# PRODUCTION SYSTEMS

# SBC Tool System 2.0

## USER MANUAL

SBC Tool System 2.0 – User Manual

2019-03-04   eng 2.00

part.no. 39971

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# Contents

The "▶" symbols in this manual are references to other manual sections.
(▶ 3.2) for example, refers to section 3.2.
If the manual is read as a PDF file, the references are clickable and linked to the designated section.
Page numbers in the table of contents are clickable as well.

# 1 Safety and Warranty

Use the following safety instructions to help ensure your own personal safety and to help protect your equipment and working environment from potential damage.

## Use

Do not use the equipment for anything other than its intended use.

Use the equipment with caution.

Do not use the equipment if it is broken or disassembled.

Only use manufacturer-approved accessories, batteries and spare parts.

Perform regular service and maintenance.

## Service and Maintenance

Do not attempt to service the equipment yourself, except as explained in your latest version Binar Elektronik AB documentation or in instructions otherwise provided to you by Binar Elektronik AB.

## Warranty

The warranty does not apply to ignoring safety instructions, normal wear, damage caused by misuse, accident or force majeure or any damage caused to the surroundings by the use of this equipment.

## Recycling

Sort the batteries and electronic components as Electronics.

Sort the metal parts as Metal and the plastic parts as Plastic.

# 2   System Overview

Spring Band Clamp Tool, SBC Tool is an industrial quality assurance tool for fixing Spring Band Clamps in car engine compartments or other similar applications. Spring Band Clamps are pre-opened pre-positioned clamps that are tensioned to clamp down. They're held open by mechanical force.

The SBC Tool releases the spring mechanism so that the clamp is drawn together and fixated.

The superior system can activate a LED indication in the SBC Tool when the operation is to begin. When the operation is done, a wireless signal is sent from the SBC Tool to the Gateway unit.

The signal can then be sent further to the superior system using CAN/Profinet/Ethernet. Depending on the local set up of the superior system.

The SBC Tool (and optionally the LED Display) indicate when the necessary number of operations have been done.

This way you can make sure you don't miss any operation, causing leakage and failure later on.
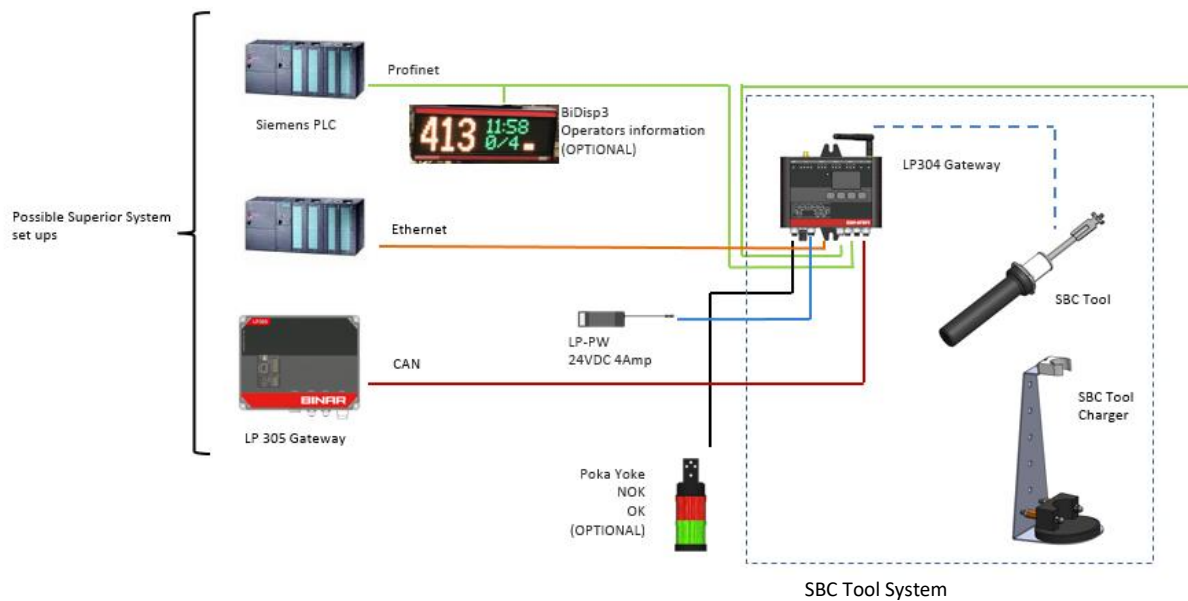
## Bill of Material



