Network for
MARITIME APPLICATIONS
satellite based navigation and logistics

Forschungshafen
Rostock

Research Port Rostock - Network for Maritime Applications

Photo: HERO/Nordlicht

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Structure

- Who we are
- What we do
- What we want
- Video

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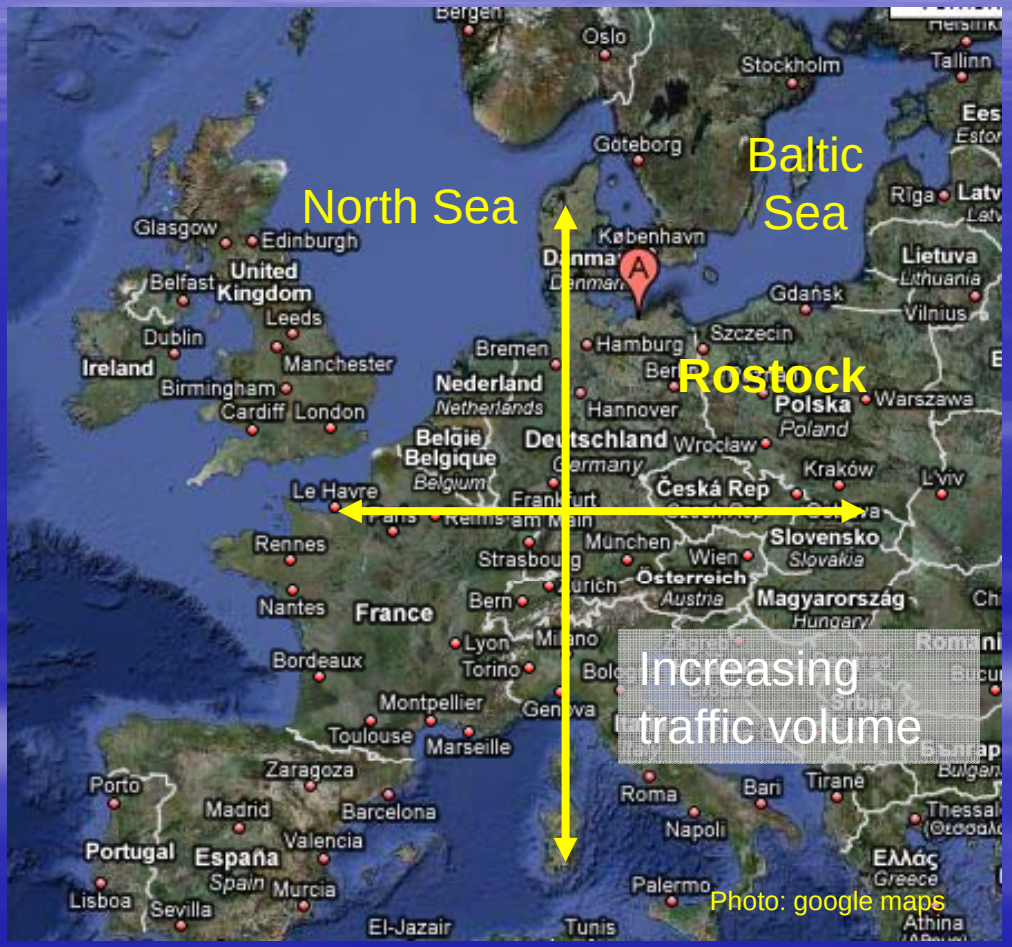
Site of Research Port Rostock

MECKLENBURG-VORPOMMERN

an initiative of the government of the German federal state Mecklenburg-Vorpommern in close cooperation with the regional industry, universities and research institutions



