



EN

Control

L1.07- Gate 2 LG

L1.07- Gate 2 WLG

099-00L107-EW501

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09.10.2018

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General instructions

WARNING



Read the operating instructions!

The operating instructions provide an introduction to the safe use of the products.

- Read and observe the operating instructions for all system components, especially the safety instructions and warning notices!
- Observe the accident prevention regulations and any regional regulations!
- The operating instructions must be kept at the location where the machine is operated.
- Safety and warning labels on the machine indicate any possible risks. Keep these labels clean and legible at all times.
- The machine has been constructed to state-of-the-art standards in line with any applicable regulations and industrial standards. Only trained personnel may operate, service and repair the machine.
- Technical changes due to further development in machine technology may lead to a differing welding behaviour.

In the event of queries on installation, commissioning, operation or special conditions at the installation site, or on usage, please contact your sales partner or our customer service department on +49 2680 181-0.

A list of authorised sales partners can be found at www.ewm-group.com/en/specialist-dealers.

Liability relating to the operation of this equipment is restricted solely to the function of the equipment. No other form of liability, regardless of type, shall be accepted. This exclusion of liability shall be deemed accepted by the user on commissioning the equipment.

The manufacturer is unable to monitor whether or not these instructions or the conditions and methods are observed during installation, operation, usage and maintenance of the equipment.

An incorrectly performed installation can result in material damage and injure persons as a result. For this reason, we do not accept any responsibility or liability for losses, damages or costs arising from incorrect installation, improper operation or incorrect usage and maintenance or any actions connected to this in any way.

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The content of this document has been prepared and reviewed with all reasonable care. The information provided is subject to change; errors excepted.

1 Contents

1	Contents	3
2	For your safety	5
2.1	Notes on the use of these operating instructions	5
2.2	Explanation of icons.....	6
2.3	Part of the complete documentation	7
3	Intended use	8
3.1	Use and operation solely with the following machines	8
3.2	Documents which also apply	8
3.3	Software version	8
4	Quick overview	9
4.1	Machine control – Operating elements	9
4.2	Screen icons	9
4.3	Machine display	11
4.3.1	Actual values, nominal values, hold values.....	11
4.3.2	Main screen	11
4.3.3	Initial screen	11
4.3.3.1	Change system language	12
5	Operating the machine control	13
5.1	Direct access keys.....	13
5.2	Context-dependent push-buttons	13
5.2.1	Changing basic settings (machine configuration menu)	13
5.3	Machine configuration (system).....	14
5.3.1	Access permission (Xbutton).....	15
5.3.1.1	User information.....	15
5.3.1.2	Activating the Xbutton rights	15
5.3.2	Status information.....	15
5.3.2.1	Errors and warnings	16
5.3.2.2	Running time	16
5.3.2.3	System components.....	16
5.3.3	System settings	17
5.3.3.1	Date.....	17
5.3.3.2	Time	17
5.3.4	Operating panel settings	17
5.3.4.1	Xnet machine	18
5.3.4.2	Couple mobile machine	18
5.3.4.3	Bar codes	18
5.3.4.4	Errors and warnings	18
5.3.4.5	Network.....	18
5.3.4.6	Clear system memory	18
5.3.4.7	Reset to factory settings	18
5.3.5	WPQR welding data assistant.....	19
5.3.6	Welding monitoring.....	19
5.4	Offline data transfer (USB)	19
5.4.1	Save JOB(s)	20
5.4.2	Load JOB(s)	20
5.4.3	Save configuration.....	20
5.4.3.1	System	20
5.4.3.2	Xnet machine	20
5.4.4	Load configuration.....	20
5.4.4.1	System	20
5.4.4.2	Xnet machine	20
5.4.5	Load languages and texts	21
5.4.6	Record on USB drive.....	21
5.4.6.1	Register USB drive.....	21
5.4.6.2	Start recording.....	21
5.4.6.3	Stop recording.....	21
5.5	Online data transfer (network)	21
5.5.1	Wired local network (LAN).....	21

5.5.2	Wireless local network (WiFi)	22
5.5.3	DHCP Plus.....	22
6	Rectifying faults.....	23
6.1	Display machine control software version.....	23
6.2	Error messages.....	23
6.2.1	Titan, Tetrix.....	23
6.2.2	Phoenix, alpha Q, Taurus.....	26
7	Appendix A.....	27
7.1	Searching for a dealer.....	27

2 For your safety

2.1 Notes on the use of these operating instructions

DANGER

Working or operating procedures which must be closely observed to prevent imminent serious and even fatal injuries.

- Safety notes include the "DANGER" keyword in the heading with a general warning symbol.
- The hazard is also highlighted using a symbol on the edge of the page.

WARNING

Working or operating procedures which must be closely observed to prevent serious and even fatal injuries.

- Safety notes include the "WARNING" keyword in the heading with a general warning symbol.
- The hazard is also highlighted using a symbol in the page margin.

CAUTION

Working or operating procedures which must be closely observed to prevent possible minor personal injury.

- The safety information includes the "CAUTION" keyword in its heading with a general warning symbol.
- The risk is explained using a symbol on the edge of the page.



Technical aspects which the user must observe to avoid material or equipment damage.

Instructions and lists detailing step-by-step actions for given situations can be recognised via bullet points, e.g.:

- Insert the welding current lead socket into the relevant socket and lock.

