

UCSI ENGINEERING CHANGE NOTICE FORM

Title: Addition of SET_PDOs Command

Applied to: UCSI Specification Version 2.0 Revision 1

Brief description of the functional changes:
Adding capability to dynamically change available Source or Sink Capability PDOs for the connectors

Benefits as a result of the changes:
Be able to change dynamically the available Source or Sink Capability PDOs based on the system conditions.

An assessment of the impact to the existing revision and systems that currently conform to the UCSI specification:
Provides additional capability

An analysis of the hardware implications:

An analysis of the software implications:

An analysis of the compliance testing implications:

UCSI ENGINEERING CHANGE NOTICE FORM

Actual Change

(a). Section x.x.x, Page x, Figure/Table x-x

New Text:

Y.Y.Y Set PDOs(R)

This command is used for overwriting all Source or Sink Capabilities PDOs in either SPR or EPR range on a connector.

This command can update Sink or Source Capability PDOs within an atomic sequence using the End of Message field. If an LPM receives command for changing either Sink or Source Capability PDOs with the End of Message indicator set to 0b before an Explicit Contract is established, the LPM shall postpone establishing an Explicit Contract until it receives the SET_PDOS command with the End of Message indicator set to 1b. This should prevent the OPM from power over subscription on the multi-port system.

When the LPM receives the SET_PDOS command with the End of Message indicator set 0b, and replies with Command Completion Indicator, the OPM shall send another SET_PDOS command within SENDER_RESPONSE_TIMEOUT to complete the series. If the SENDER_RESPONSE_TIMEOUT elapsed and the LPM has not received this SET_PDOS command, it may proceed with pending contract negotiation.

In order to speed up the process of updating PDOs on all LPMs, there is an option to broadcast command to all LPMs by OPM setting the connector number to 0. In that case PPM shall aggregate status from LPMs before forwarding them to OPM.

If a command is broken in chunks, the Data Index field will serve as a synchronization mechanism between OPM, PPM and LPM and also for error handling. As an example, if an error happened for one of the chunks, OPM has a choice either to retry sending the same chunk and keep the Data Index the same or restart the SET_PDOS command from the first chunk and set Data Index to 0.

It is recommended to send all PDOs within a single SET_PDOS command chunk if possible.

The OPM shall send the PDOs in the correct order. The LPM shall not re-order the PDOs.

When the LPM receives a SET_PDOS command it deletes the old PDOs and sets the new ones from the SET_PDOS command.

The SET_PDOS command supersedes the SET_POWER_LEVEL command, or in other words SET_POWER_LEVEL shall change power within available PDO levels. The SET_PDOS command shall result in the LPM negotiating a new Explicit Contract if necessary.

For the SET_PDOS command example see Appendix.

The format of the Set PDOs Command Structure for this command is given in the table below

UCSI ENGINEERING CHANGE NOTICE FORM

Table X-XX: SET_PDOS Command

Offset (Bits)	Field	Size (Bits)	Description
0	<i>Command</i>	8	This field shall be set to SET_PDOS.
8	<i>Data Length</i>	8	This field shall be set to the length of the number PDOs multiplied by 4bytes/PDO.
16	<i>Connector Number</i>	7	This field indicates the connector number who's PDOs shall set. A value of zero in this field indicates that this command shall be broadcasted to all connectors.
23	<i>Reserved</i>	3	Reserved and shall be set to 0b.
26	<i>Source or Sink Capabilities PDO</i>	1	This bit shall be set to one if source capabilities PDO and zero if sink capabilities PDO.
27	<i>Number of PDOs</i>	4	This field shall be set to total number of PDOs written to the LPM in this command. The number of PDOs shall not exceed the maximum number permitted by the PD specification for the specified range. Example: SPR – 7 If the SET_PDOS command is chunked, the first chunk of the command shall have this field populated. For the following chunks this field is optional
31	<i>Data Index</i>	7	The index of the SET_PDOS command chunk. The SET_PDOS command could be broken into chunks. The maximum number of chunks shall not exceed the number of total PDOs. The index increments by 1 for each SET_PDO chunk. The index shall roll over to 0 after the maximum value (7Fh) is reached.
38	<i>End of Message</i>	1	This field indicates the end of the command series. If this field is set to 0b, the series is not completed. If this field is set to 1b, the series is completed. As an example, the OPM may send SPR PDOs first with this bit set to 0b, and then send EPR PDOs with this bit set to 1b indicating the end of sequence. The OPM shall update “Number of PDOs” consecutive PDOs starting from PDO[0] with one command or with a command series.
39-63	<i>Reserved</i>		Reserved and shall be set to 0.