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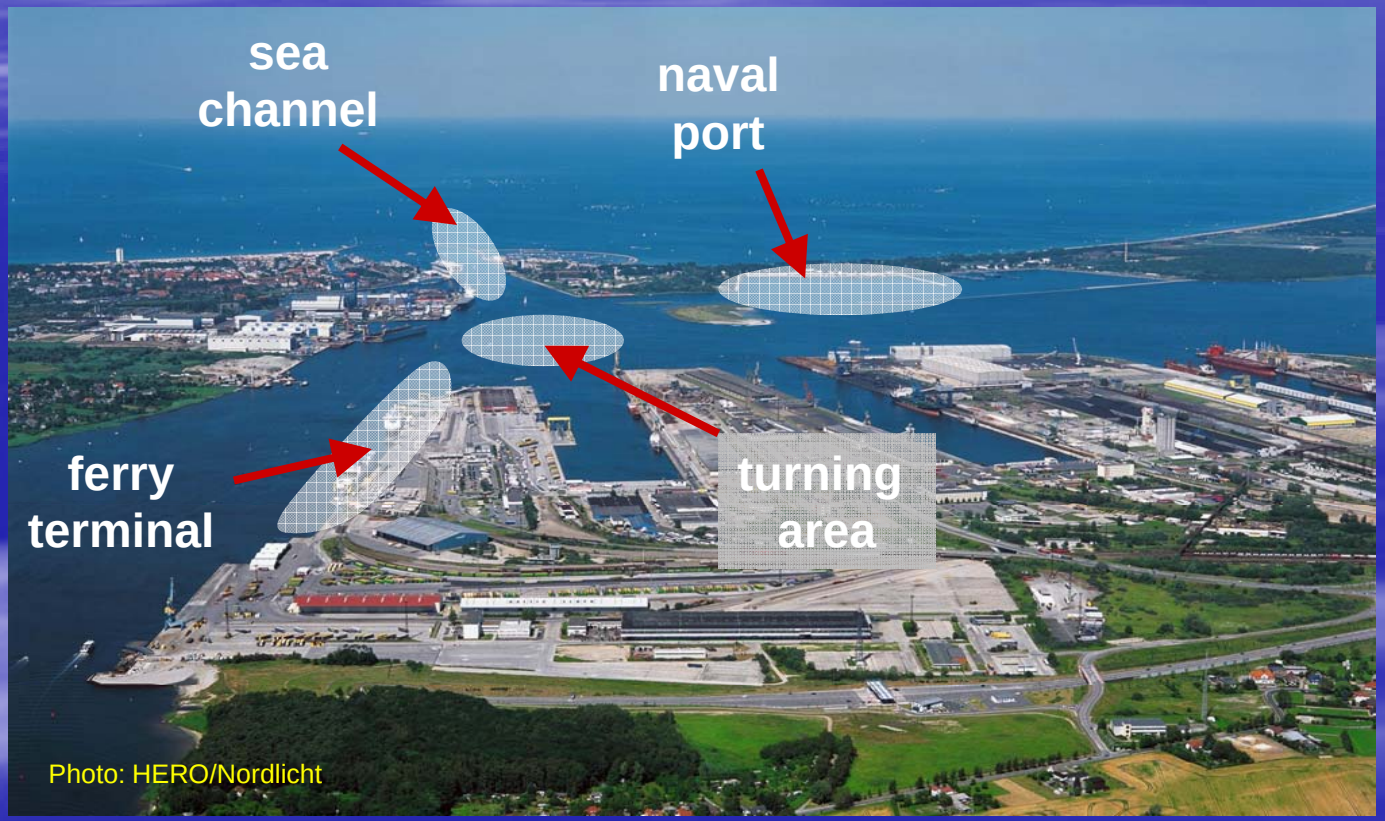
Unique Port Area



- complex user range
- critical local conditions
- high amount of ship traffic

perfect test and development environment

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Organization

Research Port Rostock

initiative of the government of the German federal state Mecklenburg-Vorpommern

‚Safer and efficient maritime navigation‘	‘Network for Maritime Applications’
Research	**Development**

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Members of the Network

Commercial partners

Research facilities

Combined with provider of infrastructure

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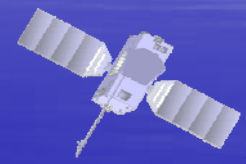
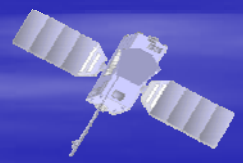
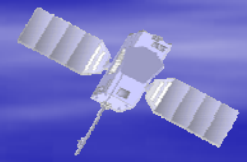
Visions of the Network

- High precise and reliable positioning within one decimeter in the entire port area in real time
- Automation of ship control systems via GNSS applications
- Automation of the intermodal transport of goods
- Time, cost and emission reduction as well as increase of user security under all operating conditions







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Fields of Activity

Logistics ⟷ **Communication** ⟷ **Navigation**

WG Tracking & Tracing

WG Portal
Research Port

WG Augmentation Systems

High precise and reliable positioning of ships, cargo, persons and infrastructure in the harbour area

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Requirements
International Maritime Organization (IMO)

Maritime positioning and navigation are “Safety of Life” - applications of existing and future Global Navigation Satellite Systems (GNSS)

