Appendix N - PLC Program and System Event Log

(Valid from version of secondary processor 6.321 and primary processor 40.31)

In the system selected system and PLC program events are recorded for service purposes. By system log is possible to trace for example an error history or history of other desired actions. Each event is recorded with its identification name, brief description , the time stamp and a group (class) to which belongs. In Indication mode the system has a format for event observing . In this format is possible to view events ,set a group (class) filter and write an event history to disk . If the system is connected to Ethernet network with TCP/IP protocol the event log can be send to an FTP server which is destined for service purposes.

The system (in version 6.320) can record up to ca 32000 events.

The PLC program can transmit to the event log text messages . If a filter is appropriately set a simple PLC terminal is established.

Appendix N1 - List of recorded events

All recorded events are partitioned to groups (classes). The event partitioning give us a possibility to select desired classes only and hence simply filter the events to desired area .

Events Groups summary:

Group	Group description
1	Events in a system part of a primary processor
2	Events of system errors and messages in a primary processor
3	Events concerning with partprograms in a primary processor
5	Events in a system part of a secondary processor
6	Events of a system errors in a secondary processor
7	Events in a PLC program
8	Events concerning with errors and messages in a PLC program

List of events for a system part in a primary processor – group 1 :

event	Event description	Detailed description	
TabRek	Configuration table	Syntactic check of machine constants and beginning of reconfiguration	1
PanRek	Panel configuration	A panel reconfiguration finished	1
TabKor	Correction table	Syntactic check of a correction table	1
TabPos	Shift table	Syntactic check of a shift table	1
TabPar	Parameter table	Syntactic check of a parameter table	1
ChMode	Change mode (mod hx)	Mode is changed to (3-place mode code + hex. code)	1
TabTch	Technology table	Syntactic check of a technological table	1
Start	Start	A system start is in process	1
Stop	Stop	A system stop is in process	1
MatKey	Keyboard (num)	A panel key is pressed (key code)	1
ChPRF	Change %F (num)	Change of percent F (percent)	1
ChPRS	Change %S (num)	Change of percent S (percent)	1

List of events for system errors and messages in a primary processor – group 2 :

Event	Event descriptions	Detailed description	
SysErr	System error (num)	System error (error number)	2
SysMsg	System message (num)	System message or query (message number)	2
PlcErr	PLC error (num)	PLC system error (error number)	2
PLCMsg	PLC message (num)	System message from the PLC program (number)	2
NCMsg	NC prog. message	Technological message from the NC program	2

List of events for partprogram in a primary processor - group 3 :

Event	Event description	Detailed description	
Syntax	NC prg. syntax chk	Start of syntactic check of a partprogram or PC	3
SynEnd	NC syntax check OK	End of syntactic check of a partprogram orPC	3

List of events in a system part in a secondary processor – group 5 :

Event	Event description	Detailed description	
Power	System ON (date)	System On (by date)	5
SecRek	Sec. configuration	Reconfiguration for the secondary processor finished	5
SecStp	Stop req. from sec.	Request to stop from the secondary processor	5
AutMan	Manual operation	Activation of auxiliary manual travels	5
ManAct	Manual op. Active (x)	Motion in auxiliary manual travels (axis)	5
AutEnd	End manual operat.	End of auxiliary manual travels	5

List of events for system errors in a secondary processor – group 6 :

Event	Event description	Detailed description	
RtmErr	RTM error (num)	Fatal error in measurement or real time error (number)	6

List of events for PLC program in a secondary processor – group 7 :

Event	Event description	Detailed description	
TSet	(PLC text)	Write text to a PLC program event log	7
StopPI	Stop req. from PLC	Request to Stop from the PLC program	7
StartP	Start req. from PLC	Request to Start from the PLC program	7
SpiAx1	Spindle location (x)	Start of spindle positioning (axis)	7
SpiAx0	End spindle locat. (x)	End of spindle positioning (axis)	7
Indik0	End indication	End of indication mode	7
Indik1	Begin indication	Start of indication mode	7
AxSpi	Spindle active (x)	Rotating coordinate switched to a spindle (axis)	7
PLCIni	PLC initialization	Initialization of theLC program execution MODULE_INIT	7
PLCClr	PLC clearing	Clearing of the PLC program, execution MODULE_CLEAR	7

