METROTEC

Systems for Measuring and Controlling Oxygen

Operating Instructions

METROTEC APP

Configuration Application (Android) for

Oxygen Measuring Modules

*** Version 1.3 ***

Our management system is certified according to

DIN EN ISO 9001:2015

© METROTEC GmbH
Heinkelstrasse 12 • 73230 Kirchheim • Germany
Phone +49 (0)7021 95336-0 • Fax +49 (0)7021 95336-13
www.metrotec.eu • info@metrotec.de

Table of Contents

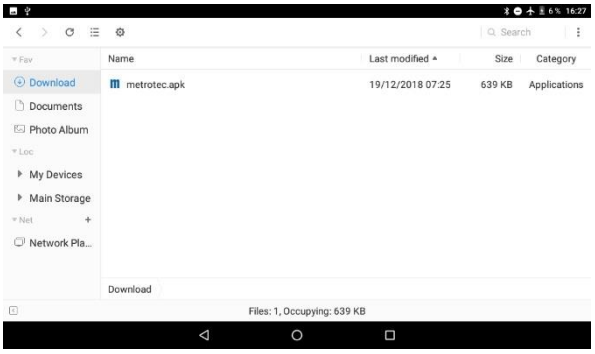
1. General

This application for Android terminals described hereafter enables communication with compatible oxygen measuring modules via a Bluetooth connection. The application enables to see measuring values and change configuration settings. It also enables the adjustment of oxygen measuring modules. The required hardware consists of an Android terminal and a compatible oxygen measuring module.

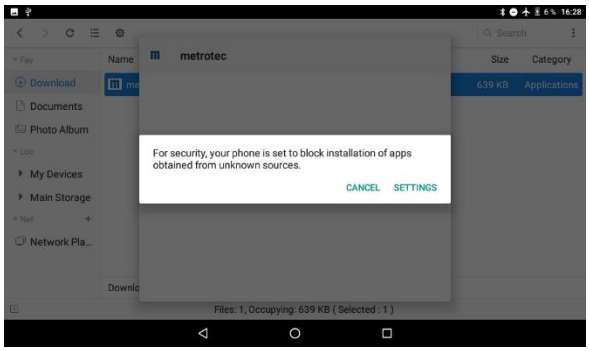
2. Installation

How to install the application on the Android terminal:

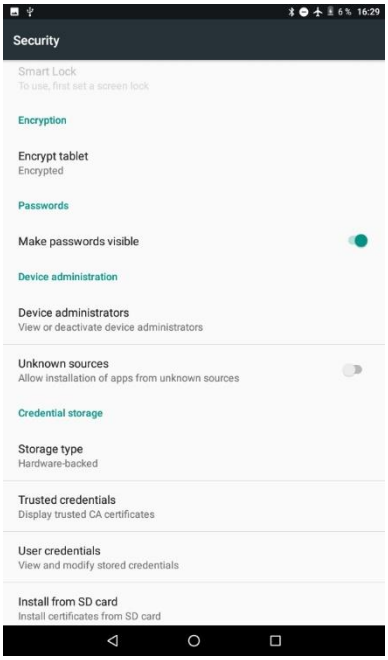
1. Download the application from the *Downloads/App* section on the www.metrotec.eu website.
2. If the download was made on the Android terminal, the file can be found in the Downloads section.

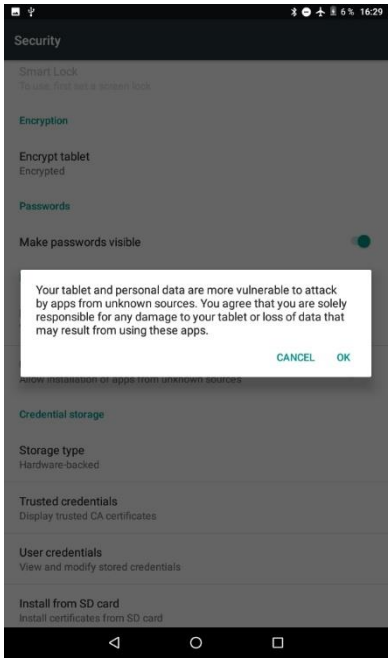


3. Double-clicking the file will install the application.
4. You may be confronted with the following error message on your device:

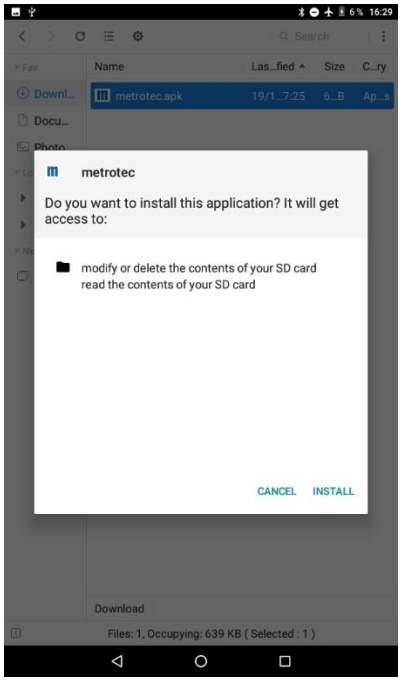


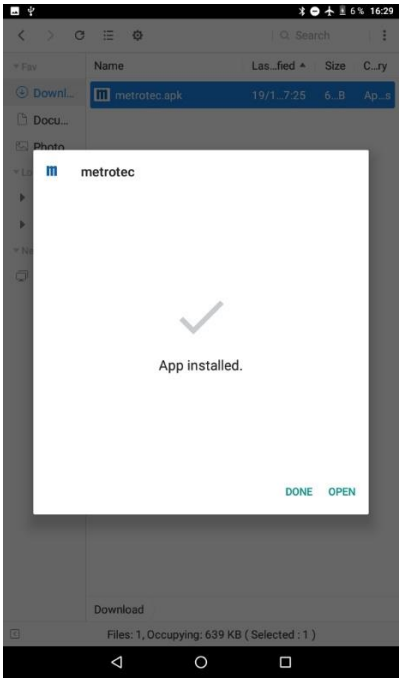
5. In this case press the *Settings* button and activate “Unknown sources” option (allow Unknown sources).
6. Confirm the following dialog with *OK*.





