

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

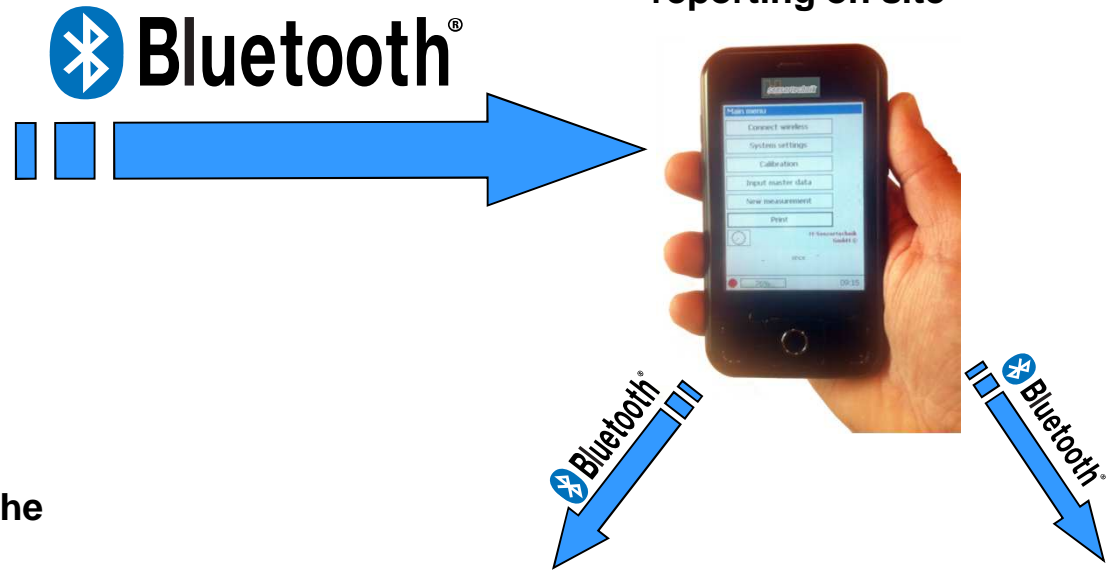
# Conception of the Measurement System



Volume data acquisition



Data evaluation and reporting on site

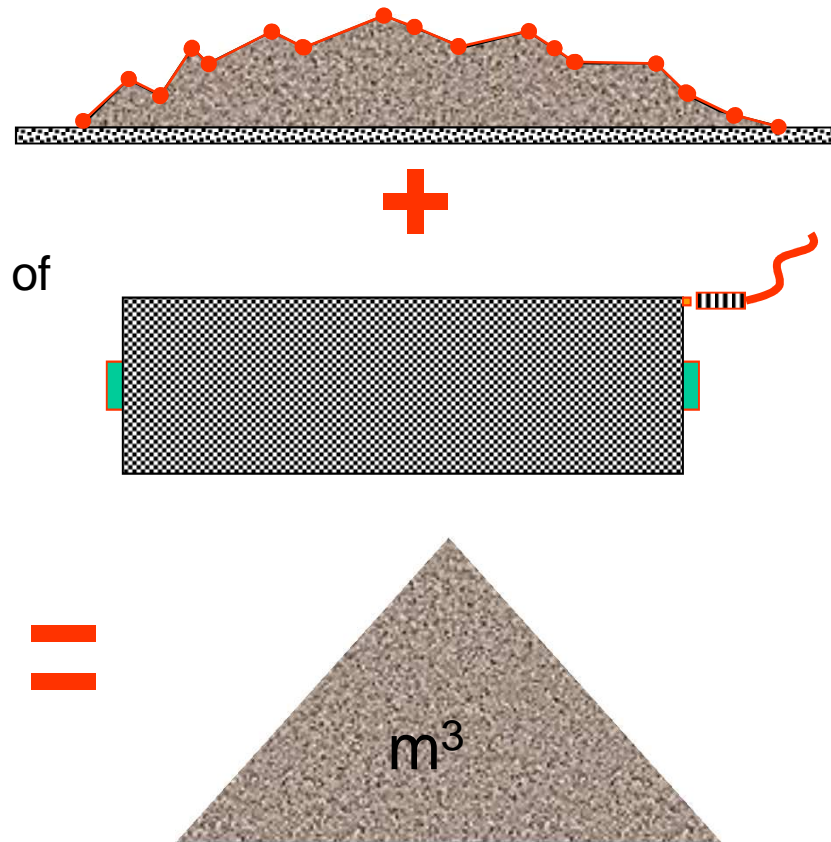


Data evaluation and billing in the headquarter of the operating company



## Volume Data Calculation

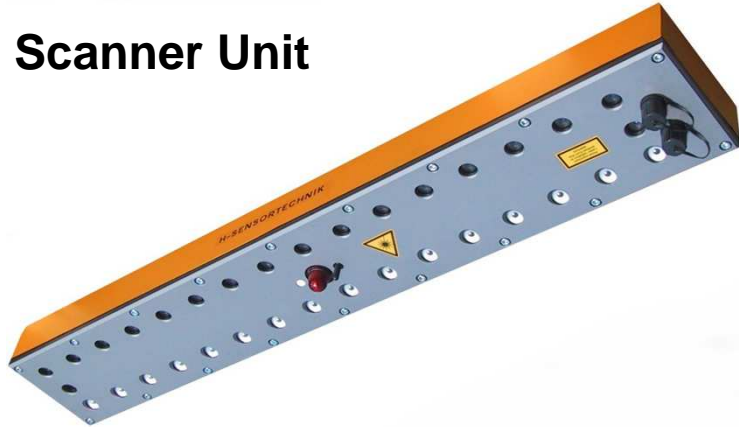
1. The sensor measures the cross-profile of the material on the conveyor belt.
2. The sensor measures the feed rate of the conveyor belt by an inductive switch.
3. This data is used together in a calculation and the result is the volume of the material on the conveyor belt.



