sensor



mA or RS232 [nmea]



Specifications

Angle sensor X & Y

Software

- Visualization
- Data storage
- Angle X & Y

Option to add draft sensor (or other mA sensors)

OPTION 01B



Specifications

Angle sensor X & Y

Local MOSS unit

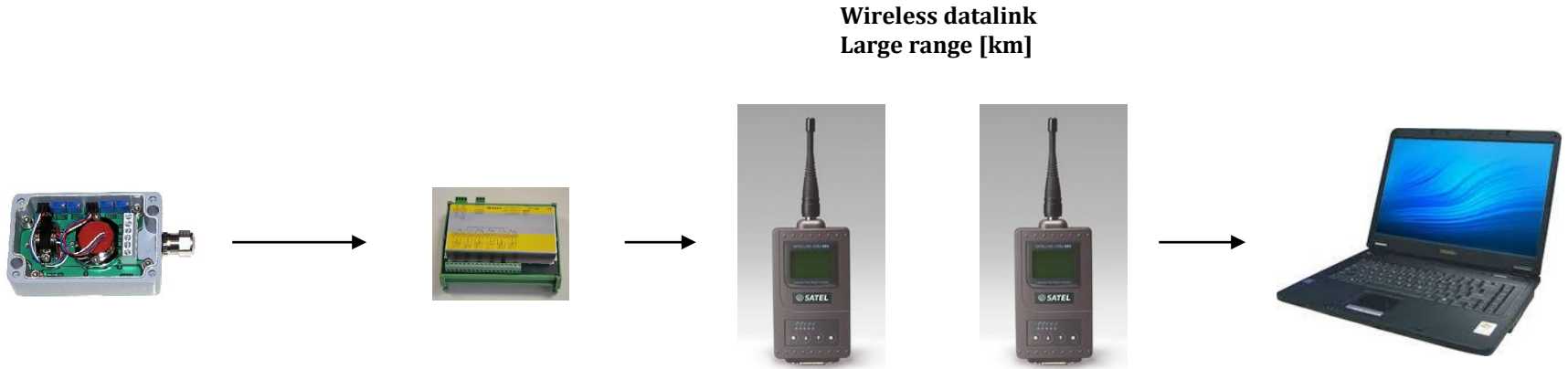
Visualization and storage

Wireless data transfer

Serial data output at receiver

Optional : laptop with software

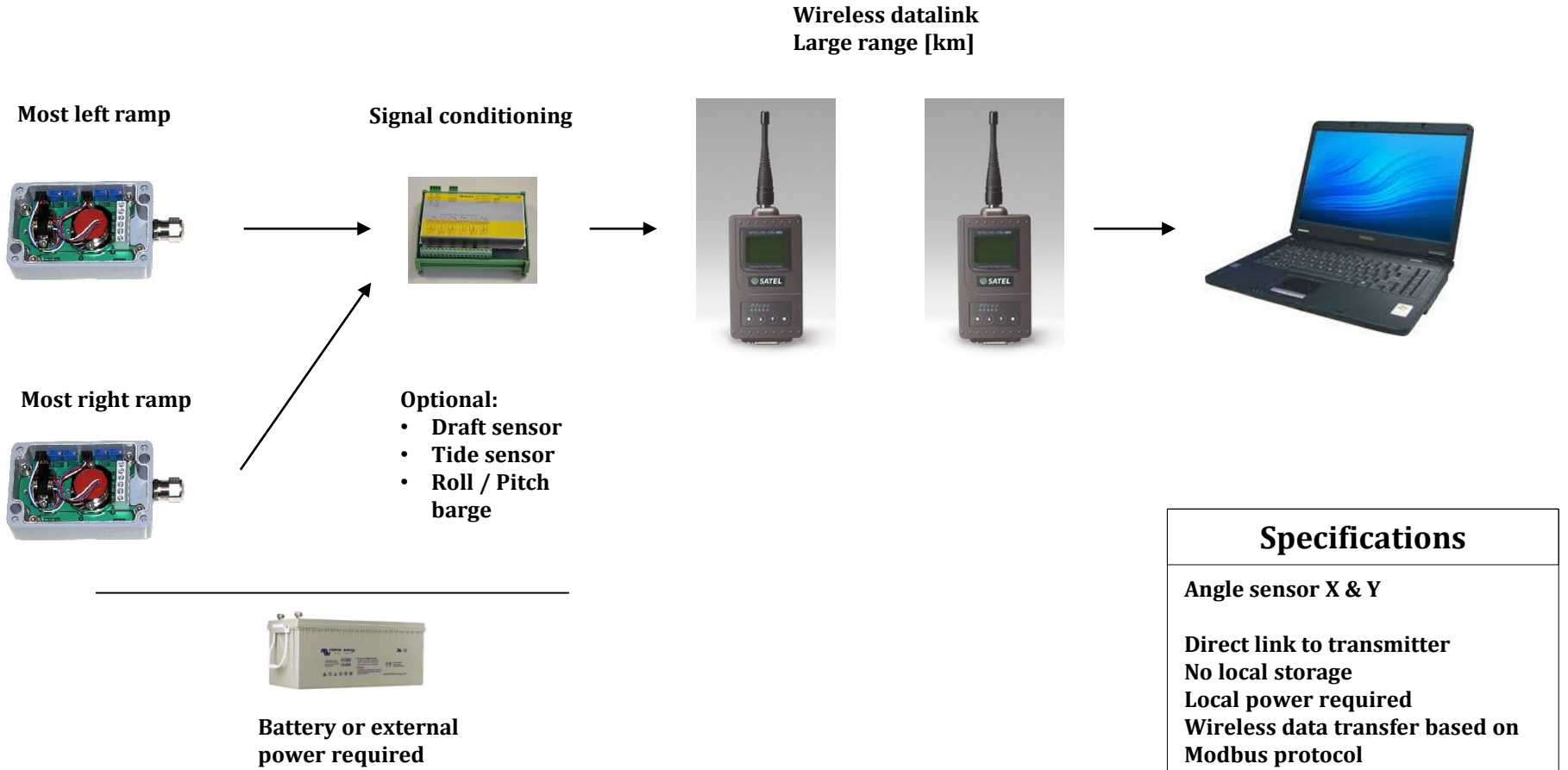
OPTION 01C



Battery or external power required

Specifications
Angle sensor X & Y
Direct link to transmitter
No local storage
