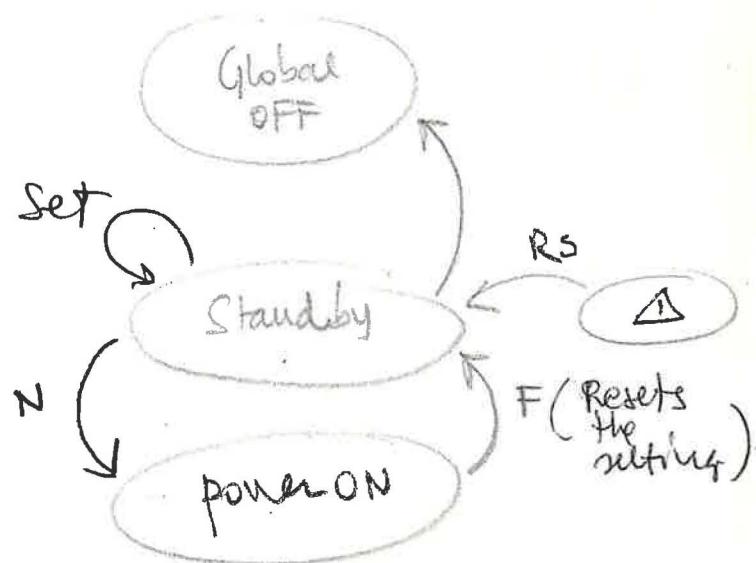


Handwritten list of commands:

- LOC
- REM
- LOCK
- UNLOCK
- RLOCK
- PRINT
- VER

WA



Error ? ~~A~~ ~~S~~ ~~I~~ \r
07 ASCII
digit

3.3.3. Programming.

In the following all commands will be listed in alphabetic order.

COMMANDS summary

1 AD X	(A)	Read value from an ADC channel.
2 ADR	(A)	Read the address of the MPS.
ADR XXX		Write an address to a MPS.
3 ASW		Enters answer mode.
BAUD XXXXX Set the Baud rate.		
4 CMD	(A)	Read current control mode.
5 CMDSTATE	(A)	Read current control state.
CONT		Continue sequence operation
6 ERRC		Coded error message.
7 ERRT		Text string error message.
8 F		Stand by Main Power OFF.
9 GOFF		Global OFF
10 LALL		Listen ALL.
LOC		Change to Local Control.
LOCK		Lock the MPS in Local Control.
UNLOCK		Unlock the MPS in Local Control.
11 N		Main Power ON.
12 NASW		No answer mode.
13 NERR		No error message.

14 PO	(A)	Polarity status.
15 PS		Read internal user information about the MPS.
16 RAR	(A)	Read the set value.
REM		Change to remote control.
RLOCK		Remote line only
18 RR	(A)	Read Slewrate
19 RS		Reset interlocks.
20 S1	(A)	Read the internal status.
STOP		Stop sequence executing
21 TS		Trig sequence
TYPE		AD type in use
UNLOCK		Unlock the MPS.
VER	(A)	Reads the software version
22 WAR		Write actual ramp end value (Set output current).
23 WR		Write slew rate

X is a number from 0 to 9

sequence for getting all
parameters
S1 LALL > ADX < RAR

3.3. Operating by RS 232c or RS 422 I/O.

The Control-Board uses standard serial interfaces RS 232C and RS 422 which are compatible with many computers and terminals.

Two data communication links are available:

- A REMOTE LINE, with either RS 232C or RS 422 communication.

The link is optically isolated.

3.3.2. Data communication.

The communication is done by transmitting characters in ASCII code terminated by CARRIAGE RETURN.
The termination characters from the Power Supply is LINE FEED and CARRIAGE RETURN.

An ERROR message includes a "?BELL". (Bell = ASCII 7.)
NOTE! None of serial lines has control signals.

AD

AD X

Command: AD'sp'ch'cr'

ch: ASCII digit 0 to 9

Example: MULT 0

Syntax: MULTsp'0'cr'

missing

Answer:

ch'sp'val'lfc'r'

ch: ASCII digit 0 to 9

val: ch 0 to 5, 7 and 9, ASCII digit 000 to 999

ch 6 ASCII +/-00 to +/-99

ch 8 ASCII 00000 to 99999

mark! val can be preceded with an E

ADC 16 bit

Errors: ILLEGAL REQUEST means that line-in-command is wrong.

SYNTAX ERROR,

means a missing space between the command and parameter or wrong syntax.

Where D is a number from 0 to 9, and S is a sign character (either + or -).

If the value returned contains an E, the returned value is the last value detected in an error-condition, and not the actual value. To get the actual value after an error-condition, just make another read. If an E still exists, the error-condition is not removed.

The primary channels giving errors are the internal supply levels, but any of the channels can be programmed to reflect errors if a certain level is passed, both below and above.