# Components of the Volume Measuring System



- **Scanner Unit**



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



- **Inductive Proximity Switch for Speed Measurement**



- **Cables**



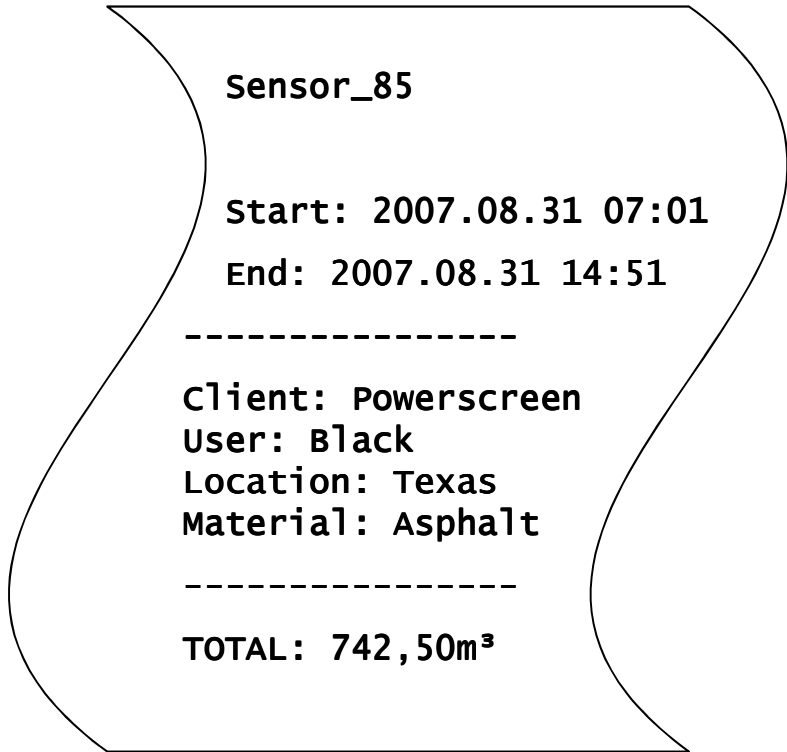
- **Mounting Components**

## 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

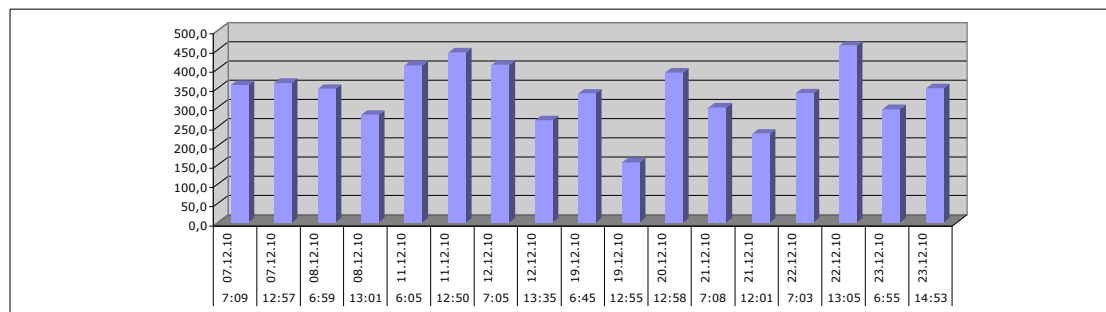
Customer	User	Location	Material	Start of Measurement		End of Measurement		Amount [m³]	Granularity [mm]	Roll [m]	m³ per 30 minutes										
											I	II	III	IV	V	VI	VII	VIII	IX	X	XI
AKM	P. Müller	Wels	Asphalt	07:09	07.12.10	12:00	07.12.07	358	0-60mm	280	12,9	43,0	45,2	31,1	28,4	38,7	47,8	35,9	40,3	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	0-180mn	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	0-180mn	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	0-180mn	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	0-180mn	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	0-180mn	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	0-180mn	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	0-180mn	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	0-180mn	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	0-180mn	