2.2 Explanation of icons

Symbol	Description	Symbol	Description
	Indicates technical aspects which the user must observe.		Activate and release / Tap / Tip
	Switch off machine		Release
	Switch on machine		Press and hold
			Switch
	Incorrect / Invalid		Turn
	Correct / Valid		Numerical value – adjustable
	Input		Signal light lights up in green
	Navigation		Signal light flashes green
	Output		Signal light lights up in red
	Time representation (e.g.: wait 4 s / actuate)		Signal light flashes red
	Interruption in the menu display (other setting options possible)		
	Tool not required/do not use		
	Tool required/use		

2.3 Part of the complete documentation

These operating instructions are part of the complete documentation and valid only in combination with all other parts of these instructions! Read and observe the operating instructions for all system components, especially the safety instructions!

The illustration shows a general example of a welding system.

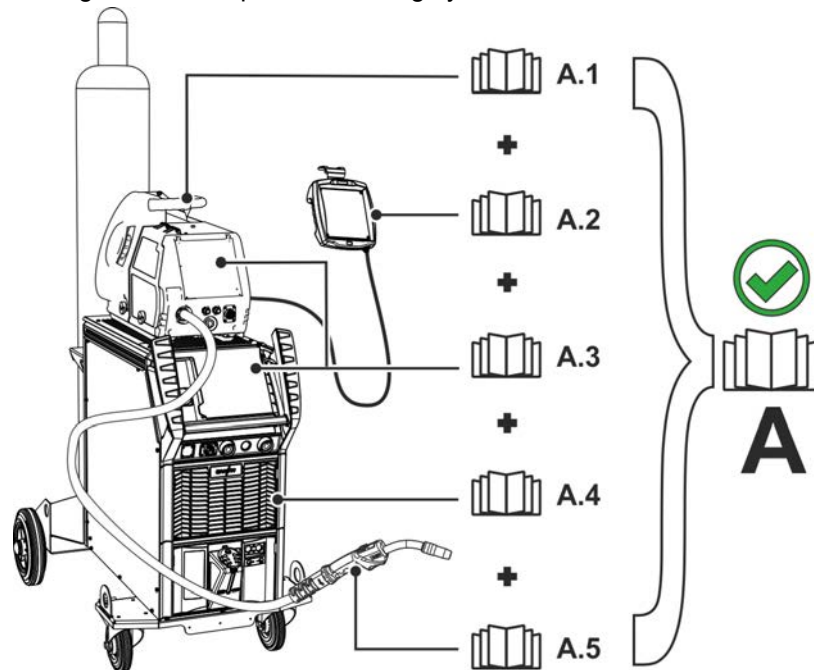


Figure 2-1

The illustration shows a general example of a welding system.

Item	Documentation
A.1	Wire feeder
A.2	Remote adjuster
A.3	Controller
A.4	Power source
A.5	Welding torch
A	Complete documentation

3 Intended use

WARNING



Hazards due to improper usage!

The machine has been constructed to the state of the art and any regulations and standards applicable for use in industry and trade. It may only be used for the welding procedures indicated at the rating plate. Hazards may arise for persons, animals and material objects if the equipment is not used correctly. No liability is accepted for any damages arising from improper usage!

- The equipment must only be used in line with its designated purpose and by trained or expert personnel!
- Do not improperly modify or convert the equipment!

3.1 Use and operation solely with the following machines

This description may be applied only to machines with the Gate 2 LG und Gate 2 WLG machine control.

3.2 Documents which also apply

- Operating instructions for the connected welding machines
- Documents of the optional expansions

3.3 Software version

These instructions apply to the following software version:

2.0.B.3

The machine control software version is shown on the screen during the start process > see 4.3.3 chapter.

