



# **MACHINE MONITORING SYSTEMS FROM WERMA – RETROFIT SOLUTIONS FOR TRANSPARENCY IN PRODUCTION PROCESSES**

FOR PRODUCTION DIRECTORS AND LEAN MANAGERS



## CONTENTS

Central Control Station offers .....	5
You too can achieve efficiency improvements. Applications in which the monitoring system can be used .....	6
References. Customer Voices .....	10
System description. The WERMA monitoring system is called "WIN" .....	13
Flexible and easy to combine. The hardware products .....	14
The solution for manual workstations. "Call for action" Andon systems ....	16
Intuitive. The WIN Software .....	17
Quick Finder. For Monitoring Systems.....	23
Monitoring Systems. Order Specifications .....	24
Quick Finder. For Manual "Call for Action" Andon Systems .....	26
Andon Products. Order Specifications .....	27
Experience the system for yourself. Your options.....	28



"It is not that we have too little time in which to do things, rather that we have too much time which we do not use."

Lucius Annaeus Seneca

Why do companies such as TRW Automotive, Continental and Kärcher use machine monitoring systems from WERMA?



## Central Control Station offers ...

### ...greater flexibility

- Changes in production quantities are easier to identify and manage
- React more effectively to product/volume variations

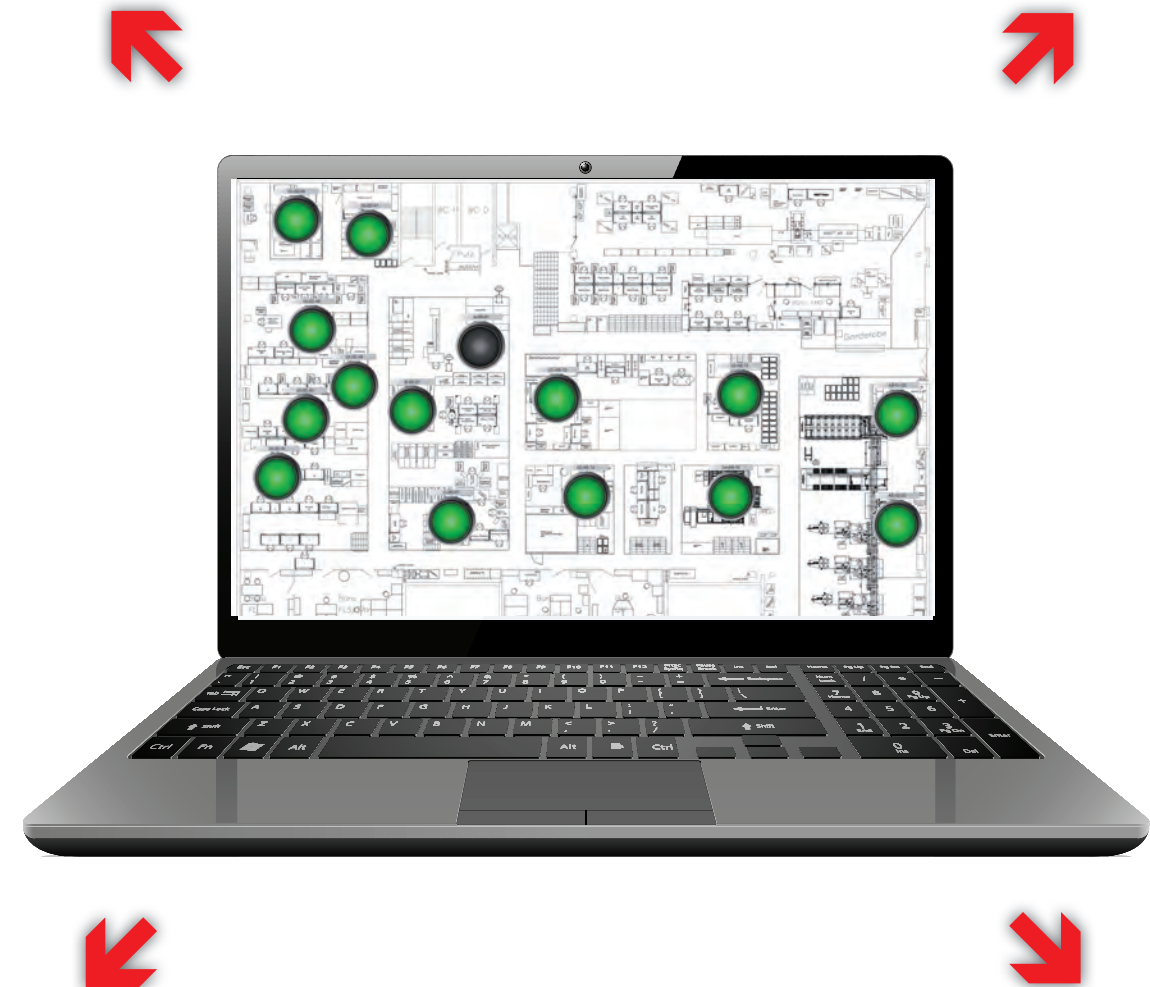
### ... a better overview of

- All machines/equipment irrespective of type
- Manual workstations

...because they want to be able to monitor machines, equipment and manual workstations on a single screen without the need for specialist IT support or complex installation.

