Module Description

GKWE 705 195 E, edition 10/88

ASEA BROWN BOVERI

PROCONTROL 44
Transfer

Annunciation Module for Monitoring Station

88 UM01-E/R0100

Application

The annunciation module for monitoring station is used within the PROCONTROL monitoring station.

It is used for conventional (i. e. parallel) signal transfer from the PROCONTROL bus system. Through this module, essential items of information are transferred from the master stations to the control room and to the process control communication system.

Features

The module is only installed once in the monitoring station.

Basically, it has four interfaces. Via two of them, it receives and transfers signals from and to both coupling modules for monitoring station 88 VU01 in the two master stations A and B.
The third interface establishes the connection with the control room (console section). The process control communication system is connected to the fourth interface.

Seven light-emitting diodes are provided at the front of the module. They serve to indicate disturbances which have been detected in the two partial systems (see "Annunciation functions").

System characteristics

To enable a better understanding of the signals processed by the module, two major characteristic features of the PROCONTROL bus system are described below.

OPERATING MODES IN THE SYSTEM

As a result of the redundant system design various operating modes are possible. These can be set on the selection module for remote bus operation 88 UB01 (see module description "Selection module for remote bus operation 88 UB01", GKWE 705 192).

Basically, there are three operating modes, with the third one offering two alternatives:

Operating mode A: Data transfer only on remote bus system A
Operating mode B: Data transfer only on remote bus system B
Operating mode AUX: Data transfer with automatic cyclic alternation between remote bus system A and B

The third operating mode is yet again subdivided into:

Operating mode AUT: Data transfer with automatic cyclic alternation, with consideration of priority.
Operating mode AUP: Data transfer with automatic cyclic alternation, without consideration of priority.

SYSTEM PRIORITIES

Disturbances which may occur in the entire system are grouped into three priority levels:

Priority 1 = Disturbances at master station level (e.g. processor faulty or module not plugged in)

Priority 2 = Disturbances at multi-purpose processing station level (e.g. control module faulty or not plugged in)

Priority 3 = Disturbances at the level of input/output and processing modules.

Depending on the selected operating mode and the priority annunciations, the coupling modules for monitoring station 88 VU01 in the two master stations A and B perform specific selection functions (see module description "Coupling module for monitoring station 88 VU01", GKWE 705 190).

Description

The most important functions of the module are described below (see "Functional diagram").

SIGNAL INPUT FROM THE MODULES 88 VU01

The module contains two identical input circuits via which it receives information from the coupling modules 88 VU01 of the two master stations A und B. The type and number of signals is the same in the two coupling modules. Both input circuits are potential isolated. Therefore all signals are transferred by the coupling modules on a two-pole basis.

The following descriptions of the inputs apply to both input circuits.

The operating mode "Automatic" is signalled by the coupling modules via inputs AUTO/AUTOR. Here, no distinction is made between operating modes AUP and AUT (see "Operating modes in the system").

Inputs ABS/ABSR are used to signal whether operating mode A or B is selected (i.e. data transfer only on one partial system).

The inputs SYA/SYAR are activated simultaneously with the system lamps on the coupling modules 88 VU01. They indicate on which partial system data transfer is currently being carried on.

The inputs STU/STUR are activated if the line monitors of the coupling modules respond.

Via inputs PRIOX/PRIOXR (X = 1, 2, 3), the priority disturbances detected and evaluated by the coupling modules are signalled (see "System priorities").

SIGNAL OUTPUT TO THE MODULES 88 VU01

Via outputs TEST/TESTR, a test signal is transferred on a two-pole basis to the coupling modules. Potential isolation is provided on the coupling modules. This signal ensures that all signals arriving from the coupling modules are output simultaneously.

SIGNAL OUTPUT TO THE PROCESS CONTROL COMMUNICATION SYSTEM

The module has an output section for signal transfer to the process control communication system in the control room. The circuit is potential isolated. Therefore all signals are transferred on a two-pole basis.

The output signals PRIOXA/PRIOXAR and PRIOXB/PRIOXBR (X = 1, 2, 3) provide information as to which priority disturbances have occurred in which partial system (A or B).

The output STU/STUR signals that the line monitors on the coupling modules 88 VU01 have responded.

Outputs AABS/AABSR and BABS/BABSR are used to indicate whether operating mode A (AABS) or B (BABS) has been selected. The signal AUTO/AUTOR signals the operating mode Automatic (AUP or AUT).

