



MS-Connect2

User manual

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16 17 18 19 20 21 22	MS-Connect before connection has been established	16 16 17 18 19 20 20
 16 17 18 19 20 21 22 23 	MS-Connect before connection has been established	16 16 17 18 19 20 20 21
 16 17 18 19 20 21 22 23 24 	MS-Connect before connection has been established	16 16 17 18 19 20 20 21 21
 16 17 18 19 20 21 22 23 24 25 	MS-Connect before connection has been established	16 16 17 18 19 20 20 21 21 21 22
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 16 17 18 19 20 21 22 23 24 25 26 27 	MS-Connect before connection has been established	16 16 17 18 19 20 20 21 21 22 23 24
 16 17 18 19 20 21 22 23 24 25 26 27 28 	MS-Connect before connection has been established	16 16 17 18 19 20 20 21 21 21 22 23 24 25



1. General information

Visualization system MS-Connect2 is designed for use with the controllers series MS-XXX and master controller MS-4CMPXv2. MS-Connect2 realizes the visualization and acquisition of the device data using the Modbus RTU transmission protocol.



Figure 1: MS-Connect2 Main screen

The software allows for readout of:

- pressure,
- temperature,
- motor current,
- service counter values,
- user and service parameter setpoints,
- error list readout,
- change of date and time,
- remote control of compressor operation parameters.



1.1. Functions

Main functionalities of the software:

- communication with MS series controllers using Modbus RTU protocol:
 - MS-185
 - MS-585
 - MS586FRQ
 - MS-587FRQ
 - MS4CMPXv2
 - MS385V24
 - MS386V24
- readout of controller ID,
- readout of sensors connected to the controller,
- preview of user and service parameters,
- remote modification of user parameters,
- preview of error history,
- ability to start and stop controller operation,
- ability to remotely acknowledge the most recent compressor error,
- backup of controller configuration,
- create a graph of the current or archived variable,
- generate .csv data export,
- generate text report, containing every available user parameter and operation history.

1.2. Requirements

1.2.1. General requirements

In order to start using the software make sure that user has the following:

- *MS* series controller equipped with communication interface RS-485 and with Modbus RTU protocol support,
- MS-CONNECT signal converter containing valid license key,
- USB A B cable



1.2.2. PC Requirements

PC Requirements:

- 1GHz CPU, 512MB RAM,
- Windows operating system (Win7, Win10 with administrative account access), 5MB of available disk space,
- .NET Framework v2.0 or newer,
- FTDI VCP device drivers

2. MS-Connect2 installation

In order to start using MS-Connect2 the user needs to install the software by running the installer (MSConnect2_install.exe).

Installer is available in English and Polish. After the installer language has been selected (Fig. 2) the user should familiarize himself with the User License Agreement (Fig. 3), and accept the license by clicking *Agree*.

Installer La	nguage	×
φ	Please select a language.	
	Polski	~
	ОК	Cancel

Figure 2: Language selection



ŝþ	Setup - MS-Connect —	×
	License Agreement Please read the following important information before continuing.	
	Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.	
	LICENSE AGREEMENT	^
	* The MSConnect2 application is fully functional (after registration). Unregistered application will be closed after 30 seconds of connection with a device.	
	* The Mikroel company as the owner of the product(MSConnect2), provides it as an additional tool to their "MS-series" controller devices, for data acquisition and visualization purposes.	~
	○ I accept the agreement	
	I do not accept the agreement	
	Next >	ancel

Figure 3: License agreement

In the next window (Fig. 4) the user can change the destination category. It is recommended to leave the default installation destination.

In the last configuration dialog (Fig. 5) the user should select additional installation components.

After clicking the *Next* button the installer will display the summary (Fig. 6). After clicking *Install*, the installation process begins.



ŝþ	Setup - MS-Connect	—		×
	Select Destination Location Where should MS-Connect be installed?			
	Setup will install MS-Connect into the following folder.			
	To continue, click Next. If you would like to select a different folder,	click Bro	owse.	
	C:\program files (86x)\MSConnect	B	rowse	
	At least 85,3 MB of free disk space is required.			
	< Back Next	>	Ca	ncel

Figure 4: Installation path selection

亦 Setu	o - MS-Connect			_		×
Sele W	ct Additional Tasks hich additional tasks should be performed?					
Se th	elect the additional tasks you would like Setup t en dick Next.	o perform	while insta	alling MS-	-Connect,	,
A	dditional shortcuts:					
6	Create a desktop shortcut					
St	erowniki:					
	Instaluj sterowniki konwertera					
٩.	IET:					
	Instaluj pakiet .NET					
		< Back	Next	>	Can	cel

Figure 5: Installation of additional components

φþ	Setup - MS-Connect	_		×
	Ready to Install Setup is now ready to begin installing MS-Connect on your computer.			
	Click Install to continue with the installation, or click Back if you want t change any settings.	o review	/ or	
	Destination location: C:\Program Files (x86)\MSConnect		1	^
	Additional tasks: Additional shortcuts: Create a desktop shortcut			
				~
	<		2	
	< Back Insta	ll	Ca	incel

Figure 6: Installation summary

2.1. MS-CONNECT Converter driver installation

If the user selected the automatic converter driver installation, the installer installs the required software components.

