TIEFENBACH
Control Systems GmbH

Electrohydraulic shield control system

TIBATRON iSA 10/1

Training Data and Information

- iZA – Master Control Unit -

Please read this operating manual carefully before using this control system in order to obtain optimum results and avoid malfunctions.

Description

Electrohydraulic shield control system iSA 10/1-*Training documents iZA*
Drawing No.: 80-105745-00-00 Item No.: 212789

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Description

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Description

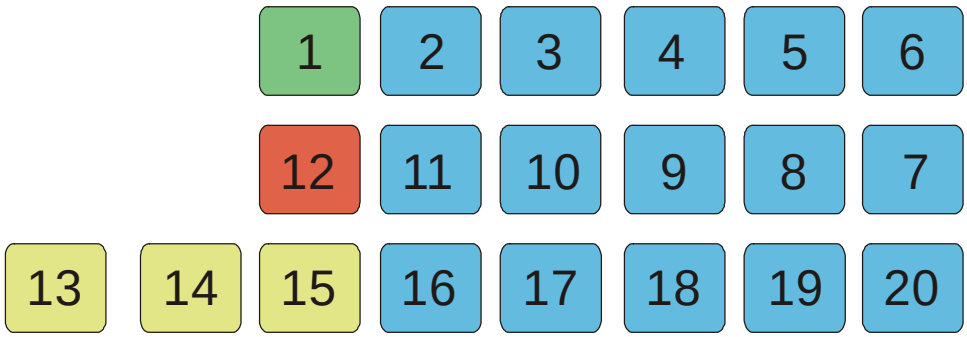
The Master Control Unit iZA is the modern coupling element between the shield support control system on the face and the visualisation unit underground or at the surface. The Master Control Unit also allows to process and transmit additional information.

Provision is made to connect the Master Control Unit to the shield control units by means of SKK28 sockets. Connection to the visualisation computer is ensured either by a modem or a TTY interface. Three additional TTY interfaces are available for further connections.

A membrane keypad is used on the Master Control Unit. It has 20 keys and is serially connected to the MCU by means of an RS 485 interface via the UART 3.

Keypad

Key numbering :



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Key configuration :

Description of functions	
0 to 9 : to input addresses and parameter changes	***Error display :*** stores all faulty SCU's including address and description of faults (yet to be implemented)
Arrows : Cursor control and „scrolling“ in the subordinated displays	***Status display :*** stores all data of every SCU (yet to be implemented)
Data traffic diagnosis : „Monitoring“ the telegram traffic with the Visu, the machine and the telegrams via face bus and adjacent bus	***Escape :*** takes you back to the previous display level
Functions : This includes Reset MSU, Reset SCU, Addressing, Remote loading, Parameterisation and display of the program versions	***Enter :*** Parameter programming, start remote loading, etc. . start functions

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Display

Default display

Machine position: 211
M. on uphill run
Bus relay closed
Time: 11:28 D

After power has been restored – when the MCU has passed from the initial program loader into the application program after 10 seconds – the default display will be shown. The following default display variants exist:

Line	Display	Meaning
1	Machine position: ###	Location of the machine in the longwall face
2	MaPos. not known	The connection from the MCU to the visualisation computer is interrupted (if machine position is transmitted from the surface).
	M on uphill run	The machine is on its pass to tail and this information is passed on to the MCU.
	M on downhill run	The machine is on its pass to head and this information is passed on to the MCU.
	Machine stand still	The machine does not move.
3	[Face bus relay on ZSG2-PM open or closed]	
	Bus relay closed	MCU is active, sending and receiving data via the face bus
	Bus relay open	MCU not sending or receiving anything via the face bus
4	[The visualisation computer transmits the server time to the MCU once every minute.]	
	Time: 13:45 M	Time of day and type of connection with visualisation computer (D=Data transmission system "DUESE", M=Modem)
	Time: --:-- D	No time data have been received for four minutes.

