

BLIDS® network – The Solution

→ Far more than Sensor Technology – An overall solution with future-proof technology

BLIDS® NETWORK is a solution for monitoring and analysing overall traffic and calculating accurate travel times of vehicles. **BLIDS® NETWORK** detects Bluetooth devices and has high capture rate, most notably when monitoring both driving directions over several lanes. The collected data is then transmitted in real-time to **BLIDS® NETWORK** data system, for further analysis.

→ **BLIDS® network** confirms **Technological Leadership**

BLIDS® NETWORK SENSORS

In-house hardware development guarantees continuity, stability and flexibility. Our system is downward compatible, modular extensible and retrofit built.



*Adjustment of scanning range via (Remote) Software
BLIDS®-Sensor with integrated security chip for protection against manipulation*

BLIDS® NETWORK SOFTWARE

Providing complete system solutions through developing own BLIDS® Sensor Firmware and BLIDS® Server Software.

BLIDS® NETWORK has low requirements on server hardware but achieves a high performance. Thus, for operating 1.000 sensors, a standard system (PC Quad Core, 4 GB RAM, SATA HDD) is fully sufficient.

BLIDS® NETWORK works with parallelisation processes for real-time data interpretation. Additionally, it utilises special algorithms for traffic data calculation.

BLIDS® NETWORK offers flexible customer interfaces (Web service) for connecting to already existing customer systems.



*BLIDS®-Computation Engine for dynamic filtering,
with versatile analysis tools and use of NoSQL database systems.*



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BLIDS® network – Description of Operation

DATA COLLECTION

Anonymous detection of visible Bluetooth interfaces facilitates a presentation of 25% to 38% of the total traffic volume.



DATA TRANSMISSION

Data transmission is done via GPRS, Ethernet or WLAN.



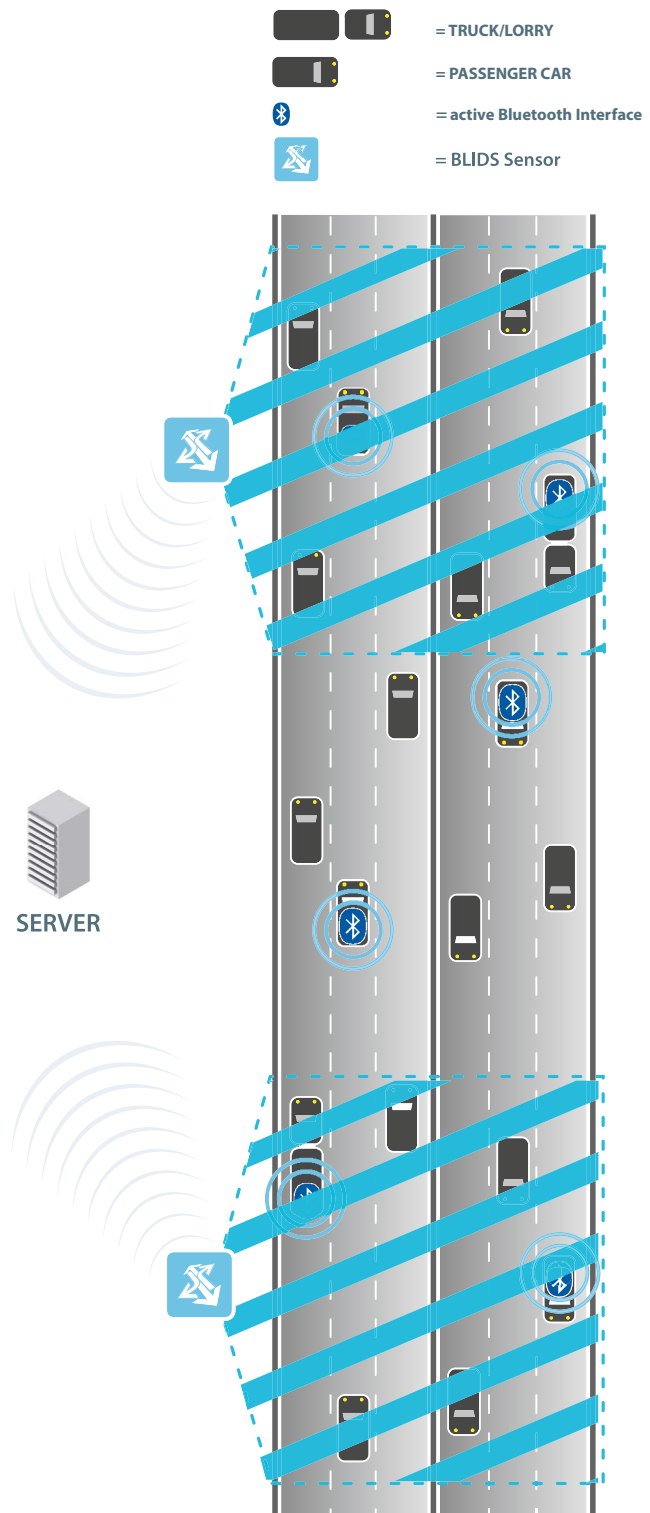
DATA PROCESSING

It includes evaluation, analysis, archiving, presentation and administration of the collected data.