After the driver installer has started (Fig. 7) the user is to click *Extract*. The driver installer starts (Fig. 8). After the user has accepted the license agreement (Fig. 9). the installer installs the device drivers and displays the summary (Fig. 10).





Figure 7: Converter drivers installer



Figure 8: Start screen of driver installer

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Device Driver	Device Driver Installation Wizard		
License Agro	eement		
Ň	To continue, accept the following license agreement. To read the entire agreement, use the scroll bar or press the Page Down key.		
	IMPORTANT NOTICE: PLEASE READ CAREFULLY BEFORE INSTALLING THE RELEVANT SOFTWARE: This licence agreement (Licence) is a legal agreement between you (Licensee or you) and Future Technology Devices International Limited of 2 Seaward Place, Centurion Business Park, Glasgow G41 1HH, Scotland (UK Company Number SC136640) (Licensor or we) for use of driver software provided by the Licensor(Software).		
	BY INSTALLING OR USING THIS SOFTWARE YOU AGREE TO THE \checkmark		
	I accept this agreement Save As Print I don't accept this agreement		
	< Back Next Cancel		

Figure 9: Driver installer license agreement

Kreator instalacji sterowników urządzeń					
	Kończenie pracy Kreatora instalacji sterowników urządzeń				
	Kreator instalacji sterowników ur żadnego oprogramowania dla ur ma lepszego oprogramowania o	ządzeń nie może zaktualizować ządzeń sprzętowych, ponieważ nie d obecnie zainstalowanego.			
	Nazwa sterownika ✓ FTDI CDM Driver Packa ✓ FTDI CDM Driver Packa	Stan Gotowe do użycia Gotowe do użycia			
	< Wstecz	Zakończ Anuluj			

Figure 10: Driver installation summary

2.2. .NET v2.0 installation

🕪 Instalacja - MS-Connect	– 🗆 X
.NET Installation	
Extracting files	×
	Cancel
	Anuluj

If the user agreed to automatic .NET installation, the required components will be installed.

Figure 11: .NET installer

3. Connecting to the controller

Before commencing the MS-Connect2 operation, connect the controller to the computer using MS-CONNECT Converter.

3.1. Connection parameters configuration

In order to connect to the controller, the user has to configure the communication parameters. The parameters set in the software must be the same as the parameters set on the controller.

Method of validating the controller communication parameters is described in the controller's manual in section *Network operation - slave controller configuration*.

Current communication parameters are shown in the quick view bar in the bottom section of the software's window area.

Port: OM14 9600bps | Status: Connected | Modbus ID: 1 |

License OK

Figure 12: Quick preview of connection parameters

In order to change the connection parameters, select Connection and Settings



łączenie Język F	omoc Wyjście					
Połącz						
Rozłącz	P	otwierdzenie Start Stop	CMP LSE SERV	Pola	R R	złacz
Ustawienia		Błędu 🔮 🖤		- Oiq		i i i i i i i i i i i i i i i i i i i
entyfikacja urządzenia	Odczyt czujników i liczników	Podgląd parametrów serwisowych	Zarządzanie pracą sprężarki	Historia pracy Wykresy	MS4CMPX	
			Etykieta ur	ządzenia		
				Producent ?????	Urządzenie	
			6	Wersja	Identyfikator	
				?????	?????	
			[Utwórz raport		L®
statni błąd: bra	k					
etetnio zderzon	io: brak					

Figure 13: Connection parameters

🚸 Connection settin	gs		Х
Modbus RTU			
Modbus ID	Timeout [ms]:		
RS 232/485			
COM port:	Baud rate [bps]:		
COM14 ~	9600 ~		
	Data bits:	Parity:	Stop bits:
	8 ~	none 🗸	2 ~
Miscellaneous			
Data sample perio	od [e]·		
	u [ə].		
	Cancel	Default settings	Save

Figure 14: Connection parameters configuration window



In connection configuration window (Fig. 14) configure the following:

- Modbus ID the controller's ID unique in the network,
- Time limit maximum time for the controller response,
- COM port virtual number of communication port,
- transmission baudrate,
- data bits,
- parity,
- stop bits.