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Status display

Operating the ***status display key*** takes you into the status display menu. Using the ***arrow up*** or ***arrow down*** key you can select the SCU you want. The ***ENTER*** key allows to input the number of the respective SCU. With the ***arrow left*** or ***arrow right*** key you alternate between the individual displays. If operating the arrow keys takes you to the respective start or end the display will be continued at the start or end. If no key is operated for 60 seconds the default display will be activated again. Operating the *ESCAPE* key takes you to the previous menu.

Line	Display		Meaning
1	Status-SCU: ##		Status display for SCU number ##
2 3 4	Timeout no current data		No current data available due to timeout. MCU does not receive any data from the selected SCU
2	QUICK STOP	ON	Quick stop switch operated.
		OFF	off.
3	S L O	ON	Support lock-out switch operated.
		OFF	off.
4	Support bypassed		This support has been bypassed via the visualisation computer.
2	NB-Left	Error	Adjacent bus to L.H. neighbour interrupted
		OK	No error on L.H. adjacent bus.
3	NB-Right	Error	Adjacent bus to R.H. neighbour interrupted
		OK	No error on R.H. adjacent bus.
4	Face disconnect		The face bus is disconnected.
			not disconnected.
2	Advance rate: ##### cm		Advance rate in cm
3	Target l.: ##### cm		Target line in cm
4	Breakprotect:	---	Break protection is disabled.
		ON	is on.
		OFF	is off.
2	Press.1:	Error	Error at sensor1
		## bar	Pressure value of sensor 1 is ## bar.
3	Stroke:	Error	Error at sensor2

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		## cm	Displacement transducer value is ## cm.
4	Press.2:	Error	Error at sensor3
		## bar	Pressure value of sensor3 is ## bar.

2	not defined 4:	Error	Error at sensor 4
		###	
3	not defined 5:	Error	Error at sensor 5
		###	
4	not defined 6:	Error	Error at sensor 6
		###	

2	not defined 7:	Error	Error at sensor 7
		###	
3	not defined 8:	Error	Error at sensor 8
		###	
4			

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Line	Display	Meaning
1	Status-SCU: ##	Status display for SCU number ##

2	Valve n	Error	Valves 1,4,7,10,13,16,19,22
		OK	
3	Valve n+1	Error	Valves 2,5,8,11,14,18,23
		OK	
4	Valve n+2	Error	Valves 6,9,12,15,19,24
		OK	

2	Track spraying system		
3 4	no valve		Track spraying system not activated.
3	machinedep.:	ON	Machine dependent track spraying activated.
		OFF	deactivated.
4	permanent:	ON	Permanent track spraying activated.
		OFF	deactivated.

2	Canopy spraying system		
3 4	no valve		Canopy spraying not activated.
3	cyclic:	ON	Cyclic canopy spraying activated.
		OFF	deactivated.
4	advance:	ON	Spraying during advancing activated.
		OFF	deactivated.

2	Aut.forepole:	---	Forepole canopy automatics disabled.
		ON	activated.
		OFF	deactivated.
3	Aut.flipper.:	---	Flipper automatics disabled.
		ON	activated.
		OFF	deactivated.
4	Aut.cycling:	---	Automatic cycling disabled.
		ON	activated.
		OFF	deactivated.

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2	Automatic:	blck	All automatic functions disabled.
		free	Automatic functions enabled.
3	APS:	disabled	Automatic positive set disabled.
		ON	activated.
		OFF	deactivated.
4	Aut.conveyor:	---	Automatic conveyor push disabled.
		ON	activated.
		OFF	deactivated.

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Error display

Operating the ***Error display key*** takes you into the error display menu. Using the ***arrow up*** or ***arrow down*** key you can select the SCU you want. The ***ENTER*** key allows to input the number of the respective SCU. With the ***arrow left*** or ***arrow right*** key you alternate between the individual error messages of the SCU. If operating the arrow keys takes you to the respective start or end the display will be continued at the start or end. If no key is operated for 60 seconds the default display will be activated again. Operating the *ESCAPE* key takes you to the previous menu.