...and because it is easy to install or retrofit:

- Wireless system, no need for extensive cabling
- Stand alone from ERP system
- No complex changes to existing IT infrastructure
- Existing signal tower serves as the common interface
- Modular design, easy to add further components



### ...a quicker response

- Recognise production issues sooner
- Reduce reaction times and downtime
- Get help and/or material line side quicker

### ...comprehensive data analysis

- To identify weak spots and implement improvements
- Makes optimisation transparent

## You too can achieve efficiency improvements. Applications in which the monitoring system can be used.

### Material Flow

- Visualisation of material flow for subsequent production steps
- Reduce re-work
- Provide a complete overview of the operational capacity



- ✓ Optimise material flow process
- ✓ Reduce flow time
- ✓ Make material flow more lean
- ✓ Eliminate wastage
- ✓ Increase productivity
- ✓ Reduce costs and process times



Picture: Höft & Wessel



Picture: Höft & Wessel

"In combination with their reliable signal towers and the excellent customer service WERMA'S MDC system is ahead of the competition and well-established in the industrial sector."

Erhan Kaya, Logistics Director  
Höft & Wessel AG, Hannover (Germany)

### Production Monitoring

- Automotive supplier with 120 stations in use
- Identify downtime on machines and equipment
- Make processes leaner and more efficient



- ✓ Transparency of the complete production facility, even if spread over several buildings
- ✓ Identify free capacity
- ✓ Reduce downtime
- ✓ Increase machine productivity



"It is a question of give and take. We are happy to have a partner for industrial signalisation with whom we can meet the challenges placed on us."

Bernd Müller, Manufacturing Development Engineer  
TRW Automotive, Blumberg (Germany)

"I was particularly impressed with the WERMA software which came with the system. It leads the user through a series of steps to establish the wireless monitoring network."

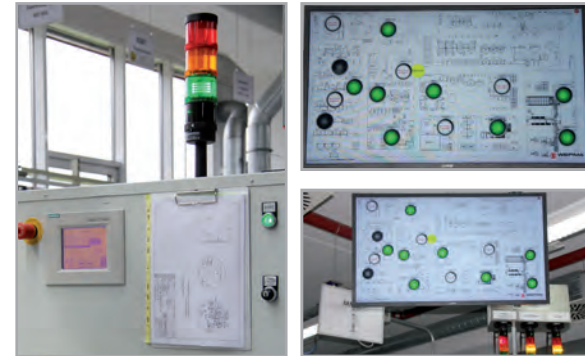
Elmar Giner, IT Database expert  
TRW Automotive, Blumberg (Germany)

## Visual Management tool

- Status transmission "workstation operational" or "out of service"
- Supervisor support in event of process disruption
- Head of line function



- ✓ Reduction in reaction and downtimes
- ✓ Increase productivity
- ✓ Overview of the complete production facility



"Thanks to the simple wireless Andon system we now have the ability to organise a rapid response to problems and disruptions to production over larger distances and therefore reduce downtime."

Erich Martin, Manufacturing Director  
WERMA Signaltechnik GmbH + Co. KG

## Machine monitoring

- Automotive supplier with 200 machines fitted with machine data collection equipment
- Analyse productivity



- ✓ 15% increase in productivity following introduction of the system



## Status indication and "Call for action" system

- Operator indicates status of workstation in Goods Inward, Despatch or Packaging areas using Andon light systems and can also request support



- ✓ Overview of complete operation
- ✓ Continuous improvement of material supply chain
- ✓ Reduce time wastage
- ✓ Better workflow



## Control Processes

- Start and stop processes
- In a cell using identical machines, a breakdown on one machine can be easily compensated by activating another machine



- ✓ Reduce downtime
- ✓ Use resources more efficiently
- ✓ Reduce waste





## References. Customer Voices

Our customers come from a most varied selection of industries:

- Manufacturers using a wide range of different equipment and machines
- Manual workstations
- Automotive suppliers
- Warehousing/Logistics and Packaging lines
- Manufacturing lines
- Mould shops
- CNC machine shops
- Machine tool manufacturers
- Electronics industry



### More customer references:

#### Global Automotive manufacturer:

"We are a supplier to the automotive industry and have equipped 30 machines with the system. Our staff activate a line stop to signal process disruption."

→ On 18 machines we have **saved € 300,000** in 10 months.

#### Manufacturer of Bio-products based in Europe:

"We wanted to reduce the number of errors and optimise processes in our production facility. We have fitted the system to 12 of our machines."

→ After just 2 months we have increased capacity utilisation from **43% to 67%**.

#### Global manufacturer of cable protection systems:

"In our metal-processing shop we have installed the system on 22 machines to monitor machine status."

→ In one year we have reduced our costs by **€ 140,000**.

#### Market leading manufacturer of bottle corking systems:

"The installation of the MDC system on 10 of our machines has increased productivity."

→ Within a very short time productivity has **increased by 10%**.





"The WERMA MDC system can be retro-fitted to existing installations without difficulty. The self-explanatory software which gives continuous information on status change and faults is impressive."

Joachim Gottwald, Maintenance Manager  
hansgrohe SE (Bathroom equipment))

## System description.

The WERMA monitoring system is called "WIN"

The WIN system is the perfect combination of a signal device, wireless technology and an ingenious software package. The common interface on all machines, equipment and workstations is the WERMA signal tower. The transmitter has a transmission range of up to 300 m clear line of sight and as it also acts as a repeater, the range can be extended to up to 900 m. As with all conventional wireless systems the transmission range indoors can be more limited but one of the strengths of the WIN system is the use of the frequency band (868 MHz). This enables it to pass through objects and walls better than WLAN or Bluetooth.