AD channel 6 differs from the other by containing a sign, plus or minus, before the value.

Nothing else is affected.

Internal execution time: XXXX μ sec.

~ 1000

ADR

AdDRess (write)

Command: ADR address'cr'
address: ASCII digits 00 to 63 in decimal notation.

Example: ADR 23
Syntax: ADR 23'cr'

Answer: No answer, except errors

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

DATA ERROR means that parameter format incorrect or a non-digit character found in data field or parameters outside specified. In case of this error you should inspect the settings or correct your parameter, and then rewrite it.

The ADR command is an internal command, used to select an actual unit. The previously addressed unit is automatically de-selected.

Only one exception is made by using the ADR command, due to the LALL mode. When connected units are in LALL mode, the first ADR command given, following the LALL command, will disable this function.

Related commands: ADR (read)

Affected commands: LALL

Internal execution time: XXXX μ sec.

ADR

AdDRess (read)

Command: **ADR'cr'**

Answer: **address**

Example: **Command:** **ADR**
 Syntax: **ADR'cr'**

Answer: **address**
Syntax: **address'lf"cr'**

address: ASCII digits 000 to 063 in decimal notation.

Errors: SYNTAX ERROR means wrong syntax.

The **ADR** command is an internal command, used to verify actually addressed unit. The command returns the address of the actually addressed unit.

Only one exception is made by using the **ADR** command, due to the **LALL** mode. When connected units are in **LALL** mode, the first **ADR** command given, following the **LALL** command, will disable this function. For the same reason, no answer will be generated, because the **LALL** mode has to be cancelled, before any answer can be generated. In this case, if you want to know the address of the addressed unit, you will have to repeat the **ADR** command.

In cases where no answer is generated, even if you have tried the command twice, you maybe have been addressing a non-existing unit-address, or the actual unit-address has been switched off. In that case just address another unit to verify the communication line and then re-address to the "dead" address for test.

Related commands: **ADR (write)**

Affected commands: **LALL**

Internal execution time: **XXXX** **μsec.**

ASW

AnSWer (remote line only)

Command: **ASW'cr'**

Example: **ASW**

Syntax: **ASW'cr'**

Answer: **No answer, except errors**

Errors: **SYNTAX ERROR** means wrong syntax.

ILLEGAL REQUEST means that line-in-command is local-line.

The command **ASW** is used to switch the remote line into an auto-answer mode in which some setup commands generate an answer. The **ASW** mode is suppressed when the controller is in **LALL** mode. Commands which will generate an answer are listed in the following: **WA, PO+/-, W1, W2, W3.**

Nothing else is affected.

Related commands: **NASW**

Internal execution time: **XXXX** μ sec.

CMD

CoMmanD line

Command: CMD'cr'

Answer: If line-in-command is remote line:

REM

Syntax: 'sp'REM'l'f"cr'

or If line-in-command is local line:

LOC

Syntax: 'sp'LOC'l'f"cr'

Example: Command: CMD
Syntax: CMD'cr'

Answer: REM

Syntax: 'sp'REM'l'f"cr'

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The command **CMD** is used to return answer about which line is line-in-command. The command is used by the control panel to decide the status of the line-in-command indicator. It can be used from remote line to decide if anyone had made change to this, from the control panel, if you receive an unexpected ILLEGAL REQUEST.

Nothing else is affected.

Related commands: CMDSTATE

Internal execution time: XXXX μ sec.

for Loc/REM Status Read back

CMDSTATE

CoMmanD line STATE

Command: **CMDSTATE'cr'**

Answer: If line-in-command is remote line:

REMOTE

Syntax: REMOTE'lf"cr'

or If line-in-command is local line and command is given from remote line: LOCAL

Syntax: LOCAL'lf"cr'

or If line-in-command is local line and command is given from local line or LOCKed from
remote line: LOCK

Syntax: LOCK'lf"cr'

Example: **Command:** **CMDSTATE**
 Syntax: CMDSTATE'cr'

Answer: REMOTE

Syntax: REMOTE'lf"cr'

Errors: **SYNTAX ERROR** means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The command **CMDSTATE** is an extended command similar to **CMD** and is also used to return answer about which line is line-in-command. The answer is more detailed than in **CMD** and is initially constructed to be used between the controller and the IEEE-488 interface unit, doing initializing.

Nothing else is affected.

Related commands: **CMD**

Internal execution time: XXXX μ sec.

ERRC

ERRor in Code (remote line only)

Command: **ERRCcr'**

Example: **ERRC**
 Syntax: **ERRCcr'**

Answer: **No answer, except errors**

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The command **ERRC** is used internally, to put the controller into a mode, in which it will respond any error, with a message containing an error string followed by a single sign, showing which error is encountered.
This mode is normally chosen, when the controller(s) is (are) connected to a host computer, which is able to decode the error message.

