

# Implementation Guide Gateway Modbus UDP extended



Operating Instructions

Roboter Interface





# Dear Reader

## Introduction

Thank you for choosing Fronius - and congratulations on your new, technically high-grade Fronius product! This instruction manual will help you get to know your new machine. Read the manual carefully and you will soon be familiar with all the many great features of your new Fronius product. This really is the best way to get the most out of all the advantages that your machine has to offer.

Please also take special note of the safety rules - and observe them! In this way, you will help to ensure more safety at your product location. And of course, if you treat your product carefully, this definitely helps to prolong its enduring quality and reliability - things which are both essential prerequisites for getting outstanding results.



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# Ethernet

## Hardware

- Data transfer rate 10 Mbaud
- Ethernet connector RJ45 / IP67 VarioSub (Phoenix Contact)
- Standard Ethernet cable (Twisted Pair, shielded)

## Protocol

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Modbus UDP (Modbus Application Protocol Specification V1.1)  
One Modbus transaction is defined.

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Adjustable UDP-Port (Factory setting is Port 502)

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Public defined Modbus function 03 (0x03) Read Holding Registers

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Public defined Modbus function 06 (0x06) Write Single Register

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Public defined Modbus function 16 (0x10) Write Multiple Register

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Public defined Modbus function 23 (0x17) Read/Write Multiple Register

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User defined Modbus function 100 (0x64) Configure Streaming Data

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User defined Modbus function 101 (0x65) Action Streaming Data

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User defined Modbus function 102 (0x66) Streaming Data

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Process data exchange between controller and power source:

- Function 23 (0x17) - Read/Write Multiple Register (0xF100-0xF110 / 0xF000-0xF00E)
  - Function 03 (0x03) – Read Holding Register (0xF100-0xF110)
  - Function 06 (0x06) – Write Single Register (0xF000-0xF00E)
  - Function 16 (0x10) – Write Multiple Register (0xF000-0xF00E)
- 

Special Data, which not defined in the process image:

- Function 03 (0x03) - Read Holding Register (0xE000-0xE0C5). It is limited to read one register.
  - Function 06 (0x06) – Write Single Register (0xE000-0xE0C5)
  - Function 16 (0x10) – Write Multiple Register (0xE000-0xE0C5)
-

# Modbus

## Protocol description

The MODBUS application data unit is built by the client that initiates a MODBUS transaction. The function indicates to the server what kind of action to perform. The MODBUS application protocol establishes the format of a request initiated by a client.

The function code field of a MODBUS data unit is coded in one byte. Valid codes are in the range of 1 ... 255 decimal (128 – 255 reserved for exception responses). When a message is sent from a Client to a Server device the function code field tells the server what kind of action to perform.

Sub-function codes are added to some function codes to define multiple actions.

The data field of messages sent from a client to server devices contains additional information that the server uses to take the action defined by the function code. This can include items like discrete and register addresses, the quantity of items to be handled, and the count of actual data bytes in the field.

The data field may be nonexistent (of zero length) in certain kinds request, in this case the server does not require any additional information. The function code alone specifies the action.

If no error occurs related to the MODBUS function requested in a properly received MODBUS ADU the data field of a response from a server to a client contains the data requested. If an error related to the MODBUS function requested occurs, the field contains an exception code that the server application can use to determine the next action to be taken.

For example a client can read the ON / OFF states of a group of discrete outputs or inputs or it can read/write the data contents of a group of registers.

When the server responds to the client, it uses the function code field to indicate either a normal (error-free) response or that some kind of error occurred (called an exception response). For a normal response, the server simply echoes the original function code.

## Data encoding

MODBUS uses a 'big-Endian' representation for addresses and data items. This means that when a numerical quantity larger than a single byte is transmitted, the most significant byte is sent first.

Register size	Value
16 Bit 0x1234	the first byte sent is 0x12 then 0x34

## Application Data Unit (ADU)

This section describes the encapsulation of a MODBUS request or response when it is carried on a MODBUS UDP network.

MPAP Header	Function code	Data
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MPAP Header description:

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### Transactions Identifier

It is used for transaction pairing, the MODBUS server copies in the response the transaction identifier of the request.

Length:	2 Byte
Description:	Identification of a MODBUS Request / Response transaction
Client:	Initialized by the client
Server:	Recopied by the server from the received request

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### Protocol Identifier

It is used for intra-system multiplexing. The MODBUS protocol is identified by the value 0.

Length:	2 Byte
Description:	0 = Modbus protocol
Client:	Initialized by the client
Server:	Recopied by the server from the received request

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### Length

The length field is a byte count of the following field, including the Unit Identifier, Function code and the data field.

Length:	2 Byte
Description:	Number of following bytes
Client:	Initialized by the client
Server:	-

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### Unit Identifier

This field is used for intra-system routing purpose. It is typically used to communicate to a MODBUS or MODBUS+ serial line slave through a gateway between an Ethernet network and a MODBUS serial line. This field is set by the MODBUS Client in the request and must be returned with the same value in the response by the server.

Length:	1Byte
Description:	Identification of a remote slave connected on a serial line or on other buses
Client:	Initialized by the client
Server:	Recopied by the server from the received request

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**Important!** All MODBUS/UDP ADU are sent via UDP on registered port 502.



# Modbus Functions

## 03 (0x03) Read Holding Registers

This function code is used to read the contents of a contiguous block of holding registers in a remote device. In the Special Data area this contiguous block is limited from 1-4 registers. The request PDU specifies the starting register address and the number of registers. In the PDU registers are addressed starting at zero. Therefore registers numbered 1-16 are addressed as 0-15.

The register data in the response message are packed as two bytes per register, with the binary contents right justified within each byte. For each register, the first byte contains the high order bits and the second contains the low order bits.

### Request

Function code	1 Byte	0x03
Starting Address	2 Bytes	0x0000 to 0xFFFF
Quantity of Registers	2 Bytes	1 to 125 (0x7D)

### Response

Function code	1 Byte	0x03
Byte count	1 Byte	2 x N*
Register value	N* x 2 Bytes	-

N\* = Quantity of Register

### Error

Error code	1 Byte	0x83
Exception code	1 Byte	01 or 02 or 03 or 04

### Example

Here is an example of a request to read registers 0xE011 (Gas preflow).

#### Request

Field Name	(Hex)
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	00
Length Hi	00
Length Lo	06
Unit Identifier	00
Function code	03
Starting Address Hi	E0
Starting Address Lo	11
No. of Registers Hi	00
No. of Registers Lo	01

#### Response

Field Name	(Hex)
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	00
Length Hi	00
Length Lo	05
Unit Identifier	00
Function code	03
Byte Count	02
Register value Hi (108)	08
Register value Lo (108)	98

The contents of register 0xE011 (Gas preflow) are shown as the two byte values of 08 98 hex, or 2200 decimal.

**06 (0x06) Write Single Registers**

This function code is used to write a single holding register in a remote device. The request PDU specifies the address of the register to be written. Registers are addressed starting at zero. Therefore register numbered 1 is addressed as 0. The normal response is an echo of the request, returned after the register contents have been written.

**Request**

Function code	1 Byte	0x06
Register Address	2 Bytes	0x0000 to 0xFFFF
Register Value	2 Bytes	0x0000 or 0xFFFF

**Response**

Function code	1 Byte	0x06
Register Address	2 Bytes	0x0000 to 0xFFFF
Register Value	2 Bytes	0x0000 or 0xFFFF

**Error**

Error code	1 Byte	0x86
Exception code	1 Byte	01 or 02 or 03 or 04

**Example**

Here is an example of a request to write register 0xE011 (Gas preflow) with the value 0x898 (decimal 2200):

**Request**

Field Name	(Hex)
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	00
Length Hi	00
Length Lo	06
Unit Identifier	00
Function code	06
Register Address Hi	E0
Register Address Lo	11
Register Value Hi	08
Register Value Lo	98

**Response**

Field Name	(Hex)
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	00
Length Hi	00
Length Lo	06
Unit Identifier	00
Function code	06
Register Address Hi	E0
Register Address Lo	11
Register Value Hi	08
Register Value Lo	98

## 16 (0x10) Write Multiple Registers

This function code is used to write a block of contiguous registers (1 to 20 registers) in a remote device. The requested written values are specified in the request data field. Data is packed as two bytes per register. The normal response returns the function code, starting address and quantity of registers written.

### Request

Function code	1 Byte	0x10
Starting Address	2 Bytes	0x0000 to 0xFFFF
Quantity of Registers	2 Bytes	0x0001 or 0x0078
Byte Count	1 Byte	2 x N*
Register Values	N* x 2 Bytes	Value

N\* = Quantity to Write

### Response

Function code	1 Byte	0x10
Starting Address	2 Bytes	0x0000 to 0xFFFF
Quantity of Registers	2 Bytes	1 to 123 (0x7B)

### Error

Error code	1 Byte	0x90
Exception code	1 Byte	01 or 02 or 03 or 04

### Example

Here is an example of a request to write two registers (0xF00B – 0xF00C)

#### Request

Field Name	(Hex)
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	00
Length Hi	00
Length Lo	??
Unit Identifier	00
Function code	10
Starting Address Hi	F0
Starting Address Lo	0B
Quantity of Registers Hi	00
Quantity of Registers Lo	02
Byte Count	04
Register Value Hi	7F
Register Value Lo	FF
Register Value Hi	7F
Register Value Lo	FF

#### Response

Field Name	(Hex)
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	00
Length Hi	00
Length Lo	06
Unit Identifier	00
Function code	10
Starting Address Hi	F0
Starting Address Lo	0B
Quantity of Registers Hi	00
Quantity of Registers Lo	02

**23 (0x17) Read/  
Write Multiple  
registers**

This function code performs a combination of one read operation and one write operation in a single MODBUS transaction. The write operation is performed before the read. Holding registers are addressed starting at zero. Therefore holding registers 1-16 are addressed in the PDU as 0-15.

The request PDU specifies the starting address and number of holding registers to be read as well as the starting address, number of holding registers, and the data to be written. The byte count specifies the number of bytes to follow in the write data field. The normal response contains the data from the group of registers that were read. The byte count field specifies the quantity of bytes to follow in the read data field.