## The WERMA MDC system consists of a receiver, transmitters and software

### Transmitter. Wireless data monitoring

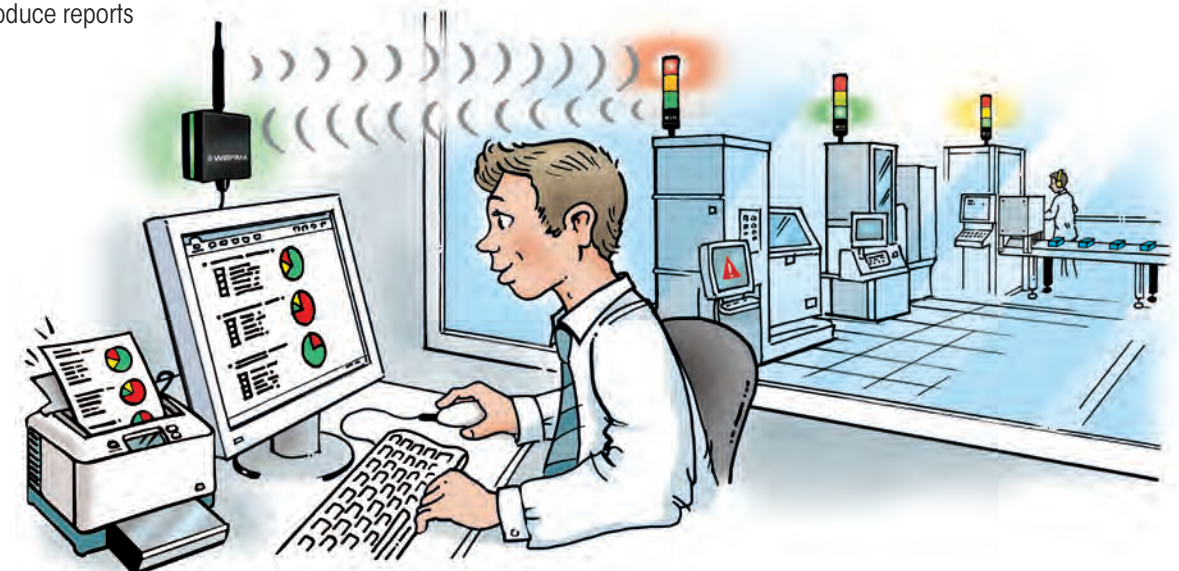
- Can be integrated into the signal tower as an additional element
- Monitors the status and counts the output of up to 50 machines or workstations
- Data transferred wirelessly to the receiver

### Receiver. Secure data collection

- Receives all the data sent by the transmitters in the network
- Transfers and saves the data to a Microsoft SQL database

### Software. Central control station

- Control station offers an overview of all machines, equipment and workstations
- Retrospective analysis of data
- Process optimisation
- React quickly to production disruptions
- Produce reports





## Flexible and easy to combine. The hardware products

The low cost monitoring system WIN is easy to install and the modular system of hardware allows retrofitting and expansion of the network at any time.

### Easy data collection. With WIN master

The "WIN master" can receive data from up to 50 transmitters and is connected by USB to a local PC in the production area. The data is then saved to a database.

### Data collection via Ethernet Network. With WIN ethernet master

In contrast to the "WIN master" the "WIN ethernet master" does not need to be connected to a local PC. The receiver just has to be configured and connected to an available ethernet socket. All data can then be collected securely via the ethernet network and saved to the database. The distance between a client PC and the "WIN ethernet master" is unlimited and the location of the master can be chosen freely thus reducing the cost of installing additional PCs on the shopfloor.

### Status monitoring. With WIN slave

The "WIN slave" is fitted to a KombiSIGN signal tower and can monitor up to 8 different conditions, transmitting status change data to the receiver wirelessly.



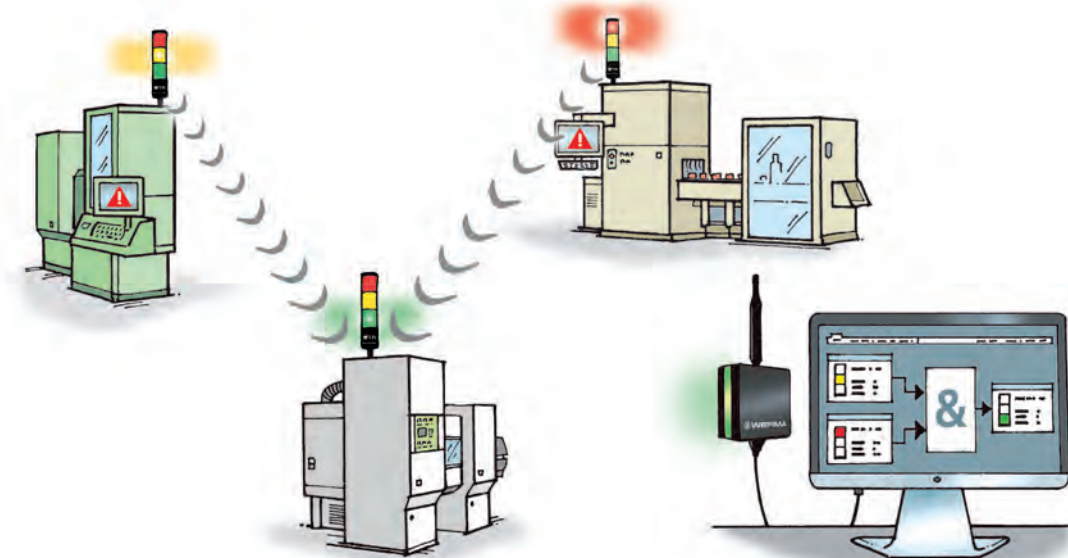
### Output counting. With WIN slave performance

The "WIN slave performance" can, in addition to monitoring status change, also count the output of a machine. The "WIN slave performance" can monitor up to 6 different conditions and count the output from the machine by picking up a count impulse.