4 Quick overview

4.1 Machine control – Operating elements

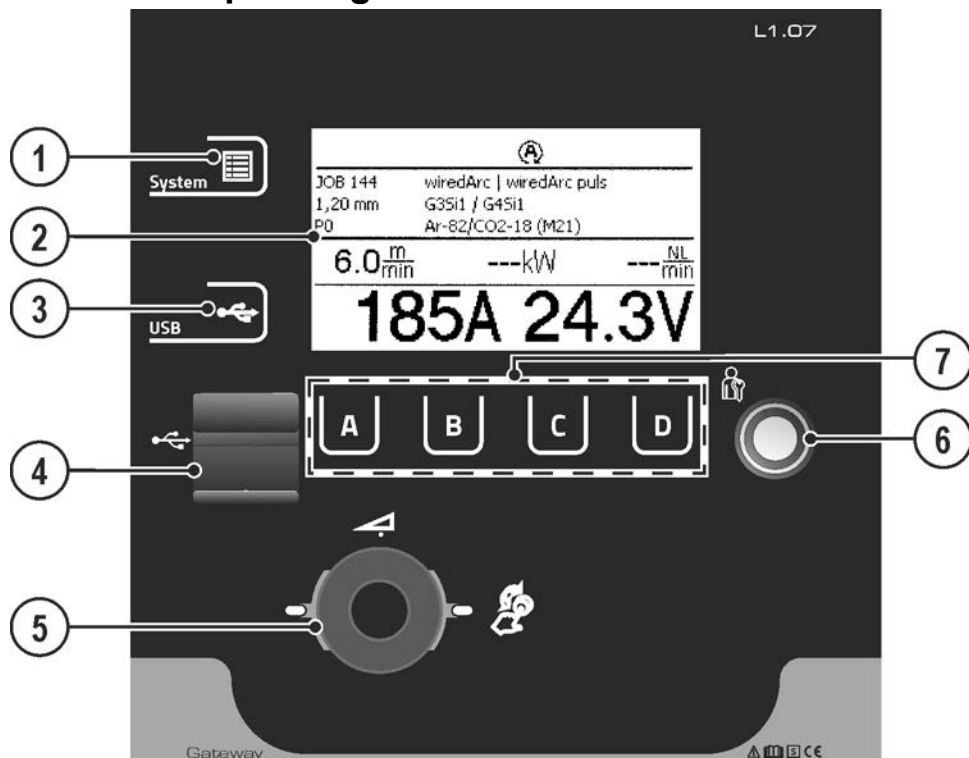































Figure 4-1

Item	Symbol	Description
1		System push-button To display and configure the system settings > see 5.3.3 chapter.
2		Machine display Graphical machine display showing all machine functions, menus and parameters with their values > see 4.3 chapter.
3		USB push-button To use and configure the USB interface > see 5.4 chapter.
4		USB interface for offline data transfer Connection capability for a USB flash memory (industrial USB flash memory recommended).
5		Rotary knob parameter values Setting various parameters values depending on the preselection. The white signal lights (LED) around the rotary knob light up when setting is possible.
6		Interface (Xbutton) Welding access based on user-defined rights to protect against unauthorised use > see 5.3.1 chapter.
7		Context-dependent push-button > see 5.2 chapter

4.2 Screen icons

Symbol	Description
	Blocked The function selected is not available with the current rights. Check access rights.
	Wire feed speed
	Welding power

Symbol	Description
	OK Process within limit values.
	Warning Indicates a possible interference in the near future
	Interference
	Temperature error
	Wired local network (LAN)
	Wireless local network (WiFi)
	User logged in
	Not possible – check priorities
	Xbutton login
	Xbutton logoff
	Xbutton version number not known
	Cancel operation
	Confirm operation
	Menu navigation Skip back to previous menu
	Menu navigation Expand the display contents.
	Save data to USB medium
	Load data from USB medium
	USB data recording
	Refresh
	After welding, the values used last (hold values) are shown from the main program.
	Information
	DHCP symbol
WPQR	WPQR welding data assistant
	Wire feed speed
	Welding speed
	Arc voltage
	Arc current
	Motor current
	Plasma gas
	Shielding gas

4.3 Machine display

The machine display shows all the information relevant to the user as text and/or graphics.

4.3.1 Actual values, nominal values, hold values

Parameter	Before welding	During welding		After welding	
	Nominal value	Actual value	Nominal value	Hold value	Nominal value
Welding current	☑	☑	☐	☑	☐
Wire feed speed	☑	☑	☐	☑	☐
Welding voltage	☑	☑	☐	☑	☐

4.3.2 Main screen

The main screen shows all the information relevant for the welding process before, while and after it is carried out. In addition, it shows status information on the machine state.

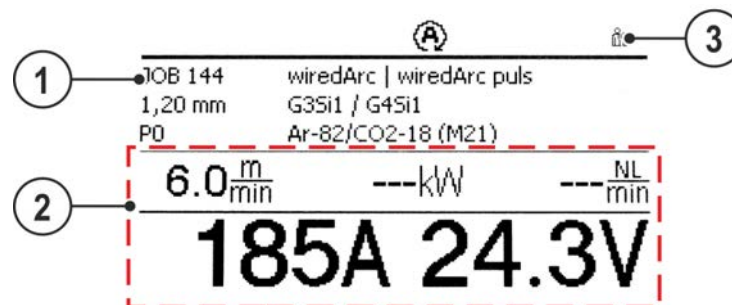


Figure 4-2

Item	Symbol	Description
1		Information on the welding task selected JOB number, process etc.
2		Display area for welding data Welding current, welding voltage, wire feed speed, etc.
3		Display area for system status Network status, error status etc. > see 4.2 chapter

4.3.3 Initial screen

During the start process the control name, machine software version and selected language are shown on the screen.

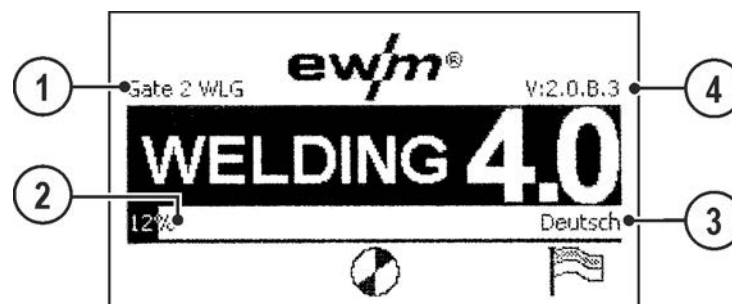


Figure 4-3

Item	Symbol	Description
1		Machine control name
2		Progress bar Shows the load progress during the start process.
3		Indication of the system language selected The system language can be changed during the start process > see 4.3.3.1 chapter.
4		Control software version

4.3.3.1 Change system language

During the start process the user can select or change the system language at the machine control.

- Switch the machine off and on again.
- Press the context-dependent push-button [D] during the start phase (the word WELDING 4.0 is displayed).
- Select the required language by turning the control button.
- Confirm the selected language by pressing the control button (the user can exit the menu by pressing the context-dependent push-button [A] without making any changes).

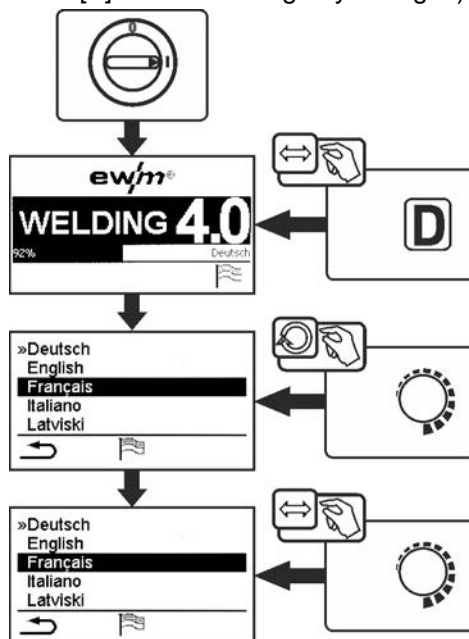


Figure 4-4

5 Operating the machine control

In general the control is operated with the central control button below the machine display.