Nothing else is affected.

Related commands: **ERRT, NERR**

Internal execution time: **XXX** μ sec.



ERRT

ERRor in Text (remote line only)

Command: ERRTcr'

Example: ERRT

Syntax: ERRTcr'

Answer: No answer, except errors

Errors: YNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The command **ERRT** is used internally, to put the controller into a mode, in which it will respond any error, with a message containing an error string followed by a text string, showing which error is encountered. This mode is normally chosen, when the controller(s) is (are) connected to a low level host computer or terminal equipment, which is not able to decode the error message.

Nothing else is affected.

Related commands: ERRC, NERR

Internal execution time: XXXX μ sec.

F

ofF

Command: Fcr'

Example: F
Syntax: Fcr'

Answer: No answer, except errors

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The command **F** is used to switch-off the main contact. It also clears all interlock's, if the interlock cases are removed.

All setting are left unaffected.

Nothing else is affected.

Related commands: N, RS

Internal execution time: XXXX μ sec.

LALL

Listen ALL (remote line only)

Command: LALL'cr'

Example: LALL

Syntax: LALL'cr'

Answer: No answer, except errors

Errors: SYNTAX ERROR means wrong syntax.

The command **LALL** is used to put all the controllers connected into a pseudo-addressed mode. This means that all controllers will respond to any setup command, except the oN command. No answers will be available.

The only way to disable the **LALL** mode is by using the **ADR** command either as a setup of a new address or to read last addressed controller. Remark that in **ADR** read, the first access will not give any response, in which way you will have to repeat the command to get an answer.

Nothing else is affected.

Related commands: **ADR**

Internal execution time: XXXX μ sec.

In this
case
ADR
twice

LOC

LOCal (line)

Command: LOCcr'

Example: LOC

Syntax: LOCcr'

Answer: No answer, except errors

Errors: SYNTAX ERROR

means wrong syntax.

The command **LOC** is used to switch the line-in-command to the local line. The line-in-command can be locked to local-line by the command **LOCK** or released by the command **UNLOCK**.

If the change to local is done by the local-line (control panel), the line-in-command will be LOCKed to local, and cannot be changed from remote line without releasing it with the command **UNLOCK**. A change to remote line made from the control panel automatically releases the lock feature.

Nothing else is affected.

Related commands: REM, LOCK, UNLOCK

Affected commands: REM

Internal execution time: XXXX μ sec.

~~LOCK~~

~~LOCK~~ (remote line only)

Command: LOCK'cr'

Example: LOCK

Syntax: LOCK'cr'

Answer: No answer, except errors

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is remote line.

The command **LOCK** is used internally, to put the controller into a mode, in which the line-in-command will be locked to local line. The **LOCK** feature is performed automatically when the line-in-command to local line change is made from control panel and released by return to remote line. From remote line you will have to perform this by separate commands. The **LOCK** feature is made to avoid remote access, when serviced and controlled by the control panel, and the **UNLOCK** feature by remote line is added for one reason only: to be able to shut down the entire system in an emergency situation. You should avoid to use the **LOCK** and **UNLOCK** feature, from the remote line except in an emergency situation.

Nothing else is affected.

Related commands: UNLOCK, (REM, LOC, RLOCK)

Internal execution time: XXXX μ sec.

new

UNLOCK

UNLOCK (remote line only)

Command: UNLOCK'cr'

Example: UNLOCK
Syntax: UNLOCK'cr'

Answer: No answer, except errors

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that the line-in-command is either remote line or unlocked in local line.

The command **UNLOCK** is used internally, to release the **LOCK** feature when the line-in-command to local line change is made from control panel. The **LOCK** feature is made to avoid remote access, when serviced and controlled by the control panel, and the **UNLOCK** feature by remote line is added for one reason only: to be able to shut down the entire system in an emergency situation. You should avoid to use the **UNLOCK** feature from the remote line except in an emergency situation.

Nothing else is affected.

Related commands: **LOCK, (REM, LOC, RLOCK)**

Internal execution time: **XXXX μsec.**

N oN

Command: N'cr'

Example: N
Syntax: N'cr'

Answer: No answer, except errors

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The command N is used to switch-on the main contact. All setting are left unaffected.
This command cannot be used in LALL mode.

Nothing else is affected.

Related commands: F, RS

Internal execution time: XXXX μ sec.

NASW

No AnSWer (remote line only)

Command: **NASW'cr'**

Example: **NASW**
 Syntax: **NASW'cr'**

Answer: **No answer, except errors**

Errors: **SYNTAX ERROR** means wrong syntax.

ILLEGAL REQUEST means that line-in-command is local-line.

The command NASW is used to cancel the auto-answer mode, in which some setup commands generate an answer.

Nothing else is affected.

Related commands: **ASW**

Internal execution time: **XXXX** μ sec.