### Switching and control. With WIN slave control

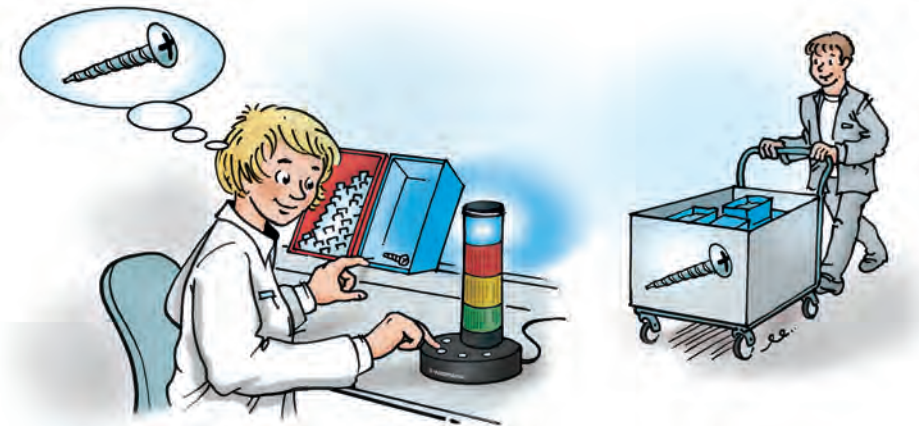
The "WIN slave control" allows you to initiate processes and start or stop machines. This enables you to reduce wastage and use production resources more efficiently. The WIN software allows the connection of all machines in a network and in this way you only need one signal tower in a "head of line" position to give you visual status management of the combined machine park.



## The solution for manual workstations. “Call for action” Andon systems

### The right solution. For each application

WERMA Andon lights can be used in a wide number of applications; for optimising kanban processes to packing lines or assembly areas.



### AndonCONTROL. For integral signal towers

AndonCONTROL can activate up to eight different status conditions. For example a shortage of material A can be signalled by the permanent yellow light whilst material B shortage could be indicated by the yellow light blinking. The switch buttons on AndonCONTROL can be labelled according to your specific status conditions.

### AndonSWITCH. For remote signal towers

AndonSWITCH is the ideal solution for applications where the signal tower will be installed remotely from the Andon product. The call system is fitted with smart electronics and illuminated switches using four switches to activate the required status change with up to eight different status condition changes being available. The switch buttons on AndonSWITCH can be labelled according to your specific status conditions.

### AndonBOX. For remote signal towers in industrial applications

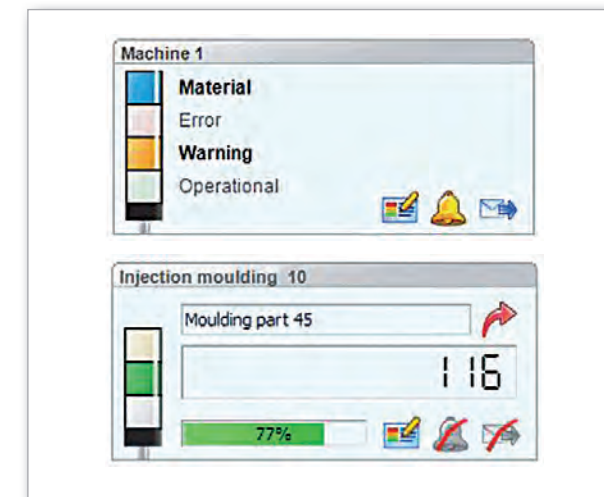
Activating one of up to four push button switches illuminates up to four different signal tower lights. The simple switch box is robust and lends itself to industrial applications. The push button switches are supplied with colour coded caps and in addition each push button can be labelled for the appropriate function.

### What is Andon?

The word “Andon” comes from the Japanese language for a lantern or warning light and is used nowadays to describe a lighting system clearly visible to all to indicate a change in a status or a warning that immediate action is to be taken. Using Andon lights not only improves the efficiency of production processes but also optimises valuable resources leading to cost reductions and becoming more flexible to changes in market demand.

## Intuitive. The WIN Software

The software supplied with the system is licence-free, easy to install and leads the user through a series of steps to establish an individual network. It displays the status condition of signal lights installed in the system, enables the user to analyse runtimes, identify causes of disruption in operations and therefore improve efficiency.



### React quickly. Control station

#### Do you know which machine is currently not operational?

The Control Station shows you the operating condition of all machines or workstations being monitored so you can quickly see if a machine is in an error condition or running normally, or monitor which order is being worked on and the status of that order. This module helps you to quickly take action to reduce downtime.

### Keep up to date with changes. Messaging service

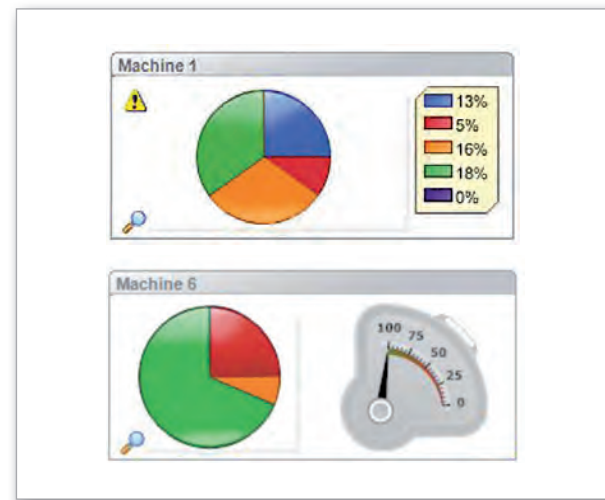
#### How quickly can you react to breakdowns?