	Ocean/Coastal SAR	Port	Automatic Docking	Galileo SoL
Position Error H/V (m)	< 10 / na	< 1 / na	< 0.1 / -	< 4 m / < 8 m
Alarm Limit (m)	25	2.5	0.25	12 m / 18 m
Time to Alarm (s)	10	10	10	< 6
Integrity Risk	1e-5/3h	1e-5/3h	1e-5/3h	3.5e-7/150s

H = horizontal
V = vertical
NA = not applicable

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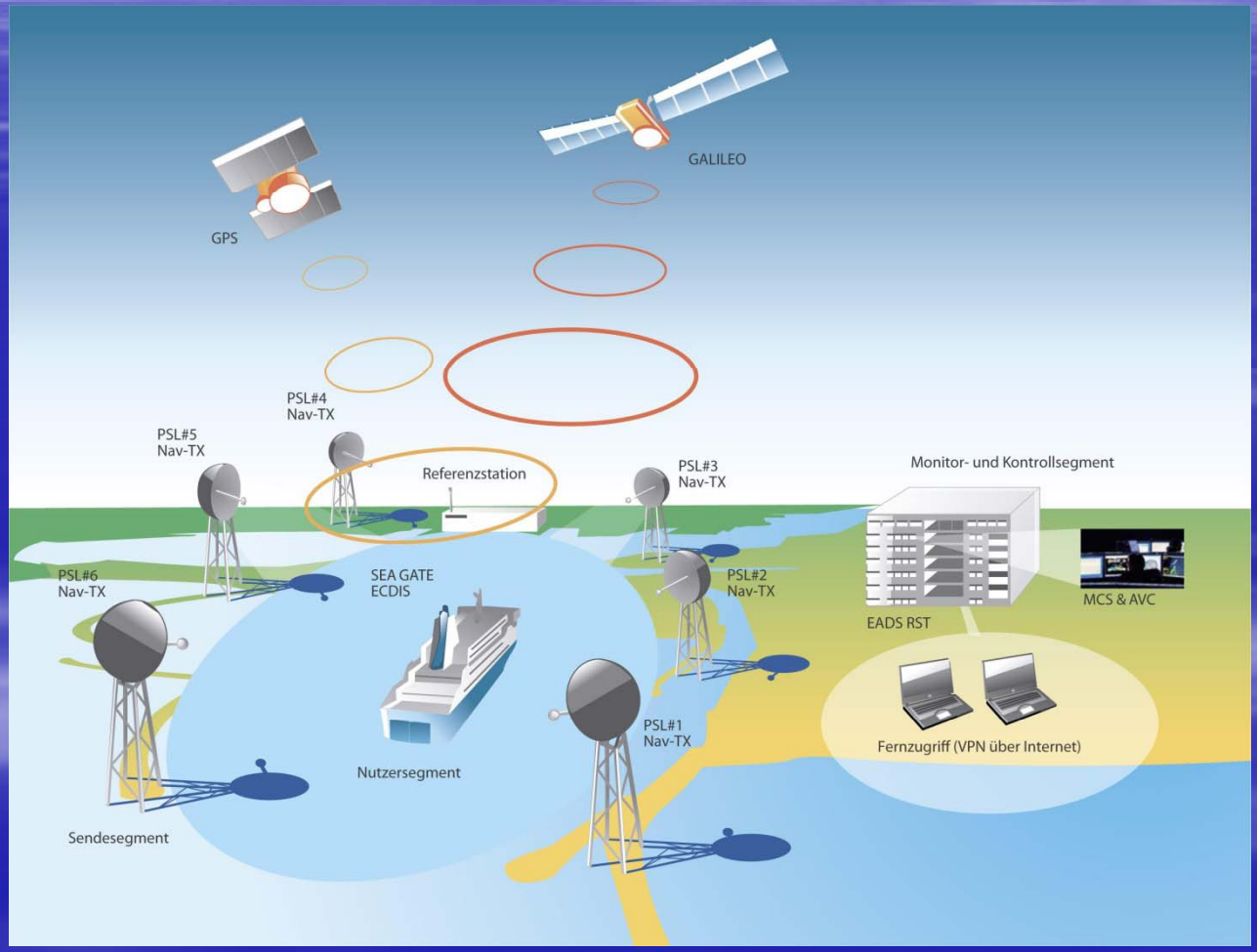
Infrastructures