Local power required
Wireless data transfer
Serial data output at receiver
Optional : laptop with software

OPTION 01D



OPTION 1E

Most left ramp



Angel sensor X/Y

Most right ramp



Optional:
Second
Angle sensor X/Y
+ 50m cable



Integrated in MOSS

- signal conditioning
- mA to Modbus
- Modbus to RS232

RS232

Wireless datalink
Large range [km]



RS232



Presentation on remote location.

- Inclusive software
- Exclusive laptop



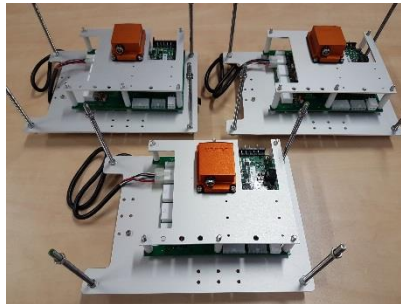
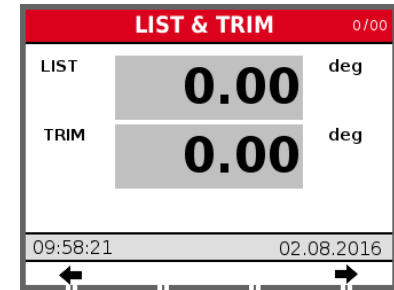
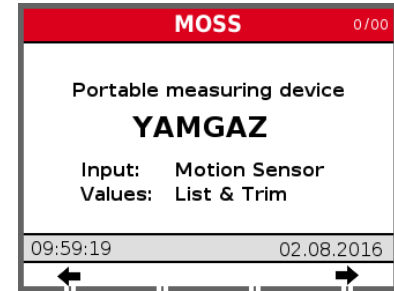
Power box