The outputs VSAA/VSAAR and VSAB/VSABR are activated by the respective input signals SYA of the two coupling modules when data transfer is in progress in the respective partial system.

All described signals are derived from the input signals of coupling modules 88 VU01. These are switched by the circuit logic directly through to the corresponding outputs for the control room or the process control communication system.

SIGNAL INPUT FROM THE PROCESS CONTROL COMMUNICATION SYSTEM

The annunciation module receives a test signal via the potential-isolated input TEST/TESTR. The test logic (see "Functional sequences") evaluates the signal. At the same time it is passed on to the two coupling modules 88 VU01 via the circuit logic (TEST/TESTR-outputs).

SIGNAL OUTPUT TO THE CONTROL ROOM (CONSOLE)

The module has an output circuit for signal transfer to the console section in the control room. The circuit is potential isolated. Therefore, all signals are transferred on a two-pole basis.

The signals output are essentially the same as those for the control system operator station (see "Signal output to process control communication system").

The only difference exists in the priority annunciations. While the PRI01-annunciations are transferred classified according to partial system A and B, the PRI02- and PRI03-annunciations are only transferred as single-pole signals. The last-mentioned annunciations are generated by the circuit logic from the single-pole annunciations of the two coupling modules via an OR-gate.

SIGNAL INPUT FROM THE CONTROL ROOM (CONSOLE)

The module receives three two-pole signals from the console section in the control room via a potential-isolated input circuit.

TQ/TQR is an acknowledgement signal produced by means of the acknowledgement pushbutton

TL/TLR is a test signal produced by means of the lamp test pushbutton

TI/TIR is an information call signal produced by means of the corresponding call pushbutton.

The meaning of the three pushbutton signals is described under "Annunciation functions".

FLASHING VOLTAGE INPUT

The module is supplied with two flashing voltages on a two-pole basis via a potential-isolated input circuit. These voltages are generated in the cubicle of the master station.

One flashing voltage with a frequency of 0.5 Hz is supplied via inputs BLM/Z.

One flashing voltage with a frequency of 2 Hz is supplied via inputs BLS/Z.

Both flashing voltages are evaluated by the circuit logic. They are used to signal certain disturbance annunciations on the console section of the control room (see "Annunciation functions").

CLOCK PULSE GENERATION

An oscillator circuit available on the module generates two clock pulses. The circuit logic is provided with active security circuits with filtering function for all input signals. These ensure that any noise signals on the input lines are suppressed. The internally generated clock pulses are processed by these circuits.

TEST LOGIC

The module receives a test signal from the control system operator station via the TEST input.

The test logic evaluates this signal and produces a short output signal (approx. 20 ms) which is transferred to both 88 VU01 coupling modules via the circuit logic. The coupling modules activate all their signal lines to the annunciation module 88 UM01 for the duration of the test signal. This module transfers the signals directly to the control system operator station.

For the duration of the test, the signal connections (of the 88 VU01-signals) to the console section and to the module annunciaction lamps are interrupted by the test logic. The signals to the console section and to the annunciation lamps which were present before the start of the test are stored by the module for the duration of the test and remain present in spite of the interruption.

With this test signal and the annunciation response of the coupling modules 88 VU01, a line monitoring process is performed from the coupling modules via the annunciation module up to the control system operator station.

Operating modes

The entire PROCONTROL bus system can be designed as a two-channel system (with two master stations A and B), or as a single-channel system (with only one master station). The annunciation module must be informed whether one or two coupling modules 88 VU01 are connected.

For this purpose, two plug-in jumpers "A" and "A;B" are arranged on the module. When two 88 VU01 coupling modules are connected, the jumper plug must be inserted in plug-in jumper "A;B".

If only one master station is available, as in the case of a single-channel design, the jumper plug must be inserted in plug-in jumper "A". The coupling module must then be connected to the contacts of the input circuit "Master station A" (see "Functional diagram").

Annunciation functions

ANNUNCIATIONS ON THE MODULE

Seven red light-emitting diodes are provided at the front of the module (see "Mechanical design").

The light-emitting diode STU is set when the line monitor of the coupling modules responds (OR-combination of the STU inputs of the two coupling modules 88 VU01).

Furthermore, three light-emitting diodes are available for each partial system (A and B). They are set when the corresponding disturbances of priorities PRI1 to PRI3 have been detected and signalled.