List of events for PLC errors and messages in a secondary processor – group 8 :

event	Event description	Detailed description	
ESet	PLC err.req.(num)	Error request from the PLC program (number)	8
MSet	PLC msg.req.(num)	Message request from the PLC program (number)	8

List of critical events (written also to file EVCRITIC.TXT, see next) :

Event	Event description	Detailed description	
ESetC	PLC err.req.(num)	instruction ESET in PLC with parameter CRITICAL	8
TSetC	PLC msg.req.(num)	instruction TSET in PLC with parameter CRITICAL	8
ScHlt	Halt secondary (num)	Halt of secondary processor + Halt number	6
SErrC	System error (num)	System error of 8. group (error error)	2

By the machine constant **R471** is possible to modify an error log. It is mainly a selection if all keys pressings should be recorded. The System (in version 6.320) records last ca 32000 events hence it should be decided if recording of all key pressings is useful.

R471 - Modification of the error log

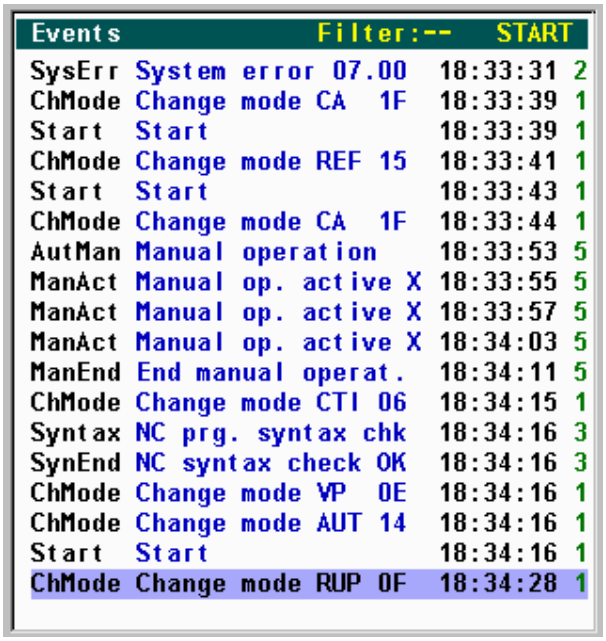
1st decade	0	Common key pressings are not recorded
	1	All key pressings are recorded
2nd decade	0	Change of percent F and percent S are recorded
	1	Change of percent F and percent S are not recorded
3rd decade	0	Execution of instruction AX_SPI_x from PLC program is recorded
	1	Execution of instruction AX_SPI_x from PLC program is not recorded

Appendix N2 - Event view

For event viewing is destined a special screen which is activated by indicating mode setting (key WIN). For the screen its own menu is activated:

Menu keys for events	Description
Start-stop viewing	Starts or stops event viewing . The event record remains
Rolling	Screen roll with recorded events in mode "stop viewing".
Filter setting	Set filter by a "group" selection . A user filter can be established by machine constant R472. (see next).
Write to disk	The actual event status is written to a file EVENTS.TXT (see next).

Example of screen for events viewing. Left is an identifying event name followed by an event description . On the right is a time stamp together with event group .



Machine constants **R472** is destined for setting of a event log viewing filter . The filter setting does not affect an actual event record but narrows selection of events to be displayed. The filter consists of one number or double number which respond to event groups. A value „00“ means no- filter -set.

R472 – Events viewing filter setting

1st and 2nd decade	00	1st filter is preset to values **2 6** …. System errors in secondary and primary processors
	xy	User option of 1st filter
3rd and 4th decade	00	2nd filter is preset to values **0 8**…. PLC errors and PLC messages
	xy	User option of 2nd filter
5th and 6th decade	00	3rd filter is preset to values **7 8**…. PLC errors and events with text messages
	xy	User option of 3rd . filter
7th and 8th decade	00	4th filter is preset to values **0 0**…. No filter

	xy	User option of 4th filter

Appendix N3 - Write events to disk

The event report is written to a file EVENTS.TXT which is located in implicit directory . The amount and a way of writing can be affected by machine constant **R470**.