7. Now confirm the installation by clicking on the *Install* button.
8. After finishing the installation, return to the Home page by clicking on *Done*.

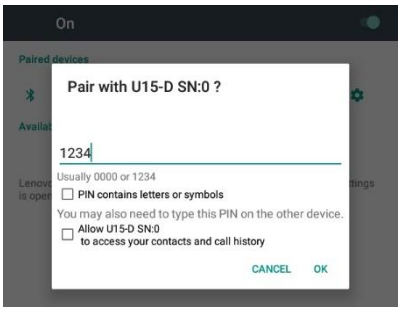




3. Pairing

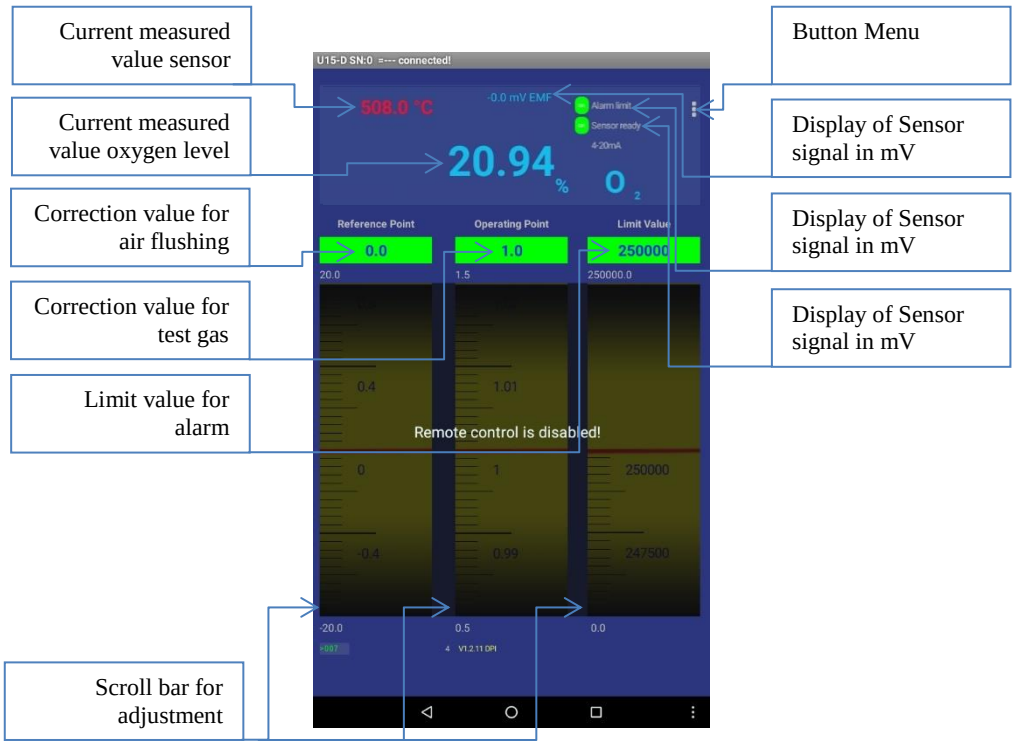
In order to use the application with an oxygen measuring module, the module must be paired with your Android terminal. To do so, please proceed as follows:

1. Activate the Bluetooth function in your oxygen measuring module (Please look up the operating instructions of the module used in order to find out how to do this).
2. Activate the Bluetooth function of your Android terminal. (This is device-dependent. Please look up the operating instructions of your Android terminal).
3. Start searching for Bluetooth devices on your Android terminal.
4. Select the desired oxygen measuring oxygen measuring module and pair the module by entering the *Code "1234"*.
5. Return to the Home page.

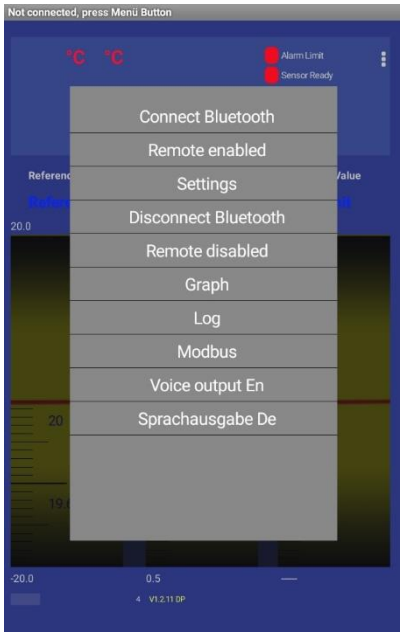


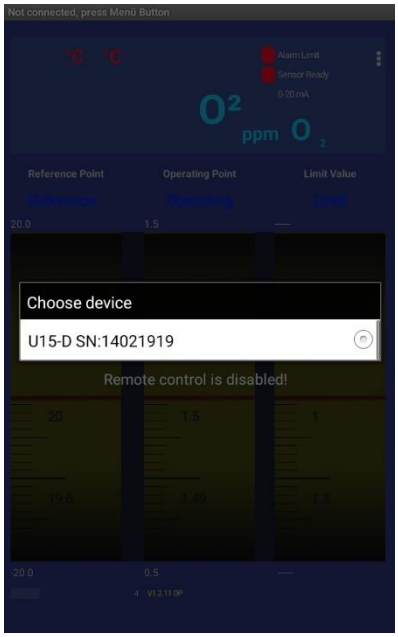
4. Operation

This section will explain how to establish a connection with an oxygen measuring module and provide an overview over the user interface and the functions of the individual menus.