Solution with GNSS-technology

SEA GATE

Maritime test and development environment



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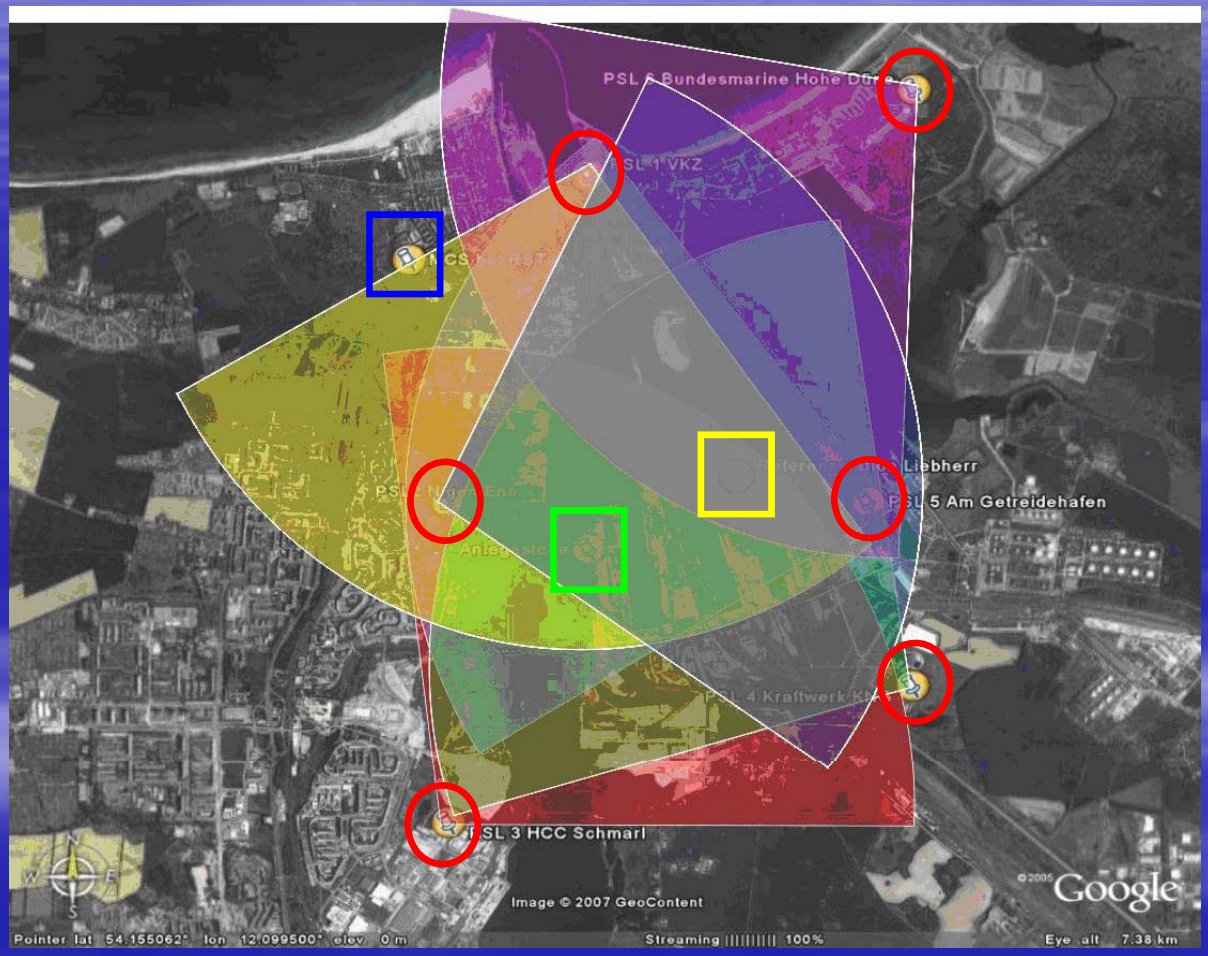
SEA GATE