React quickly regardless of your current location. If the status of a machine or workstation changes an Email can be sent automatically to a PC or Smartphone of the person needing to react. You can select to whom and after which time interval of the status change the email is to be sent.





## Intuitive. The WIN Software



### Increase efficiency. Productivity Module

#### Do you know how productive your machines or workstations are?

Using the Productivity Module you can check the productivity of your machines and workstations over any time period. You can look for example at the last working day, or define specific time periods such as shift patterns. Using this module it is possible to retrospectively analyse downtime and fault conditions and thus help improve efficiency in the future.

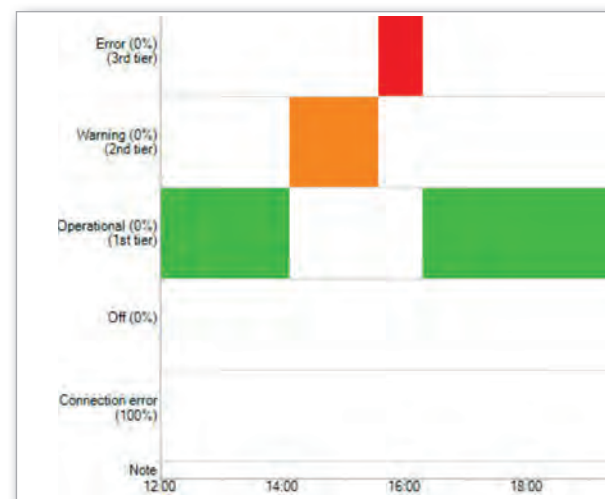


### Uptime, downtime.

#### Total productivity overview

#### Do you know the real productivity of your machines?

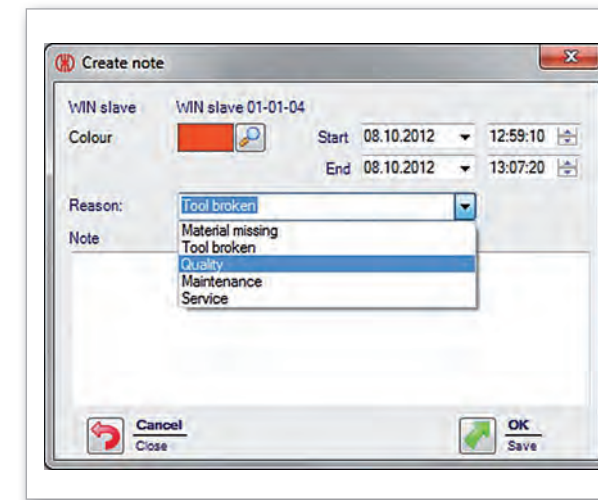
Define the productive and non productive statuses of the machine and then in the Productivity module of WIN you can analyse the real productivity of a machine, groups of machines or the complete workshop.



### Obtain Transparency. Runtime Module

#### Do you know for how long your machines or workstations are down?

The Runtime Module allows you to check the operation and downtimes of your machines or workstations. This module helps you to reduce errors as the number and length of disruptions is saved to the database. Compare machines and recognise problems which influence the entire production process.



### Document problems. Error analysis

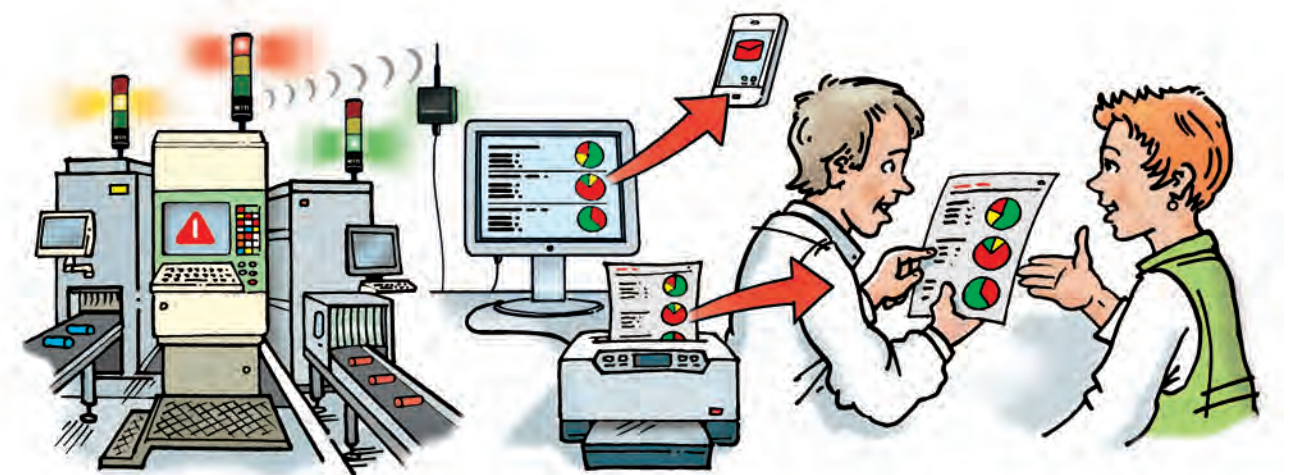
#### Why is the machine or workstation out of action so often?

Identify, comment and analyse the fault conditions. First of all define the most common reasons for fault status occurring, for example material shortage. It is then possible to retrospectively analyse the frequency and length of the fault conditions and ensure that the cause can be eliminated.

