

The Mechatronic System

Pocket guide with useful and practical information about the mechatronic system and the MWR wrenches

Atlas Copco



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System overview

Introduction

This pocket guide is intended to provide basic knowledge to the user about the mechatronic system. After reading this guide, the user should be able to install a complete demo system, which consists out of Focus 61 Controller, MWR wrench and a charging cradle. The user will be guided through the entire setup procedure including hard- and software.



System overview

Focus 61 Controller



Bottom side of Focus 61 Controller



System overview

Focus 61 Controller

The Focus 61 Controller is the accessible interface for the MWR. The image on the left side shows the bottom side of the controller with all available connectivities.

The following list provides an overview of the available interfaces of the controller:

- **SD cards (Slots 1.1 and 2.2)**
 - The SD cards contain the necessary files for the operating system for the mainboard (Slot 1.1) and the MPC (Slot 2.2).
- **Network Interface Mainboard (Interface 1.2)**
 - Connection to Toolstalk BLM
 - Connection to ToolsNet Server
 - Simple result output (Port 10001)
 - Configuration port (Port 9999)
- **Network Interface MPC (Interface 2.1)**
 - Connection to Toolstalk BLM
 - Atlas Copco Open Protocol (Ports 4545 and 4546)
 - Configuration port (Port 9999)
- **Barcode Interface**
 - Standard RS232 serial interface
 - Default BAUD 38400bit/s
 - No prefix/suffix in scanner configuration
 - CR+LF terminator
- **I/O Bus**
 - The I/O bus provides connectivity to the official Atlas Copco accessories. Currently the ESL-04 stacklight is supported by the Focus 60/61 controller.

System overview

MWR Wrench

The MWR wrench consists out of a mechanical click wrench, which is combined with an electronic transducer. There is a unique “click” feedback for the user while the torque and angle is measured with the accuracy of an electronic wrench.

To indicate and visualize the current status of the wrench the MWR has three groups of signaling LEDs.

Outside of the charging cradle

Battery	Status	Status	MWR Condition	LED red	LED green	LED yellow	LED blue
OK	active	ready to use	free of load			● 3 s. interval	● 1 s. interval
OK	active	OK	after click, free of load		● 3 s.		● 1 s. interval
OK	active	NOK	after click, free of load	● 3 s.			● 1 s. interval
OK	active	measuring	tqstart reached			● < 1 s. interval	
Deadtime	OK	active	OK = TOK		● 3 s.	● during deadtime	● after deadtime
Deadtime	OK	active	NOK = TNOK	● 3 s.		● during deadtime	● after deadtime
Rehit	OK	active	Rehit/NOK	● 3 s.		● during deadtime	● 1 s. interval
	NOK	active	ready to use	● 3 s. interval			
	NOK	active	OK		● 3 s.		● 1 s. interval
	NOK	active	NOK	● 3 s.			● 1 s. interval
	NOK	active	measuring	● 1 s. interval			
Deadtime	NOK	active	OK = TOK		● 3 s.	● during deadtime	● after deadtime
Deadtime	NOK	active	NOK = TNOK	● 3 s.		● during deadtime	● after deadtime
Rehit	NOK	active	Rehit/NOK	● 3 s.		● during deadtime	● 1 s. interval

System overview

MWR Wrench

Outside of the charging cradle

Battery	Status	Status	MWR Condition	LED red	LED green	LED yellow	LED blue
OK	no job	ready to use	free of load			● 3 s. interval	
OK	no job	OK = LCK	after click, free of load	● 3 s.			
OK	no job	NOK = LCK	after click, free of load	● 3 s.			
OK	no job	measuring	tqstart reached			● < 1 s. interval	
NOK	no job	ready to use	free of load	● 3 s. interval			
NOK	no job	OK = LCK	after click, free of load	● 3 s.			
NOK	no job	NOK = LCK	after click, free of load	● 3 s.			
NOK	no job	measuring	tqstart reached	● 1 s. interval			

Inside of the charging cradle

Battery	Status	Status	MWR Condition	LED red	LED green	LED yellow	LED blue
OK	active	ready to use				● permanently	
OK	no job	ready to use				● permanently	● 1 s. interval
NOK	active	NOK = LCK				● permanently	● 1 s. interval
NOK	no job	measuring				● permanently	

Error

Battery	LED red	LED green	LED yellow
Error outside of charging cradle	● 300 ms interval		
Outside of radio range outside of charging cradle	● 3 s. interval	● 3 s. interval	● 3 s. interval
Error outside of charging cradle	● 300 ms interval		● permanently
Outside of radio range outside of charging cradle			● permanently

System overview

MWR Charging Cradle

The charging cradle can handle all models and sizes of the MWR wrench series. You should use the support for models MWR-85TA and MWR-200TA.



