Application

The annunciation module 89 NU04 is used both in PROCONTROL multi-purpose processing stations and in monitoring stations.

It is used on the one hand for displaying different disturbance annunciation signals (generated in the station) by means of light emitting diodes on the front of the module.

On the other hand, these signals are transferred simultaneously via the appropriate outputs to the alarm annunciation system and passed on to the control system operator station.

The module is available in two versions:

89 NU04-E/R1 with 16 function units; for use in multi-purpose processing stations.

89 NU04-E/R2 with 20 function units; for use in monitoring stations.

Features

The module requires the voltage US as the operating voltage.

It does not have an interface to the PROCONTROL bus system. The disturbance annunciation signals generated by the corresponding annunciation facilities are transferred to the module hard-wired in parallel (conventional) configuration. This also applies to the transfer of the output signals from the module to the alarm annunciation system. All output signals are output from the module via relays. The module is potential-isolated if the relays are supplied by an external voltage (see "Operating modes"). Jumper for external power supply.

Description

The following is a description of the essential functions of the module (see "Function diagrams"). A difference is made here between the two module versions.

Module version R1

The module contains sixteen identical function units.

The following describes the first function unit. The others work in a similar way.

The disturbance annunciation signal to be processed is fed to an input amplifier via input E01. This actuates a relay which contains two contacts: one NC contact and one NO contact.

The input signal is provided at output A01 via the NO contact (in either floating or non-floating form, depending on the type of main power supply).

The light emitting diode for the function unit on the front of the module is activated (see "Annunciation functions") via the NC contact.

The NO contacts of all functions are combined on the module and are supplied with the common voltage US.

The sixteen function units can be divided into six groups by means of jumpers (see "Operating modes").

The six groups here process the following input signals:

Group 1: Inputs E01, E02
Group 2: Inputs E03, E04, E05
Group 3: Inputs E06, E07, E08
Group 4: Inputs E09, E10
Group 5: Inputs E11, E12, E13
Group 6: Inputs E14, E15, E16

The NO contacts for the relays of these groups can then be supplied by external voltages (independent of US) via the inputs S1-S6. This allows independent disturbance signal groups to be formed.

Module version R2

The module contains 20 function units. The function units FE1, FE2, FE3 and FE12 differ from the remaining units in a detail function.

All function units contain a relay with two NC contacts each and two NO contacts each. The basic function of all function units is identical and is described as follows.

The disturbance annunciation signal to be processed is supplied via the inputs E01-E20 to an input amplifier. This actuates the relay. The input signal is provided at the outputs A01-A20 (in potential-isolated form, depending on main supply voltage) via an NO contact.

The light emitting diode for the function unit on the front of the module is activated (see "Annunciation functions") via the NC contact.

The function units FE1, FE2, FE3 and FE12 contain the following special functions in comparison to the others:
The type of light emitting diode actuation can be selected using two plug-in jumpers each (see "Operating modes"). In the one case the light emitting diode emits a steady light for as long as the disturbance annunciation signal is present at the input Exx as a "1" signal and is set back when the input signal disappears. In the second case, the signalling is exactly the reverse.

A special feature of function unit FE 12 is that an additional specific function can be set by means of a plug-in jumper.

The following applies to all other function units. A "1" signal at the input Exx causes a "1" signal at the output Axx. With FE12, the "1" signal at output A12 can be set by means of a jumper (a "1" signal at E12 has no effect). Thus, the "1" signal at A12 can only be turned into "0" by an (active) "0" signal at input E12.

As with version R1, it is also possible with version R2 to divide the 20 function units into seven groups by using jumpers. The seven groups process the following signals:

Group 1: Inputs E01, E02, E03
Group 2: Inputs E04, E05
Group 3: Inputs E06, E07, E08
Group 4: Inputs E09, E10, E11
Group 5: Inputs E12, E13, E14
Group 6: Inputs E15, E16, E17
Group 7: Inputs E18, E19, E20.

Without a division into groups, the NO contacts of all relays activating the outputs A01-A020 are combined on the module and supplied by the common voltage US.

By dividing the function units into groups, it is possible to supply these NO contacts (for A01-A20) in groups (independent of US) with external voltages.

The following allocation applies in this case (for external power supply):

Group: Supply contact:
1   S01
2   S03
3   S05
4   S07
5   S09
6   S11
7   S13

In addition to the relay contacts described previously, each function unit has an additional NO contact and NC contact. Both contacts are used to generate further output signals. These additional signals are ORed for each group and represent the group general disturbance signal.