NERR

No EROr (remote line only)

Command: NERR'cr'

Example: NERR
Syntax: NERR'cr'

Answer: No answer, except errors

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The command NERR is used internally, to put the controller into a mode, in which it will respond any error, with a message containing an error string only, without any indication of which error is encountered.
This mode is normally chosen, if you only want to be kept informed about an error condition, and not interested in which type.

Nothing else is affected.

Related commands: **ERRC, ERRT**

Internal execution time: **XXXX μsec.**

PRINT

Command: PRINT'cr'

Example: PRINT
Syntax: PRINT'cr'

Answer: Two lines each containing 15 characters plus terminator as:

xxxxxxxxxxxxxx'cr'
xxxxxxxxxxxxxx'cr'

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The PRINT command is an internal command used to return internal information about the unit. The contents of these two lines depend on the manufacturer, who can program this field with serial and/or type number, or anything he wants.

The command was designed primarily as a service command, to get information about the unit.

The command can be used at the remote-line only.

Nothing else is affected.

Internal execution time: XXXX μ sec.

new

REM

REMOte (line)

Command: REM'cr'

Example: REM

Syntax: REM'cr'

Answer: No answer, except errors

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is locked to local-line.
Unlock can be used to release this.

The command **REM** is used to switch the line-in-command to the remote line. The line-in-command can be locked to remote-line by the command **RLOCK**, if command is given from remote-line, and is automatically released by a **LOC** command, also given at the remote-line. Local-line cannot change command-line if locked.

Nothing else is affected.

Related commands: LOC, LOCK, UNLOCK, RLOCK

Affected commands: LOC

Internal execution time: XXXX μ sec.

~~answer~~
RLOCK

Remote LOCK (remote line only)

Command: RLOCK^{cr}

Example: RLOCK

Syntax: RLOCK^{cr}

Answer: No answer, except errors

Errors: SYNTAX ERROR

means wrong syntax.

ILLEGAL REQUEST

means that the line-in-command is either remote line or unlocked in local line.

COMMAND ALREADY ACTIVE

means that the command has been given already and is still active.

The command **RLOCK** is used internally, to lock the remote line similar to the function existing, when line-in-command is switched to local by the local line.

When the **RLOCK** command is given at the remote line, it will inhibit the control panel to switch the line-in-command to local.

The **RLOCK** can only be switched off by giving a new line-in-command command from remote line (**REM** or **LOC**).

Nothing else is affected.

Related commands: **(LOCK, REM, LOC, UNLOCK)**

Internal execution time: **XXXX μsec.**

RS

ReSet

Command: RS'cr'

Example: RS
Syntax: RS'cr'

Answer: No answer, except errors

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The command **RS** is used to clear all interlock's, if the interlock cases are removed. The **RS** command can be disabled by hard-ware, where the command is accepted, but no action will occur.
All settings are left unaffected.

Nothing else is affected.

Related commands: F, N

Internal execution time: XXXX μ sec.

S1
Status 1

Command: S1'cr'

Answer: STATUS
Syntax: STATUS'lf"cr' Where STATUS consists of 24 signs . or ! , each showing the status of a specific function, including all interlocks.

Example: Command: S1
 Syntax: S1'cr'

Answer: !!.....!
Syntax: !!.....!"lf"cr

Errors: SYNTAX ERROR means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The command S1 is used to return answer about the internal status. The returned status line consists of a mixture of interlocks, polarity and on/off status.

The status command can be used in several ways to decide polarity +,- or none, to indicate type of interlocks and on/off status.

In some versions some spare bits can be assigned special functions. Each sign is specified separately elsewhere in the user manual.

Nothing else is affected.

Internal execution time: **XXXX** μ sec.

22 interlocks 24 chars
current actual delivery
read at (n) characters

TS

Trig Sequence

Command: TS'sp'stack'cr'

stack: ASCII digit 0 to 3

Example:

~~TS~~
Syntax: TS'sp'0'cr'

Answer: No answer, except errors

Errors: **STACK NO LONGER,** means that stack is marked empty in its first position, as after a CSS command or power-up/hard-reset, or a WSA/WSP command has placed a string with zero-time

STACK IS RUNNING, means attempt to Trig a running stack.

SYNTAX ERROR, means a missing space between the command and parameter or wrong syntax.

DATA ERROR, means parameters outside specified or by use of a non-digit character as parameter, which, in case, can produce a double error, as it will translate a non-digit character as a zero.

The command TS is starting a given programmed sequence, from its first position.

Related commands: HALT, STOP, CONT

Internal execution time: XXXX μ sec.

VER

VERsion

Command: **VER'cr'**

Example: **VER**
 Syntax: **VER'cr'**

Answer: Three lines each containing 23 characters plus terminator as:

xxxxxxxxxxxxxxxxxxxx'cr'
xxxxxxxxxxxxxxxxxxxx'cr'
xxxxxxxxxxxxxxxxxxxx'cr'

Errors: **SYNTAX ERROR** means wrong syntax.