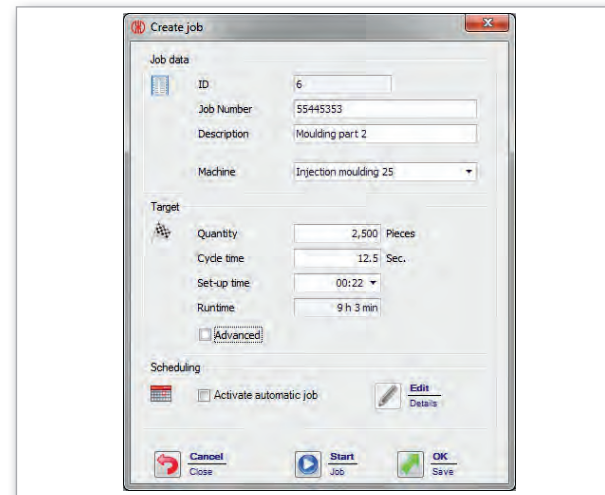
### Easy to create. Reports and export function

#### How do you create your reports?

The user friendly report creation function allows you to convert all data into individual reports in tabular or graphic form. The report is created and displayed for printing and can be individually amended and saved in various formats (pdf, HTML, Excel, CSV, jpg).



## Intuitive. The WIN Software



### Define job information. Job entry\*

#### How do you enter machine job information?

The Job Module allows you to enter job detail manually. Input for example the plan numbers such as the number of pieces to be produced and then select the machine on which the job is to be run. The CSV data allows you to import all planned orders.

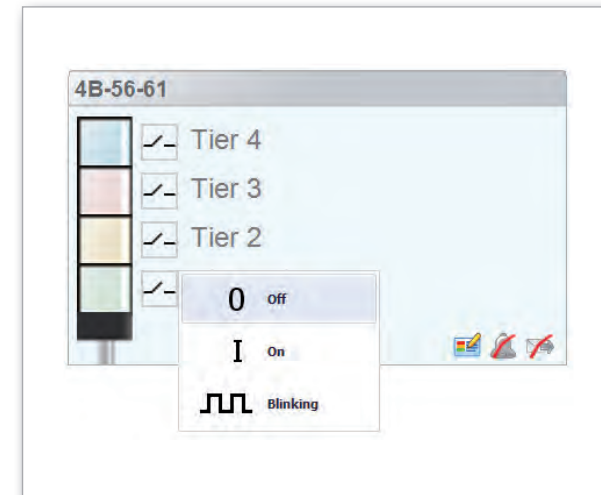
Machine	Status	Fulfillment level
Injection moulding 3	Completed	100%
Injection moulding 2	Completed	100%
Injection moulding 1	Completed	100%
Injection moulding 1	Completed	108%
CNC machine 2	Completed	100%
CNC machine 1	Running	39%
CNC machine 2	Running	49%
CNC machine 1	Waiting	0%
CNC machine 2	Waiting	0%
Injection moulding 2	Waiting	0%

### Keep track of your jobs.

#### Job overview\*

#### Do you know what is being produced on which machine?

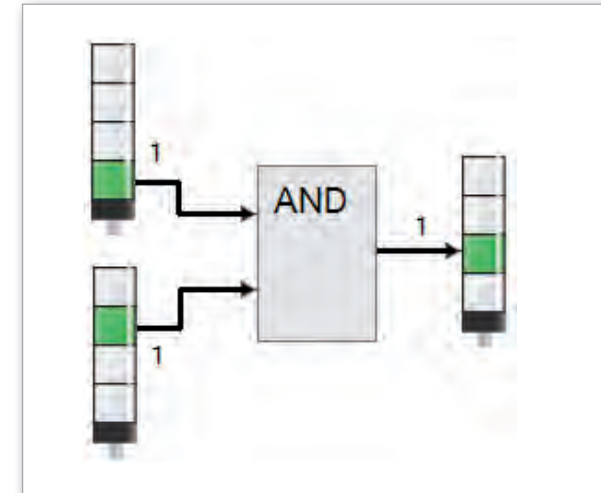
The module gives you a comprehensive overview of which job is running on which machine and how the job is progressing. Future planned jobs are shown as "waiting" and can be initiated as soon as the machine required is available.



### Switch manually. WIN slave control\*\*

#### Do you want to switch a status manually?

In the Control Station you can select the function of each tier of the WIN slave control. You can set the tier to 'permanent', 'blink', or 'off'. In this way you can inform staff directly of a status change and achieve best possible transparency.



### Switch with logic. Control module\*\*

#### How do you signal the status of your entire machine shop?

Define in the control module AND, OR, NEITHER/NOR rules in order to link all the machines in the network and connect them to the WIN slave control. Green would indicate all machines are in operation whilst a red light would show if any one machine was in error status. A very simple visual tool to give absolute transparency.

### Process control. Control module\*\*

#### What sort of wastage occurs in your facility?

Rules can also be defined to switch functions on the machines and control processes. For example, you could start a machine up on time in order to control production better. This can lead to more efficient productivity, energy savings and wastage reduction.