ANNUNCIATIONS TO THE CONSOLE SECTION

The individual annunciations to the console section are signalled by the module in different ways.

The three annunciations PRIO1A, PRIO1B and STU are indicated by flashing voltages. Whenever they appear they are indicated by flashing voltage BLS (= 2 Hz). By pressing the acknowledgement pushbutton (signal TQ), the flashing light changes to steady light provided the disturbance is still present. If the disturbance has already disappeared before acknowledgement, the annunciation is cancelled as soon as the acknowledgement pushbutton is pressed.

If the disturbance disappears after having been acknowledged, the signal changes from steady light to slow flashing light (flashing voltage BLM). The annunciation is cancelled as soon as the acknowledgement pushbutton is pressed again. If the disturbance disappears and then re-appears before it was acknowledged for the second time, the slow flashing light (with BLM) changes automatically to fast flashing light (with BLS).

If the module connections TQ and TQR are short-circuited (which corresponds to TQ being permanently set), the flashing voltages are suppressed for the three above-mentioned disturbance signals. If the disturbances occur, they are each indicated directly by a steady light. When the disturbance signals disappear, the signal lamps are set back automatically.

The module directly indicates the annunciations PRIO2, PRIO3, AABS, BABS and AUTO by steady light when they appear. The respective signal lamp is set back automatically, when these annunciations disappear. The acknowledgement pushbutton TQ has no effect on these annunciation outputs.

The annunciation outputs VSAA and VSAB contain information on the partial system on which data transfer is currently being carried out. However, these two information signals are only output by the module if the call pushbutton TI (pushbutton information) is pressed at the console section.

By pressing pushbutton for lamp test TL, all signals are output by the module simultaneously to the console section. All signal lamps then emit a steady light.

The three pushbuttons TQ, TI and TL are supplied by the module with positive voltage US, (connections TQR, TIR, TLR).

ANNUNCIATION IN THE CUBICLE

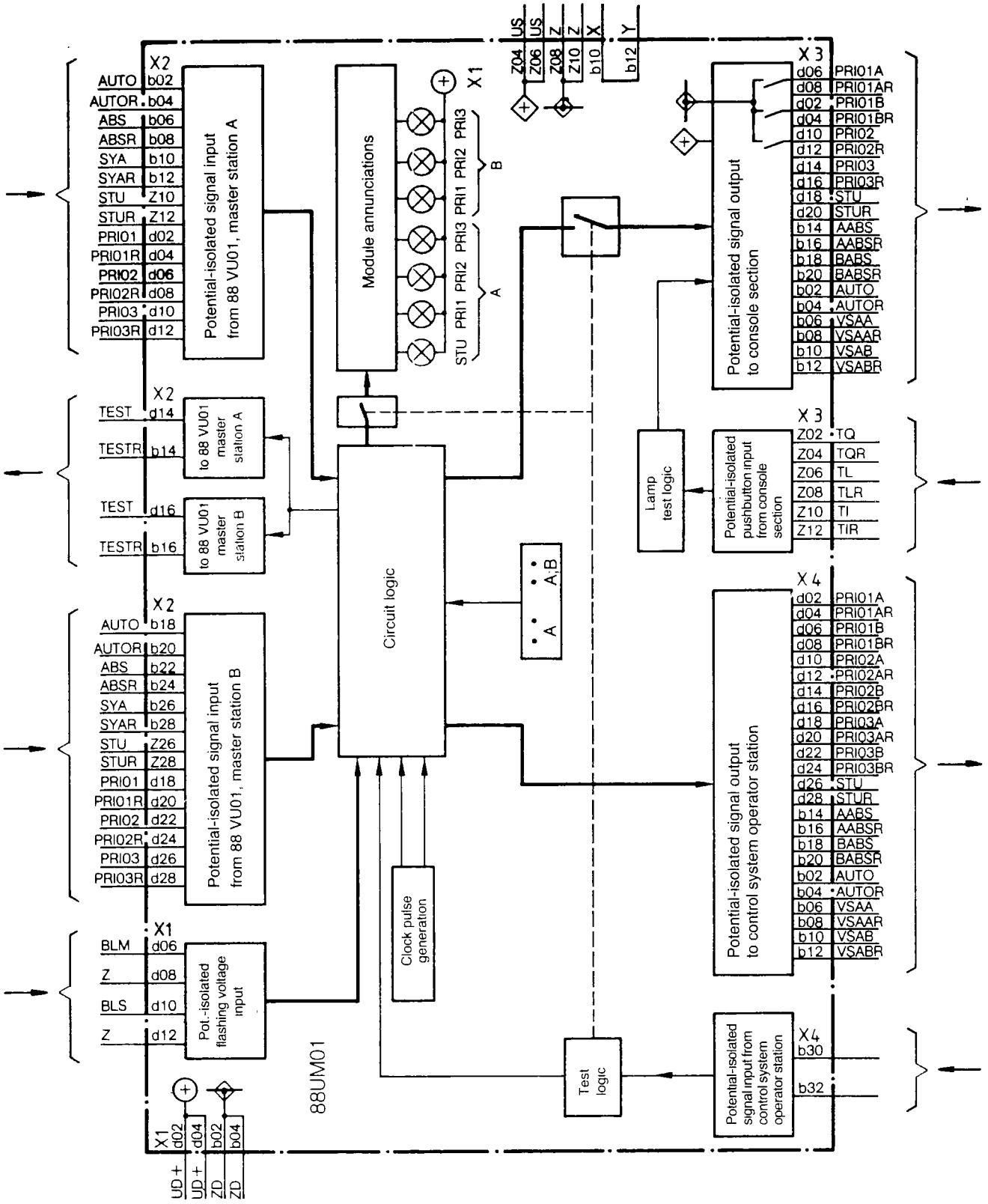
A monitoring loop is formed with connections X and Y. This loop is fed by the monitoring and flashing frequency generation module 89 NU01.