ILLEGAL REQUEST means that line-in-command is wrong.

The **VER** command is an internal command, used to return internal information about the program. The contents of these three lines depend on the program manufacturer, who programs this field with copyright notes, the actual version number and release date.

The command was designed primarily as a service command, to get information about the internal program.

The command can be used at the remote-line only.

Nothing else is affected.

Internal execution time: **XXXXX** μ sec.

3.3.3. PROGRAMMING.

All read commands are valid for the DATALOG LINE, and will not be described separately.

In the following all commands will be listed in alphabetic order.

AD.

FUNCTION : Read value(s) from the scanning 8 - Bit ADC and the optional 16 - Bit ADC.

SYNTAX : "AD X"

Where X is a number from 0 to 9.

DETAILS :

CHANNEL. (x)	VALUE.	UNITS.	RESPONSE.
0	Output current	(I/In) * 100	"DDD"
1	Tesla	T * 100	"DDD"
2	Output voltage	(V/Vn) * 100	"DDD"
3	Internal + 15 V.sup.	V * 10	"DDD"
4	Internal - 15 V.sup.	Num.(V * 10)	"DDD"
5	Internal + 5 V.sup.	V * 10	"DDD"
6	Delta temperature	(Deg.C * 10)	"SDD"
7	Trans.bank Vce	V	"DDD"
8	Optional Iout (16 Bit)	(I/In)*100000	"DDDDDD"
9	Aux.Iout (cont.panel)	(I/In)* 120	"DDD"

Where D is a number from 0 to 9, and S is a sign character (either + or -).

If switch No. 3 pos.3 is set and a special PROM is inserted on the CONTROL-BOARD, the UNITS of AD 0 and AD 2 are AMPS and VOLTS.

ADR.

FUNCTION : Read or set an MPS address.

SYNTAX : "ADR XXX" writes an address to the MPS.
"ADR" reads the MPS address.

Where X is a number from 0 to 9, and the range is from 0 to 255

DETAILS : ADR is not valid in LALL mode. The MPS will return from LALL mode on an ADR command.

Related command: "LALL".

ASW.

FUNCTION : The MPS returns and answer during polarity change or current setting.

SYNTAX : "ASW"

DETAILS : P = MPS in progress.
R = ready.

Related command: "NASW".

BAUD.

FUNCTION : SETS the Baud rate on the Remote Line.

SYNTAX : "BAUD XXXXX"

DETAILS : The Baud rates are as follows:

19200 , 9600 , 4800 , 2400
1200 , 600 , 300 , 150

NOTE : Be carefull when using this command.
An illegal setting will break the communication.

CMD.

FUNCTION : Causes the MPS to respond with its current control mode.

SYNTAX : "CMD"

DETAILS : Will respond with one of the two following text - strings:

"REM" : REMote control.

"LOC" : LOCal control, i.e. controlled via the control panel.

Related command: "CMDSTATE".

CMD STATE.

FUNCTION : Causes the MPS to respond with its current control mode.

SYNTAX : "CMDSTATE"

DETAILS : Will respond with one of the three following text - strings:

LOCAL : If the local command came from the remote line.

REMOTE : When the MPS is remote controlled.

LOCK : If the local command came from the local line.

Not valid via the data log line.

Related command: "CMD".

ERRC , ERRT.

FUNCTION : This command will cause the MPS to respond with either a coded error message or a full text error message.

SYNTAX : "ERRC" (for coded error message).
"ERRT" (for full text error message).

DETAILS : Error code, text table.

CODE NO. ERROR TEXT.

1	Syntax.
2	Data contents.
3	Data length.
4	Illegal command.
5	Can not execute command.
6	Status quo, no change.
7	Change in progress.
8	No data present.
9	Local line, input buffer full.
10	Remote line, input buffer full.
11	NOT USED.
12	Can not execute command.
13	NOT USED.
14	Datalog line, input buffer full.
15	NOT USED.
16	Program module not implemented.

F.

FUNCTION : Causes the MPS to switch the Main Power OFF if already ON.

SYNTAX : "F"

DETAILS : Refer to chapter 3.3.1 switch No. 3.

Related commands: "RS", "N".

LALL:

FUNCTION : This command is used in a multidrop system to address all power supplies (Listen ALL). The answer from the MPS will be suppressed.

SYNTAX : "LALL"

DETAILS : The "ON" command is suppressed. Other commands will be executed.

Related command: "ADR".

LOC.

FUNCTION : Will change the control mode of the MPS to local control.

SYNTAX : "LOC"

DETAILS : This command will not cause the system to LOCK.

Related commands: "REM", "LOCK", "UNLOCK".

LOCK.

FUNCTION : This command is used to lock the MPS in local control mode.