| Pos. | Part no. | Description |
|------|----------|-------------|
| 1 | 39971 | SBC Tool System 2.0 (contains a SBC Tool, a SBC Tool Charger and a LP 304 Gateway) |
| 2 | 39972 | SBC Tool |
| 3 | 39973 | SBC Tool Charger |
| 4 | 50304 | LP 304 Gateway |
| | | |
| 5 | --- | Antenna, W1030 (for radio) |
| 6 | 54400 | BiDisp3 (Optional) |
| 7 | ---- | LP-PW |
| 8 | 51113 | LP113 Indicator push button, Green LED, M12 (Optional) |

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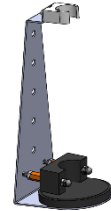# 3 Getting Started

Below you find some quick steps to getting started.

1 Read the Safety and Warranty instructions (▶ 1).

2 Make sure the superior system supports the product functions (▶5 and ▶ 7).
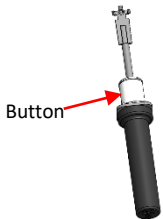
3 Mount the LP 304 Gateway (▶ 8.3).

4 Connect the superior system with the LP 304 Gateway (▶ 5).

5 Mount the SBC Tool Charger (▶ 8.2).

6 Charge the SBC Tool. (▶ 4.5)

Button →

7 Pair the SBC Tool with the LP 304 Gateway (▶ 6).

The tool is now ready for use.

8 Optional: Set up Visualization. (BiDisp3, for instance).

9 Optional: Connect the LP 304 Gateway with the LP 113 Indicator push button(▶ 5).

# 4 Operations

## 4.1 Visualization

The advantage of setting up a LED display is that it gives more detailed information to the end user, allowing them to plan out their work more in advance. It can for instance show how many clamps there are to close for each job completion.

The Poka Yoke light can flash green/yellow/red for more basic indications.
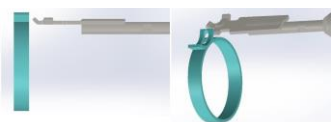
## 4.2 Clamp release

There are two main ways to use the SBC Tool for clamp release.
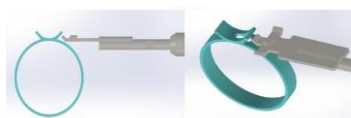


i.   Bending

The middle point is hooked into one of the "wings" on the clamp. The handle is pushed down, making the point pivot upwards. This pushes the "wing" away from the other.



ii.  Torque

One of the side points is hooked into one of the "wings" on the clamp. The handle is rotated, making the point pivot upwards. This pushes the "wing" away from the other.

Each of these methods will release the mechanism and close the clamp. Which one is preferable depends on the placement of the clamp, and what angle is necessary to reach it.

## 4.3 How it works

The SBC Tool System can detect the release of clamps with the aid of strain gauges. The strain gauge is built into the tool head and detects changes in the mechanical tension in the rod. By detecting specifically steep drops in tension, a clamp release can be determined.

## 4.4 Override function

On the SBC Tool there is a white plastic cap that serves as both protection for the inner electronics, and as a conduit for the light indications. (See ►7) On this cap there is a small white button. As show in this picture:
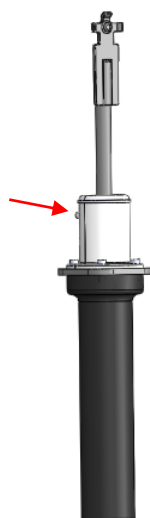


If a clamp is closed without giving off a "done" indication on the tool or on the BiDisp3, the override button can be used. Click it once for the clamp it didn't detect. The BiDisp3 will count it and the tool will flash red.

If a "done" indication comes without a clamp having been closed, there'll be a red flash for the "extra" clamps being closed. A superintendent could be notified of this.

