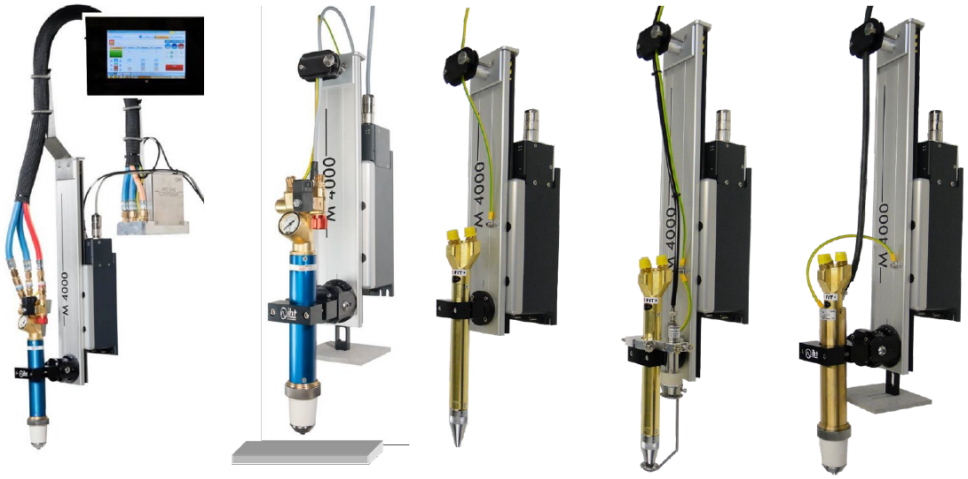
ERROR MANUAL / FEHLER HANDBUCH

FOR / FÜR
APC M4000
M4000 FIT+
M4000 MAN
M4000 CAP
M4000 ISC



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Scan proper QR Code or visit IHT Automation home page to load Instructions and Manuals:
www.iht-automation.com/login
Print it out and read it before starting product installation or use.

Laden Sie diese Anleitungen mit dem QR-Code-Reader oder über die IHT-Homepage:
www.iht-automation.com/login
Drucken Sie es aus und lesen Sie es, bevor Sie das Produkt installieren oder benutzen.

WARNING

Personnel working (installing, servicing or operating) with the product must have read and understood Instruction for Use and related documents as well as the local safety regulations related to the specific functions in use. Personnel must also be aware of any danger involved with the installation, operation, maintenance, and repair of the product as well as the machine which the product is integrated into.
To avoid errors and for work safety this and related documents must always be used in combination with the Instructions and Manuals of the machinery which the product is integrated into. Risks caused by other than the described use underlie the responsibility of the user.

Jede Person, die mit den Systemen arbeitet, muss die Sicherheitsbestimmungen und alle Handbücher, die sich auf die spezifischen Funktionen beziehen, gelesen und verstanden haben. Das Personal muss außerdem über alle Gefahren unterrichtet sein, die mit der Installation, dem Betrieb, der Wartung und der Reparatur des Systems sowie der Maschine, in die es integriert ist, verbunden sind.
Zur Vermeidung von fatalen Fehlern und zur Arbeitssicherheit muss dieses Handbuch immer in Verbindung mit allen Handbüchern der IHT APC & M4000 & B1000 Systeme und den Handbüchernnen, in die es integriert ist, verwendet werden. Risiken, die durch eine andere als die beschriebene Verwendung entstehen, liegen in der Verantwortung des Anwenders.

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Table of Contents

1 Important Basic Information

This Error Manual describes the error messages of following IHT systems:

APC	**Automatic Process Controll Oxy-Fuel Cutting with FIT+ three torch and Gas Controller**
M4000 FIT+	**M4000 system with FIT+ three torch**
M4000 ISC	**M4000 system with ISC torch**
M4000 CAP	**M4000 system with Ring Electrode**
M4000 MAN	**M4000 system with linear drive for up and down moving**

In addition to being supplied as paper copies, the manuals can be downloaded from the IHT website.

