Module and
Application Description

PROCONTROL P
Test Facility

Test Module on Station–Bus
for Commissioning and Service

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89PT01–E/R1011

Application

The test module is a commissioning and servicing aid. It serves to display bus signals and the memory contents of input/output and processing modules. It also includes a number of diagnostic functions.

Features

The module may be plugged into any multi–purpose processing station. It has a standard interface with the PROCONTROL station bus.

For system diagnosis the module functions like a normal input/output module.

Operator control of the module, display of data and indication of operating states and disturbances are effected on the front panel.

Description

Basic setup

The module may be used in the following operating modes.

– Slot address reading
– Reception of origin– and destination–addressed telegrams
– Transmission of request telegrams
(e.g. request of diagnosis register)

Apart from these three main operating modes the module may also be used for special applications which are, however, without relevance for its general use and are therefore not explained in detail in this context.

In each operating mode a specific program is carried out. Setting of the operating mode and control of the program are effected by means of switches. For indicating the operating mode of the program status and of the data selected in the respective operating mode light–emitting diodes and 7–segment displays are provided. For the sake of clarity the various operating and display functions are subdivided into individual sections.

These include:

– Disturbance annunciation section
– Voltage monitoring section
– Program monitoring start/stop
– Program sequence annunciation section
– Operating mode setting section
– Telegram input/output section
– Data display section
– Setting section

The various sections are shown on the front view of the module (see “Mechanical design”).

Disturbance annunciation section

The following annunciations are provided:

ST	Module disturbance (Hardware or software disturbance)
ABBR	Abortion of the program after its start (program cannot be executed)

ASEA BROWN BOVERI

Voltage monitoring section

In the voltage monitoring section the following voltages, if present, are indicated:

UD+	+ 5 V bus
UB+	+24 V bus
US	+24 V process
UV	−24 V process

The respective indicators emit a steady light if the voltage is present.

Program monitoring start/stop

This section includes the following indicators and/or switches:

Indicators:

END — Execution of the program is terminated, the result is displayed. Additional information, if any, appears in the annunciation or data section.

LAUF — The module is performing the set and started program. The program is not yet completed.

Switches:

START — Program start, operating mode and values are checked; the program is executed if no errors are present.

When errors appear the program is aborted and the error code is displayed.

STOP — Program stop, the current program is completed, the last result is displayed.

RESET — Resetting of the current program.
The module displays start values again.

Program sequence annunciation section

In this section the module gives supplementary information or announces fault conditions which appear while the program is under way. The section provides the following indications:

EREIGNIS INT. — not used

EREIGNIS EXT. — lights up when the module reports an event
(transmission of request telegrams)

PROM AKT. — not used

ZET — Indicates that the station's central clock is present

KEINE ZUT. — not used

KEINE ANTW. — lights up if the telegram to be received has not been received within 2 bus cycles
(Sink monitoring)

FALSCHE EING. — lights up if the combination of the set parameters is not allowable: the function will not be executed. An error code appears in the data display section. Additional error information is displayed.

STAT.BUS STÖR. — lights up

- if within 15 s after the plugging in of the module no valid address is transferred.
- if the reception program does not detect any cyclic bus traffic for 15 s.

Operating mode setting section

In this section the desired basic operating mode of the module is set. The following possibilities exist:

EMPF. Reception of the set telegram
(basic setting when the module is plugged in)

SEND. Transmission of the set request telegram and reception of the response telegram.

These two settings are interlocked with respect to each other.

EINM. Reception and/or transmission once only

ZYKL. Cyclic transmission and/or reception
(Basic setting when the module is plugged in).

These two settings are interlocked with respect to each other.

INT.	special operating modes (not used)
EXT.	
PROM	
TEST	
STAT.–DIAGN.	
AUSG.–ERGEBN.	
AUSG.–VK–SP.	

AUSG.–ADRESSE Display of the module address hard–wired on the station bus PCB, and display of the system and station address, provided that the station control module transmits these data.
For ease of operation this setting, if selected, turns off transmission and reception. When the function is turned off, the previously set values come up again.