DATA USE

Data can be used for analysis, planning and optimisation of infrastructure capacity. An evaluation in real-time is possible (e.g. through presentation of travel time, incident detection via web frontend, or traffic congestion warnings via variable message signs).



BLIDS® network – Visualisation

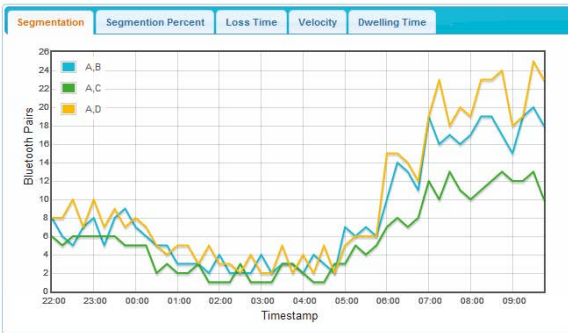
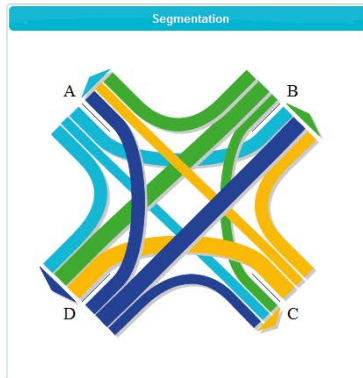


Urban/City of Graz

Date: 28.11.2011 09:57

Interval: 15 min

Routedata							
Route	Travelttime	Default Time	Speed	Bluetooth Count	Segmentation	Time Loss	Tendency
A->B	02:05	01:50	12 km/h	19	37 %	00:15	→
A->C	02:34	01:50	9 km/h	13	25 %	00:44	→
A->D	02:03	01:50	12 km/h	19	37 %	00:13	→
B->A	02:35	01:50	9 km/h	15	31 %	00:45	→
B->C	02:50	01:50	8 km/h	13	27 %	01:00	→
B->D	02:24	01:50	10 km/h	21	43 %	00:34	→
C->A	02:12	01:50	11 km/h	11	28 %	00:22	→
C->B	02:11	01:50	11 km/h	12	31 %	00:21	→
C->D	02:33	01:50	9 km/h	16	41 %	00:43	→
D->A	02:21	01:50	10 km/h	17	35 %	00:31	→
D->B	02:04	01:50	12 km/h	20	42 %	00:14	→
D->C	02:29	01:50	10 km/h	11	23 %	00:39	→



Bluetooth		
Sensor	Count	Recognition Value
A	215	1,30
B	198	1,48
C	200	1,55
D	235	1,57

ROUTE TABLE

Defined routes, Travel time in real-time, predefined travel time, Speed, Bluetooth count within the segment, percentage distribution of chosen route, Time loss (in relation to expected Travel time), Tendency (green, yellow, red) depending on any deviation from the expected Travel time.

SEGMENTATION DIAGRAM

Traffic flow diagram of every possible route and individual line width represents the traffic volume.

LINE GRAPH

Gives following options for visualising data: Segmentation overview, Segmentation in percent, Time Loss, Speed and Dwell time at intersections.

TABLE OF BLUETOOTH DATA

Number of detected Bluetooth addresses at a sensor within a determined time slot. Recognition values which relates to the average number of multiple detections of identical Bluetooth addresses (indicator for traffic jam).



Highway/A23

Date: 28.11.2011 09:57

Interval: 15 min

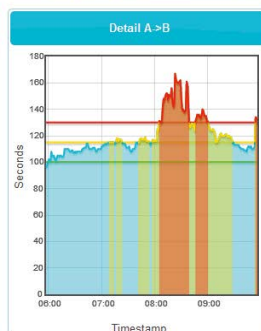
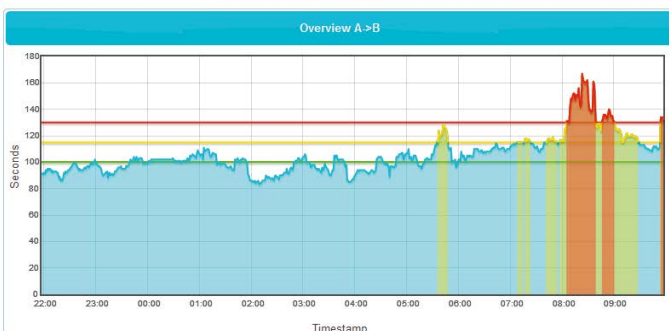
Bluetooth		
Sensor	Count	Recognition Value
A	454	1,26
B	478	1,18
C	456	1,11

Routedata							
Route	Travelttime	Default Time	Speed	Bluetooth Count	Time Loss	Tendency	
A->B->C	03:25	02:30	104 km/h	183	00:55	→	
A->B	02:12	01:40	101 km/h	197	00:32	→	
B->C	01:11	00:55	109 km/h	186	00:16	→	
C->B->A	02:49	02:30	89 km/h	155	00:19	→	
C->B	00:50	00:55	126 km/h	185	00:05	→	
B->A	01:53	01:40	78 km/h	178	00:13	→	



MAP

Users can get a Google Maps view of all measuring points.