SYNTAX : "LOCK"

DETAILS : Related commands: "UNLOCK", "LOC" and "REM".

N.

FUNCTION : Will cause the MPS to switch Main Power ON,
if no interlock errors are present.

SYNTAX : "N"

DETAILS : As the interlock errors are latched, the "N"
command must normally be preceded by a
"F" or "RS" command.

Related commands: "F", "RS".

NASW.

FUNCTION : Releases the answer mode.

SYNTAX : "NASW"

DETAILS : Related command: "ASW".

NERR.

FUNCTION : Error message from the MPS is suppressed.

SYNTAX : "NERR"

DETAILS : "?BELL" is still returned.

Related commands: "ERRC", "ERRT".

PO.

FUNCTION : Read the present polarity status of the
MPS.

SYNTAX : "PO"

DETAILS : The response can either be:

"+" Indicating Normal polarity.

Or:

"-" Indicating Reverse polarity.

If the MPS is not provided with a polarity
reversal switch the response is "+".

Related commands: "PO +", "PO -".

PO +, PO -.

FUNCTION : If the MPS is provided with a polarity reversal switch, these commands are used to change the polarity on the output of the Power Supply.

SYNTAX : "PO +" Change to Normal polarity.
"PO -" Change to Reverse polarity.

DETAILS : Related command: "PO".

RA.

FUNCTION : Read the register controlling the current setting DAC.
Standard 16 Bit, optional 18 Bit.

SYNTAX : "RA"

DETAILS : The response is "DDDDDD".

Where D is a number from 0 to 9.

To calculate the actual output current:

$$I_o = I_n * (Y / 1000000).$$

Where I_n is the nominal output current of the Power Supply, and Y is the value read by the command "RA".

Related command: "WA".

REM.

FUNCTION : Will change the control mode of the MPS to remote control.

SYNTAX : "REM"

DETAILS : If the LOCAL CONTROL PANEL has gained local control, the remote device can not change the current control mode.

In order to permit the remote device to communicate with the MPS during its Start UP procedure, two special commands are included in the instruction set.

Please refer to "LOCK" and "UNLOCK".

Related commands: "LOC", "LOCK", "UNLOCK".

RS.

FUNCTION : Resets the latched interlocks.

SYNTAX : "RS"

DETAILS : Refer to chapter 3.3.1 switch No. 3.

Related command: "F".

S1.

FUNCTION : Returns a coded text - string containing the MPS status, interlock and polarity informations.

SYNTAX : "S1"

DETAILS : The response is a character - string consisting of 24 characters, either exclamation marks or periods (i.e. ! or .) where the exclamation mark signifies an error condition, and the period signifies the normal condition.

A typical example could be as follows:

"!..!....!.....!.."
1. Character. 24. Character.

The interpretation of the individual characters, when the exclamation mark is shown, are as follows:

CHARACTER NO.	CONTENTS.
0 * 0 1	MAIN POWER OFF.
0 . 0 2	POLARITY NORMAL.
1 ! 0 3	POLARITY REVERSED.
0 . 0 4	REGULATION TRANSFORMER <> 0
	* MAIN POWER OFF.
5	!
6	!
7	! = % , . = VOLTS.
8	SPARE INTERLOCK.
9	ONE TRANSISTOR FAULT.
10	SUM - INTERLOCK.
11	DC OVERCURRENT (OCP).
12	DC OVERLOAD.
13	REGULATION MODULE FAILURE.
14	PREREULATOR FAILURE.
15	PHASE FAILURE.
16	MPS WATERFLOW FAILURE.
17	EARTH LEAKAGE FAILURE.
18	THERMAL BREAKER / FUSES.
19	MPS OVERTEMPERATURE.
20	PANIC BUTTON / DOOR SWITCH.
21	MAGNET WATERFLOW FAILURE.
22	MAGNET OVERTEMPERATURE.
23	MPS NOT READY.
24

UNLOCK.

FUNCTION : Releases the LOCK condition which exists if the LOCAL CONTROL PANEL has gained local control, whereafter the remote device can change the control mode freely.

SYNTAX : "UNLOCK"

DETAILS : If the "UNLOCK" is sent, and the MPS is not in LOCK mode, the error message "ILLEGAL COMMAND" is returned.

Related commands: "LOCK", "LOC", "REM".

WA.

FUNCTION : Sets the register controlling the current setting DAC.
Standard 16 Bit, optional 18 Bit.

SYNTAX : "WA XXXXXX"

Where X is a number from 0 to 9.

For the interpretation of the value send,
please refer to the command "RA".

DETAILS : Related command : "RA".

