

***THE ELECTRO-OPTICAL VOLUME MEASURING SYSTEM
FOR CONVEYOR BELTS***

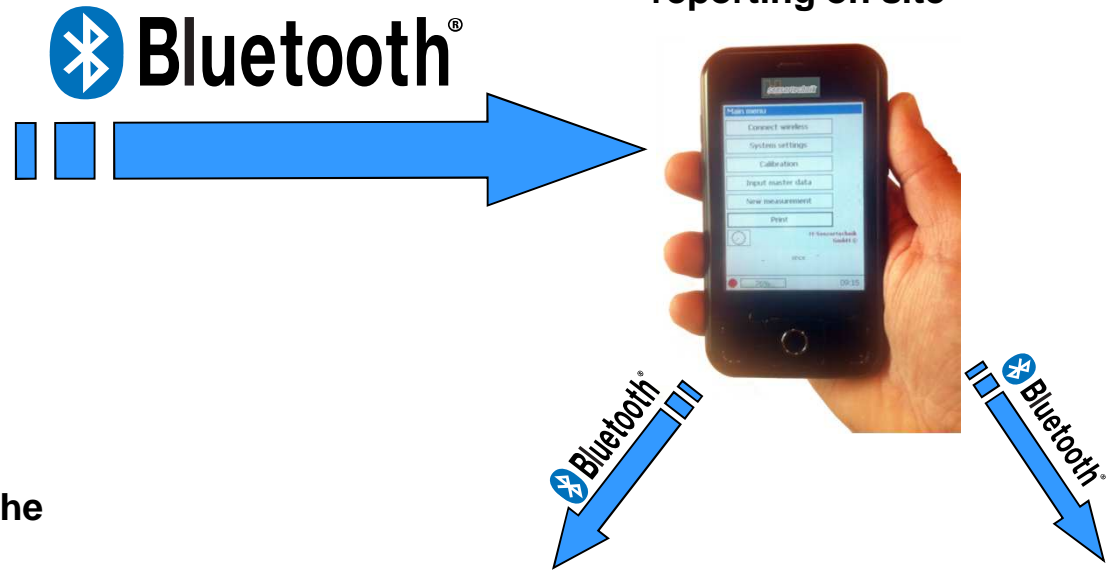
Conception of the Measurement System



Volume data acquisition



Data evaluation and reporting on site

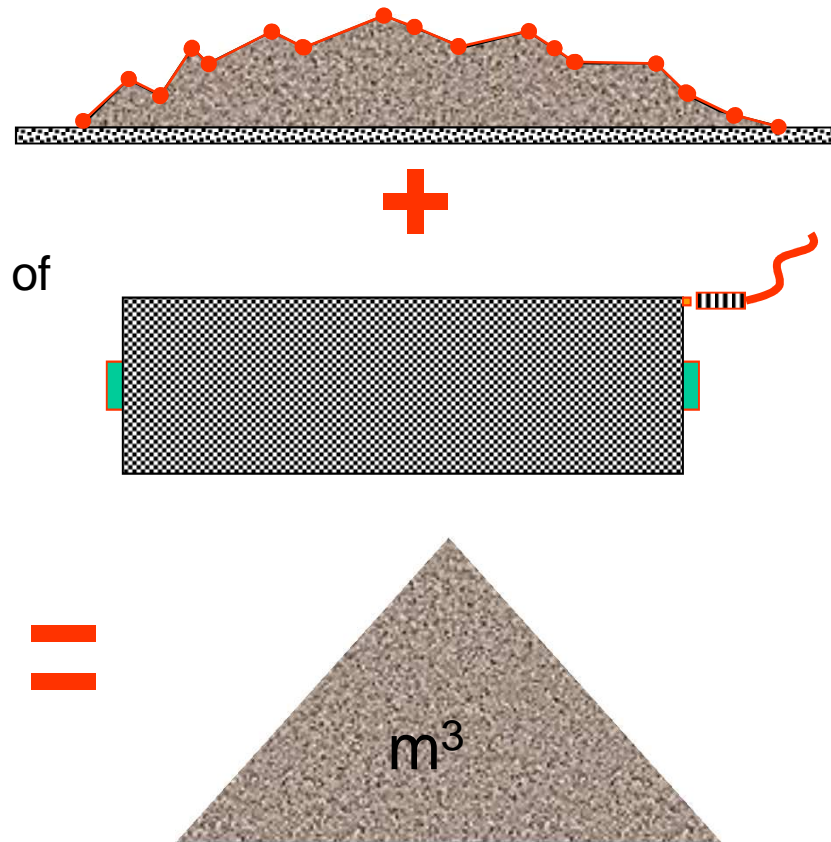


Data evaluation and billing in the headquarter of the operating company



Volume Data Calculation

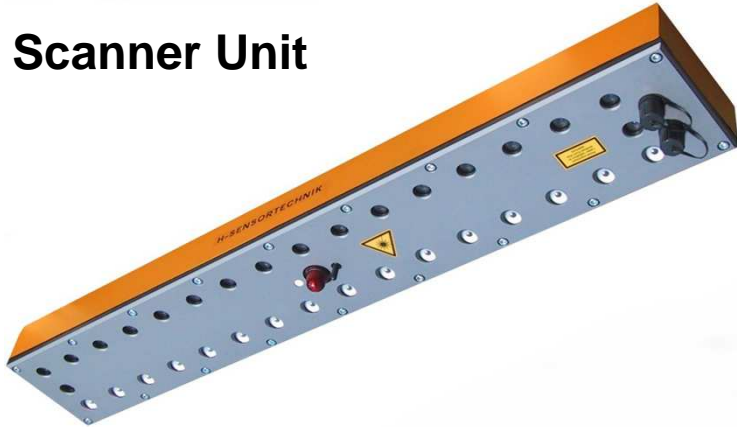
1. The sensor measures the cross-profile of the material on the conveyor belt.
2. The sensor measures the feed rate of the conveyor belt by an inductive switch.