**Request**

Function code	1 Byte	0x17
Read Starting Address	2 Bytes	0x0000 to 0xFFFF
Quantity to Read	2 Bytes	0x0001 to approx.0x0076
Write Starting Address	2 Bytes	0x0000 to 0xFFFF
Quantity to Write	2 Bytes	0x0001 to approx. 0X0076
Write Byte Count	1 Byte	2 x N*
Write Registers Value	N* x 2 Bytes	

N\* = Quantity to Write

**Response**

Function code	1 Byte	0x17
Byte Count	1 Byte	2 x N'*
Read Registers value	N'* x 2 Bytes	

N\* = Quantity to Read

**Error**

Error code	1 Byte	0x97
Exception code	1 Byte	01 or 02 or 03 or 04

**Example**

Here is an example of a request to read six registers and to write three registers:

**Request**

Field Name	(Hex)	Field Name	(Hex)
Transaction Identifier Hi	00	Write Starting Address Hi	F0
Transaction Identifier Lo	01	Write Starting address Lo	00
Protocol Identifier Hi	00	Quantity to Write Hi	00
Protocol Identifier Lo	00	Quantity to Write Lo	03
Length Hi	00	Write Byte Count	06
Length Lo	11	Write Registers Value Hi	01
Unit Identifier	00	Write Registers Value Lo	FA
Function code	17	Write Registers Value Hi	02
Read Starting Address Hi	F1	Write Registers Value Lo	FB
Read Starting Address Lo	00	Write Registers Value Hi	03
Quantity to Read Hi	00	Write Registers Value Lo	FC
Quantity to Read Lo	06		

**23 (0x17) Read/Write Multiple registers**  
(continued)

**Response**

Field Name	(Hex)	Field Name	(Hex)
Transaction Identifier Hi	00	Read Registers value Hi	0A
Transaction Identifier Lo	01	Read Registers value Lo	CD
Protocol Identifier Hi	00	Read Registers value Hi	00
Protocol Identifier Lo	00	Read Registers value Lo	01
Length Hi	00	Read Registers value Hi	00
Length Lo	0F	Read Registers value Lo	03
Unit Identifier	00	Read Registers value Hi	00
Function code	17	Read Registers value Lo	0D
Byte Count	0C	Read Registers value Hi	00
Read Registers value Hi	00	Read Registers value Lo	FF
Read Registers value Lo	FE		

**100 (0x64) Configure Streaming Data**

This function code is used to configure the data in the streaming frame. This frame will be sent without a request from the client (or master).  
The request PDU specifies the IP-address and the port number of the client, the streaming frequency and the addresses of the register. The port number 15000 and 15001 are reserved for Fronius Applications.  
The normal response is an echo of the request.

**Request**

Function code	1 Byte	0x64
IP Address Hi Word	2 Bytes	0x0000 to 0xFFFF
IP Address Lo Word	2 Bytes	0x0000 to 0xFFFF
Port number	2 Byte	0x0000 to 0xFFFF
Frequency	2 Byte	0x0000 to 0xFFFF
Number of register	1 Byte	0x00 to 0xFF
Register Address	N* x 2 Bytes	

N\* = Quantity of Register

**Response**

Function code	1 Byte	0x64
IP Address Hi Word	2 Bytes	0x0000 to 0xFFFF
IP Address Lo Word	2 Bytes	0x0000 to 0xFFFF
Port number	2 Byte	0x0000 to 0xFFFF
Frequency	2 Byte	0x0000 to 0xFFFF
Number of register	1 Byte	0x00 to 0xFF
Register Address	N* x 2 Bytes	

N\* = Quantity of Register

**Error**

Error code	1 Byte	0xE5
Exception code	1 Byte	01 or 02 or 03 or 04

**100 (0x64) Configure Streaming Data**

(continued)

**Example**

Here is an example of a request to configure the streaming data.

IP-Address: 192.168.0.2  
 Port number: 500  
 Frequency: 20 Hz  
 Address 1: 0xE070  
 Address 2: 0xE071  
 Address 3: 0xE068

**Request**

Field Name	(Hex)
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	00
Length Hi	00
Length Lo	0F
Unit Identifier	00
Function code	64
IP Address Hi Word Hi	C0
IP Address Hi Word Lo	A8
IP Address Lo Word Hi	00
IP Address Lo Word Lo	02
Port number Hi	01
Port number Lo	E4
Frequency Hi	00
Frequency Lo	14
Number of register	03
Registers Value Hi	E0
Registers Value Lo	70
Registers Value Hi	E0
Registers Value Lo	71
Registers Value Hi	E0
Registers Value Lo	68

**Response**

Field Name	(Hex)
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	00
Length Hi	00
Length Lo	0F
Unit Identifier	00
Function code	64
IP Address Hi Word Hi	C0
IP Address Hi Word Lo	A8
IP Address Lo Word Hi	00
IP Address Lo Word Lo	02
Port number Hi	01
Port number Lo	E4
Frequency Hi	00
Frequency Lo	14
Number of register	03
Registers Value Hi	E0
Registers Value Lo	70
Registers Value Hi	E0
Registers Value Lo	71
Registers Value Hi	E0
Registers Value Lo	68

**101 (0x65) Action Streaming Data**

This function code is used to start and stop the streaming frame without a request from the client (or master).

The request PDU specifies the start (0x01) or stop (0x00) of the streaming frame. The normal response is an echo of the request.

**Request**

Function code	1 Byte	0x65
Action	1 Bytes	Bit 0...0 (Stop streaming) Bit 0...1 (Start streaming)

**101 (0x65) Action Streaming Data**  
(continued)

**Response**

Function code	1 Byte	0x65
Action	1 Bytes	Bit 0...0 (Stop streaming) Bit 0...1 (Start streaming)

**Error**

Error code	1 Byte	0xE5
Exception code	1 Byte	01 or 04 or 10

**Example**

Here is an example of a request to start the streaming data.

**Request**

Field Name	(Hex)
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	00
Length Hi	00
Length Lo	03
Unit Identifier	00
Function code	65
Action streaming data	01

**Response**

Field Name	(Hex)
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	00
Length Hi	00
Length Lo	03
Unit Identifier	00
Function code	65
Action streaming data	01

**102 (0x66) Streaming Data**

This function will be send from the server without a request from the client.

The Transaction Identifier will be incremented every cycle by the server. The Protocol Identifier is the Protocol Identifier from the function 100 (0x64) Configure Streaming Data.

The Unit Identifier is the Unit Identifier from the function 100 (0x64) Configure Streaming Data.

**Response**

Function code	1 Byte	0x66
Frequency	2 Byte	0x0000 to 0xFFFF
Timestamp in ms	2 Byte	0x0000 to 0xFFFF
Number of registers	1 Byte	0x00 to 0xFF
Register address 1	2 Byte	0x0000 to 0xFFFF
Register value 1	2 Byte	0x0000 to 0xFFFF
Register address n	2 Byte	0x0000 to 0xFFFF
Register value n	2 Byte	0x0000 to 0xFFFF

**102 (0x66) Streaming Data**  
(continued)

**Example**

Here is an example of a response of the streaming data.

Frequency: 20 Hz  
 Timestamp: 1613 ms  
 Nr. of register: 0x03  
 Address 1: 0xE070  
 Address 2: 0xE071  
 Address 3: 0xE068

**Response**

<b>Field Name</b>	<b>(Hex)</b>
Transaction Identifier Hi	00
Transaction Identifier Lo	01
Protocol Identifier Hi	00
Protocol Identifier Lo	01
Length Hi	00
Length Lo	13
Unit Identifier	00
Function code	66
Frequency Hi	00
Frequency Lo	14
Timestamp Hi	06
Timestamp Lo	4D
Number of register	03

<b>Field Name</b>	<b>(Hex)</b>
Register address 1 Hi	E0
Register address 1 Lo	70
Register value 1 Hi	01
Register value 1 Lo	FF
Register address 2 Hi	E0
Register address 2 Lo	71
Register value 2 Hi	02
Register value 2 Lo	FF
Register address 3 Hi	E0
Register address 3 Lo	68
Register value 3 Hi	03
Register value 3 Lo	FF



# Exception codes

## **Code 0x01 - Illegal Function**

The function code received in the query is not an allowable action for the server (or slave). This may be because the function code is only applicable to newer devices, and was not implemented in the unit selected. It could also indicate that the server (or slave) is in the wrong state to process a request of this type, for example because it is unconfigured and is being asked to return register values.

## **Code 0x02 - Illegal Data Address**

The data address received in the query is not an allowable address for the server (or slave). More specifically, the combination of reference number and transfer length is invalid. For a controller with 100 registers, a request with offset 96 and length 4 would succeed, a request with offset 96 and length 5 will generate exception 02.

## **Code 0x03 - Illegal Data Value**

A value contained in the query data field is not an allowable value for server (or slave). This indicates a fault in the structure of the remainder of a complex request, such as that the implied length is incorrect. It specifically does NOT mean that a data item submitted for storage in a register has a value outside the expectation of the application program, since the MODBUS protocol is unaware of the significance of any particular value of any particular register.

## **Code 0x04 - Slave Device Failure**

An unrecoverable error occurred while the server was attempting to perform the requested action.

What is the reason for this error:

- License Gateway Level 1 (4,061,115) not installed in the power source
- Modbus protocol not activated (UniveralBusSteuerung -> Config)
- Wrong Firewall IP address Modbus

## **Code 0x06 - Slave Device Busy**

The server (or slave) is engaged in processing a long-duration command. The client (or master) should retransmit the message later when the server (or slave) is free.