OPTION 02A

Motion sensor -Xsens



RS232 [nmea]



Option to integrate sensor inside MOSS unit

Specifications

Motion sensor XSENS

Software

- Visualization
- Data storage
- Roll/Pitch/Acc/Rot

OPTION 02B



Specifications

Motion sensor XSENS

Local MOSS unit

Visualization and storage

**Wireless data transfer based on
RS2323 protocol**

**Serial data output at receiver
Optional : laptop with software**

OPTION 02C



Wireless datalink
Large range [km]



Battery or external
power required

Specifications

Motion sensor XSENS

Direct link to transmitter

No local storage

Local power required

Wireless data transfer

Serial data output at receiver

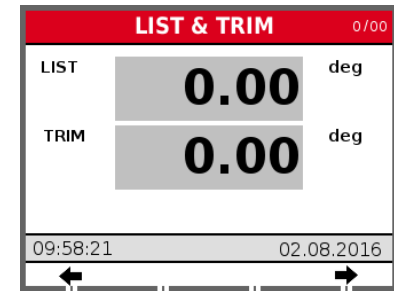
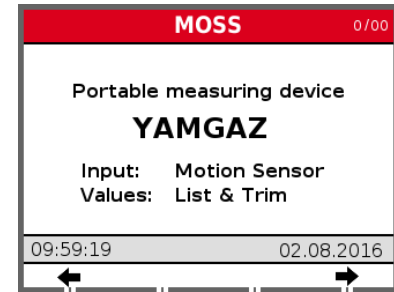
Optional : laptop with software

OPTION 03A

Motion sensor - IMU108



RS232 [nmea]



Specifications

Motion sensor IMU108
High accuracy

Software

- Visualization
- Data storage
- Roll/Pitch/Acc/Rot

Option : waterproof version to depth range of 50 meters

OPTION 03B



Specifications

- Motion sensor IMU108**
- Local MOSS unit**
- Visualization and storage**
- Wireless data transfer**

- Serial data output at receiver**
- Optional : laptop with software**

OPTION 03C



Wireless datalink
Large range [km]