⚠ WARNING

The IHT Height Control Systems are intended for machines which are operated by persons who are older than 14.

Only authorized, well informed and qualified personnel is allowed to work with the IHT Height Control Systems.

Anyone who works with the system must have read and understood the safety regulations and all manuals relating to the specific functions in use. Personnel must also be aware of any danger involved with the installation, operation, maintenance and repair of the system as well as the machine into which it is integrated.

All relevant accident prevention regulations, as well as all other generally known safety-related and job safety regulations must be complied with.

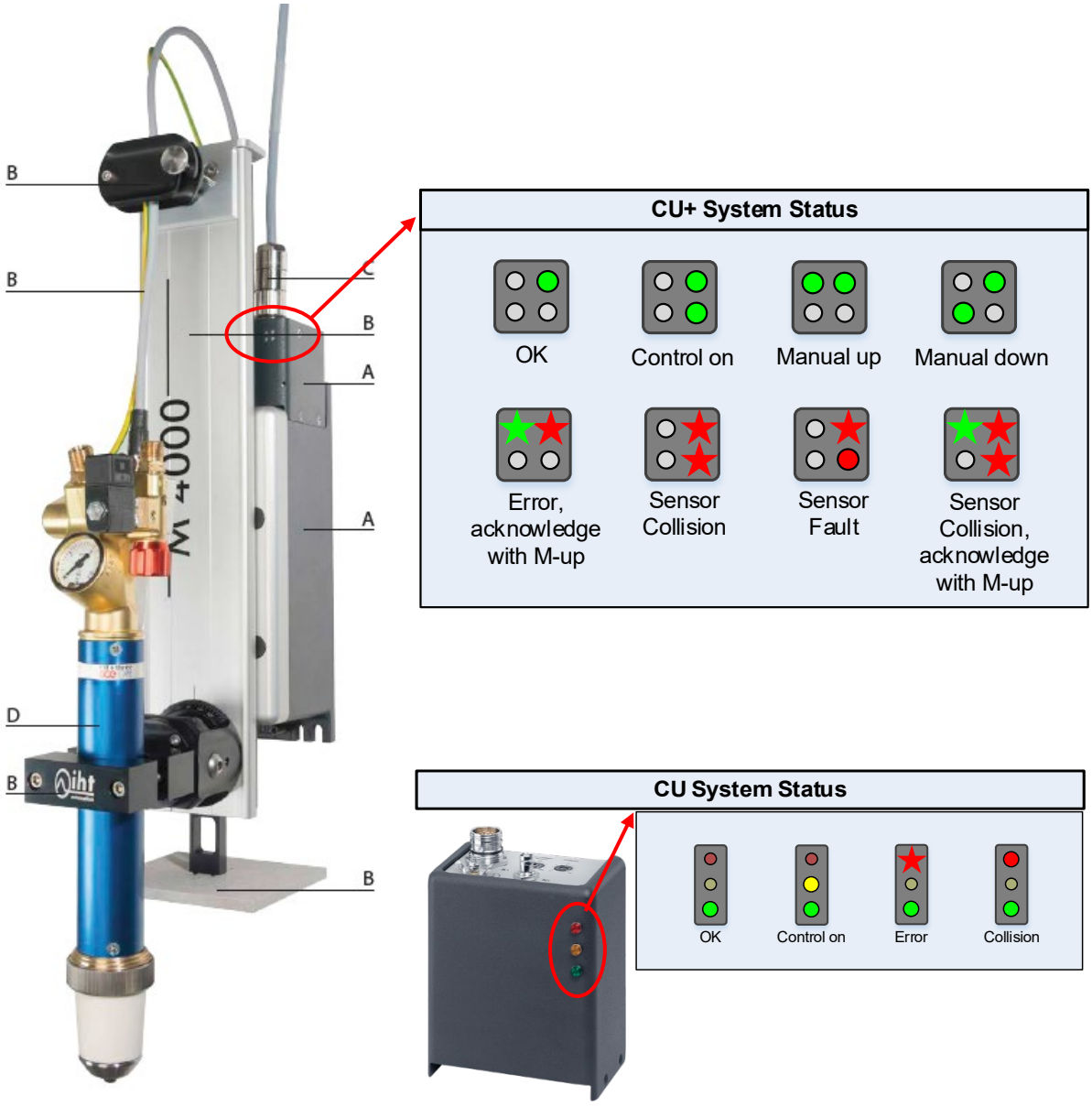
The manuafacturer is not liable for damage resulting from arbitrary changes to the system. The user/operator of the machines has to make sure that all safety systems are always in good working condition. Regular checks are necessary to verify that the equipment is in proper working condition.