The MESSAGE_IN Structure shall look like in the table below.

UCSI ENGINEERING CHANGE NOTICE FORM

Table B-BB SET_PDOS MESSAGE_OUT Structure

Offset (Bits)	Field	Size (Bits)	Description
0	<i>PDO[0]</i>	32	First PDO at PDO Offset.
32	<i>PDO[1]</i>	32	Next PDO (If present).
..
N*32	<i>PDO[N]</i>	32	Next PDO (If present).

On successful completion of the command the LPM/PPM shall set the CCI Data Structure as described in Table z-zz.

UCSI ENGINEERING CHANGE NOTICE FORM

Table z-zz: SET_PDOS Status

Offset (Bits)	Field	Size (Bits)	Description
0	<i>Reserved</i>	1	Reserved and shall be set to zero.
1	<i>Connector Change Indicator</i>	7	If an asynchronous event occurred on a connector then the PPM shall set this field to the connector number on which the change occurred.
8	<i>Data Length</i>	8	Set to 0x00.
16	<i>Data Index</i>	7	The index of the message chunk. The index increments by 1 for each SET_PDOS chunk. The index shall roll over to 0 after the maximum value (7Fh) is reached.
23	<i>Security Request Indicator</i>	1	Set to 0b
24	<i>FW Update Request Indicator</i>	1	Set to 0b
25	<i>Not Supported Indicator</i>	1	Set to 1b if the command is not supported, otherwise set to 0b
26	<i>Cancel Completed Indicator</i>	1	Set to 0b.
27	<i>Reset Completed Indicator</i>	1	Set to 0b.
28	<i>Busy Indicator</i>	1	Set to 0b. If the PPM is Busy, then the PPM shall set this field to a 1b and all other fields to zero.
29	<i>Acknowledge Command Indicator</i>	1	Set to 0b.
30	<i>Error Indicator</i>	1	If the command was not successfully completed the PPM shall set this field to 1b. Also, if the Number of PDOs/RDOs exceeds allowed by the spec, this bit shall be set to 1b.
31	<i>Command Completed Indicator</i>	1	Set this field to 1b if the command is completed successfully.

UCSI ENGINEERING CHANGE NOTICE FORM

Table A-1 Command Code

Command	Value
RESERVED	0x00
PPM_RESET	0x01
CANCEL	0x02
CONNECTOR_RESET	0x03
ACK_CC_CI	0x04
SET_NOTIFICATION_ENABLE	0x05
GET_CAPABILITY	0x06
GET_CONNECTOR_CAPABILITY	0x07
SET_CCOM	0x08
SET_UOR	0x09
SET_PDM (obsolete)	0x0A
SET_PDR	0x0B
GET_ALTERNATE_MODES	0x0C
GET_CAM_SUPPORTED	0x0D
GET_CURRENT_CAM	0x0E
SET_NEW_CAM	0x0F
GET_PDOS	0x10
GET_CABLE_PROPERTY	0x11
GET_CONNECTOR_STATUS	0x12
GET_ERROR_STATUS	0x13
SET_POWER_LEVEL	0x14
GET_PD_MESSAGE	0x15
GET_ATTENTION_VDO	0x16
Reserved	0x17
GET_CAM_CS	0x18
LPM_FW_UPDATE_REQUEST	0x19
SECURITY_REQUEST	0x1A
SET_RETIMER_MODE	0x1B
SET_SINK_PATH	0x1C
SET_PDOS	0x1D

Updating Fixed PDO Example on multiple LPMs at the same time:

UCSI ENGINEERING CHANGE NOTICE FORM