# Timeout Lifecycle

<b>General</b>	<p>Modbus UDP is a connectionless transport protocol. It provides no control mechanism when exchanging data between client and server. This results in a higher processing speed than, for example, TCP. Therefore the connection must be controlled by the client and the server.</p>
<b>Client</b>	<p>In the process image 0xF000 (Bit 0-7) Control Flag Group 1 contents the signal Timeout Lifecycle. If the value is zero, there is no control of the communication active. A value between 1-255 means a timeout from 10ms - 2550ms. Every request of a Modbus function 23 (0x17) reset the lifecycle timer in the server. After a overrun of this lifecycle timer the power source stops immediately.</p>
<b>Server</b>	<p>If the lifecycle time run over, in the process image 0xF100 Bit 1 Status Flag Group 1 the signal Modbus Timeout will be set. After a restart of the Modbus communication this flag is set as long, till the signal Source Error Reset will be set.</p>

# Modbus UDP - Process image for MIG/MAG standard synergic, MIG/MAG pulse synergic and CMT

Process data from controller to power source (0xF000 - 0xF0FF)	Address	Description	Unit	Type	Factor	R / W
0xF000	Control Flag Group 1					
	Bit 0 - 7	Timeout Lifecycle	ms	Byte	10	r/w
	Bit 8 - 15	Reserved	-	-	-	-
0xF001	Control Flag Group 2					
	Bit 0	Welding start	-	Boolean	-	r/w
	Bit 1	Robot ready	-	Boolean	-	r/w
	Bit 2	Source error reset	-	Boolean	-	r/w
	Bit 3	Gas test	-	Boolean	-	r/w
	Bit 4	Wire inching	-	Boolean	-	r/w
	Bit 5	Wire retract	-	Boolean	-	r/w
	Bit 6	Torch blow out	-	Boolean	-	r/w
	Bit 7	Welding simulation	-	Boolean	-	r/w
	Bit 8	Touch sensing	-	Boolean	-	r/w
	Bit 9	Master selection Twin	-	Boolean	-	r/w
	Bit 10	SFI disable	-	Boolean	-	r/w
	Bit 11	SynchroPuls disable	-	Boolean	-	r/w
	Bit 12	Pulse/Dynamik correction disable	-	Boolean	-	r/w
	Bit 13	Burn back correction disable	-	Boolean	-	r/w
	Bit 14	Power full range	-	Boolean	-	r/w
Bit 15	Reserved	-	Boolean	-	-	
0xF002	Control Flag Group 3					
	Bit 0 - 15	Reserved	-	Boolean	-	-
0xF003	Control Flag Group 4					
	Bit 0 - 15	Reserved	-	Boolean	-	-
0xF004	Control Flag Group 5					
	Bit 0 - 15	Reserved	-	Boolean	-	-
0xF005	Control Flag Group 6					
	Bit 0 - 15	Reserved	-	Boolean	-	-
0xF006	Control Flag Group 7					
	Bit 0 - 15	Reserved	-	Boolean	-	-
0xF007	Control Flag Group 8					
	Bit 0 - 15	Reserved	-	Boolean	-	-
0xF008	Operating mode					
	0	MIG/MAG standard synergic welding	-	-	-	r/w
	1	MIG/MAG pulse synergic welding	-	-	-	r/w
	2	Job mode	-	-	-	r/w
	3	Parameter selection internal	-	-	-	r/w
	4	MIG/MAG standard manual welding	-	-	-	r/w
	5	CC/CV	-	-	-	r/w
	6	TIG welding	-	-	-	r/w
	7	CMT	-	-	-	r/w
	8	Special process: manual standard	-	-	-	r/w
9	Special process: manual pulse	-	-	-	r/w	
0xF009	Job number		-	Byte	-	r/w
0xF00A	Program number		-	Byte	-	r/w
0xF00B	Power %		-	Word	-	r/w
0xF00C	Arc length correction		%	Word	-	r/w
0xF00D	Pulse/Dynamik correction		%	Byte	-	r/w
0xF00E	Burn back correction		ms	Byte	-	r/w

**Process data  
from controller to  
power source  
(0xF000 - 0xF0FF)  
(continued)**

Address	Description	Unit	Type	Factor	R / W
0xF00F	Reserved	-	-	-	-
0xF010	External wirefeeder Wirefeed speed actual value	m/min	Word	-	r/w
0xF011	External wirefeeder Main error	-	Byte	-	r/w
0xF012	External wirefeeder Sub error	-	Byte	-	r/w
0xF013	External wirefeeder Bit 0 External wirefeeder enable Bit 1 - 15 Reserved	- -	Boolean -	- -	r/w -

**Process data from  
power source to  
controller (0xF100  
- 0xF1FF)**

Address	Description	Unit	Type	Factor	R / W
0xF100	Status Flag Group 1 Bit 0 Modbus timeout Bit 2 - 15 Reserved	ms -	Boolean Boolean	- -	r -
0xF101	Status Flag Group 2 Bit 0 Communication ready Bit 1 Power source ready Bit 2 Arc stable Bit 3 Process active Bit 4 Main current signal Bit 5 Torch collision protection Bit 6 Wire stick control Bit 7 Wire available Bit 8 Shortcircuit timeout Bit 9 Power out of range Bit 10 Robot access Bit 11 Data documentation ready Bit 12 Limit signal Bit 13-15 Reserved	- - - - - - - - - - - - - -	Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean	- - - - - - - - - - - - -	r r r r r r r r r r r r r r
0xF102	Status Flag Group 3 Bit 0 - 15 Reserved	-	-	-	-
0xF103	Status Flag Group 4 Bit 0 - 15 Reserved	-	-	-	-
0xF104	Status Flag Group 5 Bit 0 - 15 Reserved	-	-	-	-
0xF105	Status Flag Group 6 Bit 0 - 15 Reserved	-	-	-	-
0xF106	Status Flag Group 7 Bit 0 - 15 Reserved	-	-	-	-
0xF107	Device SubError	-	Byte	-	r
0xF108	Main error number	-	Word	-	r
0xF109	Reserved	-	-	-	-
0xF10A	Welding voltage actual value	V	Word	-	r
0xF10B	Welding current actual value	A	Word	-	r
0xF10C	Motor current actual value	A	Word	-	r
0xF10D	Reserved	-	-	-	-
0xF10E	Reserved	-	-	-	-

**Process data from  
power source to  
controller (0xF100  
- 0xF1FF)**  
(continued)

Address	Description	Unit	Type	Factor	R / W
0xF10F	Reserved	-	-	-	-
0xF110	Wire speed actual value	m/min	Word	-	-
0xF111	External wirefeeder Wirefeed speed command value	m/min	Word	-	r
0xF112	External wirefeeder Wirefeed speed ramp value	15m/min/s	Word		r

# Modbus UDP - Process image for TIG

Process data  
from controller to  
power source  
(0xF000 - 0xF0FF)

Address	Description	Unit	Type	Factor	R / W
0xF000	Control Flag Group 1 Bit 0 - 7 Timeout Lifecycle Bit 8 - 15 Reserved	ms -	Byte -	10 -	- -
0xF001	Control Flag Group 2 Bit 0 Welding start Bit 1 Robot ready Bit 2 Source error reset Bit 3 Gas test Bit 4 Wire inching Bit 5 Wire retract Bit 6 Cold wire disable Bit 7 Welding simulation Bit 8 Touch sensing Bit 9 Reserved Bit 10 Reserved Bit 11 Reserved Bit 12 Base current disable Bit 13 Duty cycle disable Bit 14-15 Reserved	- - - - - - - - - - - - - - -	Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean - - - Boolean Boolean -	- - - - - - - - - - - - - -	- - - - - - - - - - - - - -
0xF002	Control Flag Group 3 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF003	Control Flag Group 4 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF004	Control Flag Group 5 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF005	Control Flag Group 6 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF006	Control Flag Group 7 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF007	Control Flag Group 8 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF008	Operating mode 0 MIG/MAG standard synergic welding 1 MIG/MAG pulse synergic welding 2 Job mode 3 Parameter selection internal 4 MIG/MAG standard manual welding 5 CC/CV 6 TIG welding 7 CMT 8 Special process: manual standard 9 Special process: manual pulse	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	r/w r/w r/w r/w r/w r/w r/w r/w r/w r/w
0xF009	Job number	-	Byte	-	r/w
0xF00A	Bit 0 DC / AC Bit 1 DC- / DC+ Bit 2 Cap shaping Bit 3 Pulse disable Bit 4 Pulse range Bit 0 Bit 5 Pulse range Bit 1 Bit 6 Pulse range Bit 2 Bit 7 Reserved	- - - - - - - -	Boolean Boolean Boolean Boolean Boolean Boolean Boolean -	- - - - - - - -	- - - - - - - -
0xF00B	Main current	A	Word	-	-

**Process data  
from controller to  
power source  
(0xF000 - 0xF0FF)**  
(continued)

Address	Description	Unit	Type	Factor	R / W
0xF00C	External parameter	-	Word	-	-
0xF00D	Base current	%	Byte	-	-
0xF00E	Duty cycle	%	Byte	-	-
0xF00F	Wire speed cold wire	m/min	10 Bit	-	-
0xF010	External wirefeeder Wirefeed speed actual value	m/min	Word	-	-
0xF011	External wirefeeder Main error	-	Byte	-	-
0xF012	External wirefeeder Sub error	-	Byte	-	-
0xF013	External wirefeeder Bit 0 External wirefeeder enable Bit 1-15 Reserved	- -	Boolean -	- -	- -

  

Pulse range selection	Bit 6	Bit 5	Bit 4
Set pulse range on power source	0	0	0
Pulse setting range deactivated	0	0	1
0,2 - 2 Hz	0	1	0
2 - 20 Hz	0	1	1
20 - 200 Hz	1	0	0
200 - 2000 Hz	1	0	1

**Process data  
from power  
source to controller (0xF100 –  
0xF1FF)**

Address	Description	Unit	Type	Factor	R / W
0xF100	Status Flag Group 1 Bit 0 Modbus timeout Bit 2-15 Reserved	ms -	Boolean Boolean	- -	- -
0xF101	Status Flag Group 2 Bit 0 Communication ready Bit 1 Power source ready Bit 2 Arc stable Bit 3 Process active Bit 4 Main current signal Bit 5 Torch collision protection Bit 6 Reserved Bit 7 Wire available (cold wire) Bit 8 Reserved Bit 9 Reserved Bit 10 Reserved Bit 11 Reserved Bit 12 Reserved Bit 13 High frequency active Bit 14 Pulse high Bit 15 Reserved	- - - - - - - - - - - - - - - -	Boolean Boolean Boolean Boolean Boolean Boolean - Boolean - - - - Boolean Boolean -	- - - - - - - - - - - - - - - -	- - - - - - - - - - - - - - - -
0xF102	Status Flag Group 3 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF103	Status Flag Group 4 Bit 0 - 15 Reserved	-	-	-	-
0xF104	Status Flag Group 5 Bit 0 - 15 Reserved	-	-	-	-
0xF105	Status Flag Group 6 Bit 0 - 15 Reserved	-	-	-	-

**Process data  
from power  
source to controller (0xF100 –  
0xF1FF)**  
(continued)

Address	Description	Unit	Type	Factor	R / W
0xF106	Status Flag Group 7 Bit 0 - 15 Reserved	-	-	-	-
0xF107	Device SubError	-	Byte	-	r
0xF108	Main error number	-	Word	-	-
0xF109	Reserved	-	-	-	-
0xF10A	Welding voltage	V	Word	-	-
0xF10B	Welding current	A	Word	-	-
0xF10C	Motor current (cold wire)	A	Word	-	-
0xF10D	Reserved				
0xF10E	Arc length actual value (AVC)	V	Byte	-	-
0xF10F	Reserved	-	-	-	-
0xF110	Wire speed (cold wire)	m/min	Word	-	-
0xF111	External wirefeeder Wirefeed speed command value	m/min	Word	-	-
0xF112	External wirefeeder Wirefeed speed ramp value	15m/min/s	Word	-	-



# Modbus UDP - Process image for CC/CV

Process data  
from controller to  
power source  
(0xF000 –  
0xF0FF)