These instructions do not substitute instructions by service personnel and required training.

2 Definitions

APC	Automatic Proces Control for oxygen	IHT product
CAP+	M4000 CAP with CU+	IHT product
CONTACT PIN	contacting pin for the SENSOR HOLDER	IHT product
CU	CONTROL UNIT	IHT product
CU+	CONTROL UNIT+	IHT product
DIGBUS	Digital BUS of IHT	
DIG Cable	Cable for DIGBUS	IHT product
EEPROM	Memory in CU+	
FIT+ Three	IHT torch	IHT product
ISC	Integrated Sensor Capacitiv	IHT product
LD	Linear Drive	
PLASH PROTECTOR		IHT product
SCU	SENSOR CONNECTOR UNIT	IHT product
SMCU	SENSOR MOTOR CONTROL UNIT	IHT product

3 System Overview



4 Error Codes for CONTROL UNIT+

Legend: ACK = Error acknowledgement
OUT = /ERROR Output pin to CNC
HI = High impedance, open line
PWR = Power +24V
M-up = Manual up
IGN = IGNITE pulse

Code	Titel	Cause	Action	Remedy	ACK	OUT
Er.— 	None	No error				
Er.01 	Torch Collision	Torch collision Triggered by initial position switch	Linear drive moves to upper reference position	Remove collision	M-up	HI
Er.02  3 sec	CutCycle Break	Cutting cycle has been interruppted, before cutting process has started	Linear drive moves to upper reference position	Self fixed		
Er.03 	Sensor Fault, Coax Break	No Sensor Signal or Coax Cable break 1) Sensor parts fault 2) COAX Cable break 3) Sensor finger touch	Not working: 1) Clearance control 2) Clearance control 3) Clearance control	1) Replace Sensor parts 2) Replace COAX Cable		HI only CAP+
Er.04  2x long 1x short	Coax, SCU, ISC Temp-Sensor short	1) COAX Cable short current 2) SCU fault 3) ISC torch temperature sensor 4) CU+ fault	Not working: 1) Clearance control 2) Clearance control 3) Distance accuracy reduced 4) Clearance control	1) Replace COAX Cable 2) Replace SCU 3) Send the torch to IHT for repair 4) Replace CU+		HI only SMCU
Er.05  1x long 2x short 3 sec	Motor Current Limit Warning	Short overcurrent	Only warning	Check torch weight, linear drive or CU+		

Code	Titel	Cause	Action	Remedy	Ack.	Out
Er.06  1x long 2x short	Motor Current Limit Error	Long overcurrent	Linear drive moves to upper reference position with reduced speed	Check torch weight, linear drive or CU+	M-up	HI
Er.07  3 sec	+24V Power Warning	+24V supply voltage less than 21V for 0.5 sec	Only warning	Check +24V power line & supply Is the correct supply voltage adjusted to the different cable lengths? See docu manual		
Er.08 	+24V Power Error	+24V supply voltage less than 19V for 0.2 sec	Linear drive moves to upper reference position with reduced speed	Check +24V power line & supply Is the correct supply voltage adjusted to the different cable lengths? See docu manual	M-up	HI
Er.09  3 sec	CU+ Temperature Warning	CU+ temperature over 100°C (210°F) for 5 sec	Only warning	Avoid CU+ temperature increasing		
Er.10 	CU+ Temperature Error	CU+ temperature over 115°C (239°F) longer than 2.5 sec	Linear drive moves to upper reference position with reduced speed	Cool down CU+	M-up	HI
Er.11  **CAP+**	Sensor Collision	Short circuit between sensor and ground (slag, etc.)	Not working: Clearance control	Check mounting, Clean sensor parts		HI
Er.11  **APC FIT+**	Sensor Collision	Short circuit between sensor and ground (slag, etc.)	Not working: Clearance control	Check mounting, Clean sensor parts	M-up	HI after 5sec