Telegram input/output section

The operation code serves to define the transmission direction, the transmission type and the data type. The following possibilities are provided:

Ü–RICH	Transmission direction	0...3
Ü–ART	Transmission type (cyclic/event)	0/1
DAT–ART	Data type	0...31

The address sections serve to define the address of the telegram to be received or sent. Possibilities are as follows:

SYS	system	0... 3
STA	station	0... 255
GER	module	0... 63
REG	register	0... 255

The parameters must be valid within the system as defined.

Data display section

In the data display section the selected data are shown after the execution of the set program. It consists of the following parts:

H 15...8 Binary display, data, High byte
L 7...0 Binary display, data, Low byte
For reception with a comparative function the specified parameters are entered in the Low byte

7–segment display In this section several types of display are possible:

– Parallel display of the binary data in the H/L byte in hexadecimal form

– Display in percent, data type 5

– Temperature display in degrees [˚C], data types 6 and 7

– Error type “ERR.x” in the case of operating errors
(see “Error types)

% 7–segment value display in per cent

 7–segment value display in ˚C.

Program setting section

The program setting section includes two toggle switches for the following functions:

ZEIGER With this toggle switch the cursor of the module is positioned. The cursor position is indicated by blinking.

Toggle upward:
The cursor moves to the left or upward by one position

Toggle downward:
The cursor moves to the right or downward by one position

Keep toggle depressed:
The cursor moves fast in the selected direction.

In the “roll over” mode the cursor is quickly moved across all input sections.

STELLEN With this toggle switch the value of a section selected with the cursor may be changed.

Toggle upward:
The value of the selected digit is increased by 1. In binary sections the selected bit is set = 1.

Toggle downward:
The value of the selected digit is decreased by 1. In binary sections the selected bit is set = 0.

Keep toggle depressed:
The value of the selected digit is increased or decreased fast.
In the case of binary sections the respective bit is set or erased once only.

If the value of the units digit is to be changed all values can be set in the “roll over” mode.

Carry–overs resulting from a value change are taken into account for the higher digit positions.

All setting values may only be changed within the allowable limits.

Error codes

The error codes listed below are displayed by the module in the data section when error conditions are present. Together with the operating mode description they provide information on how the error may be eliminated:

ERR.0 Program preselection in this combination inadmissable.

ERR.1 Selected operating mode not available in this module.

ERR.2 Module address not wired on the connector (display GER = 63).

ERR.3 No address PROM plugged in in PROM mode. Wrong setting of PROM type switch on 2716 address PROM header invalid.

ERR.4 Non–allowable transmission direction.

Handling

Commissioning

After the module has been plugged into a corresponding slot of the station to be checked the system and process voltages are displayed in the voltage monitoring section.

The module then reads its module address and awaits the next address transfer. The displays “Lauf” (running) and “Ausgabe Adresse” (address output) come up.

If the back panel address is not wired an error signal “ERR.2” together with the invalid module address “63” will be issued. If after 15 s no address transfer is detected the error signal “station bus disturbance” together with the module address read in will be generated.

A module without address cannot be used for transmission; by means of a reset the module may, however, be made to display “All zero” and to accept settings for operating mode “reception” which is still possible.

But if the station address has been received it is taken over as basic setting into the telegram input/output section and is indicated.

Thereafter the module is (by default) in the operating mode “cyclic reception”. The cursor is in the section “transmit”. The module then awaits further operator input.

Setting

Move the cursor to the desired setting section by operating the switch ZEIGER. The current cursor position is shown by the blinking display.

Set the desired value by operating the switch STELLEN.

If further settings are required for the desired operating mode they shall be effected in the same way (see description of operating modes).

Program execution

After operation of the START key the set function and the associated starting values are checked.

Errors, if any, are indicated in the accunciation section and the data section by “ERR.X”. The execution is aborted (see error codes).

With a correct setting the module performs the corresponding function and announces the result in the display sections. With cyclic operation and changing data the display at the respective locations may be flickering.

Program execution is indicated by the signal LAUF. Completion of the program is announced by the module with the END display.

Program termination

By operating the key STOP the execution of the program may be terminated. The module then shows the last result of the execution.

RESET causes an abortion of the program execution and the unchanged display of the setting prior to the start of program execution.