COMMANDS. summary

AD X	Read value from an ADC channel.
ADR	Read the address of the MPS.
ADR XXX	Write an address to a MPS.
ASW	Enters answer mode.
BAUD XXXXX	Set the Baud rate.
CMD	Read current control mode.
CMDSTATE	Read current control state.
ERRC	Coded error message.
ERRT	Text string error message.
F	Main Power OFF.
LALL	Listen ALL.
LOC	Change to Local Control.
LOCK	Lock the MPS in Local Control.
N	Main Power ON.
NASW	No answer mode.
NERR	No error message.
PO	Polarity status.
PO +	Change to Normal polarity.
PO -	Change to Reverse polarity.
RA	Read the set value.
REM	Change to remote control.
RS	Reset interlocks.
S1	Read the status.
UNLOCK	Unlock the MPS.
WA XXXXXX	Write a set value.

X is a number from 0 to 9

Following documents
from Ole Hermann
14-16 Feb. 96

General COMMAND change

8800

Change in answers from supply's

Because of the change in the new commands, where speed is important, I have made a general change to the communication.

Any answer from the supply's is now followed by a 'cr' alone and not as described in the command manual followed by 'lf' 'cr'.

WAR

RAR

GOFF

WR

RR

PO

?1 / 2 / 3 / 4

#N

check

WAR**Write Actual Ramp end****Command:**

WAR'sp'DACend'cr'

↓
set point

DACend:

digits 001000 to xxxxx

value:

001000 to MAX current (maximum 999999)

Leading zero's can be omitted in parameter

exceeding
values will
be coerced to
MAX.

Example:

WAR 025352

Syntax: WAR'sp'025352'cr' (most readable syntax but slower)

or

WAR 25352

Syntax: WAR'sp'25352'cr' (recommendable syntax medium speed)

Answer:

No answer, except errors

Errors:**SYNTAX ERROR,**

means a missing space between the command and parameters or wrong syntax.

DATA ERROR,

means that parameter format incorrect or a non-digit character found in data-field or parameters outside specified.

ILLEGAL REQUEST

means that line-in-command is wrong.

The command **WAR** is used to write an end DAC value between zero and the PSU's maximum current to be used by the ramp option as an ending value. The value given can be equal to the actual set-point which will give a ramp function with a zero slope.

Nothing else are affected.

Related commands:

RAR, MAXInternal execution time: XXXX μ sec.

REMARK: Use MAX command to readback the maximum allowed set-up current. The returned value from MAX is used internal by the WAR command to check for maximum limit.

RAR

Read Actual Ramp end

Command: RAR'cr'

Answer: value'cr'

value: digits 001000 to MAX

Leading zero's will always be implemented (allways 6 digits)

Answer: RAR 025352
Syntax: RAR'sp'025352'cr'

Errors: **SYNTAX ERROR,** means wrong syntax.

The command **RAR** is used to read-back the actual setting of end DAC value given by the **WAR** command. If **RAR** is used before a **WAR** setting is made, it will return the initial (reset) setting which is a value of (001000).

Nothing else are affected.

Related commands: [WAR](#)

Internal execution time: XXXXX μ sec.

GOFF

Global OFF

Command: **GOFF'cr'**

Example: **GOFF**
 Syntax: **GOFF'cr'**

Answer: No answer, except errors

Errors: **SYNTAX ERROR** means wrong syntax.

The command **GOFF** is used to switch off the main contactor. The command given by any of the serial lines can't be done physically before DAC is set to minimum value (output is at minimum).

Nothing else are affected.

Related commands: **F, N, RS**

Internal execution time: XXXX μ sec.

WR**Write slewRate**

Command: WR'sp'rampspeed'cr'

rampspeed: digits 001 to 100
value: 001 to 100

Units expressed in 0.1 precent (10 = 1% , 100 = 10%)
Leading zero's can be omitted in parameter

Example: WR 025

Syntax: WR'sp'025'cr' (most readable syntax but slower)

or WR 25

Syntax: WR'sp'25'cr' (recommendable syntax medium speed)

Answer: No answer, except errors**Errors:** SYNTAX ERROR, means a missing space between the command and parameters or wrong syntax.**DATA ERROR,** means that parameter format incorrect or a non-digit character found in data-field or parameters outside specified.**ILLEGAL REQUEST** means that line-in-command is wrong.

The command **WR** is used to write a value between 1 and 100 to setup the ramp speed in range 0.1 to 10 precent per second of the PSU's rated current. The default initial setting is 50.

Nothing else are affected.

Related commands: RR

Internal execution time: XXXX μ sec.

RR

Read slewRate

Command: RR'cr'

Answer: value'cr'

value: digits 001 to 100

Leading zero's will always be implemented (always 3 digits)

Answer: RR 025
Syntax: RR'sp'025'cr'

Errors: SYNTAX ERROR, means wrong syntax.

The command **RR** is used to read back the actual ramp speed value former set by the **WR** command. Initial (reset) value is 5 precent (returned value = 050)

Nothing else are affected.