## 4.5 Battery usage

Make sure that the SBC Tool is charging on breaks. The battery needs continued recharging as this improves battery life time. The battery needs to be charged '10-15' minutes every second hour to keep full capacity. If one or two charging breaks are missed, it is not of great consequence. But to keep battery fully loaded again it will need a longer period of charging. Total discharge is bad for the battery life time. The SBC Tool can go for at least 24 hours without any charge, but this will heavily drain the battery.
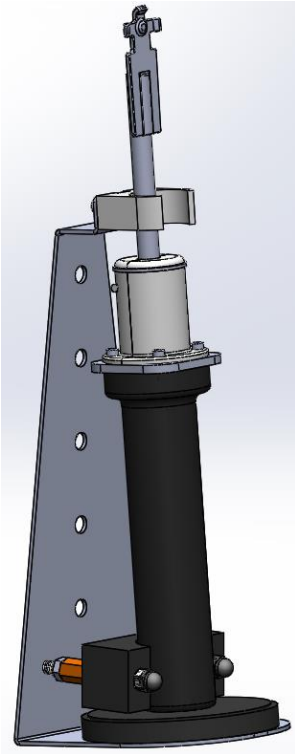


1. Set the SBC Tool in the SBC Tool Charger.

2. Make sure that the handle bottom touches the charger pad.

3. Make sure that the handle bottom is centrally placed on the charger pad.

4. If charging normally, there should be a yellow light flashing every ten seconds.

If the battery breaks, contact Binar Elektronik AB for replacement battery.

## 5  Connections

Connect the superior system with the LP 304 Gateway. If using the CAN connection, make sure that each end of the CAN-loop is ended with an end termination.
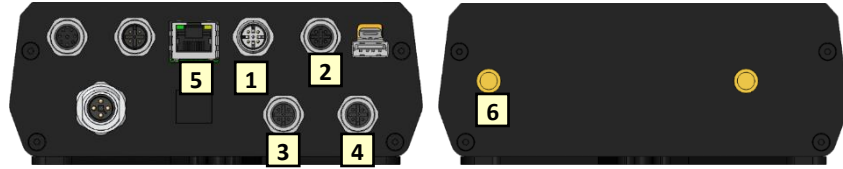


| Position | Picture | Connection | Size | Pins | Type | Code |
|---|---|---|---|---|---|---|
| 1 | | CAN IN | M12 | 5 | Male | A code |
| 2 | | CAN OUT | M12 | 5 | Female | A code |
| 3 | | Profinet IN | M12 | 4 | Female | D code |
| 4 | | Profinet OUT | M12 | 4 | Female | D code |
| 5 | | Ethernet | RJ45 | 8/8 | Modular | |
| 6 | | Radio | | | | |
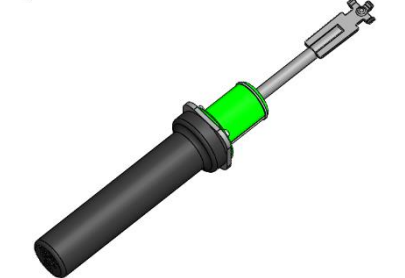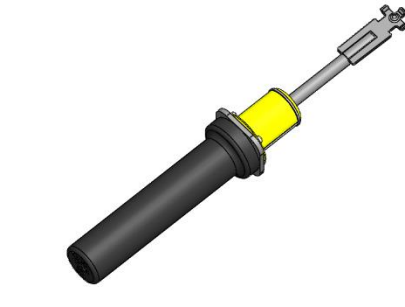
## 6   Configuration

The SBC Tool is paired with the LP 304 Gateway by the user.

1.  Hold the button on the SBC Tool (while simultaneously holding the LP113 Indicator Push Button).

2.  Tool (and Push Button) should blink green during pairing attempt.

3.  If pairing is successful, then Tool (and Push Button) should give a constant green light. If light is red, pairing has failed.

# 7   Status Indications

## 7.1   Pairing

**1** When pairing the SBC Tool to the LP 304 Gateway, the tool flashes Green continuously until pairing has been achieved. At that point it should then light up in a constant Green light. If pairing however has been unsuccessful, it will light up in Red.

## 7.2   Operating

**1** The SBC Tool flashes Green three times in rapid succession when a new job is lined up. (BiDisp3 will show how many clamps in the job.)

**2** When the SBC Tool completes an operation, it lights up in Yellow.

**3** When the SBC Tool completes a set of operations, it lights up in Green.

**4** When the override function is used, it lights up in Red.

**5** When the SBC Tool closes one clamp more than there are set in the job, it lights up in Red.

## 7.3   Charging

**1** When the SBC Tool is set in the Tool Charger, it will blink Yellow every ten seconds that it's charging.

**2** When the SBC Tool is removed from the Tool Charger, or its button is pressed, before it's fully charged, it will light up in Yellow.