If during program execution by the module an attempt is made to make entries via the setting switches the current function is aborted and the setting is displayed.

Description of operating modes

Reception of an origin–addressed telegram

Settings:		Explanation:
EMPF	EINM	The module carries out the reception program once and displays the result
	or	
EMPF	ZYKL	The module carries out the reception program cyclically and displays the results after each cycle.
Ü–RICH	= 0	Origin–addressed telegrams
Ü–ART	= any	
DAT–ART	= any	
SYS	= X	to be defined by the user
STA	= X	
GER	= X	
REG	= X	
DAT H	= any	
DAT L	= any	

After the start the setting display is turned off and reappears only together with the data received (or an error signal).

Module address output

Settings:	Explanation:
AUSG ADRESSE	The module determines its own module address and, if possible, the system and station address. They are shown on the respective display sections.

All other settings are irrelevant.

After the start of the program the system, station, and module addresses or corresponding error messages are indicated.

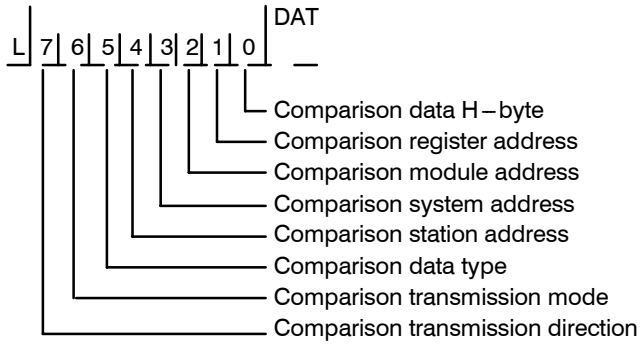
Reception as selected

Settings:		Explanation:
EMPF	EINM	The module carries out the reception program once and displays the result
or		
EMPF	ZYKL	The module carries out the reception program cyclically and displays the results after each cycle.
Ü–RICH	=1, 2, 3	This operating mode is selected with Ü–RICH = 1, 2 or 3. If the Ü–RICH is not marked in the Low byte for the selection, telegrams with Ü–RICH = 0 may also be selectively received. 1 Target–addressed telegram 2 Request telegram logon 3 Request telegram execution
Ü–Art	= X	To be defined by the user
DAT–Art	= X	
SYS	= X	
STA	= X	
GER	= X	
REG	= X	
DAT H	= X	
DAT L	= X	

After the start the setting diplay is turned off and reappears only together with the data received (or an error signal).

By a comparison of the individual telegram parts a specific telegram may be searched for and indicated in this operating mode.

For this purpose the telegram parts to be compared can be selected in section “DAT L” by setting the respective display to 1:



For a L–byte setting = 00000000 no comparison is performed and the module displays any telegrams received.

Transmission of request telegrams
(and reception of the response telegram)

Settings:		Explanation:
SEND	EINM	The module executes the transmission program once and displays the requested telegram.
SEND	ZYKL	The module executes the transmission program with the set values cyclically and displays the requested telegram with each cycle.
Ü–RICH	= 1, 2, 3	1 not allowable, in the case of “Start” error signal 4 will appear 2 Request telegram logon 3 Request telegram execution (any setting, the module by itself uses the correct transfer direction only.)
Ü–ART	= X	Event
DAT–ART	= 0	The telegram is otherwise blocked by module 88TV01 !