Select the required menu item by turning (navigate) and pressing (confirm) the central control button. In addition, the context-dependent push-buttons below the machine display can be used for confirmation.

5.1 Direct access keys

Several push-buttons on the left of the display can be used to directly access the most important menus.

5.2 Context-dependent push-buttons

The bottom push-buttons are so-called context-dependent operating elements. The selection options of these buttons depend on each screen content.

If the ↶ icon is shown on the display the user can skip back to the previous menu item (often assigned to the [A] push-button).

5.2.1 Changing basic settings (machine configuration menu)

The basic welding system functions can be adjusted in the machine configuration menu. Only experienced users should change the settings > see 5.3 *chapter*.

5.3 Machine configuration (system)

In the System menu the user can set the basic machine configuration.

Enter the menu:

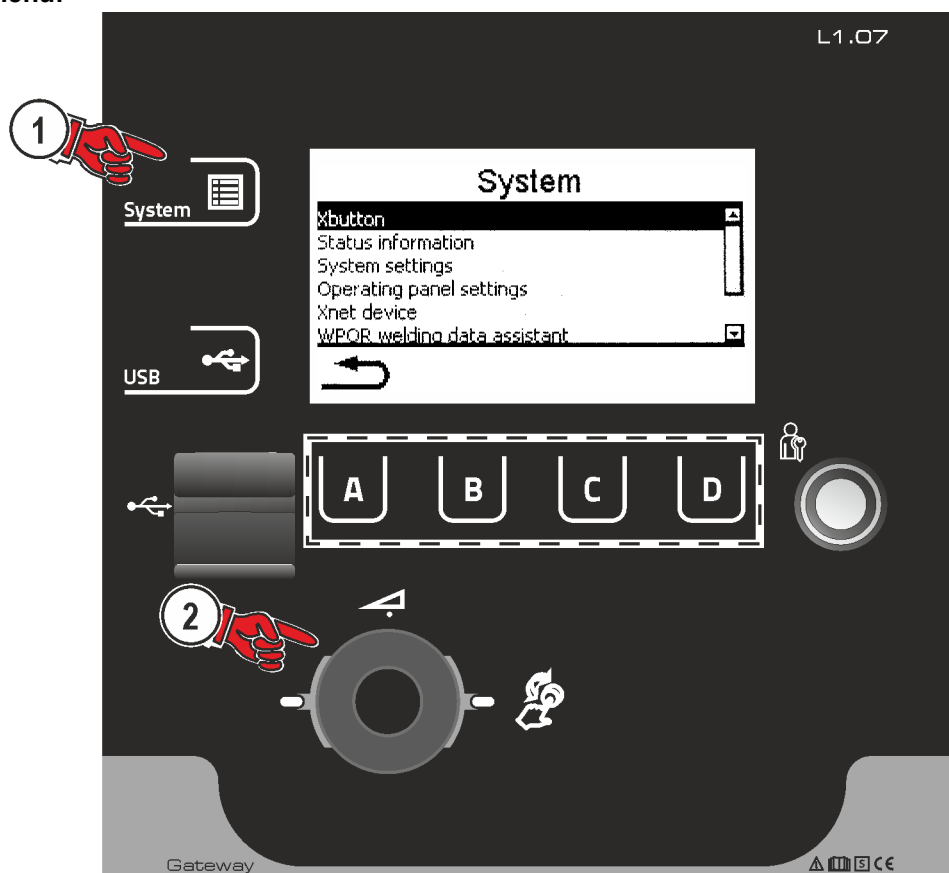


Figure 5-1

5.3.1 Access permission (Xbutton)

The welding system offers two options to prevent unauthorised access to welding parameters or unintentional reconfiguration.

- 1 Key switch (available depending on machine version). With the key switch in position 1 all functions and parameters can be configured without any restriction. In position 0 certain predefined welding parameters or functions cannot be modified (see relevant documentation).
- 2 Xbutton. With this function, permissions can be assigned to users to access those areas of the machine control defined for them. To do so, the user needs a digital key (Xbutton) to log on to the machine via the Xbutton interface. The key itself is configured by the system user (welding supervisor).

If the Xbutton function is activated, the key switch/key switch function is deactivated.

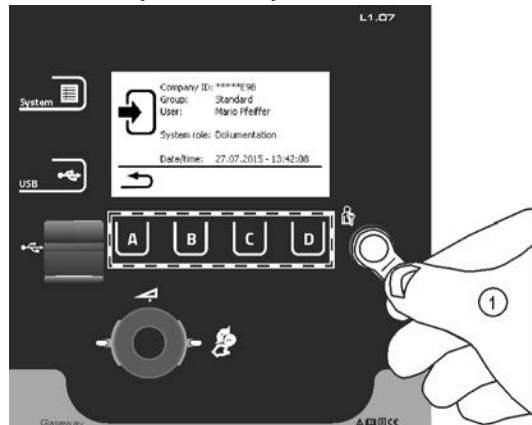


Figure 5-2

To activate Xbutton rights follow these instructions:

1. Set key switch to position "1".
2. Log on with a Xbutton and administrator rights.
3. Set menu option "Xbutton rights active" to "yes".

By following these instructions you make sure not to inadvertently block your access while not owning an Xbutton with administrator rights.

