MPODmaster enhancement

for iseg

Multi-Channel High Voltage Power Supply Module

New implemented items:

Item	Type	Access	Unit	Range
outputCurrentRiseRate	float value	read-write	[A/s]	2 - 100% of the nominal value
outputCurrentFallRate	float value	read-write	[A/s]	2 - 100% of the nominal value
outputTripTimeMaxCurrent	integer	read-write	[ms]	16 – 4000 ms

DESCRIPTION
The outputTripTimeMaxCurrent defines a span for the time out function. The activity is depending from the programmed bit field outputFailureMaxCurrent of the item outputSupervisionBehavior.

Adaptation of items:

Item	Type	Access	Status bits / Switch functions
outputStatus	bits	read	outputEnableKill (13) outputEmergencyOff (14)
outputSwitch	integer	read-write	Off (0), On (1), resetEmergencyOff (2), setEmergencyOff (3), clearEvents (10)

DESCRIPTION
Read: An enumerated value which shows the current state of the output channel.
Write: Change the state of the channel.

If the channel is On, and the write value is Off, then the channel will switch off.
If the channel is Off, and the write value is On, and if no other signals (mainInhibit, outputInhibit, outputEmergencyOff or outputFailureMaxCurrent) are active, then the channel will switch on.

If the write value is resetEmergencyOff, then the channel will leave the state EmergencyOff.
A write of clearEvents is necessary before the voltage can ramp up again.
If the write value is setEmergencyOff, then the channel will have the state EmergencyOff, which means that the High Voltage will switch off without a ramp and reset of the outputVoltage to null volt.

If the write value is clearEvents, then all failure messages of the outputStatus will be reset (all channel events, all module events and the state EmergencyOff.

Item	Type	Access	Switch functions
groupsSwitch	integer	write	Off (0), On (1), resetEmergencyOff (2), setEmergencyOff (3), disableKill (4), enableKill (5), clearEvents (10)

DESCRIPTION
Read: This function is not defined with groups of output channels.

Write: Switch the state of all channels of a group.
If any channel is On, and the write value is Off, then all channels will switch off.
If any channel is Off, and the write value is On, and if no other signals (mainInhibit, outputInhibit, outputEmergencyOff or outputFailureMaxCurrent) are active, then all channels will switch on.

If the write value is resetEmergencyOff, then all channels will leave the state EmergencyOff.
A write of clearEvents is necessary before the voltage can ramp up again.
If the write value is setEmergencyOff, then all channels will have the state EmergencyOff, which means that the High Voltage will switch off without a ramp and reset of the outputVoltage to null volt.

If the write value is disableKill, then all channels will switch to disableKill.
If the write value is enableKill, then all channels will switch to enableKill.

If the write value is clearEvents, then all failure messages of the outputStatus will be reset (all channel events, all module events and the state EmergencyOff).

Item	Type	Access
outputSupervisionBehavior	integer	read-write

DESCRIPTION
A bit field packed into an integer which define the behaviour of the output channel / power supply after failures.
For each supervision value, a two-bit field exists. The enumeration of this value (..L+..H*2) is:

WIENER LV devices
- 0 ignore the failure
- 1 switch off this channel
- 2 switch off all channels with the same group number
- 3 switch off the complete crate.

iseg HV devices
- 0 ignore the failure
- 1 switch off this channel by ramp down the voltage
- 2 switch off this channel by set a internal EmergencyOff
- 3 switch off the whole board of the HV module by set EmergencyOff.

The position of the bit fields in the integer value are:
- Bit 0, 1: outputFailureMinSenseVoltage
- Bit 2, 3: outputFailureMaxSenseVoltage
- Bit 4, 5: outputFailureMaxTerminalVoltage
- Bit 6, 7: outputFailureMaxCurrent
- Bit 8, 9: outputFailureMaxTemperature
- Bit 10, 11: outputFailureMaxPower
- Bit 12, 13: outputFailureInhibit
- Bit 14, 15: outputFailureTimeout

The iseg HV devices can use the bit fields:

outputFailureMaxCurrent	support of the function delayed trip
outputFailureInhibit	support of the optional hardware function EXTERNAL INHIBIT per channel

The channel state have to be in disableKill for a proper work of the configuration of the behaviour for the functions above.

outputFailureMaxCurrent	The programmed activity will released when the actual current exceeded permanently the value of the item outputCurrent over the span of the programmed time out (set via the item outputTripTimeMaxCurrent).
outputFailureInhibit	The programmed activity will released when an external channel inhibit occurs.