Code	Titel	Cause	Action	Remedy	Ack.	Out
Er.12  2x long 4x short	Guiding Rail / Motor Blocking	Linear drive Guiding Rail or motor is blocked	Linear drive stops	Make Guiding Rail or motor free	PWR Off / On	HI
Er.13 	TimeOut inPosition	APC: Not all torches reach the heating height within 15sec	Heating will not start. Torches move upwards	Make a new sensor calibration		
Er.15  2x long 2x short	ISC Temp-Sensor Fault	Temperature Sensor in ISC torch is not working	Bad distance accuracy	Send the torch to IHT for repair		
Er.18  1x long 11x short	Torch Power Error	Torch supply voltage less then 15V for 0.5 sec	Linear drive moves to upper reference position	Check FIT+ three supply voltage. Possible faults: CU+, cable, Torch Contr.	M-up	HI
Er.20 	General Error	General error	Linear drive moves to upper reference position	Contact IHT service		
Er.21  1x long 5x short	Encoder Error	Linear drive encoder error	No position information available, Functions are restricted	Repair encoder, contact IHT service		
Er.22  1x long 4x short	Motor Direction Error	Wrong motor rotation direction during reference moving	Linear drive stops	Change LINEAR DRIVE BODY	PWR Off / On	HI
Er.23  2x long 5x short	LD Init Guiding / Motor Blocking	Linear drive Guiding Rail or motor is blocked during linear drive reference moving	Linear drive stops	Make Guiding Rail or motor free	PWR Off / On	HI

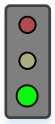
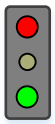
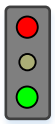
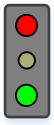
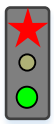
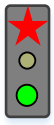
Code	Titel	Cause	Action	Remedy	Ack.	Out
Er.25 	LD Init Time Out	Timeout during linear drive reference moving	Linear drive stops	Contact IHT service	PWR Off / On	HI
Er.26  1x long 6x short	LimitSwitch Down active	During linear drive reference moving lower limit switch or initial position switch is active	Linear drive stops	Check initial position switch	PWR Off / On	HI
Er.27  1x long 6x short	LimitSwitch Up+Down active	During linear drive reference moving upper and lower limit switch are active	Linear drive stops	Check upper limit switch and initial position switch	PWR Off / On	HI
Er.28 	LD Init 3D Collision	During linear drive reference moving torch collision sensor is active. Torch collision detection provided.	Linear drive stops	Remove collision	M-up	HI
Er.29  1x long 9x short	Torch Warnings	General torch warnings a) Sensor b) Glow plug c) Temperature Compensation d) Solenoid valve **See Error 37 too**	No error handling or not working: a) ClearanceContr b) Ignition c) Distance accuracy d) Ignition	Fix torch fault or Send torch with Torch Controller to IHT for repair		
Er.30 	Eeprom Write Error	EEPROM write error	Continue with default parameters	Remove service cable	PWR Off / On	
Er.31 	Eeprom Read Error	EEPROM read error	Continue with default parameters	Remove service cable	PWR Off / On	
Er.32  1x long 7x short	Flashback	Flashback or back fire detected	Linear drive moves to upper reference position APC: oxygen and fuel gas off	Already fixed by switching off oxygen and fuel gas	M-up	HI