1. Open the application by double-clicking on the *Metrotec* icon.
2. Open the menu by clicking on the *Menu* button.
3. Select the *Connect Bluetooth* submenu.
4. Select the desired oxygen measuring module from the list shown.





5. On the main page now displayed, all relevant measurands are shown.
6. The input area is disabled in order to prevent accidental changes to parameters. In order to make changes, open the menu by clicking on the *Menu* button.
7. Select the *Remote Enabled* submenu.
8. The *Input code "5678"* will enable the edit mode.
9. Now the *Reference Point*, *Operating Point* and *Limit Value* parameters may be changed by using the scroll bars. Please note, that changing the Reference Point and Operating Point parameters will cancel the factory calibration!
   Note:
   With some module types, the Reference Point, Operating Point and Limit Value parameters cannot be changed by using the scroll bars. In this case use the Settings submenu.

The following table contains and describes the functions available in the menu bar:

Menu	**Function**
Connect Bluetooth	Connecting an oxygen measuring module
Remote enabled	Enable edit mode
Settings	Settings (see chapter 5-7 Configuration Module)
Disconnect Bluetooth	Separate connection with oxygen measuring module and close application
Remote disabled	Disable edit mode
Graph	Graphic display of measured values for oxygen and temperature
Log	Recording of measured values for oxygen
Modbus	No function
Voice output En	Voice output of measured value for oxygen in English
Voice output De	Voice output of measured value for oxygen in German

5. Configuration of Z19 Module

This section will describe the parameters for adjusting and changing the configuration of a Type Z19 oxygen measuring module in the *Settings* submenu in the application.

5.1 Parameter List

In order to make changes to the configuration, the edit mode must be enabled as described in *Chapter 4 Operation*.
All entry fields highlighted in white may now be edited. Additional fields will be used for displaying current measured values and status.

The following table contains and describes the parameters:

Parameter	**Function**
0 O2 (Lin/Log*)	Current measured value oxygen level
1 Temperature	Current measured value sensor temperature
2 Reference Point	Correction value for air flushing
3 Operating Point	Test gas correction value
4 Output 1 Min (Lin/Log*)	Oxygen value for analog output of measuring range 1 at 0/4 mA**
5 Output 1 Max (Lin/Log*)	Oxygen value for analog output of measuring range 1 at 20 mA**
6 Limit Value (Lin/Log*)	Limit value for alarm
7 System flags	Message register information
8 *EMF Output Flag	Switch output to sensor signal in mV
9 EMF (mV)	Display of Sensor signal in mV
10 Output 1 (0/4-20mA**)	Reading of output value measuring range 1 in mA
11 Output 2 (0/4-20mA**)	Reading of output value measuring range 2 in mA
12 Output 2 Min (Lin/Log*)	Oxygen value for analog output of measuring range 2 at 0/4 mA**
13 Output 2 Max (Lin/Log*)	Oxygen value for analog output of measuring range 2 at 20 mA**
14 Hyst.LimRelais (Lin/Log*)	Hysteresis for alarm relay
30 *Display at error	Application display

53 *On Alarm4_20to0	If analog output not ready to 0mA	
64 Cable length (m)	Cable length between sensor and oxygen measuring module	
80 Status	Reading of module status	
	Sensor ready	Measurement active, no errors
	Preheat xxx sec.	Measurement in heating-up phase
	Line break	Sensor cable broken
	Short circuit	Sensor cable short circuit
	Under temperature	Sensor temperature too low
84 *mA Output (1=0/4-20mA**)	Output type of analog output 1 (0=0-20;1=4-20)	

*The unit ppm O2 or log O2 depends on type/configuration of oxygen measuring module
*The output in 0-20mA or 4-20mA depends on type/configuration of oxygen measuring module

6. Configuration of U15 Module

This section will describe the parameters for adjusting and changing the configuration of a Type U15 oxygen measuring module in the *Settings* submenu in the application.

6.1 Parameter List

The parameter *95 *PG* may be used to switch between different parameter groups.
In order to make changes to the configuration, the edit mode must be enabled as described in *Chapter 4 Operation*.
All entry fields highlighted in white may now be edited. Additional fields will be used for displaying current measured values and status.

The following table contains and describes the parameter groups:

Group		**Subject of Parameters**
0	*PG Custom Main U15	Start Info
1	*PG Bus Setup U15	Field bus

6.2 Parameter Group

After switching to the parameter list, the parameter group 0 *Custom Main U15* will be shown by default.

6.2.1 Parameter Group 0

In order to be able to switch to another parameter group as shown in *Chapter 6.1 Parameter List*, the edit mode must be enabled as shown in *Chapter 4 Operation*.
In parameter group 0 switching to parameter group 1 is possible.

The following table contains and describes the parameters:

Parameter	**Function**
0 O2 (Lin/Log*)	Current measured value oxygen level
95 *PG Custom Main U15	Selection of parameter group (0 and 1)
1 Temperature	Current measured value sensor temperature
2 *Reference Point	Correction value for air flushing
3 *Operating Point	Test gas correction value
4 *Output 1 Min (Lin/Log*)	Oxygen value for analog output 1 at 0/4 mA**
5 *Output 1 Max (Lin/Log*)	Oxygen value for analog output 1 at 20 mA**
6 *Limit Value (Lin/Log*)	Limit value for alarm
7 System flags	Message register information
8 *EMF Output Flag	Switch outputs to sensor signal in mV
9 EMF (mV)	Display of Sensor signal in mV
10 Out 1=(ppm/log* 0/4-20mA**)	Reading of output value in mA
11 Out 2=(ppm/log* 0/4-20mA**)	Reading of output value in mA
12 *Output 2 Min (Lin/Log*)	Oxygen value for analog output 2*** at 0/4 mA**
13 *Output 2 Max (Lin/Log*)	Oxygen value for analog output 2*** at 20 mA**
14 *Hyst.LimRelais (Lin/Log*)	Hysteresis for alarm relay
30 *Display at error	Application display: (Standard=15)
31 *Out1 =(0/4-20mA**) 1/2/3	Output type of analog output 1 (1=0-24;2=0-20;3=4-20)
32 *Out2 =(0/4-20mA**)*** 1/2/3	Output type of analog output 2*** (1=0-24;2=0-20;3=4-20)
56 *Measurem. 1ppm 0log	Switch 0=logarithmic;1=linear (ppm)
64 *Cable length (m)	Cable length between sensor and oxygen measuring module
66	Bus type if available

