It simply works!

BK Mikro®
Tool and Process Monitoring

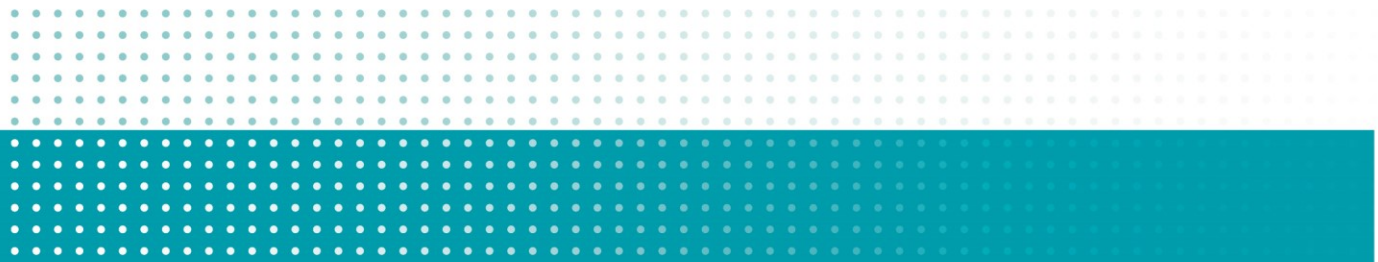## Installation Recommendation

BK Mikro9

Tool and Object Monitoring System
Protection against Follow-up Problems
in the Process of Production

Version 1.00

Nov. 26, 2018

Contents

BK Mikro9

Installation Recommendation

1 Introduction

1.1 Usage

This is a recommendation for installations of BK Mikro systems. It should help to understand how the PLC has to support BK Mikro to get an optimal benefit.

1.2 For direct contact

If you have any questions or suggestions please contact the

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You can also visit our homepage for further information:

http://www.bkmikro.de

2   BK Mikro Settings

For all parameter settings please refer to the Help Manual integrated in the system setup software.

http://www.bkmikro.de/en/support/software

Please refer also to the technical documentation.

http://www.bkmikro.de/en/support/information

3   Activating / Deactivating Checking

Not all tools can be monitored, such as big mills or measuring probes. Therefore the tool table has to be configured with a tool specific function. With a mark the user can activate or deactivate checking.

3.1   Example Tool table

Tool specific function

Tool list																
Loc.	Type	Tool name	ST	D	H	Lenght	Radius		N		1	2	M 1	M 2	M 3	M 4
⏚	✐	Drill 8	1	1	0	235.977	5.200		0	↻	✔	☐	☐	☐	✔	☐
�																
⟩																
1	⟘	Mill 10	1	1	0	10.000	10.000			↻	✔	☐	☐	☐	☐	☐
2	✐	Drill 12	1	1	0	98.332	3.800			↻	✔	☐	☐	☐	✔	☐
3																
4																
5																
6																
7																

4   Tool Number

The tool number has to be applied binary as outputs to drive the inputs of the BK Mikro controller.

Example: Tool number 03 is 0000 0011.

4.1   Fixed place coded tools

If you have a fixed place coding tool magazine, you can use the tool number directly for the breakage control.

4.2   Variable place coded tools

If you have a variable place coding tool magazine, the pocket number is not corresponding to the tool. Therefore you have to configure a user specific input field "Tool info" where the end user can input the tool number.

4.3   Example Tool table with "Tool info"

5   M-Codes

For the basic functions 'Teach' and 'Start' you need 2 M-Codes which drive 2 outputs.

5.1   M-Code 'Teach'

If a tool is new you have to teach the length of the tool. Therefore the machine has to bring the new tool in a position where the scanner can execute the teach process. The tool number has to be applied before M-Code for 'Teach'.

A very elegant way is to use the "First Time In Use" mark, if available. If the tool is loaded directly in the magazine, the machine has to bring the tool into the spindle and back to the checking position. If the tool is loaded in the spindle, the teach cycle can be done when the tool goes into the magazine the first time. In the checking position the M-Code for 'Teach' has to be applied. If the BK Mikro answers with an OK, the length of the tool is stored in the controller and the machine can continue. If KO, the system detected a problem, like maximum teach range exceeded.

5.2   Teach all

When the scanner or the wand has to be changed in case of any reason, all tools have to be reteached. Therefore it is comfortable to write a Macro where all tools, one after the other, are going into the checking position and the 'Teach' process is done automatically.

5.3   M-Code 'Start'

When the tool returns after work into the magazine the tool is to be checked. The tool number has to be applied first. Then, in the checking position the M-Code for 'Start' has to be applied also. If the BK Mikro answers with an OK the machine can continue. If KO the BK Mikro detected a problem, either too short, means broken or too long means detection of chips or other critical issues like cable broken.

5.4   Example T,S,M   M-Code 321 for 'Teach'

5.5   Example T,S,M   M-Code 323 for 'Start'

5.6   Example DIN-ISO   M-Code 321 for 'Teach'

```
T="Drill8"
M6
M321
M6
G4F5
M30
```

5.7   Example DIN-ISO   M-Code 323 for 'Start'

```
T="Drill8"
M6
M323
M6
G4F5
M30
```

6　Error Messages

Please create following error messages.

6.1　Error System

Tool number is higher than …
511 for BK Mikro Premium
63 for BK Mikro Light

6.2　Error 'Teach'

Teach limit exceed or system broken

6.3　Error 'Start'

Tool broken or chip problem

It simply works!

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