Address	Description	Unit	Type	Factor	R / W
0xF000	Control Flag Group 1 Bit 0 - 7 Timeout Lifecycle Bit 8 - 15 Reserved	ms -	Byte -	10 -	- -
0xF001	Control Flag Group 2 Bit 0 Welding start Bit 1 Robot ready Bit 2 Source error reset Bit 3 Gas test Bit 4 Wire inching Bit 5 Wire retract Bit 6 Torch blow out Bit 7 Welding simulation Bit 8 Touch sensing Bit 9 Master selection Twin Bit 10-15 Reserved	- - - - - - - - - - -	Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean -	- - - - - - - - - - -	- - - - - - - - - - -
0xF002	Control Flag Group 3 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF003	Control Flag Group 4 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF004	Control Flag Group 5 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF005	Control Flag Group 6 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF006	Control Flag Group 7 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF007	Control Flag Group 8 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF008	Operating mode 0 MIG/MAG standard synergic welding 1 MIG/MAG pulse synergic welding 2 Job mode 3 Parameter selection internal 4 MIG/MAG standard manual welding 5 CC/CV 6 TIG welding 7 CMT 8 Special process: manual standard 9 Special process: manual pulse	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	r/w r/w r/w r/w r/w r/w r/w r/w r/w r/w
0xF009	Job number	-	Byte	-	-
0xF00A	Reserved	-	-	-	-
0xF00B	Welding current	A	Word	-	-
0xF00C	Wire feed speed	m/min	Word	-	-
0xF00D	Welding voltage	V	Byte	-	-
0xF00E	Reserved	-	-	-	-
0xF00F	Reserved	-	-	-	-
0xF010	External wirefeeder Wirefeed speed actual value	m/min	Word	-	-
0xF011	External wirefeeder Main error	-	Byte	-	-

**Process data  
from controller to  
power source  
(0xF000 –  
0xF0FF)  
(continued)**

Address	Description	Unit	Type	Factor	R / W
0xF012	External wirefeeder Sub error	-	Byte	-	-
0xF013	External wirefeeder Bit 0 External wirefeeder enable Bit 1-15 Reserved	-	Boolean	-	-

**Process data  
from power  
source to cont-  
roller (0xF100 –  
0xF1FF)**

Address	Description	Unit	Type	Factor	R / W
0xF100	Status Flag Group 1 Bit 0 Modbus timeout Bit 2 - 15 Reserved	ms -	Boolean Boolean	- -	- -
0xF101	Status Flag Group 2 Bit 0 Communication ready Bit 1 Power source ready Bit 2 Arc stable Bit 3 Process active Bit 4 Main current signal Bit 5 Torch collision protection Bit 6 Wire stick control Bit 7 Wire available Bit 8 Shortcircuit timeout Bit 9 Power out of range Bit 10 Robot access Bit 11 Data documentation ready Bit 12 Limit signal Bit 13-15 Reserved	- - - - - - - - - - - - -	Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean -	- - - - - - - - - - - -	- - - - - - - - - - - -
0xF102	Status Flag Group 3 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF103	Status Flag Group 4 Bit 0 - 15 Reserved	-	-	-	-
0xF104	Status Flag Group 5 Bit 0 - 15 Reserved	-	-	-	-
0xF105	Status Flag Group 6 Bit 0 - 15 Reserved	-	-	-	-
0xF106	Status Flag Group 7 Bit 0 - 15 Reserved	-	-	-	-
0xF107	Device SubError	-	Byte	-	r
0xF108	Main error number		Word		
0xF109	Reserved	-	-	-	-
0xF10A	Welding voltage	V	Word		
0xF10B	Welding current	A	Word		
0xF10C	Motor current	A	Word		
0xF10D	Reserved	-	-	-	-
0xF10E	Reserved	-	-	-	-
0xF10F	Reserved	-	-	-	-
0xF110	Wire speed	m/min	Word	-	-
0xF111	External wirefeeder Wirefeed speed command value	m/min	Word	-	-
0xF112	External wirefeeder Wirefeed speed ramp value	15m/min/s	Word	-	-

# Modbus UDP - Process image for MIG/MAG standard manual

Process data  
from controller to  
power source  
(0xF000 –  
0xF0FF)

Address	Description	Unit	Type	Factor	R / W
0xF000	Control Flag Group 1 Bit 0-7 Timeout Lifecycle Bit 8-15 Reserved	ms - -	Byte - -	10 - -	- - -
0xF001	Control Flag Group 2 Bit 0 Welding start Bit 1 Robot ready Bit 2 Source error reset Bit 3 Gas test Bit 4 Wire inching Bit 5 Wire retract Bit 6 Torch blow out Bit 7 Welding simulation Bit 8 Touch sensing Bit 9 Master selection Twin Bit 10 Reserved Bit 11 Reserved Bit 12 Dynamik correction disable Bit 13 Burn back correction disable Bit 14 Power full range Bit 15 Reserved	- - - - - - - - - - - - - - - -	Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean - - Boolean Boolean Boolean -	- - - - - - - - - - - - - - -	- - - - - - - - - - - - - - -
0xF002	Control Flag Group 3 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF003	Control Flag Group 4 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF004	Control Flag Group 5 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF005	Control Flag Group 6 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF006	Control Flag Group 7 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF007	Control Flag Group 8 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF008	Operating mode 0 MIG/MAG standard synergic welding 1 MIG/MAG pulse synergic welding 2 Job mode 3 Parameter selection internal 4 MIG/MAG standard manual welding 5 CC/CV 6 TIG welding 7 CMT 8 Special process: manual standard 9 Special process: manual pulse	- - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - -	r/w r/w r/w r/w r/w r/w r/w r/w r/w r/w
0xF009	Reserved	-	-	-	-
0xF00A	Program number	-	Byte	-	-
0xF00B	Wire speed	m/min	Word	-	-
0xF00C	Welding voltage	V	Word	-	-
0xF00D	Dynamik correction	%	Byte	-	-
0xF00E	Burn back correction	ms	Byte	-	-

**Process data  
from controller to  
power source  
(0xF000 –  
0xF0FF)  
(continued)**

Address	Description	Unit	Type	Factor	R / W
0xF00F	Reserved	-	-	-	-
0xF010	External wirefeeder Wirefeed speed actual value	m/min	Word	-	-
0xF011	External wirefeeder Main error	-	Byte	-	-
0xF012	External wirefeeder Sub error	-	Byte	-	-
0xF013	External wirefeeder Bit 0 External wirefeeder enable Bit 1-15 Reserved	- -	Boolean -	- -	- -

**Process data  
from power  
source to cont-  
roller (0xF100 –  
0xF1FF)**

Address	Description	Unit	Type	Factor	R / W
0xF100	Status Flag Group 1 Bit 0 Modbus timeout Bit 2-15 Reserved	ms -	Boolean Boolean	- -	- -
0xF101	Status Flag Group 2 Bit 0 Communication ready Bit 1 Power source ready Bit 2 Arc stable Bit 3 Process active Bit 4 Main current signal Bit 5 Torch collision protection Bit 6 Wire stick control Bit 7 Wire available Bit 8 Shortcircuit timeout Bit 9 Power out of range Bit 10 Robot access Bit 11 Data documentation ready Bit 12 Limit signal Bit 13-15 Reserved	- - - - - - - - - - - - -	Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean Boolean -	- - - - - - - - - - - -	- - - - - - - - - - - -
0xF102	Status Flag Group 3 Bit 0 - 15 Reserved	-	Boolean	-	-
0xF103	Status Flag Group 4 Bit 0 - 15 Reserved	-	-	-	-
0xF104	Status Flag Group 5 Bit 0 - 15 Reserved	-	-	-	-
0xF105	Status Flag Group 6 Bit 0 - 15 Reserved	-	-	-	-
0xF106	Status Flag Group 7 Bit 0 - 15 Reserved	-	-	-	-
0xF107	Device SubError	-	Byte	-	r
0xF108	Main error number	-	Word	-	-
0xF109	Reserved	-	-	-	-
0xF10A	Welding voltage	V	Word	-	-
0xF10B	Welding current	A	Word	-	-
0xF10C	Motor current	A	Word	-	-
0xF10D	Reserved	-	-	-	-
0xF10E	Reserved	-	-	-	-
0xF10F	Reserved	-	-	-	-
0xF110	Wire speed	m/min	Word	-	-

**Process data  
from power  
source to controller (0xF100 –  
0xF1FF)**  
(continued)

<b>Address</b>	<b>Description</b>	<b>Unit</b>	<b>Type</b>	<b>Factor</b>	<b>R / W</b>
0xF111	External wirefeeder Wirefeed speed command value	m/min	Word	-	-
0xF112	External wirefeeder Wirefeed speed ramp value	15m/min/s	Word	-	-

# Special data

## Generic

Address	Description	Read	Write	Unit	Type	Factor
E000	Main error	TRUE	FALSE	-	Word	1
E001	Sub error	TRUE	FALSE	-	Word	1
E002	Status Flag	TRUE	FALSE	-	Word	1
	0 main current	-	-	-	-	-
	1 cooler	-	-	-	-	-
	2 fan 1	-	-	-	-	-
	3 gas 1	-	-	-	-	-
	4 cooler sensor	-	-	-	-	-
	5 process run	-	-	-	-	-
	6 process act	-	-	-	-	-
	7 wf started	-	-	-	-	-
	8 weld start	-	-	-	-	-
	9 inching	-	-	-	-	-
	10 gas test	-	-	-	-	-
	11 keylock	-	-	-	-	-
	12 UST-fan	-	-	-	-	-
	13 current flow	-	-	-	-	-
	14 started up	-	-	-	-	-
	15 hold	-	-	-	-	-
E003	Status Flag	TRUE	FALSE	-	Word	1
	0 DC+ enable	-	-	-	-	-
	1 Needle OVL	-	-	-	-	-
	2 is 3 phase machine	-	-	-	-	-
	3 is Magic Wave	-	-	-	-	-
	4 is TIG	-	-	-	-	-
E004	reserved	TRUE	FALSE	-	Word	1
E005	Job number	TRUE	TRUE	-	Word	1
E007	Push pull unit [PPU]	TRUE	TRUE	-	Word	1
E008	Operating mode	TRUE	TRUE	-	Word	1
	0 MIG/MAG standard synergic welding	-	-	-	-	-
	1 MIG/MAG pulse synergic welding	-	-	-	-	-
	2 Stick *	-	-	-	-	-
	3 TIG welding	-	-	-	-	-
	4 Job mode	-	-	-	-	-
	5 MIG/MAG standard manual welding	-	-	-	-	-
	6 CC / CV	-	-	-	-	-
	7 CMT / special process	-	-	-	-	-
	8 Unused	-	-	-	-	-
	9 Special process: manual standard	-	-	-	-	-
	10 Special process: manual pulse	-	-	-	-	-
	255 Invalid	-	-	-	-	-
E009	Cooler-flow	TRUE	FALSE	l/min	Word	0,001
E00A	Cooler filter time [C-t]	TRUE	TRUE	s	Word	1
E078	Powermaster setting [P-C]	TRUE	TRUE	-	Boolean	1
E0A2	Key lock	TRUE	TRUE	-	Word	1
	0 unlocked	-	-	-	-	-
	1 locked	-	-	-	-	-