80 Status	Reading of module status	
	Sensor ready	Measurement active, no errors
	Preheat xxx sec.	Measurement in heating-up phase
	Line break	Sensor cable broken
	Short circuit	Sensor cable short circuit
	Under temperature	Sensor temperature too low
47 UMODUL	Software version	

*The unit ppm O2 or log O2 depends on type/configuration of oxygen measuring module
*The output in 0-20mA or 4-20mA depends on type/configuration of oxygen measuring module
*** The presence of a second analog output depends on the type of oxygen measuring module

6.2.1 Parameter Group 1

Entering 1 in Parameter *95 *PG* will take you to parameter group *Bus Setup U15.* In order to make changes to the configuration, the edit mode must be enabled as described in *Chapter 4 Operation.*
Parameter group 1 will allow you to configure the bus, if available.
Note:
The bus type is device-dependent and is defined with the module order

The following table contains and describes the parameters:

Bus type
Modbus
Powerlink
Profinet
EtherCAT

6.2.1.1 Modbus

Nr.	Par. name	Value
0	O2 Lin ppm1 U15/1	0,000
95	*PG Bus Setup U15	1
77	Modbus Sign Of Life	151
78	*Send Testvalue=1	0
499	==========	==========
360	*Modbus IP xxx.-.-.-	192
361	*Modbus IP -.xxx.-.-	168
362	*Modbus IP -.-.xxx.-	0
363	*Modbus IP -.-.-.xxx	80
364	*Modb.Mask xxx.-.-.-	255
365	*Modb.Mask -.xxx.-.-	255
366	*Modb.Mask -.-.xxx.-	255
367	*Modb.Mask -.-.-.xxx	0
368	*Write values = 7878	0

The following table contains and describes the parameters:

Parameter	Function
0 O2	Current measured value oxygen level
95 *PG	Selection of parameter group (0 and 1)
77 Modbus Sign Of Life	Bus module OK when counter runs
78 *Send Testvalue=1	At 1, sending fixed values to test the bus
360 *Modbus IP xxx.-.-.-	Ethernet IP address block 1
361 *Modbus IP -.xxx.-.-	Ethernet IP address block 2
362 *Modbus IP -.-.xxx.-	Ethernet IP address block 3
363 *Modbus IP -.-.-.xxx	Ethernet IP address block 4
364 *Modb.Mask xxx.-.-.-	Subnet mask block 1
365 *Modb.Mask -.xxx.-.-	Subnet mask block 2
366 *Modb.Mask -.-.xxx.-	Subnet mask block 3
367 *Modb.Mask -.-.-.xxx	Subnet mask block 4
368 *Write values = 7878	Enter 7878 to accept the IP address and subnet mask

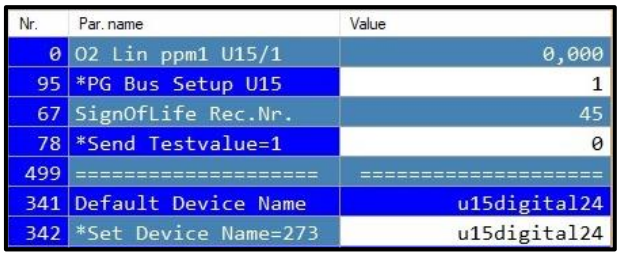
6.2.1.2 Powerlink

Nr.	Par. name	Value
0	O2 Lin ppm1 U15/1	0,000
95	*PG Bus Setup U15	1
67	Powerlink SignOfLife	109
78	*Send Testvalue=1	0
499	==========	==========
376	DNS-Nodename	M
377	*DNS-Node ID	163
378	*Gateway1 xxx.-.-.-	192
379	*Gateway2 -.xxx.-.-	168
380	*Gateway3 -.-.xxx.-	100
381	*Gateway4 -.-.-.xxx	254

The following table contains and describes the parameters:

Parameter	Function
0 O2	Current measured value oxygen level
95 *PG	Selection of parameter group (0 and 1)
67 Powerlink SignOfLife	Bus module OK when counter runs
78 *Send Testvalue=1	At 1, sending fixed values to test the bus
376 DNS-Nodename	Node name
377 *DNS-Nod ID	Node address
378 *Gateway1 xxx.-.-.-	Gateway IP address block 1
379 *Gateway2 -.xxx.-.-	Gateway IP address block 2
380 *Gateway3 -.-.xxx.-	Gateway IP address block 3
381 *Gateway4 -.-.-.xxx	Gateway IP address block 4

6.2.1.3 Profinet

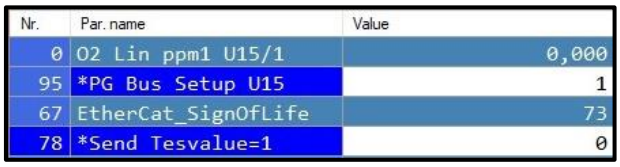


Nr.	Par. name	Value
0	O2 Lin ppm1 U15/1	0,000
95	*PG Bus Setup U15	1
67	SignOfLife Rec.Nr.	45
78	*Send Testvalue=1	0
499	==========	==========
341	Default Device Name	u15digital24
342	*Set Device Name=273	u15digital24

The following table contains and describes the parameters:

Parameter	**Function**
0 O2	Current measured value oxygen level
95 *PG	Selection of parameter group (0 and 1)
67 SignOfLife Rec.Nr.	Bus module OK when counter runs
78 *Send Testvalue=1	At 1, sending fixed values to test the bus
341 Default Device Name	Current module name
342 *Set Device Name=273	Enter 273 to accept the module name

6.2.1.4 EtherCAT



Nr.	Par. name	Value
0	O2 Lin ppm1 U15/1	0,000
95	*PG Bus Setup U15	1
67	EtherCat_SignOfLife	73
78	*Send Tesvalue=1	0

The following table contains and describes the parameters:

Parameter	**Function**
0 O2	Current measured value oxygen level
95 *PG	Selection of parameter group (0 and 1)
67 EtherCat_SignOfLife	Bus module OK when counter runs
78 *Send Testvalue=1	At 1, sending fixed values to test the bus

7. Configuration of U16 Module

This section will describe the parameters for adjusting and changing the configuration of a Type U15 oxygen measuring module in the *Settings* submenu in the application.