ROUTE SEGMENTATION OVERVIEW & DETAIL VIEW

Data is presented in a 12 hour daily load curve.



BLIDS® network – Data Protection

→ Data Protection Compliancy and Maximum Protection against Manipulation

BLIDS® NETWORK offers responsible handling of data in compliance with data protection requirements and assists traffic infrastructure operators in meeting legal requirements. In this way, the public acceptance of traffic data collection increases.

BLIDS® NETWORK ensures confidentiality and integrity of data by using hashing algorithms, adding salt-values and shortening of data directly on the BLIDS®-Sensor.

BLIDS® NETWORK ensures high security data transmission not only through an encryption protocol and mutual certificate validation checks, but also by using BLIDS proprietary protocol.

BLIDS® NETWORK offers protection against hardware and data manipulation by using the capabilities of a security chip.

→ Future-Proof and Innovative – Experience blends into development

Our longstanding market presence and expertise provide quality and customer orientation. Scientific institutions in the field of technology have shown a clear preference for the **BLIDS® NETWORK**. A permanent expert group ensures a steady knowledge transfer between research and development work. As a consequence, solutions are developed that go far beyond the current state of art in sensor technology.

BLIDS® NETWORK offers completely flexible scalability of all system parts and guarantees optimal adaptation. **BLIDS® NETWORK** allows the integration of new technology into existing

BLIDS® NETWORK customer systems.

→ Cost-Benefit Optimisation of System and Operation

The propriety development of our hardware and software enables an operation of the **BLIDS® NETWORK** without any direct or indirect licence costs. At the same time, it provides manufactures support and flexible adjustment and associated expansion options. The modular architecture of its hardware and software guarantees efficient use and cost-efficient expandability. Added to this, open interfaces enable direct links to customer systems for smooth data use. **BLIDS® NETWORK** also provides on-premise or hosting solutions. Needless to say, **BLIDS® NETWORK** with its maintenance free and centrally controllable sensor technology decreases the installation and operation effort.



BLIDS® network – Datasheet



BLIDS®-SENSOR	DESCRIPTION AND STANDARDS	NOTES
Operating System	Embedded Linux	
Range	V30i radius of 5 to 250m V20i radius of 5 to 100m	Can also be set remotely using the BLIDS antenna module.
Security Chip	OTP EPROM	Protection against manipulation
Interfaces	RS-232, USB, Ethernet	GPIO, ADC
Time Synchronisation	GPS, Network	
Position	GPS	
Data Transmission	GPRS, Ethernet	
Data Memory	Flash intern, SD-Card	max. 4GB
Voltage Supply	10V to 30V DC	
Connected Load	2,5W	
Temperature Range	-20 °C to +65 °C	
Protective Circuits	Overload, Battery Monitor	Reverse Polarity Protection, Over-voltage Protection
Certification	Mark CE	EN 55022, EN 55024, EN 50121 EN 301 489-1, EN 301 489-7



OPERATING MODES	DESCRIPTION	NOTES
Network Operation	Power Supply 110-230V	with Power Supply Unit
Battery Operation	Lead Gel Battery 12V/12Ah	max. Operating time 100h
Solar Operation	Solar Panel, Control Unit, Battery	



BLIDS® network – Facts

→ Precise Data Acquisition

Data acquisition through only one **BLIDS®-SENSOR** monitoring several traffic lanes in both directions gives the **BLIDS® NETWORK** high functionality with low costs per measurement point.

BLIDS®-SENSORS also detect vehicles with a speed of over 125 mph and allow a distinction between truck and car traffic on motorways.

→ Versatile Data Generation

Travel time measurement, origin-destination relationships, dwell time at intersections, real-time incident recognition, all of this can be generated by at least two **BLIDS®-SENSORS**.

→ Real-time Evaluation

BLIDS® NETWORK allows transmitting findings and results of the generated data directly to road users e.g. traffic congestion warnings on variable message signs. In addition, a level of compliance analysis is also possible.

→ Simple Installation and Expansion

The installation process is simple, with no additional structural components needed.

BLIDS®-SENSORS can be combined with additional external devices (e.g. radar systems).

→ Customer-Specific Scenarios

Depending on demand **BLIDS® NETWORK SYSTEMS** can be operated as fixed or mobile installation.

→ Maintenance Free

The robust design of **BLIDS®-SENSORS** ensures maintenance free operation.

→ Proven Technology

BLIDS®-SENSORS are field-proven in real operation. They have been extensively tested and are successfully operated by a great number of European customers, allocating more than one million operating hours.