**Generic**  
(continued)

Address	Description	Read	Write	Unit	Type	Factor
E0AC	Hourmeter currentflow lowward	TRUE	FALSE	Min	Word	0,1
E0AD	Hourmeter currentflow highward	TRUE	FALSE	Min	Word	0,1
E0AE	Hourmeter total lowward	TRUE	FALSE	Min	Word	0,1
E0AF	Hourmeter total highward	TRUE	FALSE	Min	Word	0,1
E0B0	Write 0x78E3 for factory-command-unlock	FALSE	TRUE	-	Integer	1
E0B1	Write 0x56AA for factory-command; unlock and command have to be set at the same time	FALSE	TRUE	-	Integer	1
E0B2	Result of factory-command	TRUE	FALSE	-	Integer	1
	0 Factory command never started	-	-	-	-	-
	1 OK	-	-	-	-	-
	2 unlock was written, but no command	-	-	-	-	-
	3 unlock OK, but command not	-	-	-	-	-
	4 unlock was wrong	-	-	-	-	-
E0B3	Write 0x65F7 for RL-adjust-command-unlock	FALSE	TRUE	-	Integer	1
E0B4	Write 0x3FEA for RL-adjust-command; unlock and command have to be set at the same time	FALSE	TRUE	-	Integer	1
E0B5	Result of RL-adjust-command	TRUE	FALSE	-	Integer	1
	0 RL-adjust command never started	-	-	-	-	-
	1 OK	-	-	-	-	-
	2 unlock was written, but no command	-	-	-	-	-
	3 unlock OK, but command not	-	-	-	-	-
	4 unlock was wrong	-	-	-	-	-
	5 test is running	-	-	-	-	-
	6 command cannot be started	-	-	-	-	-
E0B6	RL-adjust error	TRUE	FALSE	-	Integer	1
E0B7	Write 0x7BC3 for PPU-adjust-command-unlock	FALSE	TRUE	-	Integer	1
E0B8	Write for PPU-adjust-command; unlock and command have to be in the same message Bit [7...0] Testnumber Valid are: 0 = Test1, 1 = Test2 Bit8 0 = Stop Test, 1 = Start Test	FALSE	TRUE	-	Integer	1
E0B9	Result of PPU-adjust-command	TRUE	FALSE	-	Integer	1
	0 PPU-adjust command never started	-	-	-	-	-
	1 OK	-	-	-	-	-
	2 unlock was written, but no command	-	-	-	-	-
	3 unlock OK, but command not	-	-	-	-	-
	4 unlock was wrong	-	-	-	-	-
	5 test is running	-	-	-	-	-
	6 command cannot be started	-	-	-	-	-

**Generic**  
(continued)

Address	Description	Read	Write	Unit	Type	Factor
E0BA	PPU-adjust error	TRUE	FALSE	-	Integer	1
E0BB	Logical PPU-min (PPU-min = PPU-max = 255 means no PPU adjustment possible !)	TRUE	FALSE	-	Word	1
E0BC	Logical PPU-max (PPU-min = PPU-max = 255 means no PPU adjustment possible !)	TRUE	FALSE	-	Word	1
E0BD	Logical PPU, can be adjusted in the range logical-PPU-min to logical-PPU-max	TRUE	TRUE	-	Word	1
E0BE	This is the real PPU-number, generated out of the logical PPU-number	TRUE	FALSE	-	Word	1
E0C4	Error-Quit	FALSE	TRUE	-	Boolean	1
E0C5	Enable / Disable synergic calculation; disable this, before you start to transmit a manual data; enable it, after the transmission. This ensure synchron calculation	TRUE	TRUE	-	Boolean	1
E0C6	Device suberror	TRUE	FALSE	-	Word	1
E0C8	Inch mode	TRUE	TRUE	-	Boolean	1
E0C9	R-result of RL-adjustment	TRUE	FALSE	mOhm	Word	0,1
E0CA	L-result of RL-adjustment	TRUE	FALSE	μH	Word	0,01
E0CB	Clear Hold	TRUE	TRUE	-	Boolean	1
E0CD	Frontpanel Type	TRUE	FALSE	-	Word	1
	0 None	-	-	-	-	-
	1 Normal	-	-	-	-	-
	2 CMT-Version	-	-	-	-	-
	3 US-Version	-	-	-	-	-
	4 RCU 5000i	-	-	-	-	-
	255 Other	-	-	-	-	-

**MIG/MAG**

Address	Description	Read	Write	Unit	Type	Factor
E00B	Wirespeed	TRUE	TRUE	m/min	Integer	0,01
E00C	Arc length correction	TRUE	TRUE	%	Integer	0,1
E00D	Dynamic/Pulse correction	TRUE	TRUE	-	Integer	0,01
E00E	Burnback correction [bbc]	TRUE	TRUE	-	Integer	0,1
E00F	Gas command value	TRUE	TRUE	l	Integer	0,01
E010	Gas factor	TRUE	TRUE	-	Integer	0,1
E011	Gas preflow [Gpr]	TRUE	TRUE	s	Word	0,001
E012	Gas postflow [Gpo]	TRUE	TRUE	s	Word	0,001
E013	Inching speed [Fdi]	TRUE	TRUE	m/min	Word	0,01
E014	Softstart [Fdc]	TRUE	TRUE	m/min	Integer	0,01
E015	Power offset [dFd]	TRUE	TRUE	m/min	Integer	0,01
E016	SynchroPuls [F]	TRUE	TRUE	Hz	Word	0,1
E017	Cooling unit cut-out [C-C]	TRUE	TRUE	-	Word	1
E018	Wire stick [Stc]	TRUE	TRUE	-	Boolean	1



**MIG/MAG**  
(continued)

Address	Description	Read	Write	Unit	Type	Factor
E019	Ignition timeout [Ito]	TRUE	TRUE	s	Word	1
E01A	Arc break watchdog [Arc]	TRUE	TRUE	s	Word	0,01
E01B	4 TT option [S4t]	TRUE	TRUE	-	Word	1
E01C	Jobmaster special mode [Gun]	TRUE	TRUE	-	Word	1
E01D	Start current [I-S]	TRUE	TRUE	%	Word	0,1
E01E	Start time [t-S]	TRUE	TRUE	s	Word	0,1
E01F	Slope [SL]	TRUE	TRUE	s	Word	0,001
E020	End current [I-E]	TRUE	TRUE	%	Word	0,1
E021	End time [t-E]	TRUE	TRUE	s	Word	0,1
E022	Spot time [SPt]	TRUE	TRUE	s	Word	0,001
E023	Characteristic reference (high)	TRUE	TRUE	-	Word	1
E024	Characteristic reference (low)	TRUE	TRUE	-	Word	1
E025	Gun mode	TRUE	TRUE		Word	1
	0 2-step	-	-	-	-	-
	1 4-step	-	-	-	-	-
	2 special-4-step	-	-	-	-	-
	3 spotwelding	-	-	-	-	-
E026	Welding-circuit resistance MIG	TRUE	TRUE	mOhm	Word	0,1
E027	Voltage guide value MIG/MAG	TRUE	FALSE	V	Integer	0,01
E028	Current guide value MIG/MAG	TRUE	FALSE	A	Integer	0,1
E029	Sheet thickness parameter	TRUE	FALSE	mm	Word	0,01
E0C0	Welding-circuit MIG inductance	TRUE	FALSE	μH	Word	0,01
E0C7	Arc length correction 2	TRUE	TRUE	%	Integer	0,1

**Manually**

Address	Description	Read	Write	Unit	Type	Factor
E02A	Wirespeed	TRUE	TRUE	m/min	Integer	0,01
E02B	Voltage parameter manually	TRUE	TRUE	V	Integer	0,01
E02C	Dynamic parameter manually	TRUE	TRUE	-	Word	0,01

**CC/CV-mode**

Address	Description	Read	Write	Unit	Type	Factor
E02D	CC/CV-vD	TRUE	TRUE	m/min	Integer	0,01
E02E	CC/CV-I	TRUE	TRUE	A	Integer	0,1
E02F	CC/CV-U	TRUE	TRUE	V	Integer	0,01
E030	Inching speed [Fdi]	TRUE	TRUE	m/min	Word	0,01
E031	Gas command value [GAS]	TRUE	TRUE	l	Integer	0,01
E032	Gas factor [Cor]	TRUE	TRUE	-	Word	0,1

**Stick  
(Rod electrode  
welding / MMA)**

Address	Description	Read	Write	Unit	Type	Factor
E033	Current parameter stick	TRUE	TRUE	A	Integer	0,1
E034	Dynamic parameter stick	TRUE	TRUE	-	Integer	0,1
E035	Electrode line [ElN]	TRUE	TRUE	-	Word	0,01
E036	Hot current time [Hti]	TRUE	TRUE	-	Word	0,001
E037	Hot start current [HCU]	TRUE	TRUE	%	Word	0,1

**Stick  
(Rod electrode  
welding / MMA)**  
(continued)

Address	Description	Read	Write	Unit	Type	Factor
E038	Antistick [Ast]	TRUE	TRUE	-	Boolean	1
E039	Voltage cut off [Uco]	TRUE	TRUE	V	Integer	0,01
E03A	Balance [bAL]	TRUE	TRUE	-	Integer	0,1
E03B	AC mode stick	TRUE	TRUE		Word	1
	0 AC	-	-	-	-	-
	1 DC-minus	-	-	-	-	-
	2 DC-plus	-	-	-	-	-
	255 invalid	-	-	-	-	-
E03C	AC frequency [ACF]	TRUE	TRUE	Hz	Word	0,1
E0C1	Welding-circuit resistance stick	TRUE	TRUE	mOhm	Word	0,1
E0C3	Welding-circuit inductance stick	TRUE	FALSE	μH	Word	0,01