To accept the modified data, press Save.

3.2. Serial port identification

Serial port identification in Windows 7 and newer - press the right mouse button on *Computer* icon, then *Properties*, *Device manager*. Locate the *COM and LPT ports* in the list, and there *USB Serial Port (COMx)*. The number assigned in place of *x* is the port number assigned to MS-CONNECT converter.

In older systems: *Settings* in *Start menu*, then *Control panel*. In *System*, in *Hardware* tab, select *Device manager*. Locate the *COM and LPT ports* in the list, and there *USB Serial Port (COMx)*. The number assigned in place of x is the port number assigned to MS-CONNECT converter.

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🔗 Device Manager	_	×
File Action View Help		
V A DESKTOP-ODMOA1J		~
> 4 Audio inputs and outputs		
> 🍃 Batteries		
> 🚯 Bluetooth		
> 💻 Computer		
> 👝 Disk drives		
> 💵 Display adapters		
> 🔐 DVD/CD-ROM drives		
> 🚽 Floppy disk drives		
> 📲 Floppy drive controllers		
> 🕼 Human Interface Devices		
> 🖙 IDE ATA/ATAPI controllers		
> 📖 Keyboards		
> Ima Memory devices		
> 🖞 Mice and other pointing devices		
> 🛄 Monitors		
> 💂 Network adapters		
> 🐚 Other devices		
✓ Ports (COM & LPT)		
Communications Port (COM1)		
USB Serial Device (COM3)		
> 🖹 Print queues		
> Processors		
> 💯 Sensors		
> Software devices		~
Sound video and dame controllers		+

Figure 15: Serial port number identification in Windows 10

3.3. Establishing the connection

To connect to the controller press *Connect*. If the connection parameters were set properly, the controller identification occurs and the controller parameters are downloaded (Fig. **??**).



łączenie Język I	Pomoc	Wyjście									
Połącz	1				CHID		_				_
Rozłącz		F	otwierdzenie	Start Stop				Połąc	z	Rozłącz	
Ustawienia			Diçuu	•••	•			•			-
lentyfikacja urządzenia	Odczyt o	czujników i liczników	Podgląd paramet	rów serwisowyc	h Zarządzani	e pracą sprężarki	Historia pracy	Wykresy	MS4CMPX		
						- Etykieta u	rządzenia				
							Producent		Urządzenie		
							?????		?????		
							Wersja	_	Identyfikato	r	
							?????		?????		
							Litwórz raport	1 (MIKE	OEI®	
							othore report	۱ ۱		UEL	
statni błąd: bra	k										
statnio zdarzon	io hra	ŀ									

Figure 16: MS-Connect before connection has been established

In the event of communication errors, the error information appears. To interpret the error please refer to section 3.4..

3.4. Connection errors

If the connection error occurs, the following warnings may appear:



Figure 17: Controller connection error

Controller connection error (Fig. 17) indicates that the controller compatible with the software version has not been found.





Figure 18: MS-CONNECT Converter connection error

In the event of the converter connection error check the following:

- Is the controller properly connected to the converter? (section 3.),
- Is the controller connected to the power supply?
- Is the ID number in the MS-Connect2 options (Fig. 14) the same as the ID of the controller?
- Is the COM port number set (Fig. 14) accordingly to the port number assigned to the MS-CONNECT converter? (section 3.2.).

4. Using the software

After the connection with the controller has been successfully established the user can access various tabs of the program. Each of the tabs contains information and tools that define the compressor operation. Type of displayed tabs and parameters depends on controller type.

The elements such es fields containing pressure values, button for error acknowledgement and diodes signalling the compressor state are always visible, regardless of the active tab.

4.1. Main UI elements of MS-Connect2

The interface of the software id divided into tabs and compressor state bar.