**3** When the SBC Tool is removed from the Tool Charger, or its button is pressed, after it's fully charged, it will light up in Green.

# 8 Dimensions and Mounting

## 8.1 SBC Tool
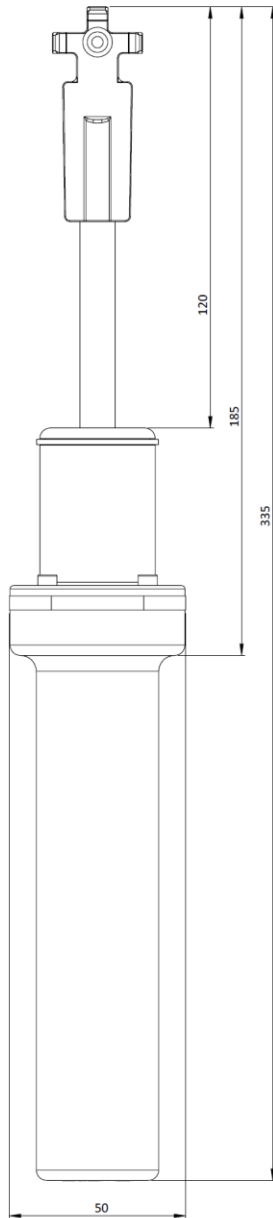
8.2      SBC Tool 2.0 Charger
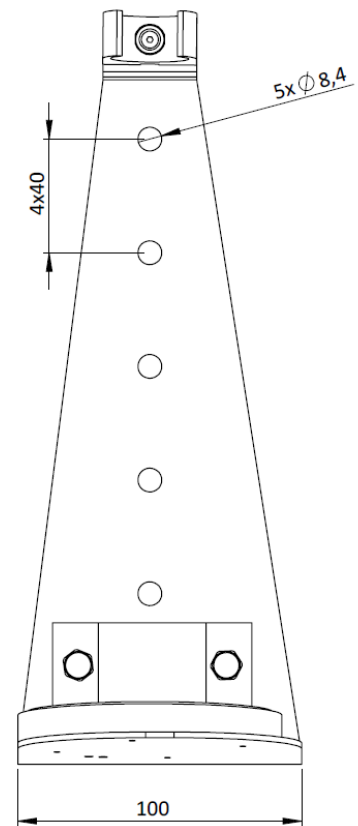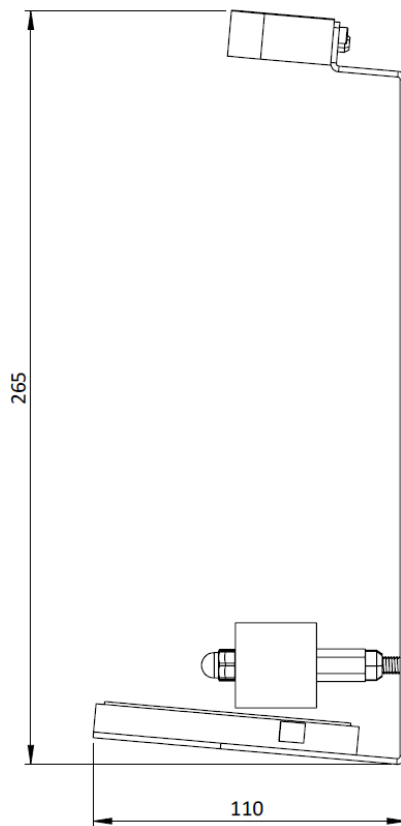