3. This data is used together in a calculation and the result is the volume of the material on the conveyor belt.



Components of the Volume Measuring System



- **Scanner Unit**



- **PDA**
- **Bluetooth Printer Unit**



- **Inductive Proximity Switch for Speed Measurement**



- **Cables**



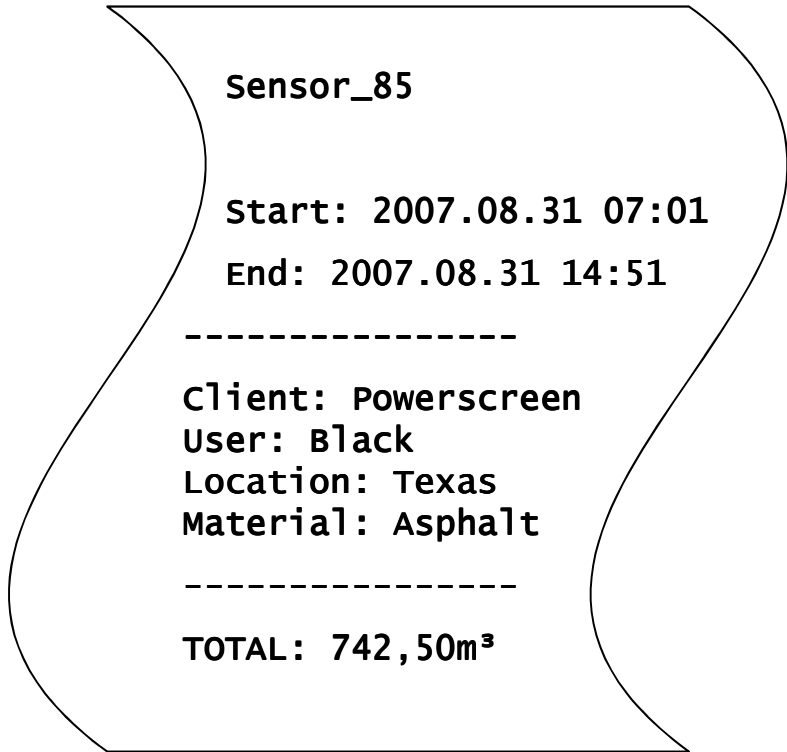
- **Mounting Components**

Portable Printer Unit



The portable bluetooth printer offers the advantage to print reports immediately on site.