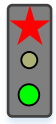
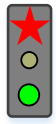
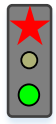
Code	Titel	Cause	Action	Remedy	Ack.	Out
Er.33  1x long 8x short	Wrong Body Parameter Error	Wrong linear drive Body or Body not detected	Linear drive stops	Change linear drive Body	PWR Off / On	HI
Er.34  1x long 10x short	DigBus Communication Error	Digital communication to FIT+ three torch disrupted	Linear drive moves to upper reference position	Fix communication error on DIG Cable		HI
Er.35  1x long 11x short	Gas Controller Error	APC: Gas Controller error	Linear drive moves to upper reference position	Fix communication error on DIG Cable or fix Gas Controller		HI
Er.36  3 sec	TimeOut FlameOn at ProcessEnd	APC: After the cut ends and no new cut within 10 sec starts	The flame shut off. Information only	Self fixed		
Er.37  1x long 9x short	Torch Error	General Torch Errors: a) General Error b) 24V Supply: <16V or >32V c) Too high temperature d) Sensor collision longer than 5 sec e) Slag on CONTACT PIN, not used the SPLASH PROTECTOR **See Error 29 too**	Linear drive moves to upper reference position. Only APC:O2 and fuel gas off	a) Contact IHT Service b) Check +24V supply c) Cool the torch d) Remove collision e) Remove slag & change CONTACT PIN	M-up	HI
Er.38 	Break Ignition Retry	Flame did not ignite after trying 3 times automatically	Ignition does not work, APC stops cutting cycle.	Check: Adjust valve Gas type Gas pressures Cutting nozzle Glow plug Solenoid valve Ignition injector	M-up	HI

Code	Titel	Cause	Action	Remedy	Ack.	Out
Er.39  2x long 3x short **CAP+** **MAN+**	Capacitive Limit Switch Body	Wrong Limit Switch detected. An inductive switch is required in the body.	Linear drive stops	Change linear drive Body against Body with inductive limit switch from Serial No: 13xxxx	PWR Off / On	HI
Er.39  **3 sec** **APC**	CU+ Sync Information	The multi-burner heating synchronization via the CU+ Sync signal is disturbed.	The synchronization is now handled by the APC software.	APC still works. However, the condition should be corrected. Contact IHT.		
Er.40 	Sensor Warning	No Sensor Signal or Coax Cable break 1) Sensor parts fault 2) COAX Cable break 3) Sensor finger touch	Not working: 1) Clearance control 2) Clearance control 3) Clearance control	1) Replace Sensor parts 2) Replace COAX Cable		
Er.41  **2x long** **1x short**	Coax Cable Warning	1) COAX Cable short current 2) SCU fault 3) ISC torch temperature sensor 4) CU+ fault	Not working: 1) Clearance control 2) Clearance control 3) Distance accuracy reduced 4) Clearance control	1) Replace COAX Cable 2) Replace SCU 3) Send the torch to IHT for repair 4) Replace CU+		
Er.42 	Sensor Collision Warning	Short circuit between sensor and ground (slag, etc.)	Not working: Clearance control	Check mounting, Clean sensor parts		
Er.43  **3 sec**	+5V internal Power warning	Internal power supply voltage less than 4,75V	Perfect CU+ function is no longer guaranteed	Send the CU+ for repair to IHT		

Code	Titel	Cause	Action	Remedy	Ack.	Out
Er.50 **Er.51** **Er.52**  **4x short** **break** **4x short**	System Exit SystemAbort Illegal Instruction	CU+ device error	Linear drive stops	Contact IHT Service	PWR Off / On	HI