Figure 19: Main screen of MS-Connect2

The fields visible on the main screen:

- 1. Operating pressure bound.
- 2. General application buttons access to all of the software functions.
- 3. "Error Acknowledgement" button remote acknowledgement of compressor error.
- 4. Diodes representing compressor state.
- 5. "Connect" and "Disconnect" buttons establishing the connection with the controller.
- 6. Latest error or event bar signalling the recent error and event that has occurred. The events are always displayed in green, non-fatal errors are displayed in yellow and fatal errors are displayed in red.
- 7. Status bar showcasing basic connectivity parameters together with compressor identification number (Modbus ID), that the software is connected to.
- 8. View of the controller's enclosure
- 9. Controller identifier

4.2. Main tab

Showcases basic information identifying the controller:



- 1. View of the controller's enclosure
- 2. Controller identifier

4.2.1. Generating reports

The user can create a text report using the *Create report* button, containing all of the available controller parameters and the operation history. After the report destination location has been selected and accepted, the report is saved in the text file with the name format: MS-xxx_vxxx_y_zzzzzzz.rtf, where the respective fields meaning is:

- MS-xxx controller name
- vxxx controller firmware version
- y controller identifier
- zzzzzzzz report generation date

4.3. Sensors tab

Showcases grouped values of parameters of available sensors and counters.

钋 MSConnect2	- 🗆 X
Connection Language Help Exit	
P = 02,89 bar	Modbus ID: 1 Connect Disconnect
Main Sensors Service parameters Work history UserControl Plots	
Pressure P = 02,89 bar Pinj = 00.00 bar DPaf = 00.00 bar	Counters
Temperatures	
TsI = 050 °C ToI = 059 °C Tpw = $060 °C$	CNT1 = 0005 h CNT2 = 0005 h label1 label2 label3 >> CNT3 = 0005 h
	CNT4 = 0005 h
$I = \boxed{000} A \qquad Asym = \boxed{019} \qquad Ron = \boxed{00}$	CNT5 = 0005 h
LCE = 000000000 kWh	CNT7 = 0005 h
	CNT8 = 0005 h
Last Error: none	
Last Event: none	
Port:OM14 9600bps Status: Connected Modbus ID: 5	License OK

Figure 20: Sensors tab

4.4. Service parameters tab

Showcases grouped values of service parameters.



P =	02,92 bar	Error Acknowledge	LSE SERV Modbus ID: 3	Connect D	isconnec
ain	Sensors Service parameters W	ork history UserControl Plots			
	Pressure limits		Work limits		
	Pmin = 05,0 bar	Pmax = 10,0 bar	tost = 30 sec	tops = 02 sec	
	Pabs = 15,9 bar	Delta = 00,2 bar	tstp = 05 sec	Ronoff = 25	
	Temperaure limits		Miscellaneous		
	Tolmin = 02 °C	Tolmax = 110 °C	Asym level = 3	tasym = 04 sec	
	Engine limits				
	Imax = 018 A	Tmax = 00 °C			
	Tchs = 000 °C	tlsemax = 150 sec			

Figure 21: Service parameters tab

4.5. Work history tab

Allows for the user to download and display a list of events and errors.

) =	02	,89 bar	Error Acknowled	ige Start Stop CMP LSE SERV	Connect Disconne
in	Sensors	Service parame	eters Work history	UserControl Plots	
	Dat	te	Time	Description	
•		05.10.2017	14:52	Delayed stop procedure	Get history
	2	05.10.2017	14:41	Interrupted work	
:	3	05.10.2017	14:41	Restart procedure	Show:
	1	05.10.2017	14:41	Delayed start procedure	Al v
	5	03.10.2017	14:17	Interrupted work	
(5	03.10.2017	14:17	Restart procedure	
	7	03.10.2017	14:17	Delayed start procedure	
1	3	03.10.2017	12:37	Delayed start procedure	Errors number: 6
)	03.10.2017	12:36	Interrupted work	
1	0	03.10.2017	12:36	Restart procedure	Events number: 35
1	1	03.10.2017	09:42	Delayed start procedure	
1	2	02.10.2017	09:49	Delayed stop procedure	
1	3	02.10.2017	07:54	Interrupted work	
1	4	02.10.2017	07:54	Restart procedure	
1	5	02.10.2017	07:54	Delayed start procedure	
1	6	26.09.2017	13:08	Interrupted work	
1	7	26.09.2017	13:08	Restart procedure	
_	_	22.00.2017	11.40	Delayed statement or	

Figure 22: Work history tab

After the *Download history* has been clicked, the software downloads a list of errors and events from the controller. The time of download is determined by number of errors and events stored in the controller's



memory and is usually not longer that twenty seconds.

The downloaded data is sorted according to date and time. Additional expanded field *Show*: allows for selecting the type of displayed information: all (errors and events), errors only or events only.

4.6. User Control tab

Displays values of user parameters, and also allows the user to start the compressor, stop the compressor and change the basic controller parameters.