The selected measurements are printed sorted by client, site, user and material size.



Data Evaluation



Measurements imported into MS-Excel

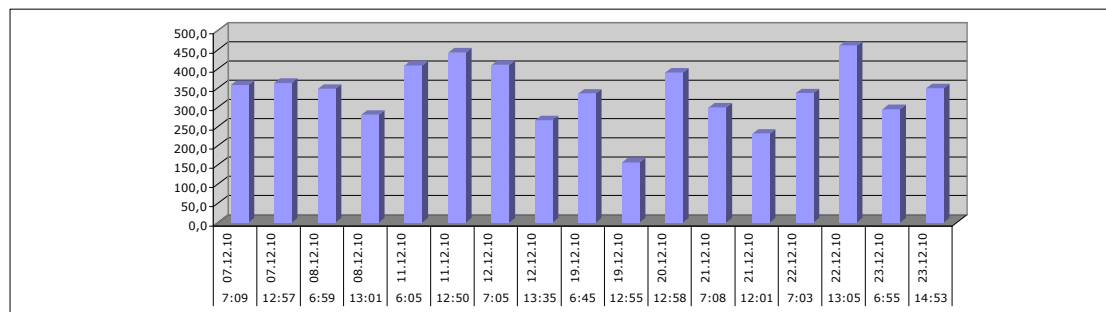
Customer	User	Location	Material	Start of Measurement		End of Measurement		Amount [m³]	Granularity [mm]	Roll [m]	m³ per 30 minutes										
				I	II	III	IV				V	VI	VII	VIII	IX	X	XI				
AKM	P. Müller	Wels	Asphalt	07:09	07.12.10	12:00	07.12.07	358	0-60mm	280	12,9	43,0	45,2	31,1	28,4	38,7	47,8	35,9	40,3	34,3	
AKM	P. Müller	Wels	Asphalt	12:57	07.12.10	18:15	07.12.07	364	0-60mm	280	13,0	47,7	36,1	33,2	32,8	29,2	21,4	44,1	25,8	48,9	31,5
AKM	P. Müller	Wels	Asphalt	06:59	08.12.10	11:50	08.12.07	348	0-60mm	280	15,4	37,6	36,0	47,0	31,7	33,8	46,4	29,0	38,9	32,5	
AKM	P. Müller	Wels	Asphalt	13:01	08.12.10	17:53	08.12.07	280	0-60mm	280	19,2	35,0	35,2	43,1	24,6	24,0	27,3	20,3	23,3	28,4	
AKM	P. Müller	Wels	Asphalt	06:05	11.12.10	12:00	11.12.07	410	0-60mm	280	15,5	42,8	29,3	35,6	29,1	22,2	27,8	25,5	46,0	45,3	47,2
AKM	P. Müller	Wels	Asphalt	12:50	11.12.10	19:12	11.12.07	443	0-60mm	280	18,2	47,1	25,7	36,6	36,1	22,5	27,7	35,8	42,6	36,8	30,3
AKM	A. Aigne	Wels	Asphalt	07:05	12.12.10	12:58	12.12.07	411	0-60mm	280	16,2	33,3	21,4	32,0	44,8	24,4	37,1	47,2	42,9	31,9	41,9
AKM	A. Aigne	Wels	Asphalt	13:35	12.12.10	17:29	12.12.07	267	0-60mm	280	11,7	26,9	28,1	34,0	42,0	34,5	48,2	41,2			
Moser Co	A. Aigne	Steyr	Natural stone	06:45	19.12.10	12:00	19.12.07	336	0-180mm	280	17,1	29,4	34,9	36,7	38,4	35,8	28,5	31,5	23,3	29,3	31,0
Moser Co	A. Aigne	Steyr	Natural stone	12:55	19.12.10	17:00	19.12.07	157	0-180mm	280	15,6	26,8	12,4	0,0	0,0	16,7	46,2	39,0			
Moser Co	A. Aigne	Steyr	Natural stone	12:58	20.12.10	18:35	20.12.07	390	0-180mm	280	14,5	22,3	33,9	41,7	24,8	39,5	29,0	47,5	41,0	24,6	23,8
Moser Co	A. Aigne	Steyr	Natural stone	07:08	21.12.10	11:01	21.12.07	300	0-180mm	280	13,3	38,9	29,1	46,7	47,9	49,3	37,6	37,0			
