The invention relates to an extraction controller for coal mining comprising a central control unit above ground and a longwall face control unit at the end of the face for controlling the extraction functions of the extraction units, i.e. robbing, advancing and jiggering. The longwall face control unit is equipped with a display, which is controlled by a program that is stored on a hard drive. The face control unit comprises additional read-only memory modules as program memories for storing the required function programs.
EXTRACTION CONTROLLER FOR COAL MINING

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a Continuation of International Application No. PCT/DE2006/000490, filed Mar. 17, 2006, and which designates the U.S. The disclosure of the referenced application is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The invention concerns an extraction control unit configured to control extraction units for mining in the longwall face of a mine.

BACKGROUND OF THE INVENTION

[0003] An extraction control unit is known, for example, from DE 100 18 481 01 (9905). In the case of an extraction control unit of this type the longwall face control unit also serves, in addition to the central control unit, the purpose of controlling the mining and extracting devices by hand and controlling the fed in control commands and/or actual state.

[0004] An object of the invention is to facilitate such above ground manual operation and manual control as well as the control of the positions and operational statuses of the mining and extraction equipment, without impairing by this the reliability and the service life of the longwall face control units, which are subjected to very unfavorable environmental effects.

SUMMARY OF THE INVENTION

[0005] This objective and others are achieved by an extraction control unit that renders it possible to equip both the central control unit and the longwall face control unit with a display screen and also to make everything visible on the longwall face control unit what is visible on the central control unit. By virtue of this the communication between the operator on the central control unit and the operator in the longwall face is facilitated. Having a plurality of functions and statuses of the mining machine (planer or cutter) and plurality of extraction units (shields) a very extensive program is required for this visualization on the display screen, while said program has to be capable to allow a random and rapid access to the individual programs. For this reason a conventional fixed disk drive, the once successfully used in great numbers of commercially available PCs, that enables the storage of a very large amount of data. With this the problem of storage of programs necessary for extraction and mining is solved, since fixed disks are available with the largest storage capacity.

[0006] The invention, however, refrains from the use of the fixed disk and for the storage of programs required for the extraction and/or mining functions and their control and monitoring uses memory modules, based on semiconductors, with digital data storage and optional access, preferably such which, after the program had been read in, do not change, can be read only, i.e. ROMs, EPROMs, EEPROMs, flash EEPROMs, for example. Depending on the program and command structure chosen, these memory modules are components of the computer units/processors of the shield control units, longwall face control units and the central control unit, which are joined for the purpose of data transfer, in particular of control commands and status reports, preferably in series, via a busbar and can be called up or triggered. In contrast to this the display screen of the longwall face control units has its own computer unit (display screen processor), that has a fixed disk with a drive and reading device to store the picture program and serves the purpose of display screen control, so that to make the working processes, functions and statuses visible on the display screen.

[0007] This configuration has the disadvantage, that in the case of failure of the fixed disk memory the display of functions, commands and statuses on the display screen also fails, yet the longwall face control unit remains functional and therefore the mining of the coal can continue, while the display of functions, commands and statuses on the display screen of the central control unit remains as was the case previously. Although the computer units/processors necessary for the control of the mining and extraction are also connected to the computer unit serving the control of the display screen (display screen processor), a failure of the fixed disk would not affect the functional performance of the computer units/processors of the shield control units, longwall face control units and central control units responsible for the control of the mining and extraction functions because the memory modules serving the purpose of storing the corresponding programs are not effected by a failure of the fixed disk.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The inventive method will be described in more detail hereinbelow with the aid of an exemplary embodiment of the inventive apparatus, with reference to the accompanying drawings.

[0009] FIG. 1 is a schematic illustration of an extraction control unit according to one exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0010] The drawing schematically illustrates the extraction control unit according to the invention. The reference numeral 1 designates the above ground central control unit, that also has a display screen 2. The central control unit is connected via a busbar 3 with a longwall face control unit, preferably two longwall face control units 4 and 5, which are situated underground at the end of the longwall faces. The computers 6 of the longwall face control units (longwall face computers) are connected with the shield control units 12 of the extraction units 11 via the busbar 3 and the respective branch lines. In addition to longwall face computers/processors each longwall face control unit 4 and 5 has also a memory 7, that as fixed memory comprises digital memory modules in a semiconductor manner, as defined, in which the functional, operational and control programs are stored, that are required by the longwall face computer/process computer 6 to control the extraction functions. The fact, that each longwall face control unit 4, 5, as well as the central control unit 1, has a keyboard with which commands can be entered, is not illustrated. The longwall face control units 4, 5 are also equipped with a display screen 8 each. For their display screen control a display screen processor 10 with fixed disk
memory 9 is allocated to each longwall face control unit 4, 5. To receive data, each display screen processor 10 is connected with the longwall face computer/processor 6. The respective image control program is stored on the fixed disk 9, that can be read by means of the fixed disk drive, as it is done in commercially available computers.

[0011] Since the functions of the extraction units is carried out via the respective longwall face control units 6 and shield control units 12 by the respective keyboard of the longwall face control unit 4 or 5 via their longwall face computers/processors 6, without the necessity to access the fixed disk memory 9 to carry out the command input and the functions, the functional performance of the longwall face control units 4 and 5 is independent from the function of the display screens 8 as well as the display screen processors 10 allocated to them and the allocated fixed disk drive 9.

That which is claimed is:

1. An extraction control unit for coal mining in the longwall face of a mine configured to control a plurality of extraction units that are erected adjacent one another along the length of the longwall face between galleries, and to control a mining machine that can travel along the coal face, comprising:
   a central control unit located above ground;
   a longwall face control unit located at the end of the longwall face and configured to control the mining functions of the mining machine and the extraction functions of the extraction units in the sense of robbing, advancing and jiggling;
   a plurality of shield control units, one of each being locally and functionally allocated to an extraction unit and configured to transform and transmit extraction commands of the longwall face control unit; and
   a busbar connecting the longwall face control unit and the shield control units,
   wherein the longwall face control unit has a display screen configured to display the commands and functions to be controlled or the positional and functional statuses of at least one of the extraction units of the mining machine, the extraction control unit, or other functional elements, wherein the program required for the display screen control is stored on a fixed disk of a fixed disk memory drive situated in the longwall control unit, and wherein the longwall control unit is equipped with fixed memory modules as program memory configured to store function programs and with a processor to process the programs and control the extraction and mining functions.

2. An extraction control unit according to claim 1, wherein the busbar is configured to connect the longwall face control unit and the shield control units in series.

3. An extraction control unit according to claim 1, wherein the fixed memory modules are read only memory modules.

4. An extraction control unit according to claim 3, wherein the read only memory modules are selected from the group consisting of ROMs, EPROMs, EEPROMs, and flash EEPROMs.

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