In this way, 89 NU01 realizes whether module 88 UM01 is plugged in. If the annunciation module for monitoring station is withdrawn, a disturbance annunciation is output by 89 NU01 (see module description GKWE 705 291).

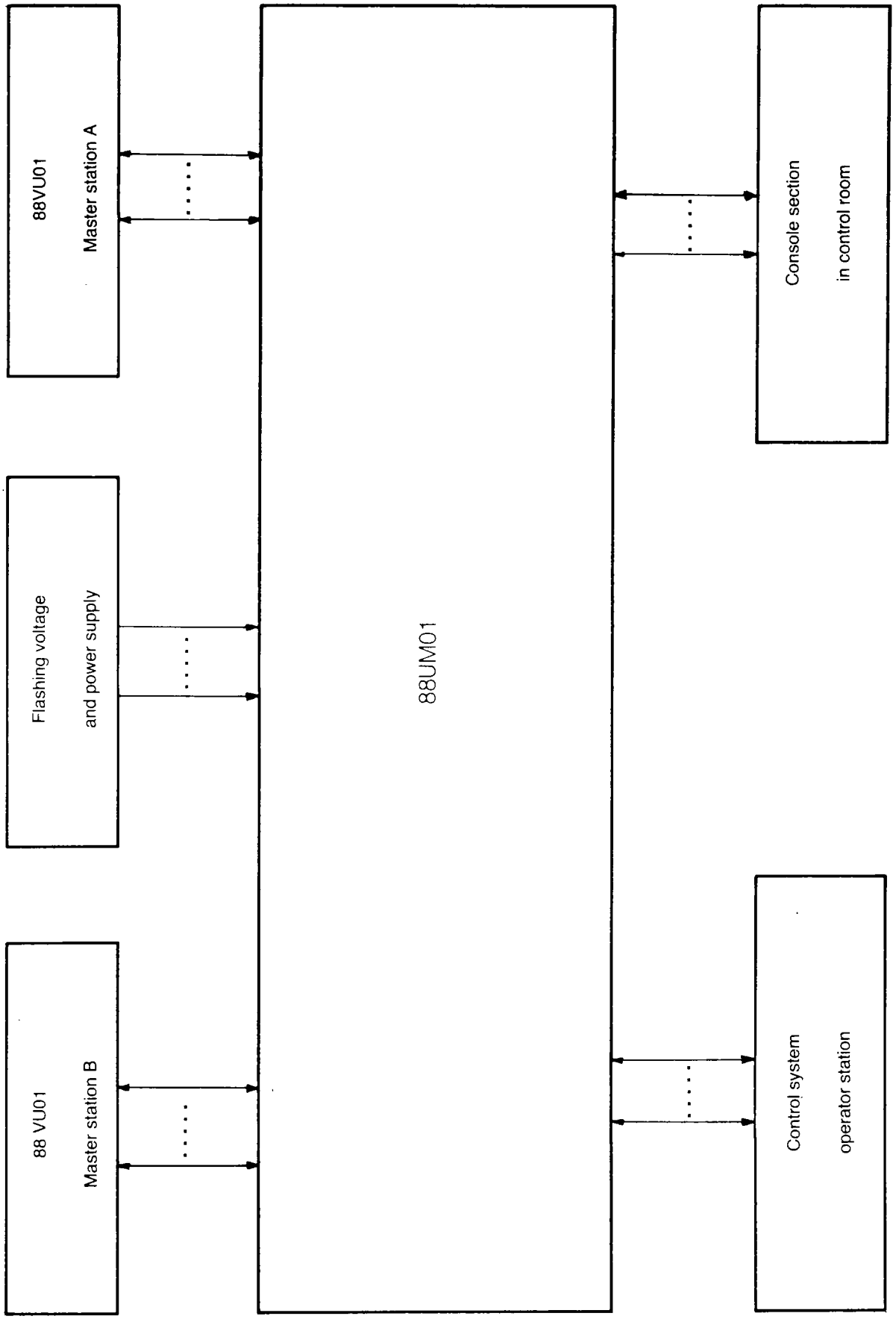
Functional diagram

Contact designations: the module consists of two printed circuit boards (see "Mechanical design"). Printed circuit board 1 is equipped with connectors X1 and X2.

Printed circuit board 2 is equipped with connectors X3 and X4. Both printed circuit boards are supplied jointly by means of connector X1.



Connection diagram



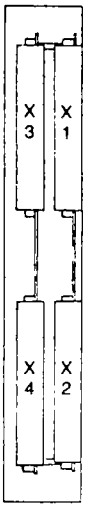
Mechanical design

Board size: 6 units, 2 divisions, 220 mm deep

Connector: according to DIN 41 612
4 x 48-pole, edge connector type F
(for X1 - X4)