R470 - Events storing to disk control

1st till 5th. decade	0	A number of events stored on disk is not limited. The last 32 000 events are recorded.
	1-32000	A value determines number of events to be set
7th decade	0	Events are automatically stored on disc after the communication interrupted error (9.13) within two seconds .
	1	The events are not recorded after communication interrupt error
8th decade	0	The events are not recorded automatically .
	1	During attended system shut down signal REQ_CLOSE_ALL from PLC program) the events are automatically stored on disk.

Example of a file EVENTS.TXT with event record:

```
$EVN
COUNT EVENT   DESCRIPTION         TIME  CLASS
-----------------------------------------------
1     Power   System ON 01.11.    18:32:22  5
2     TabRek  Configuration table 18:32:22  1
3     PanRek  Panel configuration 18:32:22  1
4     TabKor  Correction table    18:32:22  1
5     TabPos  Shift table         18:32:22  1
6     TabPar  Parameter table     18:32:22  1
7     Start   Start               18:32:22  1
8     ChMode  Change mode CA  1F  18:32:22  1
9     SecRek  Sec. configuration  18:32:22  5
10    ChPRF   Change %F 100       18:32:22  1
11    ChPRS   Change %S 100       18:32:22  1
12    ChPRF   Change %F 150       18:32:22  1
13    ChPRS   Change %S 150       18:32:22  1
14    ChMode  Change mode RUP 0F  18:32:26  1
15    Start   Start               18:32:28  1
16    SysErr  System error 07.00  18:32:28  2
```

Appendix N4 - Service purposes FTP transmitting

If the system is connected to Ethernet network with TCP/IP protocol the actual status of recorded events can be send to the FTP server. It is convenient to distinguish between two FTP servers . One is destined for partprogram transmitting and second is destined for service purposes. To set IP addresses of service FTP transfer use parameters $90 till $94 in file CNC836.KNF:

Par.	example	description
$90	192.168.0.210	IP address of service FTP transfer (TCP/IP protocol)
$91	192.168.0.5	IP address of FTP server for service
$92	192.168.0.5	IP gate address of service
$93	CNC859	A name of the system maximally 16 characters for accessing of service FTP server
$94	xxx	A system password maximally 16 characters for service FTP server access

For a proper function of FTP transfer is necessary to set parameter $46 to value **F**.

Before system start a resident program PACKET-DRIVER must be loaded according to network card used with interrupt set to value 60h . For example for cards Dlink 100Mbd set: „DLKFET.COM 0x60“.

Appendix N4.1 - control of service FTP transfer

To start FTP transfer control go through key „System“ followed by "System tools“. The two key menus are destined for transfer:

Menu key	Action
Events transfer (FTP service)	After a query the last recorded event log **EVENTS.TXT** is transferred to FTP service server together with file of critical events **EVCRITIC.TXT** (if exists). During transmitting an information window of FTP transfer is displayed in a middle of the screen where is indicated a file name and number of data transmitted .
Data transfer for service (FTP service)	After a query all records stored in file **DGN_PACK.TXT** are sequentially transferred to the FTP service server. During transmitting an information window of FTP transfer is displayed in a middle of the screen where is indicated a file name and number of data transmitted .

After successful transfer a "successful transfer" message is highlighted on the screen.
In case of FTP transfer failure the following error is indicated:

`Error 10.35 - Error of FTP transfer number: xy`

Number of sub error	description
40	FTP transmitting failed.
41	Error of connecting to FTP server - no reply
42	Log in to FTP server not allowed
43	Error of connecting to FTP server - no reply
44	User name not accepted by FTP server
45	Password verification error - server does not reply
46	FTP server log- in error - ACCT not implemented

47	Password not accepted by FTP server
48	Unsuccessful binary transfer mode - server does not react
49	Binary transfer mode not accepted by FTP server
50	Disconnecting error - FTP server does not react
51	Disconnection not allowed
52	Statement execution error - FTP server does not react
53	Statement not accepted by FTP server
54	PORT statement error - FTP does not react
55	PORT statement is not accepted by FTP server
56	Data transfer error- FTP server does not react
57	Error during data transfer
60	Data write error
61	Data target closing error
63	Data source closing error
64	Cancel...
65	Transfer cancelled
2	File not found
3	System path not found
5	File access rejected

Appendix N4.2 - List of files for FTP service transfer

In the implicit directory a file **DGN_PACK.TXT** must exist where is a list of files to be transferred to FTP server. This file can content for example the machine constants of the system, the error log etc.
Before files transmitting a file backup into temporary file **$$ARCHIV.TMP** is automatically performed according to file **ARCHIV.SYS.** It is convenient to put this file in FTP transfer hence its name must be on the list ($$ARCHIV.TMP}. Next also event log file **EVENTS.TXT** together with critical events file **EVCRITIC.TXT** should be transferred thus their names must be also on the list.