Battery or external
power required

Specifications

Motion sensor IMU108

Direct link to transmitter

No local storage

Local power required

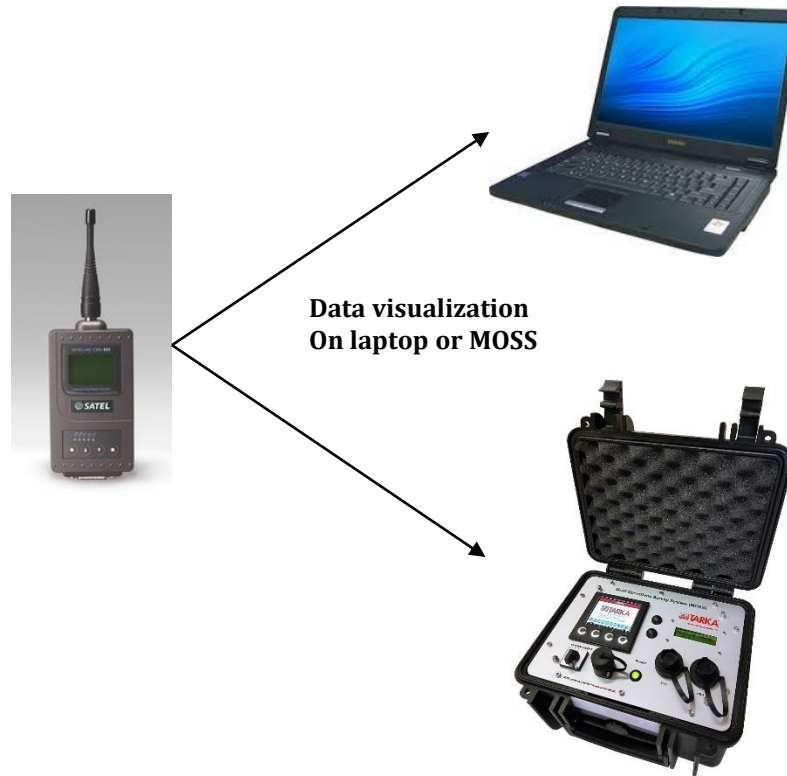
Wireless data transfer

Serial data output at receiver

Optional : laptop with software

OPTIONS AT RECEIVER

- OPTION 1B
- OPTION 1C
- OPTION 2B
- OPTION 2C
- OPTION 3B
- OPTION 3C



TANK LEVEL SENSORS

Tank level sensor

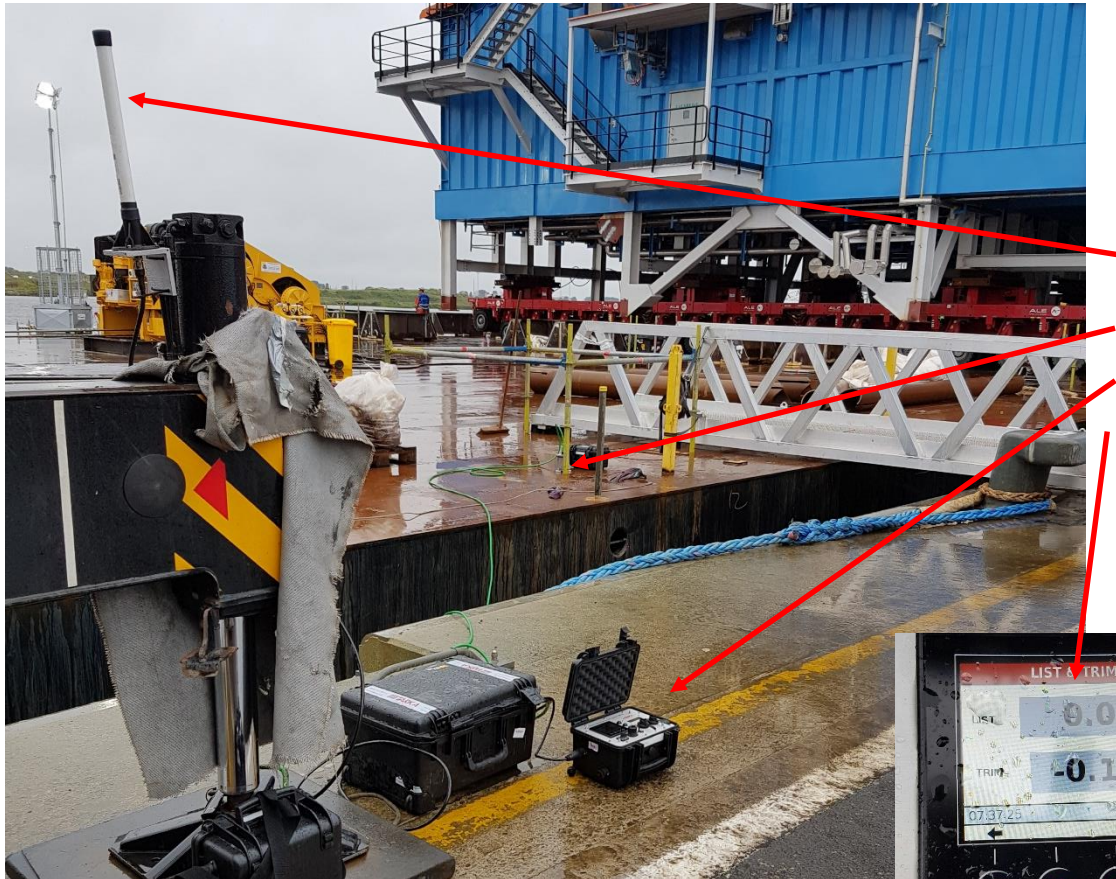


Integration box



Multiple sensors

LOAD-OUT IN BELGIUM



- Antenna for wireless link to remote location
- Motion sensor on barge
- MOSS display unit
- Read out of Roll&Pitch



LOAD-OUT CHINA



1. Special “dummy” ramp for sensor
2. Motion sensor
3. MOSS unit
4. Transmitter
5. Receiver at bridge
6. Readout on laptop at bridge