Moser Co	A. Aigne	Steyr	Natural stone	12:01	21.12.10	16:00	21.12.07	231	0-180mm	280	15,0	46,1	32,4	22,6	23,2	27,4	36,4	28,2			
Moser Co	A. Aigne	Steyr	Natural stone	07:03	22.12.10	11:56	22.12.07	337	0-180mm	280	19,5	29,6	38,4	39,6	30,2	29,0	35,3	40,1	38,2	37,0	
Moser Co	A. Aigne	Steyr	Natural stone	13:05	22.12.10	19:09	22.12.07	460	0-180mm	280	12,6	20,7	22,0	33,4	44,8	47,3	27,5	49,3	33,9	49,7	25,7
Moser Co	A. Aigne	Steyr	Natural stone	06:55	23.12.10	13:23	23.12.07	295	0-180mm	280	17,8	47,5	20,5	43,5	10,3	0,0	0,0	0,0	0,0	15,8	47,5
Moser Co	A. Aigne	Steyr	Natural stone	14:53	23.12.10	19:58	23.12.07	350	0-180mm	280	13,0	21,0	46,5	24,4	41,2	33,9	46,1	27,1	33,8	29,4	33,3
STD Linz	P. Müller	Linz	Recycling	08:58	14.01.11	12:00	14.01.08	201	0-200mm	280	19,0	22,9	33,0	24,8	24,2	42,1	35,1				
STD Linz	P. Müller	Linz	Recycling	13:13	14.01.11	14:53	14.01.08	125	0-200mm	280	11,3	39,2	44,5	29,6							
STD Linz	P. Müller	Linz	Recycling	09:00	15.01.11	14:23	15.01.08	344	0-200mm	280	15,9	37,5	35,7	40,6	36,2	33,0	22,1	21,7	22,5	32,3	46,5
STD Linz	P. Müller	Linz	Recycling	15:40	15.01.11	19:23	15.01.08	245	0-200mm	280	11,3	36,4	32,4	23,8	48,2	21,0	47,2	24,5			
STD Linz	P. Müller	Linz	Recycling	07:03	16.01.11	11:45	16.01.08	302	0-200mm	280	14,6	47,9	25,4	33,0	22,2	23,6	35,4	37,5	39,4	23,2	
STD Linz	P. Müller	Linz	Recycling	12:00	16.01.11	17:13	16.01.08	346	0-200mm	280	17,5	21,8	38,5	35,6	25,8	20,5	46,2	30,7	39,1	34,6	35,7
STD Linz	P. Müller	Linz	Recycling	07:09	17.01.11	11:56	17.01.08	350	0-200mm	280	13,9	44,9	40,5	25,9	36,8	44,4	28,1	37,8	39,7	38,0	
STD Linz	P. Müller	Linz	Recycling	12:15	17.01.11	17:33	17.01.08	376	0-200mm	280	18,0	47,8	40,3	31,9	42,8	26,7	40,8	21,8	33,1	42,8	30,0
STD Linz	P. Müller	Linz	Recycling	13:25	18.01.11	18:13	18.01.08	297	0-200mm	280	12,5	32,2	37,9	27,7	23,9	30,8	24,9	44,6	36,0	26,5	