\*only available with WIN slave performance

\*\*only available with WIN slave control

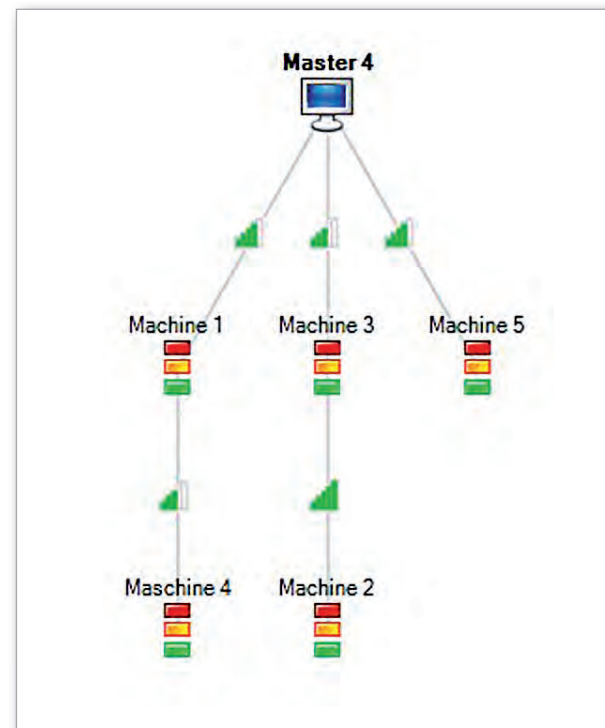


## Intuitive. The WIN Software

### Include a range of users. Multiple Operator Access

#### Who can use the WIN software?

The database can be used by any client and there is no restriction to the number of clients who can install the licence-free WIN software on their PCs. Everyone can see the current status of the machines.



### Stability of the network. Routing Module

#### How is the WIN network actually set up?

The Routing Module assists in setting up or adjusting the best network for WIN. The route network graphic shows the current set up of the WIN network and the signal strength of each "transmitter". Each "transmitter" will automatically select the best route back to the "receiver" either directly, or indirectly.

## Quick Finder. For Monitoring Systems

### ADDITIONAL ITEMS

FUNCTION	PC (USB)	Ethernet	Signal Tower KombiSIGN 71	Signal Tower KombiSIGN 70	POSITION
Switch and control			WIN slave control	WIN slave control	
Machine status and part count monitoring			WIN slave performance *	WIN slave performance *	
Machine status monitoring			WIN slave *	WIN slave *	
Receiver	WIN master *	WIN ethernet master			

\*This option is offered in a starter kit - see below

### STARTER KITS

FUNCTION	without KombiSIGN 70/71	KombiSIGN 70/71 available	SIGNAL TOWER
Machine status and part count monitoring	WIN complete performance KombiSIGN 71	WIN system performance KombiSIGN 71 WIN system performance KombiSIGN 70	
Machine status monitoring	WIN complete KombiSIGN 71	WIN system KombiSIGN 71 WIN system KombiSIGN 70	

Please check the wireless frequency. In North America the version with 915 MHz is used. In Europe the version with 868 MHz is used. Please enquire about use in other countries.

The product part numbers for ordering kits and individual components can be found on pages 24-25.

Monitoring Systems. Order Specifications

ADDITIONAL ITEMS



ORDER SPECIFICATIONS:	
WIN master	860 000 01
WIN ethernet master	860 000 07
<ul style="list-style-type: none"><li>WIN master with USB cable (Receiver)</li><li>WIN ethernet master with USB connector and ethernet cable (Receiver)</li><li>Software CD</li></ul>	



ORDER SPECIFICATIONS:	
WIN slave for KombiSIGN 71	860 640 05
WIN slave for KombiSIGN 70	860 840 05
<ul style="list-style-type: none"><li>WIN slave (not pre-configured)</li></ul>	



WIN slave performance for KombiSIGN 71	860 640 15
WIN slave performance for KombiSIGN 70	860 840 15
<ul style="list-style-type: none"><li>WIN slave performance (not pre-configured)</li></ul>	



WIN slave control for KombiSIGN 71	860 640 25
WIN slave control for KombiSIGN 70	860 840 25
<ul style="list-style-type: none"><li>WIN slave control (not pre-configured)</li></ul>	

STARTER KITS



ORDER SPECIFICATIONS:	
WIN complete for KombiSIGN 71	860 640 06
<ul style="list-style-type: none"><li>Three KombiSIGN 71 signal towers (three LED permanent light elements in red, yellow and green, terminal element and base with integrated tube)</li><li>Three WIN slaves (pre-configured)</li><li>WIN master with USB cable (Receiver)</li><li>Software CD</li></ul>	
The "WIN complete" starter kit contains everything you need to monitor three machines or workstations wirelessly - plug and play.	



ORDER SPECIFICATIONS:	
WIN system for KombiSIGN 71	860 640 04
WIN system for KombiSIGN 70	860 840 04
<ul style="list-style-type: none"><li>Three WIN slaves (pre-configured)</li><li>WIN master with USB cable (Receiver)</li><li>Software CD</li></ul>	

The "WIN system" starter kit is designed for those users who already have WERMA signal towers in use or who wish to configure their own signal towers. The modular "WIN slave" units are simply fitted to the existing WERMA signal tower and the system is ready for use once the "WIN master" and the software have been installed.



ORDER SPECIFICATIONS:	
WIN complete with WIN slave performance for KombiSIGN 71	860 640 16

- Three KombiSIGN 71 signal towers (three LED permanent light elements in red, yellow and green, terminal element and base with integrated tube)
- Three WIN slaves performance (pre-configured)
- WIN master with USB cable (Receiver)
- Software CD

The "WIN complete performance" starter kit contains everything you need to monitor three machines or workstations wirelessly - plug and play.