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	0-200mn	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	0-200mn	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	0-200mn	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	0-200mn	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	0-200mn	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	0-200mn	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	0-200mn	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	0-200mn	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	0-200mn	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	
<b>TOTAL</b>								<b>5735,4</b>														

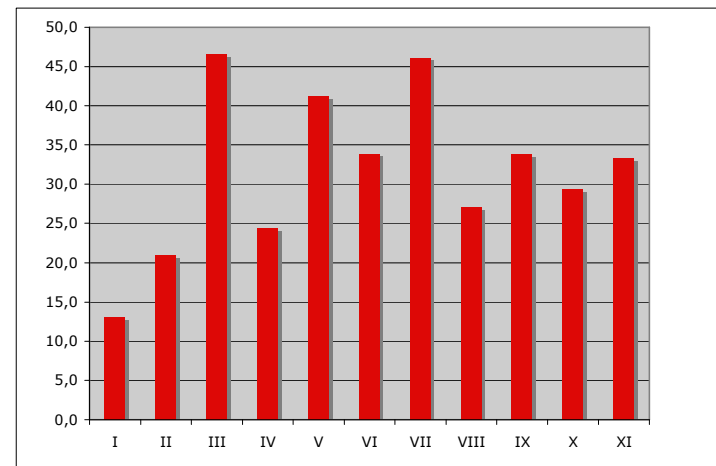
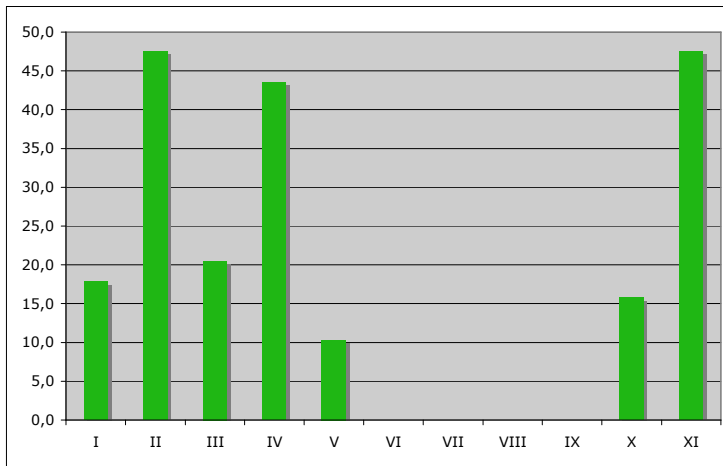




# Daily Characteristics



Customer	User	Location	Material	Start of Measurement		End of Measurement		Amount [m <sup>2</sup> ]	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

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

## PDA and Printer Unit

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<b>PDA:</b>	H-Sensortechnik
<b>Printer:</b>	Type H -55-BT (H-Sensortechnik)
technical data:	see data sheet

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