7.1 Parameter List

The parameter *95 *PG* may be used to switch between different parameter groups.
In order to make changes to the configuration, the edit mode must be enabled as described in *Chapter 4 Operation*.
All entry fields highlighted in white may now be edited. Additional fields will be used for displaying current measured values and status.

The following table contains and describes the parameter groups:

Group		**Subject of Parameters**
0	*PG Custom Main U16	Start Info
1	*PG Custom Adjustment	Adjustment of measured value
2	*PG Custom Setup mA1	Analog output 1
3	*PG Custom Setup mA2	Analog output 2
4	*PG Custom Setup Alarm	Limit value / Alarm
5	*PG Bus Setup U16	Field bus

7.2 Parameter Groups

After switching to the parameter list, the parameter group 0 *Custom Main U16* will be shown by default.

7.2.1 Parameter Group 0

In order to be able to switch to another parameter group as shown in *Chapter 7.1 Parameter List*, the edit mode must be enabled as shown in *Chapter 4 Operation*.
In parameter group 0 switching to parameter groups 1-5 is possible.

The following table contains and describes the parameters:

Parameter	**Function**	
0 O2	Current measured value oxygen	
95 *PG	Selection of parameter group (0….5)	
1 Temperature	Current measured value sensor temperature	
2 *Reference Point	Correction value for air flushing	
3 *Operating Point	Test gas correction value	
7 System flags	Message list information	
9 EMF (mV)	Display of Sensor signal in mV	
10 Out 1	Reading of output value in mA	
11 Out 2	Reading of output value in mA	
25 *mA1	Output type Out1 (1=log;2=ppm;3=EMF;4=Temp)	
26 *mA2	Output type Out2 (1=log;2=ppm;3=EMF;4=Temp)	
30 *Display at error	Application display: (Standard=15)	
56 *Measurem. 1ppm 0log	Switch alarm evaluation and oxygen reading in application (0=logarithmic;1=ppm)	
155 O2 log actual	Current measured value oxygen log	
156 O2 ppm actual	Current measured value oxygen lin	
80 Status	Reading of module status	
	Sensor ready	Measurement active, no errors
	Preheat xxx sec.	Measurement in heating-up phase
	Line break	Sensor cable broken
	Short circuit	Sensor cable short circuit
	Under temperature	Sensor temperature too low
47 UMODUL	Software version	

Note:
The parameter group 0 should only be used for selecting parameter groups 1-5. Further settings may be done in the respective parameter groups.

7.2.2 Parameter Group 1

Entering 1 in Parameter *95 *PG* will take you to parameter group *Custom Adjustment*. In order to make changes to the configuration, the edit mode must be enabled as described in *Chapter 4 Operation*.
Parameter group 1 will allow you to adjust the oxygen measurement.

The following table contains and describes the parameters:

Parameter	**Function**
0 O2	Current measured value oxygen
95 *PG	Selection of parameter group (0….5)
1 Temperature	Current measured value sensor temperature
2 *Reference Point	Correction value for air flushing
3 *Operating Point	Test gas correction value
7 System flags	Message list information
9 EMF (mV)	Display of Sensor signal in mV
10 Out1	Reading of output value in mA
11 Out2	Reading of output value in mA
155 O2 log actual	Current measured value oxygen log
156 O2 ppm actual	Current measured value oxygen lin

Note:
There is a reference point and an operating point. The reference point refers to an air level of 20.94% oxygen. The operating point refers to a measured value which is smaller or larger than the reference point (test gas). The order of adjusting must start with the reference point. The adjustment of an operating point with the reference point leads to a shifting measurement curve and to deviating measurements at various oxygen concentration levels.

This section describes how to execute the adjustment of the oxygen measurement by means of oxygen sensor and oxygen measuring module.

1. Start the oxygen measurement process according to the operating instructions of the module used (up-to-date operating instructions may be obtained in the *Downloads/Manuals* section on the www.metrotec.eu website).
2. The oxygen measurement should be operational around 30 minutes before the adjustment will be executed.
3. Connect the oxygen measuring module as described in *Chapter 4 Operation.*

Correction of Reference Points:

1. Make sure that the sensor is flushed through with clean ambient air.
2. Adjust parameter *2 *Reference Point* until the sensor signal in mV at parameter *9 EMF (mV)* reads 0mV.
3. In case an adjustment with a test gas is not required, the adjustment is now complete.

Correction of Operating Point

1. Flush through the sensor with a test gas of which the oxygen level is known.
2. Wait until the displayed current measured value of oxygen parameter *0 O2* does not change anymore.
3. Adjust parameter *3 *Operating Point* until the current measured value of oxygen at parameter *0 O2* corresponds with the value of the test gas.
4. The adjustment is complete and the test may be removed.

7.2.3 Parameter Group 2

Entering 2 in Parameter *95 *PG* will take you to parameter group *Custom Setup mA1*. In order to make changes to the configuration, the edit mode must be enabled as described in *Chapter 4 Operation*.
Parameter group 2 will allow you to configure the analog output 1.