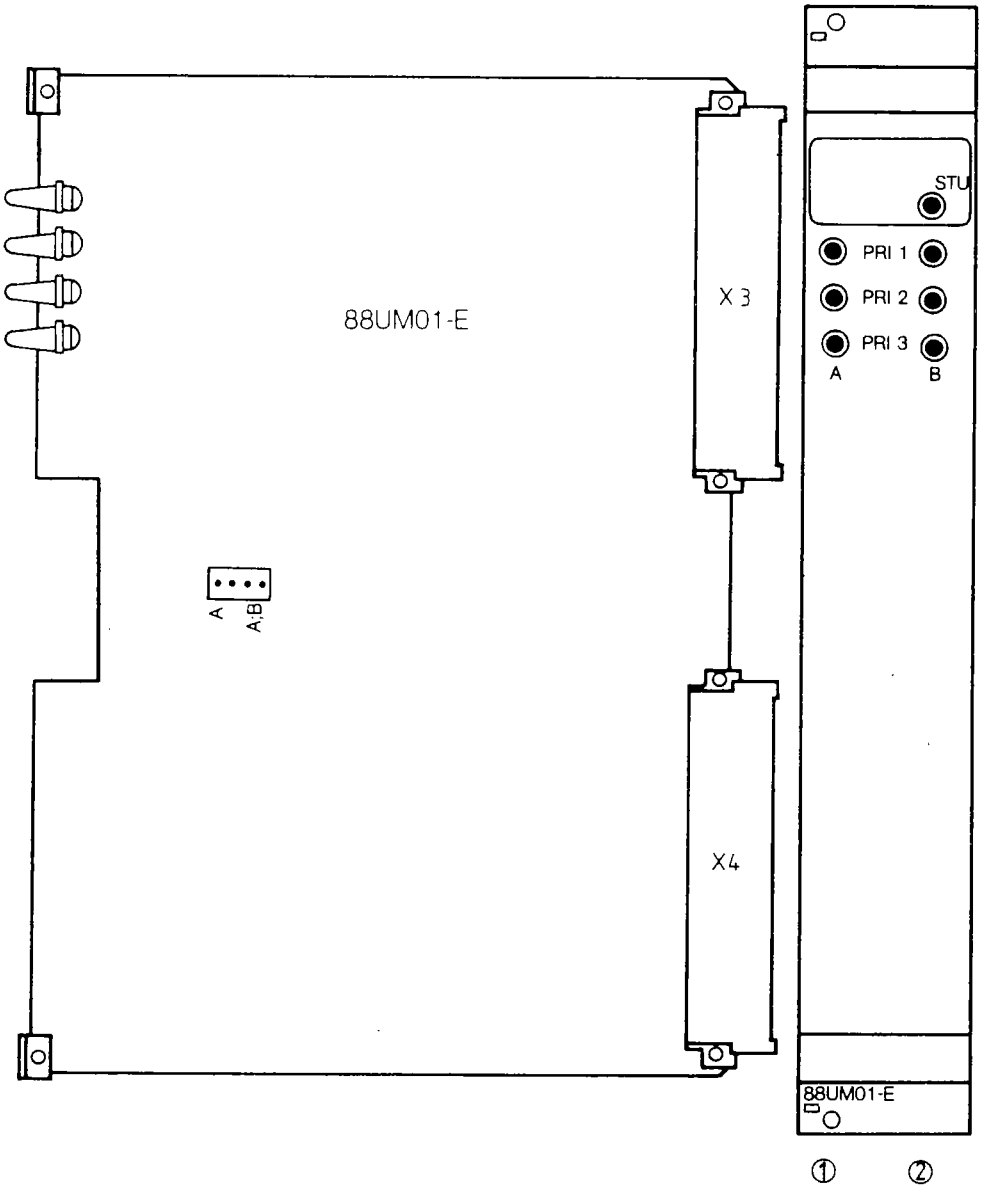
Weight: approx. 0.65 kg

View of connector side:



Both printed circuit boards are connected with each other mechanically and electrically.

POSITION OF THE PLUG-IN JUMPERS ON PRINTED CIRCUIT BOARD 2 AND FRONT VIEW



Line monitors responded

Priority disturbances of the partial systems

① = printed circuit board 1 ② = printed circuit board 2

Technical data

In addition to the system data the following values apply:

POWER SUPPLY

Operating voltage (module)	UD+ = + 5 V
Operating voltage (for signal output to the console section and for the flashing voltages)	US = +24 V
Current consumption	I_D = 1 A I_S = 1 A
Power dissipation typ.	P_V = 29 W

ZD - Reference potential for UD+
Z - Reference potential for US

INPUT SIGNALS

AUTO/AUTOR	-	Operating mode "Automatic" (from the 88 VU01)	
ABS/ABSR	-	Operating mode "Absolute" (from the 88 VU01)	
SYA/SYAR	-	System active (from the 88 VU01)	
$\overline{\text{STU}}/\overline{\text{STUR}}$	-	Transfer error (from the 88 VU01)	
$\overline{\text{PRIOX}}/\overline{\text{PRIOXR}}$ (X =1,2,3)	-	Priority annunciations (from the 88 VU01)	
TEST/TESTR	-	Test signal from the control system operator station	
TQ/TQR	-	Pushbutton command "acknowledge"	
TL/TLR	-	Pushbutton command "lamp test"	
TI/TIR	-	Pushbutton command "information call"	
BLM	-	Flashing light for annunciation	1 NL