# Mounting

1   Mount the SBC Tool Charger on the wall near a power supply (220 V).

2   Connect power supply.

3   Place the SBC Tool. (Remember to keep the handle in the center of the charging pad, and in physical contact with the pad.)
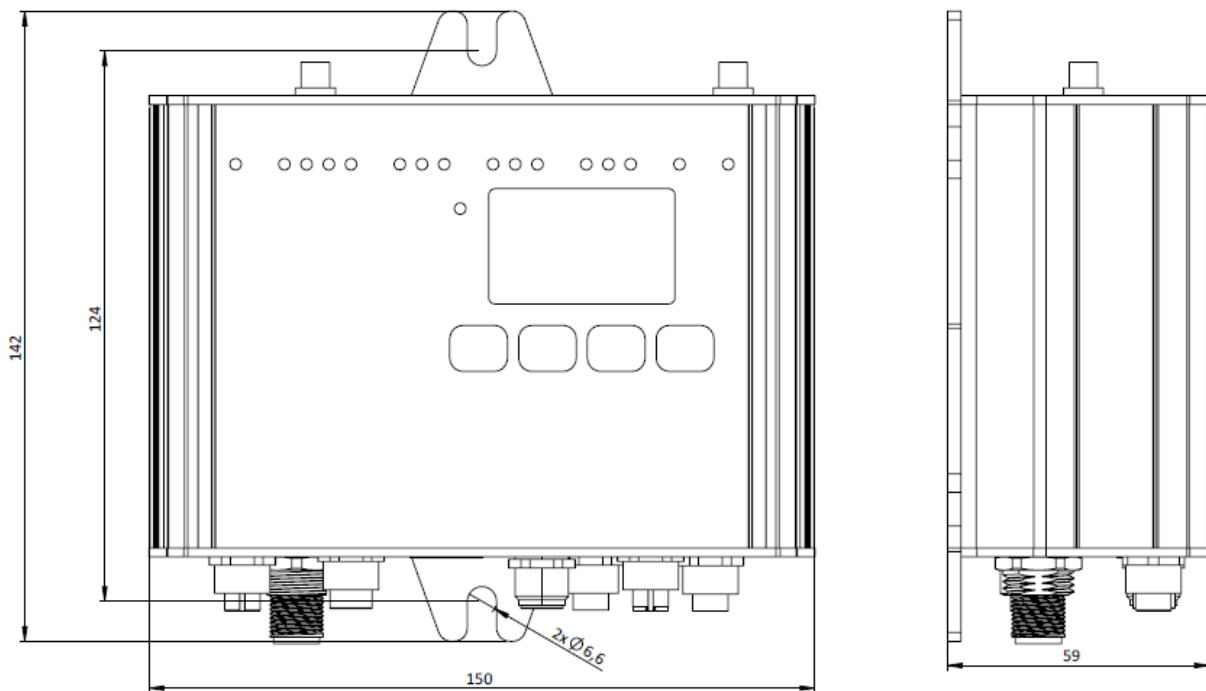
## Mounting

1    Find a wall without screening sheet metal or other material that might block radio waves.

2    Mount the LP 304 Gateway.

3    Make sure that the radio antenna is connected to the right port.

4    Connect it into the system.

## 9 Technical Data

### TECHNICAL DATA TOOL

| | |
|---|---|
| Batteries | Lithium-ION |
| Temperature range | 0 - 40°C |
| Humidity | 0 - 95% non-condensing |
| IP code | IP41 |
| Dimensions | w 50 x h 335 x d 50 mm |
| Weight | 0.35kg |
| Wireless range (open air) | 10 meters |

### TECHNICAL DATA CHARGER

| | |
|---|---|
| Temperature range | 0 - 40°C |
| Dimensions | w 100 x h 265 x d 110 mm |
| Weight | 0.25kg |
| Effect | 10 Watt |
| Input | 5 V/2 A, 9 V/1.67 A DC |
| Output | 5 V/1 A, 9 V/1.2 A DC |

### TECHNICAL DATA LP 304 GATEWAY

| | |
|---|---|
| Connectors | CAN, M12, 5 pin, male, A code<br>Profinet,<br>Ethernet |
| Temperature range | 0 - 50°C |
| Humidity | 0 - 95% non-condensing |
| IP Code | IP41 |
| Dimensions | w 150 x h 142 x d 55 mm |
| Weight | 0.65kg |
| Radio frequency | 2.4 GHz |
| Output | +5 dBm |
| Radio type | IEEE 802.15.4 Radio |
| Communication | IPv6, 6lowPAN |
| Encryption | AES-128 |

# 10 Troubleshooting

| Problem | Action |
|---------|--------|
| The SBC Tool can't release the mechanism to fixate SBCs | Make sure there is no problem with the Spring Band Clamps.<br><br>Check for Control Rod wear. |
| The SBC Tool breaking operation is inert | Check for wear. |
| No light signal in the SBC Tool | Charge the tool.<br><br>Check pairing status. |
| No flashing light during battery charge | Check that the tool handle is placed centrally on the charger.<br><br>Check that the tool handle is in physical contact with the charger pad.<br><br>Check that the tool charger is connected to a power supply. |

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