5 Error Codes for CONTROL UNIT

Code	Titel	Cause	Action	Remedy	Ack.	Out
	None	No error				
	Vertival Collision	Initial position switch has responded	LD moves to upper reference position	Remove collision	M-up	0V
	Clearance Sensor Collision	Collision by: a) Ring Electrode or Clearance Sensor b) SCU fault c) Coax Cable fault d) CU fault e) ISC torch fault	LD moves up until collision disappears	a) Remove Collision b) change SCU c) change Coax d) change CU e) change torch		0V
	ISC no Sensor	Automatic is on: a) Splash Protector is mounted b) No Clearance Sensor mounted	LD moves to upper reference position, working with clearance control is not possible	Switch Automatic off		0V
 1x long 2x short	Overload	a) LD blocked b) Guidung Rail clamped with pinion c) CU fault	LD stopps moving	a) change Guiding Rail b) Get Guiding Rail to running position c) change CU	PWR Off / On	0V
 1x long 4x short	Wrong motor polarity	a) LD blocked b) wrong motor connection in Body c) CU fault	LD stopps moving	a) Get Guiding Rail to running position b) contact IHT c) change CU	PWR Off / On	0V

Code	Titel	Cause	Action	Remedy	Ack.	Out
 1x long 6x short	Upper limit switch fault	a) Upper limit switch does not respond b) Upper limit switch always responds	LD moves and did not reach the upper limit position, LD stopps after time out	-Clean & check limit switch -Change BODY or CU	PWR Off / On	0V
 1x long 8x short	Wrong Body Parameter Error	Wrong linear drive Body or Body not detected	Linear drive stops	Change linear drive Body	PWR Off / On	0V
 1x long 9x short	CU sensor fault	CU sensor board damaged	Linear drive stops	Change CU	PWR Off / On	0V
 10x long After power on	Temperature sensor fault	1) ISC temperature sensor is defect 2) Ring Electrode is used	1) Clearance control works without temperature compensation, now lower distance accuracy 2) Normal work, only indication that a Ring Electrode is used	1) Change ISC torch 2) Nothing to do		

6 Revision History

Rev.	Date	Page	Description
00	August 08. 2017		First documentation
01	November 22. 2017	all	Formal & substantial improvements
02	November 23. 2017	all	Formal & substantial improvements
03	October 05. 2018	All 4-6	Error LEDs corrected Error 37 corrected to 1x long & 9x short
04	October 10. 2018	3-6 3-7 4-8	Error 29, /ERROR output is not activ Error 32 ACK with M-up Error 37 no backfire, flashback message included
05	October 17. 2018	3-4 3-5	Error 07 different power cable length, different supply Volt Error 08 different power cable length, different supply Volt
06	September 17. 2019	all 3-4 3-6 3-7 3-8 3-8 4-9	M4000 CAP+ added Error 4 added for CU+ CAP/ISC Error 15 added for CU+ CAP/ISC Error 29: Changed to Torch Warnings Error 37: Added fault cause by slag Error 38 added for CU+ DIG FB Error 90 added
07	October 10. 2019	3-4 3-5	Error 3 added for CU+ CAP/ISC Error 11 added for CU+ CAP/ISC
08	January 03. 2020	3-8 4-9 5-10,11	Error 39 added for CU+ CAP/ISC Error 40,41,42 added Added CONTROL UNIT (CU) Errors
09	March 31. 2020	4-3	Error 01: no 5sec delay of the /ERROR output signal
10	April 17. 2020	4-7	Error 37: APC: Torch Errors to General Torch Errors
11	October 26. 2020	4-5 4-5, 4-6 4-6 4-8 4-8 4-9 5-11	Error 12, 22 corrected: ACK is not possible with M-up Error 23, 26 added for all CU+ variants Error 25, 27 corrected: ACK is not possible with M-up Error 39 added for APC Error 90: number changed to Error 43 Error 97, 98, 99: numbers changed to Error 50, 51, 52 Added notice for Ring Electrode indication
12	March 10.2021	all	new manual formatting
13	June 13.2022	4-8	Error 39 is only an information and has been rewritten.
14	June 22. 2022	Front	Front page changed

File name: IHT_M4000_Oxy_Error_Manual