Related commands: **WR**

Internal execution time: XXXX μ sec.

PO

Polarity read

Command: PO'cr'

Answer: Polarity

Answer: PO polarity
Syntax: RR'sp'polarity'cr'

Polarity can be: ASCII sign plus, minus, N or O (+ or - or N or O)

Errors: SYNTAX ERROR, means wrong syntax.

The command PO is used to read back the actual polarity. The command returns the actual polarity as ascii sign plus or minus or a single ascii letter N for neutral position.

Nothing else are affected.

Related commands: none

Internal execution time: XXXXX μ sec.

?1**Binary quick read of high def. Current ADC**

Command: ?1'cr'**Answer:** value'cr'

value: 24 bit binary'cr'

Example: Command: ?1
Syntax: ?1'cr'**Answer:** ADC reading in binary
Syntax: 24 bit binary'cr'**Errors:** SYNTAX ERROR, means wrong syntax.

The command **?1** is used to read back the actual unsigned ADC reading from the high-def. ADC. The value returned is a raw value without any relating to the supply's actual output current in Amp's. The value has to be handled as a relative value between 0 (zero) and the value returned with command **?4**, which is equal to the supply's 100% output. The answer will always be in 24 bit binary followed by a 'cr'.

Nothing else are affected.

Related commands: **ADCV, ?3**Internal execution time: <1000 μ sec.

?2**Binary quick read of status**

Command: ?1'cr'

Answer: value'cr'

value: 32 bit binary'cr'

Example: Command: ?2
Syntax: ?2'cr'

Answer: Status reading in binary
Syntax: 32 bit binary'cr'

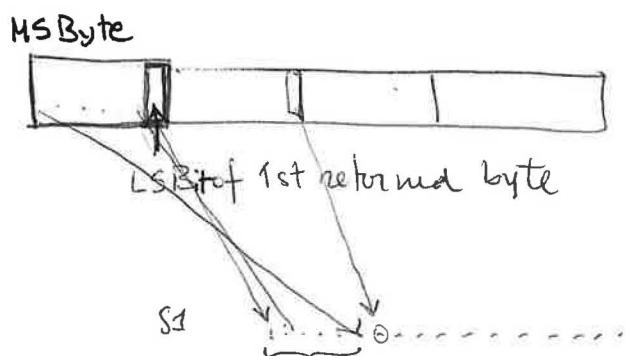
Errors: SYNTAX ERROR, means wrong syntax.

The command ?2 is used to read back the actual STATUS in binary format. The answer is organised as following: The LSB of the first returned byte is equal to the 1. bit returned using the S1 command, LSB+1 equals the next and so on. The LSB of the next byte equals to 8. bit returned using S1 command and so on for the remaining bytes.

Nothing else are affected.

Related commands: S1, ?3

Internal execution time: <1000 μ sec.



3

Binary quick read combining ?1 and ?2 commands

Command: ?3'cr'

Answer: value'cr'

value: 32 bit status + 24 bit binary ADC'cr'

Answer: Status and ADC reading in binary
Syntax: 32 bit status + 24 bit binary ADC'cr'

Errors: SYNTAX ERROR, means wrong syntax.

The command ?3 is a combination of ?1 and ?2, please see those for details.

Nothing else are affected.

Related commands: [?1](#), [?2](#)

Internal execution time: <1000 μ sec.

?4**Binary read of high-def ADC (100% calibration value)**

Command: ?4'cr'

Answer: value'cr'

value: 24 bit binary'cr'

Example: Command: ?1
Syntax: ?1'cr'

Answer: ADC max ref. in binary
Syntax: 24 bit binary'cr'

Errors: SYNTAX ERROR, means wrong syntax.

The command ?4 is used to read back the value stored doing the calibration at the 100% output point. The value returned is a raw value without any relating to the supply's actual 100% output current in Amp's. The value is used to calculate to calculate the supply's actual current in percent of maximum in this way: $((?1) / (?4)) * 100$. The output in current can be done by using the value returned by the MAX command.

Nothing else are affected.

Related commands:

Internal execution time: <1000 μ sec.

I readout [mA] ?1/?4 * MAX

(SYN) Ascii Code Command

SYN ascii code use

Command: **SYN**

Answer: Possible a 'S'
and only if a supply on the line is addressed

Answer: Possible a 'S'
No answer if none of the PSU's are addressed

Errors: **NON**

The command **SYN** is used to synchronize (initiate) the serial communication controller and the related buffers. The command can be used at any time before a new address set-up or if the network is locked-up (hanging). After the command is given You will have to wait at least 150 μ sec. then send a 'cr' to initiate, followed by the normal commands.

This command, is for those who are familiar with IEEE-488 parallel interface, similar to the hard-wired IFC (InterFace Clear) line.

Nothing else are affected.

Related commands:

Internal execution time: <200 μ sec.