A text file **DGN_PACK.TXT** can content on the beginning a random text . The list itself is introduced by a keyword „**$FTP**“.

If the files mentioned in the list does not content in their names a whole path they shall be searched in implicit directory (CMOS) . If the files content whole path the files are searched according to this path

Example of list DGN_PACK.TXT :

```
List of files for service FTP transfer

$FTP
$$ARCHIV.TMP
EVENTS.TXT
EVCRITIC.TXT
```

Appendix N5 - PLC program events record

To the event log are automatically recorded all important actions from the PLC program together with errors and information messages (instructions **ESET, MSET**).

The PLC program can send by instructions **TSET**, **TSETM**, **TSET1** and **TSETM1** text messages to the event log. Text messages can be transferred permanently or can be used by the PLC program as debugging information. (for more detailed description see Programming Guide, Error messages , warnings and information reports from the PLC program.)

If the instructions type ESET or TSET content also a second parameter with keyword „**CRITICAL“,** the relevant record is immediately written into file of critical events **EVCRITIC.TXT.**

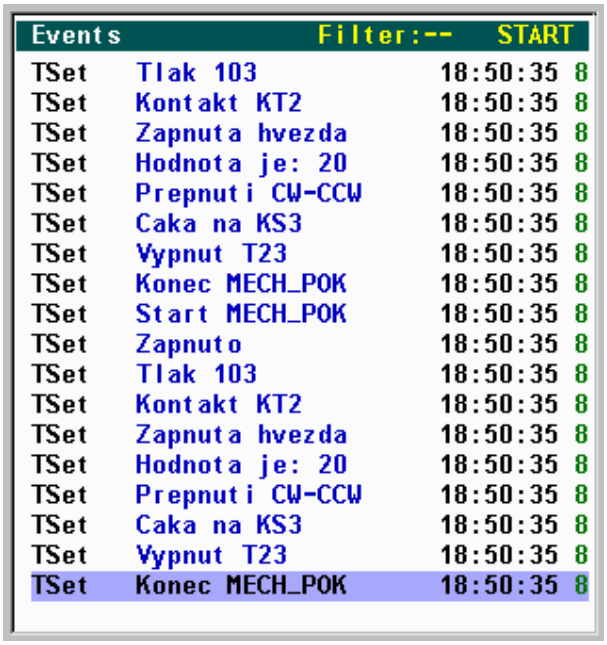
If during event viewing an appropriate filter is used a simple **PLC terminal** is created which allows a time analyse of desired event.

In the error log are also some important action generated by the PLC program like START, STOP, positioning of rotating coordinate, switch to a spindle etc.

Appendix N5.1 - Error Stack of PLC program

Except text messages all PLC error requests and PLC report generated automatically by instructions **ESET** and **MSET** are recorded in the event report . The PLC program can send to the CNC system only one error in cells BZH11 and BZH22. In more complex PLC programs is a bigger amount of errors and also simultaneous error occurrence is possible. Here viewing events can be done by using an error stack. By browsing through error log is possible to trace a history of error highlighted on the screen . This simplifies a PLC program creation because an error stack need not be created by designer and is a standard part of the system error browser.

Example of record of text messages from the PLC program into events log:



Appendix N6 - critical events

Starting with panel software version 40.48 and a secondary processor software version 6.386 (26.10.2005) the system writes the critical events to a file **EVCRITIC.TXT.**

Among critical events belong serious system failures (communication interrupt, measurement failures , hardware failures etc..) and the events generated by PLC program which have set an attribute CRITICAL.

The critical events are continuously written to the file EVCRITIC.TXT. This file is not erased by the system. During first critical event write also a date is recorded in the file.