The following table contains and describes the parameters:

Parameter	Function
0 O2	Current measured value oxygen
95 *PG	Selection of parameter group (0….5)
1 Temperature	Current measured value sensor temperature
7 System flags	Message list information
9 EMF (mV)	Display of Sensor signal in mV
10 Out1	Reading of output value in mA
25 *mA1	Output type Out1 (1=log;2=ppm;3=EMF;4=Temp)
155 O2 log actual	Current measured value oxygen log
156 O2 ppm actual	Current measured value oxygen lin

171 *EMF	mA type Out1 (1=0-24mA; 2=0-20mA; 3=4-20mA)
172 *EMF min. mA	Scaling Out1 Minimum for EMF
173 *EMF max. mA	Scaling Out1 Maximum for EMF
174 *mA NotReady EMF	mA reading at NotReady for EMF
175 *ppm	mA type Out1 (1=0-24mA; 2=0-20mA; 3=4-20mA)
176 *ppm min. mA	Scaling Out1 Minimum for ppm
177 *ppm max. mA	Scaling Out1 Maximum for ppm
178 *mA NotReady ppm	mA reading at NotReady for ppm
179 *log	mA type Out1 (1=0-24mA; 2=0-20mA; 3=4-20mA)
180 *log min. mA	Scaling Out1 Minimum for log
181 *log max. mA	Scaling Out1 Maximum for log
182 *mA NotReady log	mA reading at NotReady for log
192 *Sim mA -2 0-24	Simulation Out1

7.2.4 Parameter Group 3

Entering 3 in Parameter *95 *PG* will take you to parameter group *Custom Setup mA2*. In order to make changes to the configuration, the edit mode must be enabled as described in *Chapter 4 Operation*.
Parameter group 3 will allow you to configure the analog output 2.

The following table contains and describes the parameters:

Parameter	**Function**
0 O2	Current measured value oxygen
95 *PG	Selection of parameter group (0….5)
1 Temperature	Current measured value sensor temperature
7 System flags	Message list information
9 EMF (mV)	Display of Sensor signal in mV
11 Out2	Reading of output value in mA
26 *mA2	Output type Out1 (1=log;2=ppm;3=EMF;4=Temp)
155 O2 log actual	Current measured value oxygen log
156 O2 ppm actual	Current measured value oxygen lin
221 *EMF	mA type Out2 (1=0-24mA; 2=0-20mA; 3=4-20mA)
222 *EMF min. mA	Scaling Out2 Minimum for EMF

223 *EMF max. mA	Scaling Out2 Maximum for EMF
224 *mA NotReady EMF	mA reading at NotReady for EMF
225 *ppm	mA type Out2 (1=0-24mA; 2=0-20mA; 3=4-20mA)
226 *ppm min. mA	Scaling Out2 Minimum for ppm
227 *ppm max. mA	Scaling Out2 Maximum for ppm
228 *mA NotReady ppm	mA reading at NotReady for ppm
229 *log	mA type Out2 (1=0-24mA; 2=0-20mA; 3=4-20mA)
230 *log min. mA	Scaling Out2 Minimum for log
231 *log max. mA	Scaling Out2 Maximum for log
232 *mA NotReady log	mA reading at NotReady for log
242 *Sim mA -2 0-24	Simulation Out2

7.2.5 Parameter Group 4

Entering 4 in Parameter *95 *PG* will take you to parameter group *Custom Setup Alarm.* In order to make changes to the configuration, the edit mode must be enabled as described in *Chapter 4 Operation.*
Parameter group 4 will allow you to configure the digital limit value contact.

The following table contains and describes the parameters:

Parameter	**Function**
0 O2	Current measured value oxygen
95 *PG	Selection of parameter group (0….5)
1 Temperature	Current measured value sensor temperature
7 System flags	Message list information
9 EMF (mV)	Display of Sensor signal in mV
155 O2 log actual	Current measured value oxygen log
156 O2 ppm actual	Current measured value oxygen lin
260 *Limit Value Lin	Limit value for ppm
261 *Hyst.Lim Relay Lin	Switching hysteresis limit value for ppm
262 *Limit Value Log	Limit value for log
263 *Hyst.Lim Relay Log	Switching hysteresis limit value for log
270 *Sim Ready Rel. < >-1	Simulation Relay Ready
271 *Sim Alarm Rel. < >-1	Simulation Relay Alarm

Note:
*The adjustment of parameter 56 *Measurem. 1ppm 0log in parameter group 0 Custom Main U16 defines the active limit value as either lin or log (see Chapter 7.2.1 Parameter Group 0).*

7.2.6 Parameter Group 5

Entering 5 in Parameter *95 *PG* will take you to parameter group *Custom Field Bus.* In order to make changes to the configuration, the edit mode must be enabled as described in *Chapter 4 Operation*.
Parameter group 5 will allow you to configure the bus, if available.
Note:
The bus type is device-dependent and is defined with the module order

The following table contains and describes the parameters:

Bus type
Modbus
Powerlink
Profinet
EtherCAT

7.2.6.1 Modbus

Nr.	Par. name	Value
0	O2 Lin ppm5 U16/5	0,000
95	*PG Custom Bus Param	5
67	U16 Bus Sign Of Life	148
68	*Bus write enabled=1	1
69	Comand No. UModul	0
70	Comand No. PLC	0
71	Parameter No. PLC	0
72	Value PLC	0,000
74	Sign Of Life PLC	0
78	*Modbus Testvalue	0
499	==========	==========
360	*Modbus IP xxx.-.-.-	192
361	*Modbus IP -.xxx.-.-	168
362	*Modbus IP -.-.xxx.-	0
363	*Modbus IP -.-.-.xxx	80
364	*Modb.Mask xxx.-.-.-	255
365	*Modb.Mask -.xxx.-.-	255
366	*Modb.Mask -.-.xxx.-	255
367	*Modb.Mask -.-.-.xxx	0
368	*Write values = 7878	0

The following table contains and describes the parameters:

Parameter	**Function**
0 O2	Current measured value oxygen level

95 *PG	Selection of parameter group (0….5)
67 U16 Bus Sign Of Life	Bus module OK when counter runs
68 *Bus write enabled=1	At 1, writing via bus enabled
69 Comand No. UModul	Command counter module
70 Comand No. PLC	Command counter PLC
71 Parameter No. PLC	Sent parameter number from PLC
72 Value PLC	Sent parameter value from PLC
74 Sign Of Life PLC	Bus PLC OK when counter runs
78 *Modbus Testvalue	At 1, sending fixed values to test the bus
360 *Modbus IP xxx.-.-.-	Ethernet IP address block 1
361 *Modbus IP -.xxx.-.-	Ethernet IP address block 2
362 *Modbus IP -.-.xxx.-	Ethernet IP address block 3
363 *Modbus IP -.-.-.xxx	Ethernet IP address block 4
364 *Modb.Mask xxx.-.-.-	Subnet mask block 1
365 *Modb.Mask -.xxx.-.-	Subnet mask block 2
366 *Modb.Mask -.-.xxx.-	Subnet mask block 3
367 *Modb.Mask -.-.-.xxx	Subnet mask block 4
368 *Write values = 7878	Enter 7878 to accept the IP address and subnet mask

7.2.6.2 Powerlink

Nr.	Par. name	Value
0	O2 Lin ppm5 U16/5	0,000
95	*PG Custom Bus Param	5
67	U16 Bus Sign Of Life	66
68	*Bus write enabled=1	1
69	Comand No. UModul	0
70	Comand No. PLC	0
71	Parameter No. PLC	0
72	Value PLC	0,000
74	Sign Of Life PLC	0
78	*Powerlink Testvalue	0
499	==========	==========
376	DNS-Nodename	M
377	*DNS-Node ID	163
378	*Gateway1 xxx.-.-.-	192
379	*Gateway2 -.xxx.-.-	168
380	*Gateway3 -.-.xxx.-	100
381	*Gateway4 -.-.-.xxx	254

The following table contains and describes the parameters:

Parameter	**Function**
0 O2	Current measured value oxygen level
95 *PG	Selection of parameter group (0….5)
67 U16 Bus Sign Of Life	Bus module OK when counter runs
68 *Bus write enabled=1	At 1, writing via bus enabled
69 Comand No. UModul	Command counter module
70 Comand No. PLC	Command counter PLC
71 Parameter No. PLC	Sent parameter number from PLC
72 Value PLC	Sent parameter value from PLC

74 Sign Of Life PLC	Bus PLC OK when counter runs
78 *Powerlink Testvalue	At 1, sending fixed values to test the bus
376 DNS-Nodename	Node name
377 *DNS-Node ID	Node address
378 *Gateway1 xxx.-.-.-	Gateway IP address block 1
379 *Gateway2 -.xxx.-.-	Gateway IP address block 2
380 *Gateway3 -.-.xxx.-	Gateway IP address block 3
381 *Gateway4 -.-.-.xxx	Gateway IP address block 4

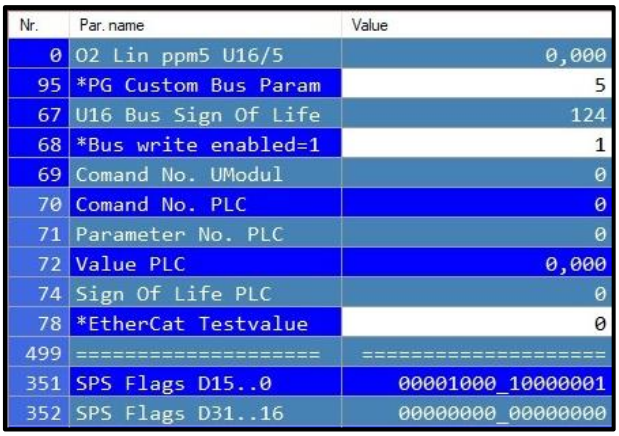
7.2.6.3 Profinet

Nr.	Par. name	Value
0	O2 Lin ppm5 U16/5	0,000
95	*PG Custom Bus Param	5
67	U16 Bus Sign Of Life	91
68	*Bus write enabled=1	1
69	Comand No. UModul	0
70	Comand No. PLC	0
71	Parameter No. PLC	0
72	Value PLC	0,000
74	Sign Of Life PLC	0
78	*ProfiNet Testvalue	0
499	==========	==========
345	Default Device Name	u16umodul
346	*Set Device Name=273	u16umodul

The following table contains and describes the parameters:

Parameter	**Function**
0 O2	Current measured value oxygen level
95 *PG	Selection of parameter group (0….5)
67 U16 Bus Sign Of Life	Bus module OK when counter runs
68 *Bus write enabled=1	At 1, writing via bus enabled
69 Comand No. UModul	Command counter module
70 Comand No. PLC	Command counter PLC
71 Parameter No. PLC	Sent parameter number from PLC
72 Value PLC	Sent parameter value from PLC
74 Sign Of Life PLC	Bus PLC OK when counter runs
78 *ProfiNet Testvalue	At 1, sending fixed values to test the bus
345 Default Device Name	Current module name
346 *Set Device Name=273	Enter 273 to accept the module name

7.2.6.4 EtherCAT



Nr.	Par. name	Value
0	O2 Lin ppm5 U16/5	0,000
95	*PG Custom Bus Param	5
67	U16 Bus Sign Of Life	124
68	*Bus write enabled=1	1
69	Comand No. UModul	0
70	Comand No. PLC	0
71	Parameter No. PLC	0
72	Value PLC	0,000
74	Sign Of Life PLC	0
78	*EtherCat Testvalue	0
499	==========	==========
351	SPS Flags D15..0	00001000_10000001
352	SPS Flags D31..16	00000000_00000000

The following table contains and describes the parameters:

Parameter	**Function**
0 O2	Current measured value oxygen level
95 *PG	Selection of parameter group (0….5)
67 U16 Bus Sign Of Life	Bus module OK when counter runs
68 *Bus write enabled=1	At 1, writing via bus enabled
69 Comand No. UModul	Command counter module
70 Comand No. PLC	Command counter PLC
71 Parameter No. PLC	Sent parameter number from PLC
72 Value PLC	Sent parameter value from PLC
74 Sign Of Life PLC	Bus PLC OK when counter runs
78 *EtherCat Testvalue	At 1, sending fixed values to test the bus
351 SPS Flags D15..0	Status bits 1
351 SPS Flags D31..16	Status bits 2

Adjustment

8.1 U16 Module

This section describes how to execute the adjustment of the oxygen measurement by means of oxygen sensor and oxygen measuring module. In order to make changes to the adjustment, switch to parameter group 1 *Custom Adjustment* as described in *Chapter 7.2.2 Parameter Group 1*.