5.3.1.1 User information

User information such as company ID, user name, group etc. are shown.

5.3.1.2 Activating the Xbutton rights

Menu navigation:

Menu item/parameter	Value	Comment
Xbutton rights active:	Yes	Access rights active
	No	Key switch active
Reset Xbutton configuration:	Yes	Company ID, group and access rights when logged off will be reset to the factory settings. Xbutton rights will be deactivated.
	No	

An Xbutton starter set is required for individual programming of the Xbutton.

5.3.2 Status information

This menu provides the user with information on current system interferences and warnings..

5.3.2.1 Errors and warnings

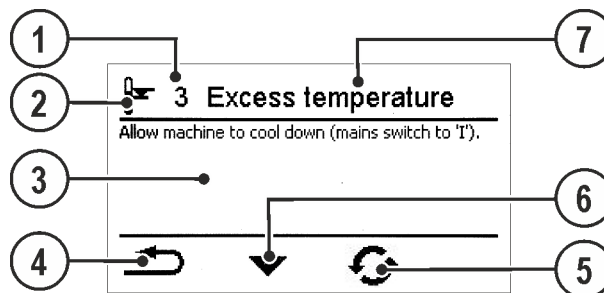


Figure 5-3

Item	Symbol	Description
1		Error number > see 6.2 chapter
2		Error icons ----- Warning (prior to interference) ----- Interference (welding process will be stopped) ----- Specific (e.g. temperature error)
3		Long error description
4		Menu navigation Skip back to previous menu
5		Reset message The message can be reset
6		Menu navigation (if available) Scroll to next page or message
7		Error name

5.3.2.2 Running time

Menu item/parameter	Value	Comment
Duty cycle can be reset:	0:00 h	Values can be reset by pressing or turning the main control button
Arc time can be reset:	0:00 h	
Overall duty cycle:	0:00 h	
Overall arc time:	0:00 h	

5.3.2.3 System components

A list of all components available in the system is displayed, along with ID number, software version and name.

5.3.3 System settings

In this area the user can configure advanced system settings.

5.3.3.1 Date

Menu item/parameter	Value	Comment
Year:	2014	
Month:	10	
Day:	28	
Date format:	DD.MM.YYYY	
	YYYY.MM.DD	

5.3.3.2 Time

Menu item/parameter	Value	Comment
Hour:	0–24	
Minute:	0–59	
Time zone (UTC +/-):	-12h to +14h	
Summer time:	Yes	
	No	
Time format:	24 h	
	12 h AM/PM	

5.3.4 Operating panel settings

Menu item/parameter	Value	Comment
Display brightness:	0-100 %	
Display contrast:	0-100 %	
Display negative:	No	
	Yes	
Average value display for superPuls:	Yes	When superPuls is enabled the welding power is displayed as average value.
	No	The welding power is displayed by program A even when superPuls is enabled.
Hold function:	On	
	Off	
Language	German	
Measuring units	Metric	
	Imperial	
Text for material	Standard	
	Alternative	
Text for gas	Standard	
	Alternative	
Number files consec.	Yes	The file names are numbered consecutively when saving the Favourites keys.
	No	One file is always overwritten.
Gate 2 reset to factory settings	Yes	Only those parameters relevant for Gate 2 (e.g. display settings and languages) will be reset. System parameters such as Xbutton activation or JOBS are not affected.
	No	

5.3.4.1 Xnet machine

The Xnet machine defines the system component required for operating the Xnet system as part of the Expert XQ 2.0 Net/Gateway to connect to power sources or to record welding data.

5.3.4.2 Couple mobile machine

QR code for coupling mobile end devices. Upon a successful connection, welding data are displayed on the end device.

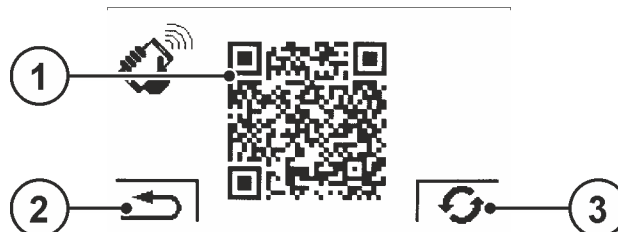


Figure 5-4

Item	Symbol	Description
1		QR code
2		Menu navigation Skip back to previous menu
3		Reset message The message can be reset and a new QR code may be requested from the network.

5.3.4.3 Bar codes

Bar codes predefined in ewm Xnet are recorded with a manual scanner. Component data are retrieved and displayed in the control.

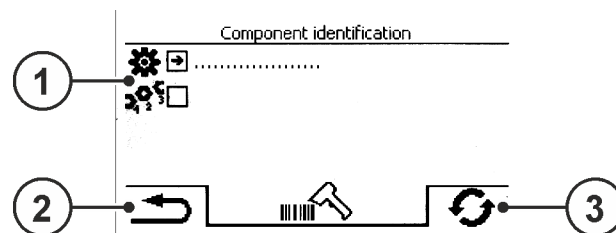


Figure 5-5

Item	Symbol	Description
1		Component data
2		Menu navigation Skip back to previous menu
3		Reset message The message can be reset

5.3.4.4 Errors and warnings

A list of all ewm Xnet-specific errors and warnings are displayed with their ID number and description.

5.3.4.5 Network

Information about the current network configuration and network status is displayed.

5.3.4.6 Clear system memory

Resets the internal system memory used for saving welding and log data and deletes all data.

All welding data recorded so far, which have not been transferred to the Xnet server via flash drive or network connection, will be permanently deleted.