Monthly Calculations



Example: December

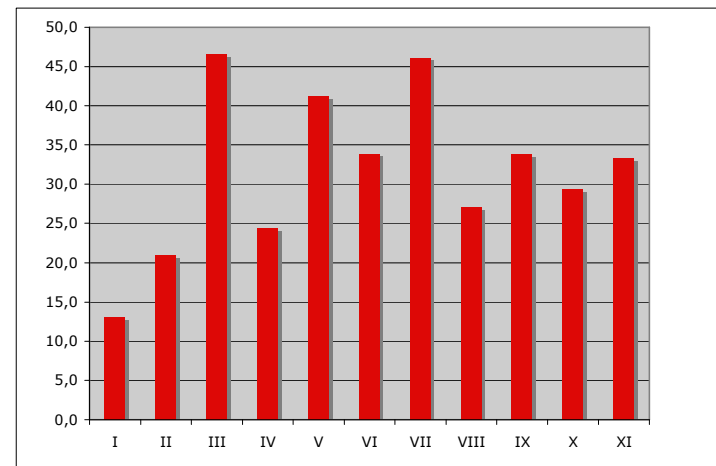
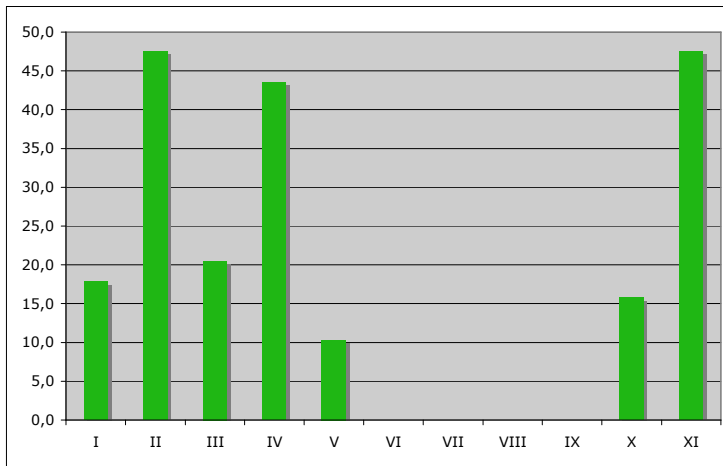
Customer	User	Location	Material	Start of Measurement		End of Measurement		Amount [m³]	Granularity [mm]	Roll [mm]	Roll											
											I	II	III	IV	V	VI	VII	VIII	IX	X	XI	
AKM	P. Mller	Wels	Asphalt	7:09	07.12.10	12:00	07.12.07	357,6	0-60mm	280	12,9	43,0	45,2	31,1	28,4	38,7	47,8	35,9	40,3	34,3		
AKM	P. Mller	Wels	Asphalt	12:57	07.12.10	18:15	07.12.07	363,7	0-60mm	280	13,0	47,7	36,1	33,2	32,8	29,2	21,4	44,1	25,8	48,9	31,5	
AKM	P. Mller	Wels	Asphalt	6:59	08.12.10	11:50	08.12.07	348,3	0-60mm	280	15,4	37,6	36,0	47,0	31,7	33,8	46,4	29,0	38,9	32,5		
AKM	P. Mller	Wels	Asphalt	13:01	08.12.10	17:53	08.12.07	280,4	0-60mm	280	19,2	35,0	35,2	43,1	24,6	24,0	27,3	20,3	23,3	28,4		
AKM	P. Mller	Wels	Asphalt	6:05	11.12.10	12:00	11.12.07	409,5	0-60mm	280	15,5	42,8	29,3	35,6	29,1	22,2	27,8	25,5	46,0	45,3	47,2	
AKM	P. Mller	Wels	Asphalt	12:50	11.12.10	19:12	11.12.07	442,9	0-60mm	280	18,2	47,1	25,7	36,6	36,1	22,5	27,7	35,8	42,6	36,8	30,3	
AKM	A. Aigner	Wels	Asphalt	7:05	12.12.10	12:58	12.12.07	410,9	0-60mm	280	16,2	33,3	21,4	32,0	44,8	24,4	37,1	47,2	42,9	31,9	41,9	
AKM	A. Aigner	Wels	Asphalt	13:35	12.12.10	17:29	12.12.07	266,6	0-60mm	280	11,7	26,9	28,1	34,0	42,0	34,5	48,2	41,2				
Moser Co.	A. Aigner	Steyr	Natural stone	6:45	19.12.10	12:00	19.12.07	335,9	0-180mm	280	17,1	29,4	34,9	36,7	38,4	35,8	28,5	31,5	23,3	29,3	31,0	
Moser Co.	A. Aigner	Steyr	Natural stone	12:55	19.12.10	12:00	19.12.07	156,7	0-180mm	280	15,6	26,8	12,4	0,0	0,0	16,7	46,2	39,0				
Moser Co.	A. Aigner	Steyr	Natural stone	12:58	20.12.10	18:35	20.12.07	390,3	0-180mm	280	14,5	22,3	33,9	41,7	24,8	39,5	29,0	47,5	41,0	24,6	23,8	
Moser Co.	A. Aigner	Steyr	Natural stone	7:08	21.12.10	11:01	21.12.07	299,8	0-180mm	280	13,3	38,9	29,1	46,7	47,9	49,3	37,6	37,0				
Moser Co.	A. Aigner	Steyr	Natural stone	12:01	21.12.10	16:00	21.12.07	231,3	0-180mm	280	15,0	46,1	32,4	22,6	23,2	27,4	36,4	28,2				
Moser Co.	A. Aigner	Steyr	Natural stone	7:03	22.12.10	11:56	22.12.07	336,9	0-180mm	280	19,5	29,6	38,4	39,6	30,2	29,0	35,3	40,1	38,2	37,0		
Moser Co.	A. Aigner	Steyr	Natural stone	13:05	22.12.10	19:09	22.12.07	460,0	0-180mm	280	12,6	20,7	22,0	33,4	44,8	47,3	27,5	49,3	33,9	49,7	25,7	
Moser Co.	A. Aigner	Steyr	Natural stone	6:55	23.12.10	13:23	23.12.07	294,9	0-180mm	280	17,8	47,5	20,5	43,5	10,3	0,0	0,0	0,0	0,0	15,8	47,5	
Moser Co.	A. Aigner	Steyr	Natural stone	14:53	23.12.10	19:58	23.12.07	349,7	0-180mm	280	13,0	21,0	46,5	24,4	41,2	33,9	46,1	27,1	33,8	29,4	33,3	
TOTAL								5735,4														