**TIG**

Address	Description	Read	Write	Unit	Type	Factor
E03D	Current parameter TIG	TRUE	TRUE	A	Integer	0,1
E03E	Start current [I-S]	TRUE	TRUE	%	Word	1
E03F	Upslope time [UPS]	TRUE	TRUE	s	Word	0,01
E040	Reduced current [I-2]	TRUE	TRUE	%	Word	1
E041	Downslope time [dSL]	TRUE	TRUE	s	Word	0,01
E042	End current [I-E]	TRUE	TRUE	%	Word	1
E043	Start time [t-S]	TRUE	TRUE	s	Word	0,01
E044	End time [t-E]	TRUE	TRUE	s	Word	0,01
E045	AC mode TIG	TRUE	TRUE	-	Word	1
	0 AC	-	-	-	-	-
	1 DC-minus	-	-	-	-	-
	2 DC-plus	-	-	-	-	-
	255 invalid	-	-	-	-	-
E046	AC frequency [ACF]	TRUE	TRUE	Hz	Word	0,1
E047	Balance [bAL]	TRUE	TRUE	-	Integer	0,1
E048	Positive waveform [pos]	TRUE	TRUE	-	Word	1
E049	Negative wave form [nEG]	TRUE	TRUE	-	Word	1
E04A	Pulse frequency [F-P]	TRUE	TRUE	Hz	Word	0,01
E04B	Pulse frequency [F-P]	TRUE	TRUE	Hz	Word	1
E04C	Dutycycle [dcY]	TRUE	TRUE	-	Word	1
E04D	Background current [I-G]	TRUE	TRUE	%	Word	1
E04E	Gas preflow [GPr]	TRUE	TRUE	s	Word	0,1
E04F	Gas postflow high [G-H]	TRUE	TRUE	s	Word	0,1
E050	Gas postflow low [G-L]	TRUE	TRUE	s	Word	0,1
E051	Gas command value [GAS]	TRUE	TRUE	l	Integer	0,01
E052	Gas factor [Cor]	TRUE	TRUE	-	Integer	0,1
E053	Tacking time [tAC]	TRUE	TRUE	s	Word	0,1
E054	Needle diameter [Eld]	TRUE	TRUE	mm	Word	0,1
E055	Guntrigger mode	TRUE	TRUE	-	Word	1
	0 2-step	-	-	-	-	-
	1 4-step	-	-	-	-	-
E056	Spot time [SPt]	TRUE	TRUE	s	Word	0,01
E057	Standard-TIG cooling unit cut-out [C-C]	TRUE	TRUE	-	Word	1
E058	Calotte	TRUE	TRUE	-	Boolean	1

**TIG**  
(continued)

Address	Description	Read	Write	Unit	Type	Factor
E059	Comfort Stop Senesitivity [CSS]	TRUE	TRUE	V	Integer	0,01
E05A	Ignition timeout [Ito]	TRUE	TRUE	s	Word	0,1
E05B	Arc break watchdog [Arc]	TRUE	TRUE	s	Word	0,1
E05C	Special 4-step [SFS]	TRUE	TRUE	-	Word	1
E05D	External parameter [E-P]	TRUE	TRUE	-	Word	1
E05E	Phase [PHA] only available on 3-phase powersources!	TRUE	TRUE	-	Word	1
E05F	Reverse polarity ignition [rPi]	TRUE	TRUE	-	Boolean	1
E060	HF-time	TRUE	TRUE	ms	Word	1
E061	Welding-circuit TIG resistance	TRUE	TRUE	mOhm	Word	0,1
E062	Feeder 1 [Fd.1]	TRUE	TRUE	m/min	Integer	0,01
E063	Feeder 2 [Fd.2]	TRUE	TRUE	%	Word	1
E064	Inching speed [Fdi]	TRUE	TRUE	m/min	Word	0,01
E065	Feeder-delay 1 [dt1]	TRUE	TRUE	s	Word	0,1
E066	Feeder-delay 2 [dt2]	TRUE	TRUE	s	Word	0,1
E067	Feeder back [Fdb]	TRUE	TRUE	mm	Word	1
E09F	Pre-HF-time	TRUE	TRUE	s	Word	0,1
E0A0	Spezial-2-step	TRUE	TRUE	-	Word	1
E0AB	Gas purge	TRUE	TRUE	-	Word	1
E0C2	Welding-circuit TIG inductance	TRUE	FALSE	μH	Word	0,01
E0CC	IOFFSET [Io]	TRUE	TRUE	A	Integer	1

**Real Values**

Address	Description	Read	Write	Unit	Type	Factor
E068	Actual welding time	TRUE	FALSE	s	Word	0,1
E069	Pulse-synchron sliding window for TIG-current	TRUE	FALSE	A	Integer	0,1
E06A	Pulse-synchron sliding window for TIG-voltage	TRUE	FALSE	V	Integer	0,01
E06B	Current at end of pulse	TRUE	FALSE	A	Integer	0,1
E06C	Voltage at end of pulse	TRUE	FALSE	V	Integer	0,01
E06D	Current at end of ground-phase	TRUE	FALSE	A	Integer	0,1
E06E	Voltage at end of ground-phase	TRUE	FALSE	V	Integer	0,01
E06F	Real value arc length	TRUE	FALSE	V	Integer	0,01
E070	Real value voltage	TRUE	FALSE	V	Integer	0,01
E071	Real value current	TRUE	FALSE	A	Integer	0,1
E079	Current mean value of neg. wave	TRUE	FALSE	A	Integer	0,1
E07A	Voltage mean value of neg. wave	TRUE	FALSE	V	Integer	0,01
E0BF	Real value gas	TRUE	FALSE	ml	Integer	1

**Limits**

Address	Description	Read	Write	Unit	Type	Factor
E072	Min. feeder-value	TRUE	FALSE	m/min	Integer	0,01
E073	Max. feeder-value	TRUE	FALSE	m/min	Integer	0,01
E074	Min. voltage command value	TRUE	FALSE	V	Integer	0,01

**Limits**  
(continued)

Address	Description	Read	Write	Unit	Type	Factor
E075	Max. voltage command value	TRUE	FALSE	V	Integer	0,01
E076	Min. current command value	TRUE	FALSE	A	Integer	0,1
E077	Max. current command value	TRUE	FALSE	A	Integer	0,1
E0A9	Min. Eld value	TRUE	FALSE	mm	Word	0,1
E0AA	Max. Eld-value	TRUE	FALSE	mm	Word	0,1

**Special process:  
MIG/MAG manual  
standard**

Address	Description	Read	Write	Unit	Type	Factor
E07B	Feeder creep speed	TRUE	TRUE	m/min	Integer	0,01
E07C	Ignition current	TRUE	TRUE	A	Integer	0,1
E07D	Ignition current time	TRUE	TRUE	ms	Word	0,01
E07E	Wirefeed speed	TRUE	TRUE	m/min	Integer	0,01
E07F	Background current	TRUE	TRUE	A	Integer	0,1
E080	Voltage command value	TRUE	TRUE	V	Integer	0,01
E081	Characteristic slope	TRUE	TRUE	$\mu$ Ohm	Word	1
E082	Special dynamic	TRUE	TRUE	-	Word	1
E083	Current decrease	TRUE	TRUE	-	Word	1
E084	Current rise	TRUE	TRUE	-	Word	1
E085	Burn back time	TRUE	TRUE	s	Word	0,01
E086	Burn back pulse time	TRUE	TRUE	ms	Word	0,01
E087	Burn back pulsing current	TRUE	TRUE	A	Integer	0,1

**Special process:  
MIG/MAG manual  
pulse**

Address	Description	Read	Write	Unit	Type	Factor
E088	Feeder creep speed	TRUE	TRUE	m/min	Integer	0,01
E089	Ignition current	TRUE	TRUE	A	Integer	0,1
E08A	Ignition current time	TRUE	TRUE	ms	Word	0,01
E08B	Base current	TRUE	TRUE	A	Integer	0,1
E08C	Current rise	TRUE	TRUE	A/ms	Word	0,1
E08D	Current rise tau	TRUE	TRUE	ms	Word	0,01
E08E	Pulsing current	TRUE	TRUE	A	Integer	0,1
E08F	Pulsing current time	TRUE	TRUE	ms	Word	0,01
E090	Current decrease	TRUE	TRUE	A/ms	Word	0,1
E091	Current drop tau	TRUE	TRUE	ms	Word	0,01
E092	Droplet detachment current	TRUE	TRUE	A	Integer	0,1
E093	Droplet detachment time	TRUE	TRUE	ms	Word	0,01
E094	Pulsing frequency	TRUE	TRUE	Hz	Word	0,1
E095	Wirefeed speed	TRUE	TRUE	m/min	Integer	0,01
E096	Voltage command value	TRUE	TRUE	V	Integer	0,01
E097	Fact I_b_control_pi	TRUE	TRUE	%	Word	0,01
E098	Fact I_p1_control_pi	TRUE	TRUE	%	Word	0,01
E099	Fact f_control_p	TRUE	TRUE	%	Word	0,01
E09A	Fact I_b_correction	TRUE	TRUE	%	Word	0,01
E09B	Fact I_p1_correction	TRUE	TRUE	%	Word	0,01
E09C	Fact f_correction	TRUE	TRUE	%	Word	0,01

**Special process:  
MIG/MAG manual  
pulse**  
(continued)

<b>Address</b>	<b>Description</b>	<b>Read</b>	<b>Write</b>	<b>Unit</b>	<b>Type</b>	<b>Factor</b>
E09D	Current rise sc	TRUE	TRUE	A/ms	Word	0,1
E09E	Burn back time	TRUE	TRUE	s	Word	0,01
E0A1	Regulator output	TRUE	FALSE	-	Integer	1

**Pilot Plasma**

<b>Address</b>	<b>Description</b>	<b>Read</b>	<b>Write</b>	<b>Unit</b>	<b>Type</b>	<b>Factor</b>
E0A3	Gas preflow [GPr]	TRUE	TRUE	s	Word	0,001
E0A4	Gas postflow [GPo]	TRUE	TRUE	s	Word	0,001
E0A5	Gas command value [GAS]	TRUE	TRUE	l	Integer	0,01
E0A6	Gas factor [Cor]	TRUE	TRUE	-	Word	0,1
E0A7	Pre-/Post Gas command value [GPA]	TRUE	TRUE	l	Integer	0,01
E0A8	Pilot current	TRUE	TRUE	A	Integer	0,1