5.3.4.7 Reset to factory settings

All machine configuration data relating to Xnet will be reset to the factory setting. The system memory data will not be affected, i.e. any welding or log data recorded will be saved.

5.3.5 WPQR welding data assistant

The cooling-down time from 800°C to 500°C essential for the welding result (known also as t8/5 time) can be calculated using the input data in the WPQR welding data assistant. Prerequisite is the prior determination of the heat input. Upon input of the values, the valid t8/5 time is displayed with a black background.

Menu item/parameter	Value	Comment
Weld length:	1.0-999.9 cm	
Welding speed:	1.0-999.9 cm/min.	
Thermal efficiency:	10-100%	
Heat input:	kJ/mm	
Preheating temperature:	0-499 °C	
Weld seam factor:	0.01-1.5	
Transition thickness:	mm	
t8/5-time:	s	

5.3.6 Welding monitoring

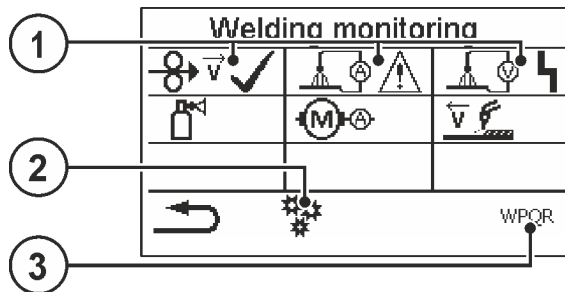


Figure 5-6

Item	Symbol	Description
1		Process parameters
2		Advanced settings To adjust welding monitoring
3	WPQR	WPQR welding data assistant > see 5.3.5 chapter

Menu item/parameter	Value	Comment
Automatic	No	
	Yes	The welding monitoring window opens automatically from the main screen after a welding start. A rotary knob actuation automatically switches back to the main window.

5.4 Offline data transfer (USB)



You may only use this USB interface to exchange data with a USB flash memory. You must not connect any other USB devices such as keyboards, hard disks, mobile telephones, cameras or other devices so as to avoid any damage to the machine. The interface does not provide any load functions either.

Using the USB interface, data can be transferred between the machine control and a USB storage medium.

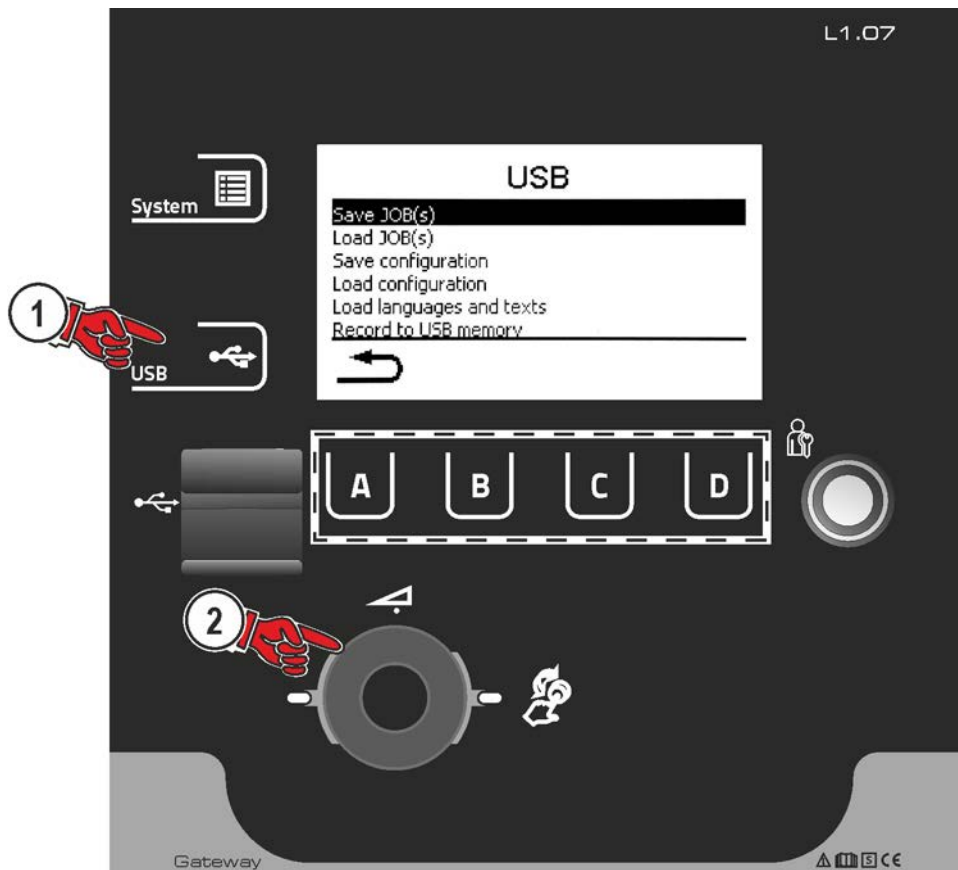


Figure 5-7

5.4.1 Save JOB(s)

Saving a single (JOB) or a range of welding tasks (JOB)s (from-to) from the welding machine to the storage media (USB).

5.4.2 Load JOB(s)

Loading a single JOB or a range of welding tasks (JOB)s (from-to) from the storage media (USB) to the welding machine.

5.4.3 Save configuration

5.4.3.1 System

Configuration data of the power source's system components.

5.4.3.2 Xnet machine

Master configuration

Core data for network communication (independent of machine).

Individual configuration

Machine-related configuration data, matching the current power source only.

5.4.4 Load configuration

5.4.4.1 System

Configuration data of the power source's system components.