Cradle with support for
MWR-85 TA / MWR-200 TA

The charging cradle indicates the status of the charging process by a RGB LED according to the following table.

MWR-TA	Status	LED blue	LED green	LED red
Outside of cradle	standby	● permanent		
Inside of cradle	charging		● 1 s. interval	
Inside of cradle	standby-charging		● permanently	
Inside of cradle	Error			● permanent
Inside of cradle	Error	● alternating		● alternating

First start-up

Turning on the system

1. Insert the power cord into the Focus 61 Controller and turn on the power switch.



2. Insert the battery into the MWR wrench. When the battery has sufficient voltage the LEDs on the MWR start to flash. Only use rechargeable batteries with the following specifications:



Rechargeable battery NiMH
Type AAA, 1.2 V, 1000 mAh

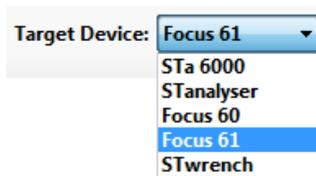
First start-up

Connection via Toolstalk BLM

The Focus 61 Controller indicates the successful system startup by showing the Blue LED to the user (system ready).



1. When the system has started up correctly, you can connect a network cable to one of the two network interfaces (Interfaces 1.2 and 2.1) of the Focus 61 Controller to establish a connection.
2. Now run ToolsTalk BLM to connect to the controller. When the Focus 61 is in the same network as your computer, ToolsTalk BLM will automatically find all Focus 61 controllers in this network.
3. Select the device to which you want to connect, either Focus 60 or Focus 61:



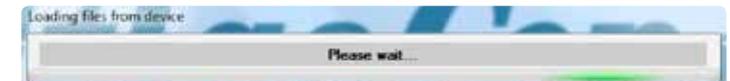
First start-up

Connection via Toolstalk BLM

4. Click on the controller to which you want to connect to



5. ToolsTalk BLM will automatically establish the connection to the chosen controller:

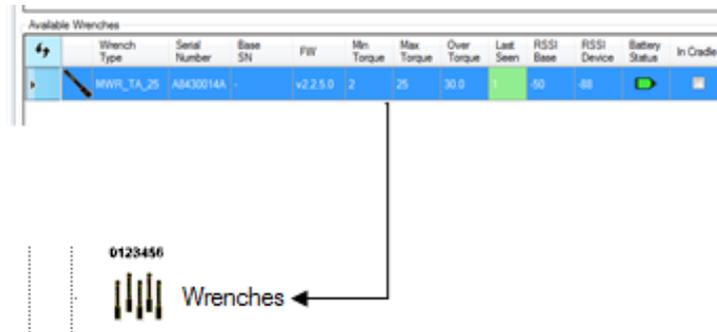


Creating the first configuration

Linking wrenches

After establishing the connection to the controller via ToolsTalk BLM you need to link a MWR wrench to the Focus 61 in order to create a working set-up.

Drag and drop the MWR wrench from the "available wrenches" into the wrenches table on the left side as shown below to link it to the Focus 61 controller.