- 6 pseudolites
- 1 reference station
- 1 master control station

- Preciseness < 0,5m
- Free accessible signals
- Operation 24h/7d

  - base mode
  - base mode + correction data



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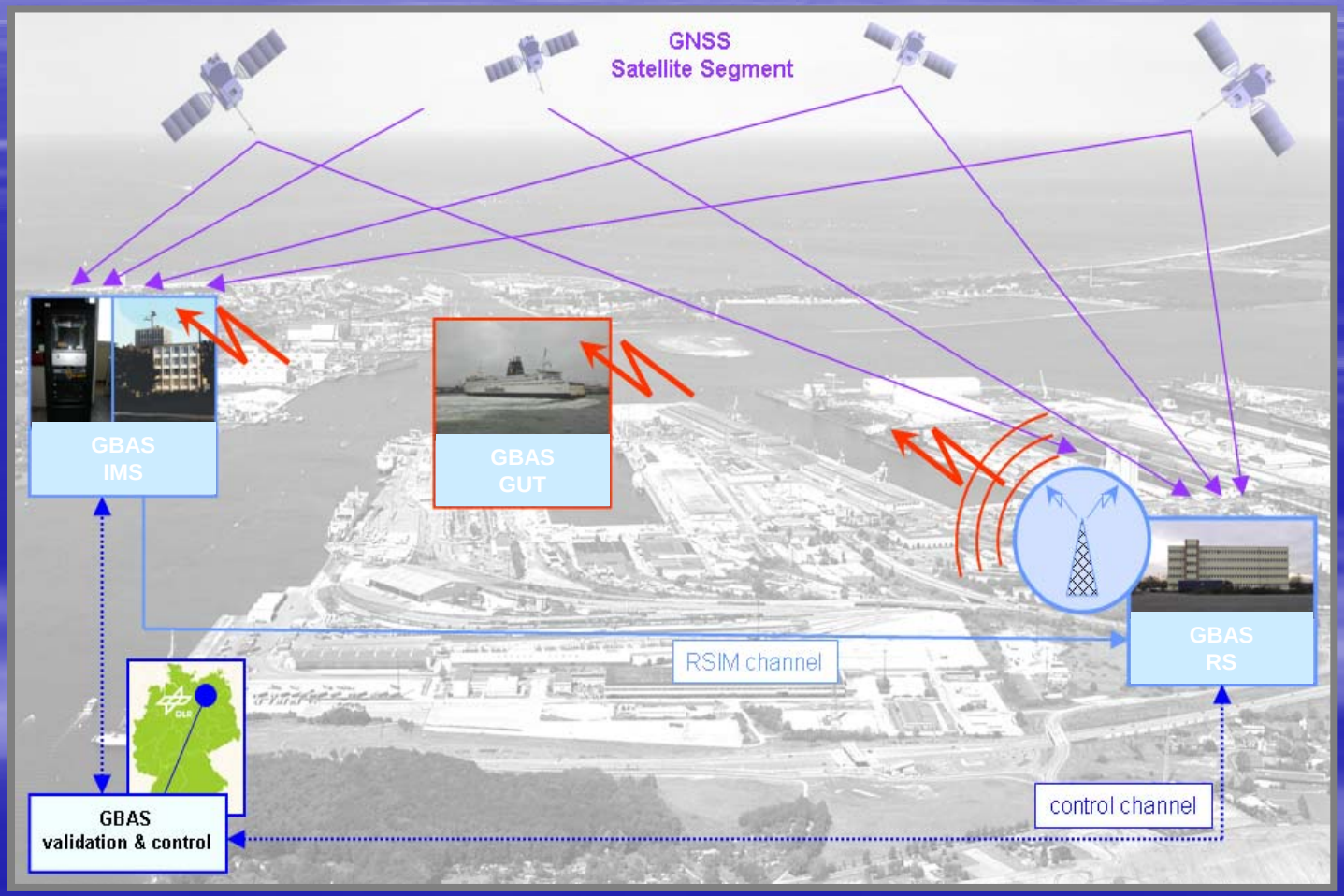
M-GBAS

Alegro/ASMS

- accuracy until 1dm
- phase-based DGNSS (RTK)
- correction and integrity data
- Galileo prepared
- base mode
- base mode + integrity massage
- base mode and validation



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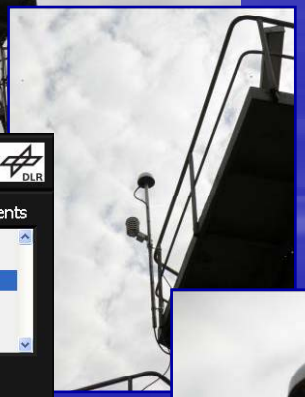
M-GBAS