P = 02,89 bar Error Acknowledg	Start Stop CMP LSE SERV Modbus ID: 1 :	Disconnect
Aain Sensors Service parameters Work history	JserControl Plots	
General settings Pd = 07,2 bar >>		
Pu = 08,0 bar >>	Start Stop	
tlse = 300 sec >>		
tlse = 300 sec >> Mode:AUTO	-Clock settings	
tlse = 300 sec >> Mode:AUTO ~ tdrst = 10 min >>	Clock settings Time: 09 : 14 Hour:Minute	
tlse = 300 sec >> Mode:AUTO ~ tdrst = 10 min >> tdrsp = 10 min >>	Clock settings Time: 09 : 14 Hour:Minute Date: 17 - 10 - 12 Year-Month-Day	
tlse = 300 sec >> Mode:AUTO tdrst = 10 min >> tdrsp = 10 min >> tdri = 30 sec >>	Clock settings Time: 09 : 14 Hour:Minute Date: 17 - 10 - 12 Year-Month-Day Clock synchronization	

Figure 23: User Control tab

4.6.1. Changing the parameters' values

To change the parameter value, click the » button. The window allowing the user to change parameter values appears (Fig. 24).

	x
Pd = 07.2 bar	-
Cancel	Set

Figure 24: Parameter value modification window

To save the modified value, click *Save* button. The value typed in the field will be written to the controller.





4.6.2. Changing the compressor operation mode

To change the compressor operation mode, select the appropriate value from the drop-down box:

- for MS-XXX: AUTO, CONST, REM, LOCAL
- for MS-4CMPXv2: SEQ, CAS, MAN

4.6.3. Controller's clock synchronization

To synchronize the controller's clock with the user's computer system time, click the Clock synchronization.

4.7. Plots tab

The plots show the compressor's sensor values in time.

9b MSConnect2		×
Connection Language Help Exit		
P = 02,92 bar	E SERV Modbus ID: 3 + Connect Discon	nect
Main Sensor General Sensor Work natory User Control Pressure limits Pmin = 05,0 bar Pmax = 10,0 bar Pabs = 15,9 bar Delta = 00,2 bar	Work limitstost = 30 sectops = 02 sectstp = 05 secRonoff = 25	
Temperaure limits Tolmin = 02 °C Tolmax = 110 °C	Mscellaneous Asym level = 3 tasym = 04 sec	
Engine limits $Imax = \boxed{018} A \qquad Tmax = \boxed{00} ^{\circ}C$ $Tchs = \boxed{000} ^{\circ}C \qquad tisemax = \boxed{150} sec$		
Last Error: none		
Last Event: none		
Port: OM14_9600bps Status: Connected Modbus ID: 1	licen	se OK

Figure 25: Plot tab

The plots can be drawn for the active or archived session. Save date and duration of the previous session is displayed in the *Archive* field.

The archive can store up to eight recent connection sessions.

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Figure 26: Changing the plotted parameter

To display a graph showing the selected parameter for the active connection session, choose a symbol of the desired parameter from the drop-down list, select *Active* field and click *Start draw*.

In order to plot a graph of an archived session, select the *Archive* field, select the appropriate session from the table and click *Start draw*.

The plot's X axis always displays the time that has elapsed from the session start.

By selecting a section of the graph with the left mouse button pressed, the user can zoom into a section of the plot.

To open plot options (Fig. 27) click the right mouse button on the plot area.





Figure 27: Additional plot window options

4.8. MS-4CMPXv2 tab

Tab accessible only if a valid connection with MS-4CMPXx2 master controller has been established.

The tab displays information about network operation of up to four controllers managed by master controller MS-4CMPXv2.



5. MS-Connect Converter



Figure 28: MS-CONNECT Converter view

5.1. General information

MS-CONNECT Converter allows for a connection with any device using EIA-485 communication protocol. Additionally, MS-CONNECT Converter contains a license key to MSConnect2 software.

5.2. Technical parameters

5.2.1. Electrical characteristics

Parameter	Value
Power supply voltage	5V DC, USB-powered
Power consumptions	Up to 1W
Maximum USB current draw	250mA
EIA-485 - minimum allowed voltage on pin	-7V
EIA-485 - maximum allowed voltage on pin	12V

5.2.2. Mechanical information



Table 2: MS-CONNECT Converter mechanical information

Parameter	Value
Enclosure dimensions	66x44x25 mm
Weight (without packaging)	65g
Enclosure type	Free-standing enclosure

5.2.3. Operating conditions

Table 3: Operating conditions

Parameter	Value
Operating temperature	-15 ÷ 50 °C
Storage temperature	-20 ÷ 70 °C
Relative humidity	10 ÷ 90 %, no condensation

5.3. Enclosure drawing





Figure 29: MS-CONNECT dimensions

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