# TAG Table

Adress	Description	Read	Write	Group	Unit	Type	Factor
E000	Main error	True	False	Generic		Word	1
E001	Sub error	True	False	Generic		Word	1
E002	Status Flag Bit 0 maincurrent Bit 1 cooler Bit 2 fan1 Bit 3 gas1 Bit 4 coolersensor Bit 5 processrun Bit 6 processact Bit 7 wf started Bit 8 weldstart Bit 9 inching Bit 10 gastest Bit 11 keylock Bit 12 UST-fan Bit 13 currentflow Bit 14 started up Bit 15 hold	True	False	Generic		Word	1
E003	Status Flag Bit 0 1=DC+ enable Bit 1 1=Needle OVL Bit 2 1=3 phase machine Bit 3 1=Magic Wave Bit 4 1=TIG Bit 5 1=I-RV-display Bit 6 1=U-RV-display Bit 7 1=Fd-RV-display Bit 8 1=enable jobchange Bit 9 1=par.-select.-int. Bit 10 1=Touchsensing active	True	False	Generic		Word	1
E004	Reserved	True	False	Generic		Word	1
E005	Jobnumber	True	True	Generic		Word	1
E007	Push pull unit [PPU]	True	True	Generic		Word	1
E008	Operatring mode 0 MIG Standard 1 MIG Pulse 2 Stick 3 TIG 4 Job mode 5 Manual mode 6 CC/CV 7 CMT special mode 8 Unused 9 Manual standard 10 Manual puls 255 Invalid	True	True	Generic		Word	1
E009	Coolerflow	True	False	Generic	l/min	Word	0,001
E00A	Cooler filtertime [C-t]	True	True	Generic	s	Word	1
E078	Powermaster-setting [P-C]	True	True	Generic		Boolean	1

Adress	Description	Read	Write	Group	Unit	Type	Factor
E0A2	Key lock 0 unlocked 1 locked	True	True	Generic		Word	1
E0AC	Hourmeter currentflow low-word	True	False	Generic	Min	Word	0,1
E0AD	Hourmeter currentflow high-word	True	False	Generic	Min	Word	0,1
E0AE	Hourmeter total low-word	True	False	Generic	Min	Word	0,1
E0AF	Hourmeter total high-word	True	False	Generic	Min	Word	0,1
E0B0	Write 0x78E3 for factory-command-unlock	False	True	Generic		Integer	1
E0B1	Write 0x56AA for factory-command, unlock and command have to set at the same message	False	True	Generic		Integer	1
E0B2	Result of factory-command 0 Factory-command never started 1 OK 2 unlock was written, but no command 3 unlock OK, but command not 4 unlock was wrong	True	False	Generic		Integer	1
E0B3	Write 0x65F7 for RL-adjust-command-unlock	False	True	Generic		Integer	1
E0B4	Write 0x3FEA for RL-adjust-command, unlock and command have to set at the same message	False	True	Generic		Integer	1
E0B5	Result of RL-adjustment-command 0 RL-adjustment-command never started 1 OK 2 unlock was written, but no command 3 unlock OK, but command not 4 unlock was wrong 5 test is running 6 command cannot be started	True	False	Generic		Integer	1
E0B6	RL-adjust error	True	False	Generic		Integer	1
E0B7	Write 0x7BC3 for PPU-adjust-command-unlock	False	True	Generic		Integer	1
E0B8	Write for PPU-adjust-command, unlock and command have to be in the same message Bit[7....0] Testnumber Valid are 0 = Test1 1 = Test2 Bit8 0 = Stop Test 1 = Start Test	False	True	Generic		Integer	1

Adress	Description	Read	Write	Group	Unit	Type	Factor
E0B9	Result of PPU-adjust-command 0 PPU-adjustment-command never started 1 OK 2 unlock was written, but no command 3 unlock OK, but command not 4 unlock was wrong 5 test is running 6 command cannot be started	True	False	Generic		Integer	1
E0BA	PPU-adjust error	True	False	Generic		Integer	1
E0BB	Logical PPU-min (PPU-min = PPU-max==255 means no PPU adjustment possible!)	True	False	Generic		Word	1
E0BC	Logical PPU-max (PPU-min = PPU-max==255 means no PPU adjustment possible!)	True	False	Generic		Word	1
E0BD	Logical PPU, can be adjusted in the range of logical-PPU-min to logical-PPU-max	True	True	Generic		Word	1
E0BE	This is the real PPU-number, generated out of the logical-PPU-number	True	False	Generic		Word	1
E0C4	Error-Quit	False	True	Generic		Boolean	1
E0C5	Enable / Disable synergic calculation - disable this before you start to transmit a manual data, enable it after the transmission. This ensures synchron calculation	True	True	Generic		Boolean	1
E0C6	Device suberror	True	False	Generic		Word	1
E0C8	Inch mode	True	True	Generic		Boolean	1
E0C9	R-result of RL-adjustment	True	False	Generic	mOhm	Word	0,1
E0CA	L-result of RL-adjustment	True	False	Generic	μH	Word	0,01
E0CB	Clear Hold	True	True	Generic		Boolean	1
E0CD	Frontpanel Type 0 None 1 Normal 2 CMT-Version 3 US-Version 4 RCU5000i 255 Other	True	False	Generic		Word	1
E0CE	Jobnumber for jobcorrection	True	True	Generic		Word	1
E0CF	Jobcorrection for TIG main current	True	True	Generic	A	Integer	0,1
E0D0	Jobcorrection-min for TIG main current	True	False	Generic	A	Integer	0,1
E0D1	Jobcorrection-max for TIG main current	True	False	Generic	A	Integer	0,1



Adress	Description	Read	Write	Group	Unit	Type	Factor
E0D5	Programmcode=process<<DM<< Mat Process      0=Puls 1=Standard 2=CMT Mat            0=SG2... 15=SP2 DM            0=0,8 mm 4=SP	True	True	Generic		Word	1
E0D6	Reference-number-high for position defined in Tag E0D5	True	False	Generic		Word	1
E0D7	Reference-number-high for position defined in Tag E0D5	True	False	Generic		Word	1
E0D8	low=data [0], high=data [1]	True	False	Generic		Word	1
E0D9	low=data [2], high=data [3]	True	False	Generic		Word	1
E0DA	low=data [4], high=data [5]	True	False	Generic		Word	1
E0DB	low=data [6], high=data [7]	True	False	Generic		Word	1
E0DC	virtual pointer to matlist beginning with 0.	True	True	Generic		Word	1
E0DD	size of matlist	True	False	Generic		Word	1
E0DE	0=matlist is not ready, !0=matlist is ready	True	False	Generic		Boolean	1
E00B	Wirespeed	True	True	MigMag	m/min	Integer	0,01
E00C	Arc length correction	True	True	MigMag	%	Integer	0,1
E00D	Dynamik/Puls correction	True	True	MigMag		Integer	0,01
E00E	Burnback correction [bbc]	True	True	MigMag		Integer	0,1
E00F	Gas commandvalue	True	True	MigMag	l	Integer	0,01
E010	Gasfactor	True	True	MigMag		Integer	0,1
E011	Gas preflow [Gpr]	True	True	MigMag	s	Word	0,001
E012	Gas postflow [Gpo]	True	True	MigMag	s	Word	0,001
E013	Inching speed [Fdi]	True	True	MigMag	m/min	Word	0,01
E014	Softstart [Fdc]	True	True	MigMag	m/min	Integer	0,01
E015	Power offset [dFd]	True	True	MigMag	m/min	Integer	0,01
E016	Synchropuls [F]	True	True	MigMag	Hz	Word	0,1
E017	Cooling unit cut-out [C-C]	True	True	MigMag		Word	1
E018	Wire stick [Stc]	True	True	MigMag		Boolean	1
E019	Ignition timeout [lto]	True	True	MigMag	s	Word	1
E01A	Arc break watchdog [Arc]	True	True	MigMag	s	Word	0,01
E01B	4 TT option [S4t]	True	True	MigMag		Word	1
E01C	Jobmaster special mode [Gun]	True	True	MigMag		Word	1
E01D	Start current [I-S]	True	True	MigMag	%	Word	0,1
E01E	Start time [t-S]	True	True	MigMag	s	Word	0,1
E01F	Slope [SL]	True	True	MigMag	s	Word	0,001
E020	End current [I-E]	True	True	MigMag	%	Word	0,1
E021	End time [t-E]	True	True	MigMag	s	Word	0,1
E022	Spot time [SPT]	True	True	MigMag	s	Word	0,001
E023	Characteristic reference (high)	True	True	MigMag		Word	1
E024	Characteristic reference (low)	True	True	MigMag		Word	1

Adress	Description	Read	Write	Group	Unit	Type	Factor
E025	Gun mode 0 2-step 1 4-step 2 special-4-step 3 spotwelding	True	True	MigMag		Word	1
E026	Welding-circuit resistance MIG	True	True	MigMag	mOhm	Word	0,1
E027	Voltage guide value MIG/MAG	True	False	MigMag	V	Integer	0,01
E028	Current guide value MIG/MAG	True	False	MigMag	A	Integer	0,1
E029	Sheet thickness parameter	True	False	MigMag	mm	Word	0,01
E0C0	Welding-circuit inductance MIG	True	False	MigMag	μH	Word	0,01
E0C7	Arc length correction 2 (AI2)	True	True	MigMag	%	Integer	0,1
E0E0	ALS	True	True	MigMag		Word	1
E0E1	ALt, 0=OFF, steps in 0,05s-units	True	True	MigMag	s	Word	0,05
E02A	Wirespeed	True	True	Manually	m/min	Integer	0,01
E02B	Voltageparameter manually	True	True	Manually	V	Integer	0,01
E02C	Dynamicparameter manually	True	True	Manually		Word	0,01
E02D	CC/CV-vD	True	True	CC_CV_mode	m/min	Integer	0,01
E02E	CC/CV-I	True	True	CC_CV_mode	A	Integer	0,1
E02F	CC/CV-U	True	True	CC_CV_mode	V	Integer	0,01
E030	Inching speed [Fdi]	True	True	CC_CV_mode	m/min	Word	0,01
E031	Gas commandvalue [GAS]	True	True	CC_CV_mode	l	Integer	0,01
E032	Gasfactor [Cor]	True	True	CC_CV_mode		Word	0,1
E033	Currentparameter stick	True	True	Stick	A	Integer	0,1
E034	Dynamicparameter stick	True	True	Stick		Integer	0,1
E035	Electrode line [EIn]	True	True	Stick		Word	0,01
E036	Hot current time [Hti]	True	True	Stick		Word	0,001
E037	Hot start current [HCU]	True	True	Stick	%	Word	0,1
E038	Antistick [Ast]	True	True	Stick		Boolean	1
E039	Cutoff voltage [Uco]	True	True	Stick	V	Integer	0,01
E03A	Balance [bAL]	True	True	Stick		Integer	0,1
E03B	AC mode Stick 0 AC 1 DC-minus 2 DC-plus 255 invalid	True	True	Stick		Word	1
E03C	AC frequency [ACF]	True	True	Stick	Hz	Word	0,1
E0C1	Welding-circuit resistance Stick	True	True	Stick	mOhm	Word	0,1
E0C3	Welding-circuit inductance Stick	True	False	Stick	μH	Word	0,01
E03D	Currentparameter TIG	True	True	TIG	A	Integer	0,1
E03E	Start current [I-S] ATTENTION: this will write both values - for AC and DC simultaneously	True	True	TIG	%	Word	1
E03F	Upslope time [UPS] ATTENTION: this will write both values - for 2-step and 4-step simultaneously	True	True	TIG	s	Word	0,01