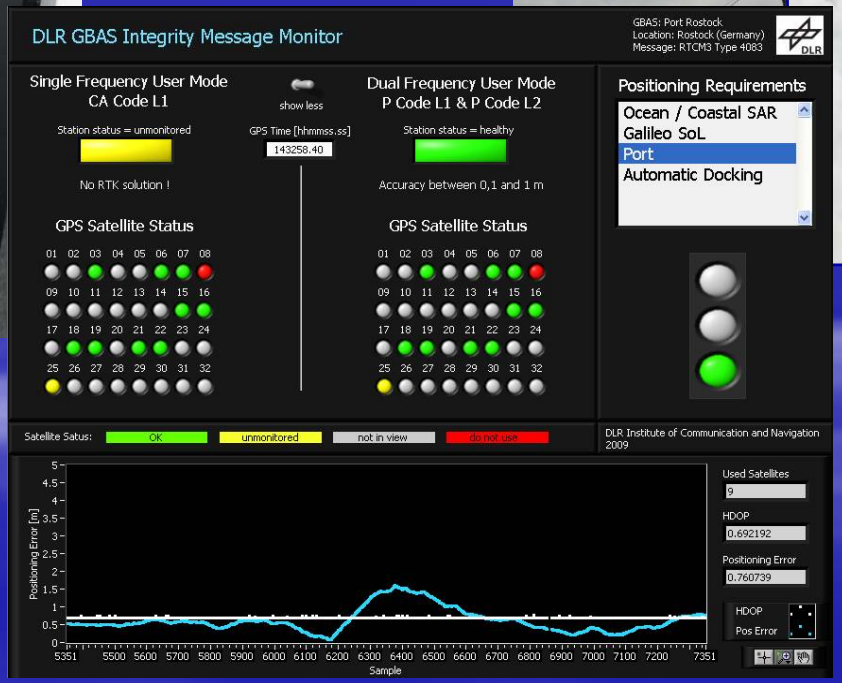
GHR1

GHR0

Antennas & Weather Sensors



GNSS receiver (TOPCON NET-G3)



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Experience in Projects

SEA GATE

EADS RST

Infrastructure of 6 transmit stations to send Galileo like signals (pseudolites)

M-GBAS

DLR

Evaluation of GNSS signal quality and provision of correction and integrity data (RTK)

SAR

AGaPaS

University Rostock

Self activating rescue system, which detects person who fell overboard and which allows a remote-controlled assurance of the survival conditions

ZuMANZ

Hochschule Wismar

maneuver simulation for prediction of ship performance while varying of ship parameter like helm, propeller etc.

MARSPEED

Hochschule Wismar

Training simulator for maritime high-speed vehicles, maneuver training

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What we want

- Users of the installed maritime Galileo GBAS in Rostock
- Users of high precise and reliable positioning in the port area
- Project partners to realize prototypes
- Long term cooperation partners
- Technical and legal information on GNSS, maritime industry and logistics
- Information on Galileo test beds in Europe

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Events 2010

28.-29. April CERGAL Rostock

International Symposium on Certification of GNSS Systems & Services

04.-06. May BalticFuture Rostock

Workshop ‘Innovative Approaches on Maritime Navigation and Logistics’

07.-10. September SMM Hamburg

International trade fair on shipbuilding, machinery & marine technology

15.-17. September CAMS Rostock

International Conference on Control Applications in Marine Systems

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Proposal

Combined nereus Workshop in Rostock

- Live demonstration of installed maritime GBAS
- International projects with involvement of nereus WG GNSS and WG GMES
- Participation in the 3rd Call of FP7

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Video

Sea GATE

Maritime Galileo Test and Development Environment

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Contact

Thank you for the attention!

Find more information on www.netmaritime.de

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List of Abbreviations

- **DLR** – Deutsches Zentrum fuer Luft- und Raumfahrt, German Aerospace Center
- **GNSS** – Global Navigation Satellite System
- **DGNSS** – Differential GNSS
- **Pseudolites** – Pseudo-satellite, ground-based transmitter of GNSS signals
- **RTK** – Real Time Kinematic
- **SEA GATE** – Maritime Galileo Test and Development Environment
- **M-GBAS –** Maritime Ground Based Augmentation System
- **AGaPaS – A**utonomously Acting Rescue Robot For Persons in Distress at Sea
- **ZuMANZ –** condition based maneuver display for consulting of ship navigation
- **HERO** – Hafen-Entwicklungsgesellschaft Rostock mbH
- **GMES** – Global Monitoring for Environment and Security
- **M-V** – Mecklenburg-Vorpommern
- **IMO** – International Maritime Organization