5.4.4.2 Xnet machine

Master configuration

Core data for network communication (independent of machine).

Individual configuration

Machine-related configuration data, matching the current power source only.

5.4.5 Load languages and texts

Load a language and text package from the storage medium (USB) to the welding machine.

5.4.6 Record on USB drive


You can record welding data on a storage medium and read or analyse them using the Xnet quality management software when required. For machine variants with network capability (LG/WLG) only!

5.4.6.1 Register USB drive

To identify and allocate the welding data between power source and storage medium the storage medium has to be registered once. This is done by selecting the menu option "Register USB drive" or by starting a data recording process. Successful registration is indicated by a checkmark next to the relevant menu option.

If the storage medium is registered and connected when the power source is being switched on, recording of the welding data starts automatically.

5.4.6.2 Start recording

After confirming the start of data recording the storage medium will be registered (if not registered yet). Data recording starts and is indicated at the main screen by a slow flashing of the  icon.

5.4.6.3 Stop recording

To avoid data loss, finish the recording with this menu option before removing the USB drive or switching off the machine.

In order to avoid data loss, the recording with this menu item must be terminated before removing the USB memory or switching of the device. When welding is running, the recording is only completed after the end of welding and the USB memory is released.

Welding data must be imported into the Xnet quality management software using the XWDImport software. This software is an integral part of the Xnet installation.

5.5 Online data transfer (network)

The network is used to transfer welding data from manual, automated and welding machines. It can include as many welding machines and computers as require and the collected data can be retrieved from one or several server PCs.

The Xnet software allows the user to monitor all welding parameters in real time and/or to subsequently analyse the saved welding data. The results can be used for process optimisation, welding calculations or checking welding wire batches.

Depending on the welding machine the data are transferred to the server via LAN/WiFi and can then be accessed in a browser window. The user interface and web-based design of the software offer the possibility to analyse and monitor the welding data via a tablet PC.

5.5.1 Wired local network (LAN)

LAN status:

Status description	Status display Gate 2
No physical connection to a network	LAN symbol deactivated
Connection to the network, the machine has been configured, no data transfer	LAN symbol activated
Connection to the network, the machine has been configured and transfers data	LAN symbol flashing
Connection to the network, the machine has been configured and tries to connect to the data server	LAN symbol flashing in the specified rhythm
A DHCP mechanism is configured, no address reference active	Enabled DHCP symbol
A DHCP mechanism automatically attempts to obtain an IP address	Flashing DHCP symbol
The DHCP mechanism has reached the timeout state, no IP address could be obtained, no data exchange takes place	Enabled DHCP symbol (crossed)

5.5.2 Wireless local network (WiFi)

WiFi status:

Status description	Status display Gate 2
No physical connection to a network	WiFi symbol deactivated
Connection to a network, no data transfer	WiFi symbol activated
Connection to a network, transferring data	WiFi symbol flashing
Connection to the network, the machine has been configured and tries to connect to the data server	LAN symbol flashing in the specified rhythm
A DHCP mechanism is configured, no address reference active	Enabled DHCP symbol
A DHCP mechanism automatically attempts to obtain an IP address	Flashing DHCP symbol
The DHCP mechanism has reached the timeout state, no IP address could be obtained, no data exchange takes place	Enabled DHCP symbol (crossed)

5.5.3 DHCP Plus

Automatic assignment via DHCP ensures that the device can be accessed and configured in the network at any time. The protocol addition DHCP Plus is connected downstream of the DHCP protocol. It ensures a direct exchange of the server data with the requesting machine.

This allows unconfigured machines to connect to an Xnet server independently.

6 Rectifying faults

All products are subject to rigorous production checks and final checks. If, despite this, something fails to work at any time, please check the product using the following flowchart. If none of the fault rectification procedures described leads to the correct functioning of the product, please inform your authorised dealer.

6.1 Display machine control software version

Identifying the machine software is key to quick troubleshooting by the authorised service technician. The version number is shown on the initial screen of the machine control for about 5 seconds (switch the machine off and on again) > see 4.3.3 chapter.


6.2 Error messages

A welding machine error will be signalled by an error code (see table) on the control display. In the event of an error, the power unit shuts down.

The display of possible error numbers depends on the machine version (interfaces/functions).

- Document machine errors and inform service staff as necessary.
- If multiple errors occur, these are displayed in succession.

Legend for categories (reset error)

- The error message will disappear once the error has been rectified.
- The error message can be reset by pressing a context-dependent push-button with the  icon.
- The error message can only be reset by switching the machine off and on again.

6.2.1 Titan, Tetrax

Err	Category			Error	Possible cause	Remedy
	a)	b)	c)			
3				Tacho error	Error of wire feeder	Check connections (connections, pipes)
					Permanent overload of the wire drive	Do not place liner in tight radii, check wire core for smooth movement
4				Excess temperature	Power source overheated	Allow the power source to cool down (mains switch to "1")
					Fan blocked, dirty or defective	Check fan and clean or replace
					Air inlet or outlet blocked	Check air inlet and outlet
5				Mains overvoltage	Mains voltage is too high	Check the mains voltages and compare with the power source connection voltages
6				Mains undervoltage	Mains voltage is too low	
7				Lack coolant	Flow rate too low (< = 0.7 l/min) / (< = 0.18 gal./min) ^{[1] [3]}	Check coolant flow, clean water block, remove kinks in hose package, adjust flow threshold
					Coolant volume too low	Fill coolant
					Pump does not run	Turn the pump shaft
					Air in the coolant circuit	Vent coolant circuit
					Hose package not completely filled with coolant	Switch device off/on, pump runs for 2 min
					Operation with gas-cooled welding torch	Connect coolant feed and coolant return (insert hose bridge) Disable water block
					Automatic cutout failure	Press to reset automatic cutout