The following allocation applies:

Group: General disturbance output:
1   A31
2   A32
3   A33
4   A34
5   A35
6   A36
7   A37

By means of jumpers it is possible to arrange for this general disturbance signal to be output on the open-circuit principle or closed-circuit principle, as appropriate.

For these general disturbance signals it is also possible to determine by means of jumpers whether the relay contacts are supplied jointly for all 20 function units or separately according to group.

If these disturbance annunciation signals are supplied by group, the following allocation applies:

Group: Supply contact:
1   S02
2   S04
3   S06
4   S08
5   S10
6   S12
7   S14

By means of appropriate jumpers it is also possible to determine whether the contacts for the general annunciation signals (A31-A37) are to be supplied by US, Z or an external voltage (via the inputs S02-S14).

Operating modes

With both module versions, the different operating modes possible can be set by means of a series of jumpers. Their meaning and functions are described below (see also "Mechanical design").

Module version R1

The plug-in jumpers 1001, 1002, 1004, 1006, 1008 and 1010 are provided on the module. All these jumpers are used for the following settings:

— all NO contacts of the relays (for the outputs A01-A16) are supplied with US.
— the NO contacts are supplied in groups by external voltages (via the inputs S01-S06).

The jumpers 1002 ... 1010 each have two plug-in positions: A-A and B-B. They enable the 16 function units to be separated by groups.

The following standard positions apply here:

Plug-in position: Function:
A-A Group is connected with the adjacent group; common power supply
B-B Groups are separated; external power supply
The jumper 1001 has the plug-in positions A-B and A-E.

The following applies here:

**Plug-in position: Function:**

A-B
The NO contacts of all relays are supplied with voltage US (requirement: jumpers 1002 - 1010 in position A-A)

A-E
Supply is effected separate from US by external power supply. The groups (depending on the position of the jumpers 1002 - 1010) can be supplied either together or separately by group with an external supply.

**Module version R2**

The function units FE1, FE2, FE3 and FE12 are provided with the jumpers 1015, 1016, 1017 and 1018. These serve to set the way in which the appropriate light emitting diode on the front of the module is to be activated. Each of the four jumpers has the plug-in positions A-B, B-C, A-D, D-E. The appropriate light emitting diode can be arranged to be energized when the input signal is present; alternatively, arrangements can be made for the reverse case.

The following applies to all four jumpers

<table>
<thead>
<tr>
<th>Input signal</th>
<th>Plug-in jumper: A-B-C</th>
<th>Jumper: A-D-E</th>
<th>Annunciation Mxx:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>A-B</td>
<td>D-E</td>
<td>●</td>
</tr>
<tr>
<td>1</td>
<td>A-B</td>
<td>D-E</td>
<td>×</td>
</tr>
<tr>
<td>0</td>
<td>B-C</td>
<td>A-D</td>
<td>×</td>
</tr>
<tr>
<td>1</td>
<td>B-C</td>
<td>A-D</td>
<td>●</td>
</tr>
</tbody>
</table>

Legend:

● = steady light
× = LED dark

The plug-in jumper 1014 with the two positions A-A and B-B is specifically intended for function unit FE12. With this jumper, one can determine whether the "1" signal is preset inside the module at the output A12.

The following allocation applies here:

**Plug-in position: Function:**

A-A
"1" signal at output A12 specified (irrespective of a "1" signal at input E12), "0" signal at A12 is obtained by an (active) "0" signal (on the signal source side) at E12.

B-B
Function as with all other function units.

The plug-in jumpers 10, 20, ... 200 belong functionally to all 20 function units. With them it is possible to arrange for the disturbance signal to be processed according to the open-circuit or closed-circuit principle.

The following standard allocation applies here:

- **Plug-in position: Function:**
  - B-A NO contact
  - B-C NC contact

The plug-in jumpers 1002-1013 permit the division of the 20 function units into groups (in terms of the external power supply of the relay contacts via inputs Sxx).

In this case, all NO contacts on the module for the annunciation outputs A01-A20 are combined (see "Function diagram"). On the other hand, the NO/NC contacts are combined for the general disturbance signals that are generated group-oriented (outputs A31-A37).

The jumpers 1002, 1004, 1006, 1008, 1010 and 1013 are designed for the supply of outputs A01-A20. All the jumpers have the plug-in positions A-A and B-B.

The following allocation applies here

**Plug-in position: Function:**

A-A
Group is connected with adjacent groups; common power supply

B-B
Groups are separated; external power supply.