Line	Display	Meaning
1	ERROR DISPLAY	You are in the error display menu
2 3 4	* no errors *	No errors occurred
2	Shield-No.: nnn	Address of the shield which has an error displayed.
3 4	Timeout no data	MCU does not receive any data from this shield
3 4	* QUICK STOP * operated	Quick stop switch has been operated.
3 4	* S L O * operated	The support lock-out switch has been operated.
3 4	NB-Bus LEFT faulty	Adjacent bus to the L.H. neighbour is interrupted
3 4	NB-Bus RIGHT faulty	Adjacent bus to the R.H. neighbour is interrupted
3 4	Face bus disconnected	The face bus was disconnected.
3 4	Support bypassed	The shield was bypassed.
3 4	int.Error	An internal error occurred.
3 4	Short circuit Press1	Short circuit at sensor 1
3 4	Short circuit Displ.transducer	Short circuit at sensor 2
3	Short circuit Press2	Short circuit at sensor 3

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4		
3 4	Short circuit not defined 4	Short circuit at sensors 4 –8
3 4	Interruption Press1	Interruption at sensor 1
3 4	Interruption Displ.transducer	Interruption at sensor 2
3 4	Interruption Press2	Interruption at sensor 3
3 4	Interruption not defined4	Interruption at sensors 4-8
3 4	Valve ## defective	Valve error at valve number ##

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Data traffic diagnosis

Intended for commissioning/start-up.
There the contents of the telegrams – mainly MCU ← → Visu – can be displayed.

Functions

Operating the ***functions key*** takes you into the functions menu. The function which could be executed will blink. The ***arrow up*** or ***arrow down*** key allows to select the required function. Pressing the ***ENTER key*** confirms the selection. If no key is operated for 60 seconds the default display will be reactivated. Operating the ESCAPE key takes you back to the previous menu. The following functions are available:

Function	Display	Execution
Reset MCU	Reset MCU [ENTER] Yes [ESC] Back	After the ENTER key has been operated the MCU falls back into the IPL and boots again.
Reset all SCU´s	Reset all SCU´s [ENTER] Yes [ESC] Back	After operation of the ENTER key all SCU's fall back into the IRL and boot again.
Reset 1 SCU	Reset 1 SCU Address SCU: 001 [ENTER] Yes [ESC] Back	After the respective SCU address has been entered and operation of the ENTER key the MCU will send a Reset telegram to the respective SCU. Pressing ENTER will cause the display to automatically return to the default display.
Addressing	Start addressing ? [ENTER] Yes [ESC] Back	Operating the ENTER key causes the SCU's connected to the face bus to be addressed.
	Addressing Address ASG: xx	During the addressing process the address of the currently addressed SCU will be shown.

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Remote load	Remote loading [ENTER] Yes [ESC] Back	Operating the ENTER key causes the SCU's connected to the face bus to be remotely loaded.
	Remote loading Count Down All Remaining 8050 71C0	During remote loading, first a counter counts down from 11 seconds to 0. During this time, all SCU's delete their application program. Next, the HEX number below **Remaining** will be counted downwards (= size of the new application program). At the end, the counter is set to 6 again and counts down. (= application program starts).

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Parameter	The following parameters can be set : • Start of face • Face end • Machine length • Transfer pressure • Mining method	Input value and accept by pressing ENTER. **CAUTION !!** This parameter input is only intended for the start-up phase when ***no visualization computer*** is connected !!
Programm Version	Program version IPL MCU : x.yy Appl. MCU : x.yy Appl. SCU: x.yy	Display of the currently loaded program versions
Language	Language D [1] GB [2] PL [3] RUS [4] [ESC] Back	The display can be shown in 4 different languages. German, English, Polish, and Russian. Particularly in the Polish and Russian variant some technical terms still need to be translated
DEFAULT value configuration	?? accept ?? DEFAULT value c. [ENTER] Yes [ESC] Back	Is intended for start-up, if a new MCU without visualization computer is installed. The configuration adapts the software to match the current installation. With the DEFAULT values an MCU without visualization computer can run, if required, but in a very RESTRICTED MODE.
To the surface	To the surface 1: Modem 2: Data transmission system DUESE [ESC] Back	The type of connection to the Visu at the surface must be set in the visualization computer and also in the MCU.

This is by no means the final version. Please feel free to talk to me if you want to suggest changes or discuss new functions or displays.