DPM86xx Series Power Supply Simple Communication Protocol

Autor and Version

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Introduction and overview

The power supplies of the DPM86xx series provide two communication protocols: the classical modbus protocol and a so-called “Simple Communication Protocol”, which is a proprietary development of the manufacturer.

This summary describes the “Simple Communication Protocol” as far as it is possible for me at the present time. The information is based on various documents I found in the internet and my own experiences.

Corrections are welcome. This document is “work in progress”. Please watch out for the latest version. Feel free to contribute any improvements. Don’t rely on any of the information presented in this document. You have been warned. :-)

Many thanks goes to MSe, which helped me to improve this document and did some final work.

The “Simple Communication Protocol”

The “Simple Communication Protocol” is a stateless, straight forward, point-to-point client-server, command-respond protocol based on a serial connection. It is used to write and read numerical values between 0 and 65535 (a word) from/to the power supply.

Multiple power supplies can be controlled from a single server by addressing the commands to a specific power supply. For this case, each power supply has a address between 1 (default) and 99, which can be configured via its physical interface. The protocol implements this feature via the corresponding field in each command and in each response.

Each power supply provides various state information and accepts various commands via so called functions. Each function has its own function number which is addressed by the corresponding field in the command frames.

Only a subset of the functions are documented.

Format of the write command

start symbol	address	access	function	equal symbol	value	feedback	end code
:	01..99	w	00..99	=	0..65535	,/.	\r\n

Field name	Comment/description
start symbol	Each command starts with a ‘:’.
address	Address of the power supply. The valid range is between 01 and 99.
access	Access is ‘w’ indicating a write access.
function	Number of a specific function (see section “Functions”).
equal symbol	The character “=” separates the field “function” from the field “value”.
value	Value (between 0 and 65535) which will be written to the specified function.
feedback	The “feedback” field indicates if the power supply should return the feedback immediately (“.”) or if the feedback should be queued (“,”) until a command with the feedback field (“.”) shows up.
end code	Each command is terminated by the string ‘\r\n’ (this is actually a return character followed by a newline character in ASCII, hexadecimal representation is 0x0d, 0x0a).

Format of the read command

start symbol	address	access	function	equal symbol	nr. of additional functions to read	feedback	end code
:	01...99	r	00...99	=	0...99	, or .	\r\n

Field name	Comment/descriptionSee section “Write command format”.
start symbol	See section “Write command format”.
address	See section “Write command format”.
access	Access is ‘r’ indicating a read access.
function	See section “Write command format”.
equal symbol	See section “Write command format”.
nr. of additional functions to read	One or more consecutive functions can be read with a single read command. The field “additional functions to read” indicates how many additional functions will be read. The value ‘00’ indicates that only the function ‘function number’ will be read. A value of 01 and above will read the function ‘function number’ and the specified number of consecutive functions.
feedback	See section “Write command format”.
end code	See section “Write command format”.

Known Data types

data type	description	example	range
voltage	Voltage (volt). Four-digit integer, first two digits positions interpreted as before, last two digits interpreted as position after the decimal point.	1234 → 12.34 V	0...6000 (0..60 V)
current	Current (ampere). Four-digit integer, first digit interpreted as the position before, last three digits interpreted as the positions after the decimal point	1234 → 1.234 A	DPM-8605: 0...5000 (0...5A) DPM-8608: 0...8000 (0...8A) DPM-8616: 0...16000 (0...16A) DPM-8624: 0...24000 (0...24A) Hint: Maximum value can be read via function 01.
boolean	Boolean (true/false)	0 → off	0/1
temperature	Temperature (celsius). Two-digit-integer.	23 → 23° C	0..80 (?)

Known Functions

function	R	W	description	data type	comment/hint
00	X		Read the max output voltage (V). Will always be 6000 (60V).	voltage	0 → power supply not ready yet (?) 6000 → 60V
01	X		Read the max output current (A).	current	5000 → 5A → DPM-8605 8000 → 8A → DPM-8608 16000 → 16A → DPM-8616 24000 → 24A → DPM 8624
10	X	X	Read/set output voltage target.	voltage	
11	X	X	Read/set output current target.	current	
12	X	X	Read/set output status.	boolean	0 → off, 1 → on
20		X	Set output voltage and current target.	voltage, current	“1234,5678” → 12,34 V and 5,678 A
30	X		Read current output voltage.	voltage	
31	X		Read current output current.	current	
32	X	X	Read/set constant mode (current or voltage).	boolean	0 → constant voltage 1 → constant current
33	X		Read temperature.	temperature	23 → 23° C

Unknown functions

The protocol supports 100 functions (function codes 0 to 99). For each read command addressing a valid function, the power supply provides a response. Addressing a function above 99 results in a timeout (no response returned by the power supply).

During a quick scan, the following responses had been seen:

function	documented	undocumented returns “0”	undocumented returns values <> “0”
00-01	X		
02-03			X
04-09		X	
10-12	X		
13-19		X	
20	X		
21-29		X	
30-33	X		
34-37			X
38-49		X	
50-57			X
58-70		X	
71-72			X
73-99		X	