The jumpers 1003, 1005, 1007, 1009, 1011 and 1012 are designed for the supply of outputs A31-A37. Also these jumpers have the standard plug-in positions A-A and B-B.

The following allocation applies:

**Plug position: Function:**

A-A
Group is connected with adjacent groups; common power supply

B-B
Groups are separated; external power supply.

The jumper 1001 is functionally designed to provide various power supply options for the relay contacts. One option allows all NO contacts for the outputs A01-A20 to be supplied with the common module voltage US.

Alternatively, the NO/NC contacts for the outputs A31-A37 can be supplied jointly with US or Z, as desired.

The following allocation applies here:

**Plug-in position: Function:**

A-B
Supply of outputs A01-A20 with the module voltage US (Requirement: jumpers 1002 - 1013 in position A-A)

A-E
No supply of US to outputs A01-A20; external power supply

A-F
No supply of US to the NO/NC contacts for the outputs A31-A37
A-C       Supply of the outputs A31-A37 with US
C-D       Supply of the outputs A31-A37 with Z.

Two or several adjacent groups can be supplied jointly via an
external power supply by appropriate selection of the jumpers
1002 - 1013.

Annunciation functions

Annunciations on the module

17 light emitting diodes are provided on the front of module
version R1.

The green light emitting diode US emits a steady light for as
long as the operating voltage US is present.

The 16 yellow light emitting diodes M01-M16 are allocated to
the 16 function units. They emit a steady light for as long as
the appropriate function unit is activated by an input signal.

21 light emitting diodes are provided on the front of module
version R2.

The green light emitting diode US emits a steady light for as
long as the operating voltage US is present.

The 20 yellow light emitting diodes M01-M20 are allocated to
the 20 function units. They emit a steady light for as long as
the appropriate function unit is activated by an input signal.
Function diagram

Module version R1, part 1 (function units 1-8)
Function diagram

Module version R1, part 2 (function units 9-16)
Function diagram

Module version R2, part 1 (function units 1-10)
Function diagram

Module version R2, part 2 (function units 11-20)
Connection diagram

(Example version R2)

Explanations UST = Monitoring station, VST = Master station, Sp. = Voltage

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89 NU04

<table>
<thead>
<tr>
<th>Power Supply UST</th>
<th>E01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply VST-A</td>
<td>E02</td>
</tr>
<tr>
<td>Power Supply VST-B</td>
<td>E03</td>
</tr>
<tr>
<td>Temperature monitoring high UST</td>
<td>E06</td>
</tr>
<tr>
<td>Temperature monitoring high VST-A</td>
<td>E07</td>
</tr>
<tr>
<td>Temperature monitoring high VST-B</td>
<td>E08</td>
</tr>
<tr>
<td>Cubicle door open UST</td>
<td>E09</td>
</tr>
<tr>
<td>Cubicle door open VST-A</td>
<td>E10</td>
</tr>
<tr>
<td>Cubicle door open VST-B</td>
<td>E11</td>
</tr>
<tr>
<td>Module disturbed UST</td>
<td>E12</td>
</tr>
<tr>
<td>Module disturbed VST-A</td>
<td>E13</td>
</tr>
<tr>
<td>Module disturbed VSTB</td>
<td>E14</td>
</tr>
<tr>
<td>PRIO 1 error in VST-A</td>
<td>E15</td>
</tr>
<tr>
<td>PRIO 1 error in VST-B</td>
<td>E16</td>
</tr>
<tr>
<td>PRIO 2 error</td>
<td>E17</td>
</tr>
<tr>
<td>PRIO 3 error</td>
<td>E18</td>
</tr>
<tr>
<td>STÜ</td>
<td>E19</td>
</tr>
</tbody>
</table>

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Annunciation to Control System Operator
Station
CSOS