ORDER SPECIFICATIONS:	
WIN system with WIN slave performance for KombiSIGN 71	860 640 14
WIN system with WIN slave performance for KombiSIGN 70	860 840 14
<ul style="list-style-type: none"><li>Three WIN slaves performance (pre-configured)</li><li>WIN master with USB cable (Receiver)</li><li>Software CD</li></ul>	

The "WIN system performance" starter kit is designed for those users who already have WERMA signal towers in use or who wish to configure their own signal towers. The modular "WIN slave" units are simply fitted to the existing WERMA signal tower and the system is ready for use once the "WIN master" and the software have been installed.



# Quick Finder. For Manual "Call for Action" Andon Systems

Installation type, position of signal tower and number of status conditions that can be activated

TYPE OF INSTALLATION	Signal tower mounted directly on Andon product	Signal tower mounted separately on Andon product	Signal tower mounted separately on Andon product	POSITION OF THE SIGNAL TOWER
	AndonCONTROL	AndonSWITCH	AndonBOX	
Base mounting				
Wall mounting				
Mounting on aluminium profile				
	8 States	8 States	4 States	NUMBER OF STATUS CONDITIONS

Product part numbers for ordering manual "call for action" systems can be found on page 27.

# Andon Products. Order Specifications

The WERMA signal tower can be used in conjunction with various Andon products.

## AndonCONTROL (for integral signal towers)



### ORDER SPECIFICATIONS:

AndonCONTROL for KombiSIGN 71  
AndonCONTROL for KombiSIGN 70

860 640 07  
860 840 07

- AndonCONTROL
- Power supply unit
- Plug adaptors for EU, UK and North America
- Non slip rubber feet on base



## AndonSWITCH (for remote signal towers)



### ORDER SPECIFICATIONS:

AndonSWITCH

860 000 04

- AndonSWITCH with M12 plug
- Power supply unit
- Plug adaptors for EU, UK and North America
- Non slip rubber feet on base



## AndonBOX (for remote signal towers)



### ORDER SPECIFICATIONS:

AndonBOX

860 000 03

- AndonBOX with M12 mounting
- Power supply unit
- Plug adaptors for EU, UK and North America
- Push button switch caps in red, green, yellow, white and blue



### ORDER SPECIFICATIONS:

Bracket, metal

975 883 01

The bracket can be used with AndonCONTROL and AndonSWITCH for wall and rail mounting.



### ORDER SPECIFICATIONS:

Cable 5 m with M12 plug (8 pole)

960 860 01

Cable 5 m with M12 connector and plug (8 pole)

960 000 46

A 5m cable with single connector for use with AndonSWITCH or AndonBOX to ensure optimum location of a signal tower positioned away from the Andon product.



## Experience the system for yourself. Your options

### Live Presentation. Lean Factory

Visit us at one of the roadshows. Register at [www.lean-factory.com](http://www.lean-factory.com).

Or experience the system at one of our many trade fairs and events worldwide. Visit [www.werma.com](http://www.werma.com) for more details.



### Experiment with the product in your own facility. Sample Case

Order our free sample case.



You want to introduce Lean Production Methods and be prepared for Industry 4.0? – The WERMA solutions make the transition easy.



**WERMA Signaltechnik GmbH + Co. KG**

Dürbheimer Str. 15  
 D - 78604 Rietheim-Weilheim  
 Fon +49 (0) 74 24 95 57 - 153  
 Fax +49 (0) 74 24 95 57 - 44  
[www.werma.com](http://www.werma.com) • [mde@werma.com](mailto:mde@werma.com)


**WERMA Signaltechnik**

Niederlassung Neuhausen am Rhf.  
 Rheingoldstrasse 50  
 8212 Neuhausen am Rheinfall  
 Switzerland  
 Phone +41 (0) 52 674 00 60  
 Fax +41 (0) 52 674 00 66  
[www.werma.ch](http://www.werma.ch)  
[info@werma.ch](mailto:info@werma.ch)

**WERMA SARL**

56, Rue Colière  
 69780 Mions  
 France  
 Phone +33 (0) 4 72 22 37 37  
 Fax +33 (0) 4 72 22 37 64  
[www.werma.fr](http://www.werma.fr)  
[info@werma.fr](mailto:info@werma.fr)

**WERMA BENELUX bvba**

Industrieweg 78-80 Bus 2  
 9032 Wondelgem  
 Belgium  
 Phone +32 (9) 220 31 11  
 Fax. +32 (9) 222 81 11  
[www.wermabenelux.com](http://www.wermabenelux.com)  
[info@wermabenelux.com](mailto:info@wermabenelux.com)

**WERMA (UK) Ltd.**

11 Regent Park  
 37 Booth Drive  
 Park Farm Industrial Estate  
 Wellingborough NN8 6GR  
 Great Britain  
 Phone +44 (0) 1536 486 930  
 Fax +44 (0) 1536 514 810  
[www.werma.co.uk](http://www.werma.co.uk)  
[uksales@werma.com](mailto:uksales@werma.com)

**WERMA USA Inc.**

6731 Collamer Road  
 East Syracuse, NY 13057 USA  
 Phone +1 315 414 0200  
 Fax. +1 315 414 0201  
[www.werma.com](http://www.werma.com)  
[us-info@werma.com](mailto:us-info@werma.com)

**WERMA (Shanghai) Co., Ltd.**

No. 8, High Technology Zone,  
 No. 503, Meinengda Road,  
 Songjiang, Shanghai, P. R. C  
 201613  
 China  
 Phone +86 (0) 21 5774-0024  
 Fax +86 (0) 21 5774-6601  
[www.werma.com.cn](http://www.werma.com.cn)  
[info@werma.com.cn](mailto:info@werma.com.cn)