BLS	-	Flashing light for alarm	1 NL

OUTPUT SIGNALS

TEST/TESTR	-	Test signals to the 88 VU01

The following signals are transferred simultaneously to the console section and to the control system operator station. They are essentially the same and differ only in the case of the PRIO signals.

PRIOXA/PRIOXAR (X =1,2,3)	Priority annunciations
PRIOXB/PRIOXBR (X =1,2,3)	
PRIOX/PRIOXR (X =2,3)	

STU/STUR	-	Transfer error	
AABS/AABSR	-	Only system A in operation	
BABS/BABSR	-	Only system B in operation	
AUTO/AUTOR	-	Operating mode "Automatic"	
VSAA/VSAAR	-	System A transferring	
VSAB/VSABR	-	System B transferring	
X, Y	-	Connections for monitoring for un-plugged module	100 mA

The signal exchange between the annunciation module and the coupling modules 88 VU01 is carried out at TTL signal levels.

The signal outputs to the console section supply 50 NL at 24 V.

The potential-isolated input/outputs (optocoupler) to the control system operator station are fed from there.
5 V or 24 V can be used at I_{max} = 30 mA.

ORDERING DATA

Type designation: 88 UM01-E/R0100

Order number: GJR2329800R0100

Technical data are subject to change without notice!

ABB Kraftwerksleittechnik GmbH

P. O. Box 100351, D–68128 Mannheim
Phone (0621) 381 2712, Telefax (0621) 381 4372
Telex 462 411 107 ab d

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