The file of critical events EVCRITIC.TXT is stored in implicit directory together with a file EVENT.TXT. During a service FTP transfer request is automatically transferred also the file of critical events

Example of list of critical events in a file EVCRITIC.TXT:

```
22.10.2005

SErrC   System error 08.12  11:13:14  2
ScHlt   Halt secondary 02   11:13:17  6
ScHlt   ~ EIP:00001ABE      11:13:17  6
ScHlt   ~ DS:0068  CS:0080  11:13:17  6

25.10.2005

SErrC   System error 08.12  11:13:44  2

26.10.2005

SErrC   System error 08.12  14:46:46  2
ScHlt   Halt secondary 02   14:46:55  6
ScHlt   ~ EIP:00001ABE      14:46:55  6
ScHlt   ~ DS:0068  CS:0080  14:46:55  6
```

Summary of a critical event keywords

Event	Event description	Detailed description	
ESetC	PLC err.req.(num)	instruction ESET in PLC with parameter CRITICAL	8
TSetC	PLC msg.req.(num)	instruction TSET in PLC with parameter CRITICAL	8
ScHlt	Halt secondary (num)	Halt of secondary processor + Halt number	6
SErrC	System error (num)	System error of 8th group (error number)	2

System's errors implemented to critical events (keyword SErrC)

error	description
8.01	IRC control counter error Servo-loop: (num.)

8.02	Differential counter overflow . Servo-loop: (num.)
8.03	Drive controlled through CAN-BUS channel error: (num.)
8.04	Password error č No:0 (Password no:0) in file PASSWORD.SYS
8.05	The number of units SU05 (R270) is greater then actual one
8.06	Synchronizing failure of unit SU05 - time out overflow
8.07	Synchronizing failure of unit SU05 - incorrect number of records
8.08	Communication failure from SLM drive
8.09	Cross-back failure of adjusting of servo-loops
8.11	CDIST-PCI card not found
8.12	Error CDIST-PCI: beginning of table XLINX (0FFh) not found
8.13	Error CDIST-PCI: RWC not in initial position
8.14	Error CDIST-PCI: incorrect bit of RWC during writing to RAM
8.15	Error CDIST-PCI: configuration of Xilinx not possible (RAM test failed)
8.16	Error CDIST-PCI: Atmels have not DRDY51A,B = 0 after reset
8.17	Error CDIST-PCI: Atmel B -non communication
8.18	Error CDIST-PCI: before interrupt enable DRDY51A,B = 0
8.19	Error CDIST-PCI: Test RAM->Atmel A – error (Atmel B can be short-circuited)
8.20	Error CDIST-PCI: information exchange cycle non finished (cb1=1)
8.22	Run-in reference error - type HEIDENHAIN
8.23	Too many PLC files ! - probably low software version (PLC program discarded !)
8.24	Error during receiving of PLC program - non complete number of files (PLC program discarded !)
8.25	Error CDIST-PCI: Peripherals not initialized (IO_INIT) !
8.26	Coordinate system transformation error . (FLAT,SPACE)
8.27	Touch probe error !
8.28	Touch probe error!
8.30	Initialization error in SLM drive TIME-OUT
8.31	SLM drive configuration error Ki=0 ! Channel: (num.)
8.32	SLM drive configuration error PID(1) ! Channel: (num.)
8.33	SLM drive configuration error PID(2) ! Channel: (num.)
8.34	SLM drive configuration error PID(3) ! Channel: (num.)
8.35	SLM drive configuration error PID(4) ! Channel: (num.)
8.36	SLM drive configuration error PID(5) ! Channel: (num.)
8.37	SLM drive configuration error PID(6) ! Channel: (num.)
8.38	SLM drive configuration error FILTER ! Channel: (num.)
8.39	Axis configured can not be SLM Channel: (num.)
8.40	SLM for axis not switched on, missing card SU5SLM ? Channel: (num.)
8.41	SLM drive not connected Channel: (num.)
8.42	SLM drive bad identification Channel: (num.)
8.43	RESET statement error for axis SLM Channel: (num.)
8.44	Error during reading parameters for axis SLM Channel: (num.)
8.45	Incorrect checksum of axis SLM sensor parameters Channel : (num.)
8.46	Incorrect checksum of SLM axis motors parameters Channel : (num.)
8.47	Error during parameter writing of axis SLM Channel: (num.)
8.48	Unknown statement for SLM axis Channel : (num.)
8.49	SLM status clear error Channel: (num.)
8.50	SLM axis status reading error Channel: (num.)
8.51	SU8X configuration error . Error of write counter (missing card ?)
8.52	SU8X configuration error Card do not report bit: buffer empty (STATUS: bit 7)
8.53	SU8X configuration error Card do not report bit: erroneous number of records (STATUS: bit 6)
8.54	SU8X configuration error Card buffer not empty within 5 ms
8.56	SU8X configuration error Premature interrupt
8.57	SU8X configuration error No interrupt
8.58	SU8X write error Erroneous number of records during 5 ms
8.59	Machine shut down during motion. Position probably incorrect. Switch OFF and ON the machine
8.60	SU04 configuration error
8.61	Incorrect function of analog output. Error of coordinate unit SU04. Axis order number: (num.)
8.62	Short circuit or broken IRC sensor .Error of coordinate unit SU04 Axis order number: (num.)
8.63	Incorrect number of records and readings . Error of coordinate unit SU04 Axis order number:

	(num.)
8.64	Bus connection error. Error of coordinate unit SU04 Axis order number: (num.)
8.65	Incorrect hardware version error. Error of coordinate unit SU04 Axis order number: (num.)
8.66	Short circuit or broken IRC sensor. Error of coordinate unit SU04 Axis order number: (num.)
8.67	Phase error of IRC sensor. Error of coordinate unit SU04 Axis order number: (num.)
8.69	Reference run-in too fast
8.70	axis SLM non initialized. Channel: (num.)
8.71-8.77	Signal phase error of IRC in axis 1 – 7
8.78	No reference signal received SLM axis channel: (num.)
8.81-8.87	IRC control counter error axis: 1 - 7
8.88	Checksum error of 3D nonlinear corrections
8.91-8.97	Differential counter overflow axis: 1 – 7
8.98	PLC program checksum error
8.99	PLC program version and System version do not match . System out of control cycle (HALT)

Some causes of communication interrupt HALT-STATUS (error 9.13)

Halt-status	**description**
70	Unknown header during receiving in communication between BSP and SEC processor
71	Driver communication error between BSP and SEC processor
72	Error during block transfer between BSP and SEC processor
30	Unknown interrupt
13	Global protection error (exception in protected mode)
02	Division error in the secondary processor (division by zero or division overflow)
03	Coprocessor error in the secondary processor
10	Double nesting in cycle (1ms)
04	Double nesting of computing cycle
01	Communication time out between BSP and SEC processor
05	Awake inhibition of SEC processor in sleep mode
06	PIS_HALT module start from PLC program
07	Too big trajectory increment (DRT) on interpolator's output
11	Unexpected interrupt from SU5
12	Unexpected interrupt from local APIC in SEC processor
14	No interrupt from SU05 (or too late)
15	Parameter CLOCK in TECH.KNF and FSB bus real clock do not match

Appendix N6.1 - Critical events from PLC program

PLC program can send by instructions **ESET** and **TSET** a record to critical event file. Regularly the instructions type ESET and TSET generate only record to common event file (EVENT.TXT). If instructions ESET and TSET have a second parameter with a keyword **CRITICAL** the event is recorded to common events file and also to critical events file **EVCRITIC.TXT**. The record to file EVCRITIC.TXT is immediate.

The second parameter „CRITICAL“ is optional and can be used in instructions:

```
ESET
ESET1
TSET
TSETM
TSET1
TSETM1
```

Instruction type ESET have syntax as follows:

```
ESET  error, CRITICAL
ESET  -, CRITICAL
```

Instruction type TSET have syntax as follows:

```
TSET  TEXTx, CRITICAL
TSET  'abcd...', CRITICAL
```

Example:

```
;Used in mechanism
;Writing text to the events and also to a file for critical events

      TSETM       'Serious error', CRITICAL


;Used outside mechanism
;Write text located in string TEXT1  to event file and also to critical
event file

      TSET        TEXT1,CRITICAL


;Serious error in the PLC program. Write message to event file and also to
critical event file

      ESET        ERR_22,CRITICAL
```

Příloha se přeloží : APPENDIX Přílohy APPENDICES