Err	Category			Error	Possible cause	Remedy
	a)	b)	c)			
					Fuse failure F3 (4A) on printed circuit board VB xx0 ^[3]	Inform the service
8	✓	✓	✗	Shielding gas error ^[2]	No shielding gas	Check shielding gas supply
					Pre-pressure too low	Remove kinks in the hose package; nominal value: 4-6 bar pre-pressure
9	✗	✗	✓	Sec. overvoltage	Overvoltage at output: Inverter error	Inform the service
10	✗	✗	✓	Earth fault	Electrical connection between welding wire and housing	Check wire space, eliminate connection
					Electrical connection between welding circuit, housing and earthed objects	Check housing, eliminate connection
11	✓	✓	✗	Quick shut-down	Removing the logical signal "robot ready" during the process	Eliminate errors on the higher-level control
22	✓	✗	✗	Coolant excess temperature ^[3]	Coolant overheated ($\geq 70^{\circ}\text{C}$ / $\geq 158^{\circ}\text{F}$) ^[1] measured in the coolant return line	Allow the power source to cool down (mains switch to "1")
					Fan blocked, dirty or defective	Check fan, clean or replace
					Air inlet or outlet blocked	Check air inlet and outlet
48	✗	✓	✗	Ignition error	During a process start with an automated system, no ignition has taken place	Check the wire feeding, check the connections of the load cables in the welding circuit, clean corroded surfaces on the workpiece before welding if applicable
49	✗	✓	✗	Arc interruption	While welding with an automated system, there was an arc interruption	Check wire feeding, adjust welding speed.
51	✓	✗	✗	Emergency stop	The emergency stop circuit of the power source has been activated.	Disable the activation of the emergency stop circuit (release protective circuit)
52	✗	✗	✓	No wire feeder	After switching on the automated system, no wire feeder was detected	Check or connect control lines of the wire feed units; correct the identification number of the automated wire feed units (with 1DV: number 1, with 2DV each with a wire feeder number 1 and a wire feeder number 2)
53	✗	✓	✗	No wire feeder 2	Wire feeder 2 not detected	Check or connect the control lines of the wire feed units
54	✗	✗	✓	VRD error	Open circuit voltage reduction error	if necessary, disconnect external device from the welding circuit; notify the service
55	✗	✓	✗	WF excess current	Overcurrent detection on wire feeder	Do not place liner in tight radii; check wire core for smooth movement
56	✗	✗	✓	Mains phase failure	One phase of the mains voltage has failed	Check mains connection, mains plug and mains fuses

Err	Category			Error	Possible cause	Remedy
	a)	b)	c)			
57	✗	✓	✗	Slave tacho error	Wire feeder fault (slave drive)	Check connectors, cables, connections
					Permanent overload of the wire drive (slave drive)	
58	✗	✓	✗	Short circuit	Check welding circuit for short circuit	Check welding circuit; isolate welding torch before depositing
59	✗	✗	✓	Incompatible device	A device connected to the system is not compatible	Please disconnect the incompatible device from the system
60	✗	✗	✓	Software incompat.	A machine's software is not compatible.	Inform the service
61	✗	✓	✗	Welding monitor	The actual value of a welding parameter is outside the specified tolerance field	Observe tolerance fields, adjust welding parameters

^[1] ex works

^[2] Option

^[3] only device series Titan

6.2.2 Phoenix, alpha Q, Taurus

Err	Category			Possible cause	Remedy
	a)	b)	c)		
1	✗	✗	✓	Mains overvoltage	Check the mains voltages and compare with the welding machine connection voltages
2	✗	✗	✓	Mains undervoltage	
3	✓	✗	✗	Welding machine excess temperature	Allow the machine to cool down (mains switch to "1")
4	✓	✓	✗	Coolant error	Fill coolant Turn on pump shaft (coolant pump) Check air cooling unit overcurrent trip
5	✓	✗	✗	Wire feeder, tachometer error	Check the wire feeder tachogenerator is not issuing a signal, motor control defective > inform Service.
6	✓	✗	✗	Shielding gas error	Check shielding gas supply (for machines with shielding gas monitoring)
7	✗	✗	✓	Secondary overvoltage	Inverter error > inform Service
8	✗	✗	✓	Wire error	Separate the electrical connection between welding wire and casing or an earthed object
9	✓	✗	✗	Quick shut-down	Rectify error on robot (Interface for automated welding)
10	✗	✓	✗	Arc interruption	Check wire feeding (Interface for automated welding)
11	✗	✓	✗	Ignition error (after 5 s)	Check wire feeding (Interface for automated welding)
13	✓	✗	✗	Emergency stop deactivation	Check the emergency stop switch at the interface for automated welding
14	✗	✓	✗	Wire feeder detection	Check cable connections
				ID number allocation error (2DV)	Correct ID numbers
15	✗	✓	✗	Second wire feeder detection	Check cable connections
16	✗	✗	✓	Open circuit voltage reduction error (VRD)	Inform Service.
17	✗	✓	✓	Overcurrent detection on wire feeder	Check ease of wire feeding
18	✗	✓	✓	Tachogenerator signal error	Check the connection and particularly the tachogenerator of the second wire feeder (slave drive).
56	✗	✗	✓	Mains phase failure	Check mains voltages
59	✗	✗	✓	Machine incompatible	Check machine usage
60	✗	✗	✓	Software update required	Inform Service.

7 Appendix A**7.1 Searching for a dealer**

Sales & service partners
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