Daily Characteristics



Customer	User	Location	Material	Start of Measurement		End of Measurement		Amount [m³]	Granularity [mm]	Roll [mm]	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Moser Co.	A. Aigner	Steyr	Natural stone	6:55	23.12.10	13:23	23.12.10	294,9	0-180mm	280	17,8	47,5	20,5	43,5	10,3	0,0	0,0	0,0	0,0	15,8	47,5
Moser Co.	A. Aigner	Steyr	Natural stone	14:53	23.12.10	19:58	23.12.10	349,7	0-180mm	280	13,0	21,0	46,5	24,4	41,2	33,9	46,1	27,1	33,8	29,4	33,3



The sensor is **dust and vibration proof** and has no moving parts.

The Sensor works also on very short belts and on chevron belts.

The scale can also be mounted on all pivoting and foldable conveyor belts.

PDA and **printer** are not mounted to the machine. Therefore these devices are not influenced by vibration, temperature and wetness.

**When the angle of conveyer belt is changed,
such as on mobile equipment,
the system does not need to be recalibrated.**

This is a big advantage in operation with modern mobile mining and quarrying equipment, used extensively today for its efficiency.

Assembly can be completed in two hours
by two service technicians.

Application Spectrum



Shredders



Wood Chips



Waste

... any materials
on conveyors

Application Spectrum



Technical Data



Volume Scanner

Power:	24 VDC +-20%, 5 A
Operating Temperature:	-45°C - +70°C
Weight:	10,2 kg
Dimensions(LxWxH):	1023 x 160 x 72 mm
Com-Ports:	Var 1: RS-422 (4 line) Var 2: Bluetooth (Class 1) Var 3: analog output (4-20mA)
Measuring rate:	200 Frames/sec
Storage capacity:	Production data over 1 years

PDA and Printer Unit

PDA:	H-Sensortechnik
Printer:	Type H -55-BT (H-Sensortechnik)
technical data:	see data sheet

Weight (PDA incl.Printer):	530 g
Dimensions (PDA incl. Printer):	195 x 85 x 60 mm