SYS	= X	to be defined by the user
STA	= X	
GER	= X	
REG	= X	

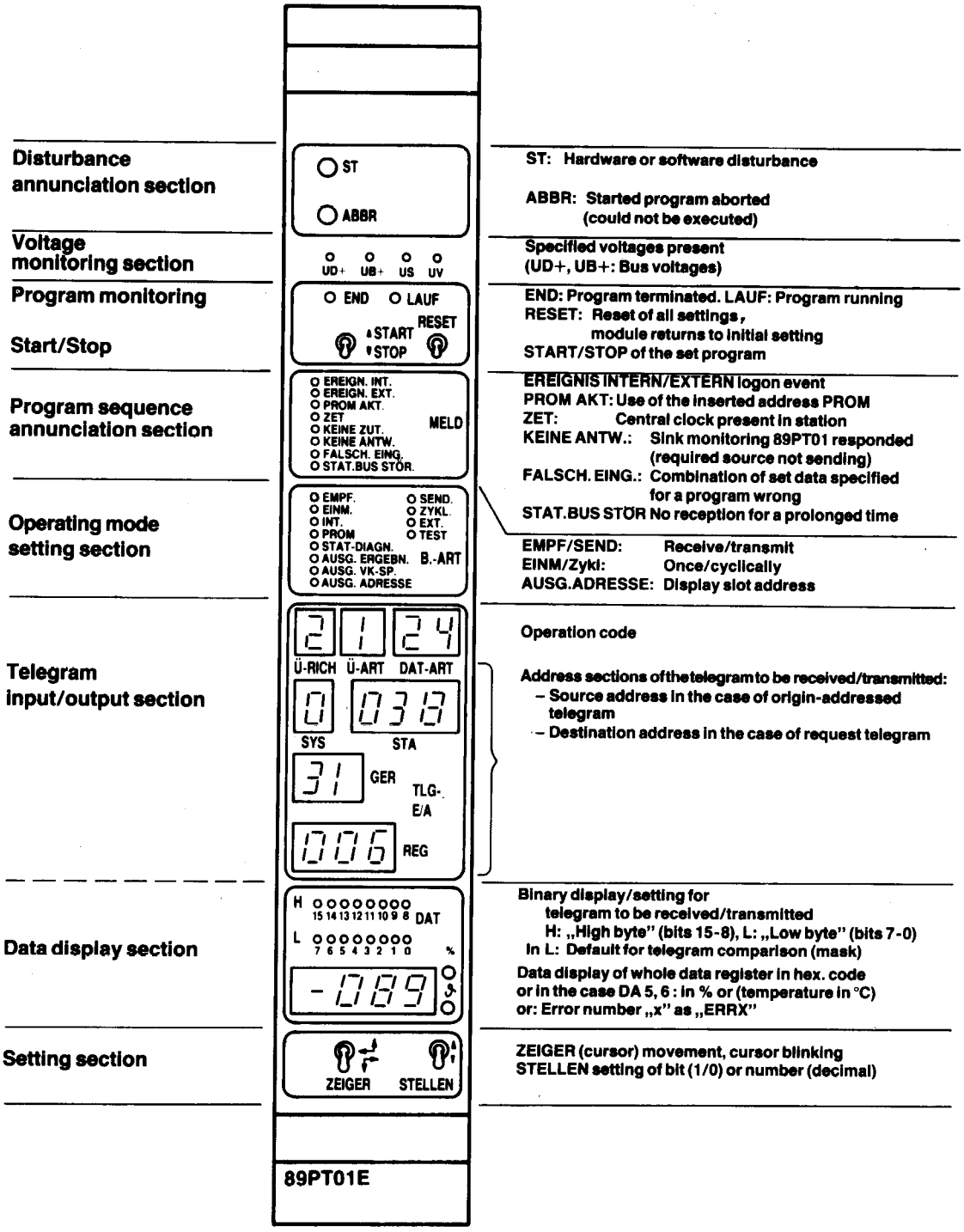
DAT H	= any
DAT L	= any

After the start of the program the set request telegram is transmitted every 200 ms. The requested telegram is only displayed when it is received. There is no display when it is not received.

Mechanical design

Board size:	6 units, 2 divisions, 220 mm deep
Connector:	to DIN 41612 2 x 48–pole, edge connector type F
Weight:	approx. 1.12 kg

The two printed circuit boards are mechanically and electrically connected.



Technical data

Apart from the system data the following values apply:

Power supply

Operating voltage	UD+ = + 5 V US = +24 V UB+ = +24 V UV = −24 V
Voltages UD+ and UB+ are the module power supply.	
Voltages US and UV serve for display on the front panel only.	
Current consumption	ID+ = 2.1 A IB = 17 mA
Power dissipation	Pv = 11 W
Reference potential bus section	ZD = 0 V

Input and output values

SS – standard interface

ORDERING DATA

Type designation: 89PT01–E/R1011

Order number: GJR2344600R1011

Technical data 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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