Note:
There is a reference point and an operating point. The reference point refers to an air level of 20.94% oxygen. The operating point refers to a measured value which is smaller or larger than the reference point (test gas). The order of adjusting must start with the reference point. The adjustment of a operating point with the reference point leads to a shifting measurement curve and to deviating measurements at various oxygen concentration levels.

1. Start the oxygen measurement process according to the operating instructions of the module used (up-to-date operating instructions may be obtained in the *Downloads/Manuals* section on the www.metrotec.eu website).
2. The oxygen measurement should be operational around 30 minutes before the adjustment will be executed.
3. Connect the oxygen measuring module as described in *Chapter 4 Operation*.

Correction of Reference Points:

1. Make sure that the sensor is flushed through with clean ambient air.
2. Adjust parameter *2 *Reference Point* until the sensor signal in mV at parameter *9 EMF (mV)* reads 0mV.
3. In case an adjustment with a test gas is not required, the adjustment is now complete.

Correction of Operating Point

1. Flush through the sensor with a test gas of which the oxygen level is known.
2. Wait until the displayed current measured value of oxygen parameter *0 O2* does not change anymore.
3. Adjust parameter *3 *Operating Point* until the current measured value of oxygen at parameter *0 O2* corresponds with the value of the test gas.
4. The adjustment is complete and the test may be removed.

8.2 U15 Module

This section describes how to execute the adjustment of the oxygen measurement by means of oxygen sensor and oxygen measuring module. In order to make changes to the adjustment, switch to parameter group 0 *Custom Main U15* as described in *Chapter 6.2.1 Parameter Group 0*.

Note:
There is a reference point and an operating point. The reference point refers to an air level of 20.94% oxygen. The operating point refers to a measured value which is smaller or larger than the reference point (test gas). The order of adjusting must start with the reference point. The adjustment of a operating point with the reference point leads to a shifting measurement curve and to deviating measurements at various oxygen concentration levels.

1. Start the oxygen measurement process according to the operating instructions of the module used (up-to-date operating instructions may be obtained in the *Downloads/Manuals* section on the www.metrotec.eu website).
2. The oxygen measurement should be operational around 30 minutes before the adjustment will be executed.
3. Connect the oxygen measuring module as described in *Chapter 4 Operation*.

Correction of Reference Points:

1. Make sure that the sensor is flushed through with clean ambient air.
2. Adjust parameter *2 *Reference Point* until the sensor signal in mV at parameter *9 EMF (mV)* reads 0mV.
3. In case an adjustment with a test gas is not required, the adjustment is now complete.

Correction of Operating Point

1. Flush through the sensor with a test gas of which the oxygen level is known.
2. Wait until the displayed current measured value of oxygen parameter *0 O2* does not change anymore.
3. Adjust parameter *3 *Operating Point* until the current measured value of oxygen at parameter *0 O2* corresponds with the value of the test gas.
4. The adjustment is complete and the test may be removed.

8.3 Z19 Module

This section describes how to execute the adjustment of the oxygen measurement by means of oxygen sensor and oxygen measuring module. In order to make changes to the adjustment, switch to the Parameter List as described in Chapter 5.1 Parameter List.

Note:
There is a reference point and an operating point. The reference point refers to an air level of 20.94% oxygen. The operating point refers to a measured value which is smaller or larger than the reference point (test gas). The order of adjusting must start with the reference point. The adjustment of a operating point with the reference point leads to a shifting measurement curve and to deviating measurements at various oxygen concentration levels.

1. Start the oxygen measurement process according to the operating instructions of the module used (up-to-date operating instructions may be obtained in the *Downloads/Manuals* section on the www.metrotec.eu website).
2. The oxygen measurement should be operational around 30 minutes before the adjustment will be executed.
3. Connect the oxygen measuring module as described in *Chapter 4 Operation*.

Correction of Reference Points:

1. Make sure that the sensor is flushed through with clean ambient air.
2. Adjust parameter *2 *Reference Point* until the sensor signal in mV at parameter *9 EMF (mV)* reads 0mV.
3. In case an adjustment with a test gas is not required, the adjustment is now complete.

Correction of Operating Point

1. Flush through the sensor with a test gas of which the oxygen level is known.
2. Wait until the displayed current measured value of oxygen parameter *0 O2* does not change anymore.
3. Adjust parameter *3 *Operating Point* until the current measured value of oxygen at parameter *0 O2* corresponds with the value of the test gas.
4. The adjustment is complete and the test may be removed.

8. Datalogging Function

The application's datalogging function serves to save measured values to the internal memory of the Android terminal.

1. Open the menu by clicking on the *Menu* button.
2. Select the *Log* submenu.
3. Select the log interval in the *Choose log interval* menu.
4. The following dialog will show the name of the log file. The log file is saved under the *device name* in the *Internal Storage/Download* folder.
5. Start the log process with the *OK* button.
6. In order to stop the log process, open the menu by clicking on the *Menu* button.
7. Select the *Log* submenu.
8. Stop the log process with the *OK* button.

Note:
During recording, the Android device must not switch to the lock screen or power saving mode. The recording will be interrupted during this time and will only be continued once the display is activated.