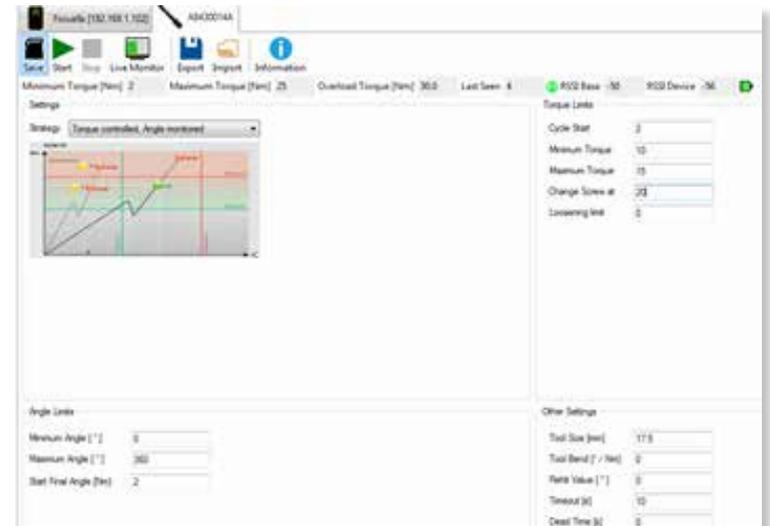


When the wrench is linked, the PSET mask will automatically pop up.

Creating the first configuration

Setting up the PSET

Next step: Configure the PSET of the linked wrench. The PSET mask looks as follows:



When all parameters are configured, click on the "save"-button in the upper left corner and save the PSET.

ToolsTalk BLM confirms the correct saving.



Creating the first configuration

Job configuration

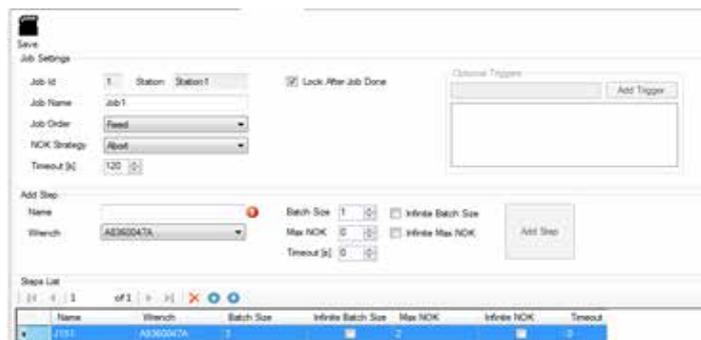
It is necessary to configure a job for the linked wrench.

The job can consist in multiple job steps with a predefined batch size (number of OK tightenings). Each tightening will be analyzed for the specified parameters inside the PSET to get a tightening status (OK, NOK, LCK, etc.).

To create a new job, doubleclick on the Tab "Add Job" inside your station configuration on the left side:



As a result, the job window will pop-up which needs to be configured.



Creating the first configuration

Job configuration

It is necessary to configure a job for the linked wrench.

Type in a name for the job and select the job order (fixed/free) as well as the NOK Strategy (Abort/Continue).

Specify the name of the job step and select the parameters for the step (batch size, max NOK, timeout) and click on the button "Add Step".

For a demo we recommend:

1. Check the boxes for "infinite batch size" and "infinite NOK" and specify the timeout with 0 seconds. This will create an infinite Job sequence.
2. After clicking the button "add step" the configured job step will be added to the job steps list.
3. Save the configuration by clicking on the "save"-button.



1

2

3

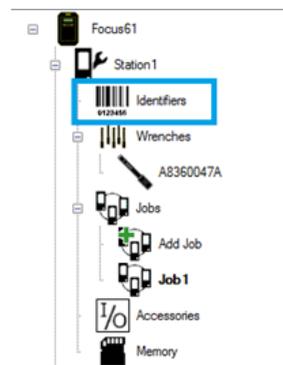
Creating the first configuration

Event configuration

Finally the Focus 61 needs an event configuration in order to start the job with the linked MWR.

The easiest way to start a job is the "INIT STATION" event.

This event is triggered when the controller successfully starts up. To create an event, double click on the tab "identifiers" on the left side:



Select your configured job in the drop down menu as follows:

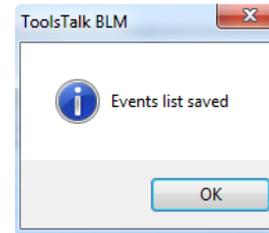


Creating the first configuration

Event configuration

When the right job is selected, save the event configuration by clicking the "Save"-button.

ToolsTalk BLM confirms the correct saving:



Disconnect ToolsTalk BLM from the Focus 61 controller and reboot the Focus 61.

After reboot, the controller should start the job automatically and will unlock the linked wrench. The wrench is active, when the blue LED is flashing on the wrench.

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The Atlas Copco logo consists of the company name in a stylized, italicized serif font, positioned between two horizontal white bars on a blue background.

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