Annunciation to Alarm Annunciation System
AAS
GMA

<table>
<thead>
<tr>
<th>S01</th>
<th>A01 Power Supply UST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A02 Power Supply VST-A</td>
</tr>
<tr>
<td></td>
<td>A31 Power Supply VST-B</td>
</tr>
<tr>
<td></td>
<td>A31 Power Supply UST, VST-A, VST-B</td>
</tr>
<tr>
<td>S02</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A04</td>
</tr>
<tr>
<td></td>
<td>A05</td>
</tr>
<tr>
<td></td>
<td>A06 Temperature monitoring UST</td>
</tr>
<tr>
<td></td>
<td>A07 Temperature monitoring VST-A</td>
</tr>
<tr>
<td></td>
<td>A08 Temperature monitoring VST-B</td>
</tr>
<tr>
<td>S06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A32</td>
</tr>
<tr>
<td></td>
<td>A33 Temperature monitoring UST, VST-A, VST-B</td>
</tr>
<tr>
<td>S07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A09 Cubicle door open UST</td>
</tr>
<tr>
<td></td>
<td>A10 Cubicle door open VST-A</td>
</tr>
<tr>
<td></td>
<td>A11 Cubicle door open VST-B</td>
</tr>
<tr>
<td>S08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A34 Cubicle door open UST, VST-A, VST-B</td>
</tr>
<tr>
<td>S09</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A12 Module disturbed UST</td>
</tr>
<tr>
<td></td>
<td>A13 Module disturbed VST-A</td>
</tr>
<tr>
<td></td>
<td>A14 Module disturbed VST-B</td>
</tr>
<tr>
<td>S10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A35 Module disturbed UST, VST-A, VST-B</td>
</tr>
<tr>
<td>S11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A15 PRIO 1 A error in VST-A</td>
</tr>
<tr>
<td></td>
<td>A16 PRIO 1 B error in VST-B</td>
</tr>
<tr>
<td></td>
<td>A17 PRIO 2 error</td>
</tr>
<tr>
<td>S12</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A36</td>
</tr>
<tr>
<td>S13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A18 PRIO 3 error</td>
</tr>
<tr>
<td>A19</td>
<td>Interconnection VST-A, VST-B, US disturbed STÜ</td>
</tr>
<tr>
<td>A20</td>
<td></td>
</tr>
<tr>
<td>S14</td>
<td></td>
</tr>
<tr>
<td>A37</td>
<td></td>
</tr>
</tbody>
</table>

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LE13009
Mechanical design

Board size: 6U, 1T, 160 mm deep (R1)

Connector: to DIN 41612, edge connector type F
1 x 48-pole (R1)
2 x 48-pole (R2)

Weight: approx. 0.4 kg (R1)
approx. 0.54 kg (R2)

Positions of plug-in jumpers on PCB; Front panel (R1)
Position of plug-jumpers on PCB; front panel (R2)
Technical data

In addition to the system data, the following values apply:

**Power supply**

<table>
<thead>
<tr>
<th>Operating voltage</th>
<th>US = + 24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power consumption</strong></td>
<td>Version 1</td>
</tr>
<tr>
<td>no input activated</td>
<td>IS = 88 mA</td>
</tr>
<tr>
<td>all 16 inputs activated</td>
<td>IS = 418 mA</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>Version 2</td>
</tr>
<tr>
<td>no input activated</td>
<td>IS = 144 mA</td>
</tr>
<tr>
<td>all 16 inputs activated</td>
<td>IS = 495 mA</td>
</tr>
<tr>
<td><strong>Power dissipation</strong></td>
<td>Version 1</td>
</tr>
<tr>
<td>no input activated</td>
<td>p = 2.1 W</td>
</tr>
<tr>
<td>all 16 inputs activated</td>
<td>p = 12.5 W</td>
</tr>
<tr>
<td><strong>Power dissipation</strong></td>
<td>Version 2</td>
</tr>
<tr>
<td>no input activated</td>
<td>p = 3.5 W</td>
</tr>
<tr>
<td>all 20 inputs activated</td>
<td>p = 13.0 W</td>
</tr>
</tbody>
</table>

* Values without output currents

**Input values**

E01 ... E16/E20
- Input signal

E12
- Load to US with jumper 1014 in position A-A
  1.8 kΩ

S01 ... S06
- Power supply of NO contacts (with R1)
  I ≤ 1A

S01,S03,S05,S07, S09,S11,S13
- Main power supply of NO contacts for the outputs A01-A20 (with R2)
  I ≤ 1A

S02,S04,S06,S08,
S10,S12,S14
- Main power supply of NO/NC contacts for the outputs A31-A37 (with R2)
  I ≤ 1A
Output values

A01 ... A16/A20 - Contact outputs
A31 ... A37 - Switching capacity of contacts
Switching voltage $U < 60 \text{ V}$
Switching current $I < 1 \text{ A}$
Switching power $P < 60 \text{ W}$

*Observe total current via power supply
S01 ... S14 and US!

Transfer values

Time delays
Switch-on time $t_E < 15 \text{ ms (typ. 10 ms)}$
Switch-off time $t_A < 10 \text{ ms}$

Ordering data

Order numbers
: GKWE 853 000 R1
    GKWE 853 000 R2

Technical data are subject to change without notice.