Adress	Description	Read	Write	Group	Unit	Type	Factor
E040	Reduced current [I-2]	True	True	TIG	%	Word	1
E041	Downslope time [dSL] ATTENTION: this will write both values - for 2-step and 4-step simultaneously	True	True	TIG	s	Word	0,01
E042	End current [I-E]	True	True	TIG	%	Word	1
E043	Start time [t-S]	True	True	TIG	s	Word	0,01
E044	End time [t-E]	True	True	TIG	s	Word	0,01
E045	AC mode TIG 0 AC 1 DC-minus 2 DC-plus 255 invalid	True	True	TIG		Word	1
E046	AC frequency [ACF]	True	True	TIG	Hz	Word	0,1
E047	Balance [bAL]	True	True	TIG		Integer	0,1
E048	Positive waveform [pos]	True	True	TIG		Word	1
E049	Negative waveform [nEG]	True	True	TIG		Word	1
E04A	Pulse frequency [F-P]	True	True	TIG	Hz	Word	0,01
E04B	Pulse frequency [F-P]	True	True	TIG	Hz	Word	1
E04C	Dutycycle [dcY]	True	True	TIG		Word	1
E04D	Background current [I-G]	True	True	TIG	%	Word	1
E04E	Gas preflow [GPr]	True	True	TIG	s	Word	0,1
E04F	Gas postflow high [G-H]	True	True	TIG	s	Word	0,1
E050	Gas postflow low [G-L]	True	True	TIG	s	Word	0,1
E051	Gas commandvalue [GAS]	True	True	TIG	l	Integer	0,01
E052	Gasfactor [Cor]	True	True	TIG		Integer	0,1
E053	Tacking time [tAC]	True	True	TIG	s	Word	0,1
E054	Needle diameter [Eld]	True	True	TIG	mm	Word	0,1
E055	Guntrigger mode 0 2-step 1 4-step	True	True	TIG		Word	1
E056	Spot time [SPt]	True	True	TIG	s	Word	0,01
E057	Standard-TIG Cooling unit cut-out [C-C]	True	True	TIG		Word	1
E058	Calotte	True	True	TIG		Boolean	1
E059	Comfort Stop Senesitivity [CSS]	True	True	TIG	V	Integer	0,01
E05A	Ignition timeout [Ito]	True	True	TIG	s	Word	0,1
E05B	Arc break watchdog [Arc]	True	True	TIG	s	Word	0,1
E05C	Special 4-step [SFS]	True	True	TIG		Word	1
E05D	External parameter [E-P]	True	True	TIG		Word	1
E05E	Phase [PHA] only available on 3-phase powersources!	True	True	TIG		Word	1
E05F	Reverse polarity ignition [rPi]	True	True	TIG		Boolean	1
E060	HF-time	True	True	TIG	ms	Word	1
E061	Welding-circuit resistance TIG	True	True	TIG	mOhm	Word	0,1
E062	Feeder 1 [Fd.1]	True	True	TIG	m/min	Integer	0,01
E063	Feeder 2 [Fd.2]	True	True	TIG	%	Word	1

Adress	Description	Read	Write	Group	Unit	Type	Factor
E064	Inching speed [Fdi]	True	True	TIG	m/min	Word	0,01
E065	Feeder-delay 1 [dt1]	True	True	TIG	s	Word	0,1
E066	Feeder-delay 2 [dt2]	True	True	TIG	s	Word	0,1
E067	Feeder back [Fdb]	True	True	TIG	mm	Word	1
E09F	Pre-HF-time	True	True	TIG	s	Word	0,1
E0A0	Spezial-2-step	True	True	TIG		Word	1
E0AB	Gas purge	True	True	TIG		Word	1
E0C2	Welding-circuit inductance TIG	True	False	TIG	μH	Word	0,01
E0CC	Ioffset [Io]	True	True	TIG	A	Integer	1
E0D2	Start current [I-S] ATTENTION: there are two different values for AC and DC, so change ACMODE before changing this value	True	True	TIG	%	Word	1
E0D3	Upslope time [UPD] ATTENTION: there are two different values for 2-step and 4-step, so change GUNMODE before changing this value	True	True	TIG	s	Word	0,01
E0D4	Downslope time [dSL] ATTENTION: there are two different values for 2-step and 4-step, so change GUNMODE before changing this value	True	True	TIG	s	Word	0,01
E0DF	Multiplicator for TIG-ST2: 0...100% means le...lh	True	True	TIG	%	Word	1
E068	Actual weldingtime	True	False	Real Values	s	Word	0,1
E069	Puls-synchron sliding window for TIG-current	True	False	Real Values	A	Integer	0,1
E06A	Puls-synchron sliding window for TIG-voltage	True	False	Real Values	V	Integer	0,01
E06B	Current at end of puls	True	False	Real Values	A	Integer	0,1
E06C	Voltage at end of puls	True	False	Real Values	V	Integer	0,01
E06D	Current at end of ground-phase	True	False	Real Values	A	Integer	0,1
E06E	Voltage at end of ground-phase	True	False	Real Values	V	Integer	0,01
E06F	Realvalue arlength	True	False	Real Values	V	Integer	0,01
E070	Realvalue voltage	True	False	Real Values	V	Integer	0,01
E071	Realvalue current	True	False	Real Values	A	Integer	0,1
E079	Current-meanvalue of neg. wave	True	False	Real Values	A	Integer	0,1
E07A	Voltage-meanvalue of neg. wave	True	False	Real Values	V	Integer	0,01
E0BF	Realvalue gas	True	False	Real Values	ml	Integer	1
E072	Min. Feeder-value	True	False	Limits	m/min	Integer	0,01
E073	Max. Feeder-value	True	False	Limits	m/min	Integer	0,01
E074	Min. Voltage-commandvalue	True	False	Limits	V	Integer	0,01
E075	Max. Voltage-commandvalue	True	False	Limits	V	Integer	0,01
E076	Min. Current-commandvalue	True	False	Limits	A	Integer	0,1
E077	Max. Current-commandvalue	True	False	Limits	A	Integer	0,1
E0A9	Min. Eld-value	True	False	Limits	mm	Word	0,1
E0AA	Max. Eld-value	True	False	Limits	mm	Word	0,1

Adress	Description	Read	Write	Group	Unit	Type	Factor
E07B	Feeder creep speed	True	True	MigMag ManSTD	m/min	Integer	0,01
E07C	Ignition current	True	True	MigMag ManSTD	A	Integer	0,1
E07D	Ignition current time	True	True	MigMag ManSTD	ms	Word	0,01
E07E	Wirefeed speed	True	True	MigMag ManSTD	m/min	Integer	0,01
E07F	Background current	True	True	MigMag ManSTD	A	Integer	0,1
E080	Voltage command value	True	True	MigMag ManSTD	V	Integer	0,01
E081	Characteristic slope	True	True	MigMag ManSTD	$\mu$ Ohm	Word	1
E082	Special dynamic	True	True	MigMag ManSTD		Word	1
E083	Current decrease	True	True	MigMag ManSTD		Word	1
E084	Current rise	True	True	MigMag ManSTD		Word	1
E085	Burn back time	True	True	MigMag ManSTD	s	Word	0,01
E086	Burn back pulse time	True	True	MigMag ManSTD	ms	Word	0,01
E087	Burn back pulsing current	True	True	MigMag ManSTD	A	Integer	0,1
E088	Feeder creep speed	True	True	MigMag ManPULS	m/min	Integer	0,01
E089	Ignition current	True	True	MigMag ManPULS	A	Integer	0,1
E08A	Ignition current time	True	True	MigMag ManPULS	ms	Word	0,01
E08B	Base current	True	True	MigMag ManPULS	A	Integer	0,1
E08C	Current rise	True	True	MigMag ManPULS	A/ms	Word	0,1
E08D	Current rise tau	True	True	MigMag ManPULS	ms	Word	0,01
E08E	Pulsing current	True	True	MigMag ManPULS	A	Integer	0,1
E08F	Pulsing current time	True	True	MigMag ManPULS	ms	Word	0,01
E090	Current decrease	True	True	MigMag ManPULS	A/ms	Word	0,1
E091	Current drop tau	True	True	MigMag ManPULS	ms	Word	0,01
E092	Droplet detachment current	True	True	MigMag ManPULS	A	Integer	0,1
E093	Droplet detachment time	True	True	MigMag ManPULS	ms	Word	0,01
E094	Pulsing frequency	True	True	MigMag ManPULS	Hz	Word	0,1
E095	Wirefeed speed	True	True	MigMag ManPULS	m/min	Integer	0,01
E096	Voltage command value	True	True	MigMag ManPULS	V	Integer	0,01
E097	Fact I_b_control_pi	True	True	MigMag ManPULS	%	Word	0,01
E098	Fact I_p1_control_pi	True	True	MigMag ManPULS	%	Word	0,01
E099	Fact f_control_p	True	True	MigMag ManPULS	%	Word	0,01
E09A	Fact I_b_correction	True	True	MigMag ManPULS	%	Word	0,01
E09B	Fact I_p1_correction	True	True	MigMag ManPULS	%	Word	0,01
E09C	Fact f_correction	True	True	MigMag ManPULS	%	Word	0,01
E09D	Current rise sc	True	True	MigMag ManPULS	A/ms	Word	0,1
E09E	Burn back time	True	True	MigMag ManPULS	s	Word	0,01
E0A1	Regulator output	True	False	MigMag ManPULS		Integer	1
E0A3	Gas preflow [GPr]	True	True	Pilot Plasma	s	Word	0,001
E0A4	Gas postflow [GPo]	True	True	Pilot Plasma	s	Word	0,001
E0A5	Gas commandvalue [GAS]	True	True	Pilot Plasma	l	Integer	0,01
E0A6	Gasfactor [Cor]	True	True	Pilot Plasma		Word	0,1
E0A7	Pre-/Post Gas commandvalue [GPA]	True	True	Pilot Plasma	l	Integer	0,01
E0A8	Pilot current	True	True	Pilot Plasma	A	Integer	0,1







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