CS Relay/GFD PCB
Protocol Specification

Revision: C **Date:** 01.06.2015

General:

The CAN Bus in the iCsys Control System runs on 250 Kbit baudrate.

Type: Describes the type of product. The CS Relay/GFD Pcb has the type number 5.

NodeID: is the adress from 0 to 7 set by jumpers on the board or 1 to 127 set by command.

Ser.LSB & Ser.MSB: are the serial number of the board seperated into Least and Most significant bytes.

Status: Each bit represent these statuses:

0: General Fault

1: N/A

2: Waiting for new settings value

3: Waiting for System Acceptance

4: Message forwarded from secondary CAN-Bus (Not applicable to this board)

Version: Indicates the firmware version running on the microcontroller on the board.

On/Off: If this byte is 1 then the board starts to transmit and if this is 0 the board stops transmitting.

OpCode: can have these values

0: Read variable request to node

1: Read variable answer from node

2: Set variable request to node

3: Set variable answer from node

Vno.LSB & Vno.MSB: are the setting number

0: Node-ID (if no jumpers attached)

1: Serial Number (DO NOT CHANGE)

2: Message Interval (pause in milliseconds between each message)

100: Relay 1 Default startup Trip Level

101: Relay 2 Default startup Trip Level

102: Relay 3 Default startup Trip Level

103: Relay 4 Default startup Trip Level

104: Relay 5 Default startup Trip Level

105: Relay 6 Default startup Trip Level

Val.LSB & Val.MSB: are the new setting value to be stored in the previously sent setting number.

CAN Messages:

Heartbeat:

Every third second a heartbeat message is transmitted from the board.

ID	DLC	B0	B1	B2	B3	B4	B5	B6	B7
1	8	Type	NodeID	Ser.LSB	Ser.MSB	Status	N/A	N/A	Version

Node Accepted:

This message must be sent to the board for the board to automatically transmit data at the given interval (see chapter about setting values).

ID	DLC	B0	B1	B2	B3	B4	B5	B6	B7
2	3	Type	NodeID	On/Off					

Get/Set Setting Request:

A setting stored in EEPROM can be read or set by sending this command.

If the OpCode is set to read, the board will answer with the requested value.

If the OpCode is set to write new value, the «Set New Setting» message (message ID 4) must be sent with the new value after this message. The board will confirm by replying the same message with the OpCode changed (ref. explanation of OpCode on page 1).

ID	DLC	B0	B1	B2	B3	B4	B5	B6	B7
3	7	Type	NodeID	Ser.LSB	Ser.MSB	OpCode	Vno.LSB	Vno.MSB	

Set New Setting:

If a message with ID 3 is sent with OpCode set to write new value, this message must be sent afterwards to the board with the new setting value. The board will confirm by replying the same message with the OpCode changed (ref. explanation of OpCode on page 1).

ID	DLC	B0	B1	B2	B3	B4	B5	B6	B7
4	7	Type	NodeID	Ser.LSB	Ser.MSB	OpCode	Val.LSB	Val.MSB	

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Analog Inputs:

If the node is accepted into the system, these messages is sent in the set interval with all the analog values from the board.

ID	DLC	B0	B1	B2	B3	B4	B5	B6	B7
384 + NodeID	8	1.LSB	1.MSB	2.LSB	2.MSB	3.LSB	3.MSB	4.LSB	4.MSB
640 + NodeID	8	5.LSB	5.MSB	6.LSB	6.MSB	7.LSB	7.MSB	8.LSB	8.MSB
896 + NodeID	8	9.LSB	9.MSB	10.LSB	10.MSB	11.LSB	11.MSB	12.LSB	12.MSB
1152 + NodeID	8	13.LSB	13.MSB	14.LSB	14.MSB				

Variable 1: Relay 1 Current (mA)
Variable 2: Relay 1 GFD (raw ADC value)
Variable 3: Relay 2 Current (mA)
Variable 4: Relay 2 GFD (raw ADC value)
Variable 5: Relay 3 Current (mA)
Variable 6: Relay 3 GFD (raw ADC value)
Variable 7: Relay 4 Current (mA)
Variable 8: Relay 4 GFD (raw ADC value)
Variable 9: Relay 5 Current (mA)
Variable 10: Relay 5 GFD (raw ADC value)
Variable 11: Relay 6 Current (mA)
Variable 12: Relay 6 GFD (raw ADC value)
Variable 13: Bit 0 to 5 indicates if relays are on or off
Variable 14: Bit 0 to 5 indicates if relay over current trip has occured on relays 1 to 6

Set Outputs:

Send this to activate any relay, trip-reset, GFD measurement and to set trip limits on the board.

ID	DLC	B0	B1	B2	B3	B4	B5	B6	B7
512 + NodeID	8	Relay On/Off	Trip Reset	GFD Act.	0	T1.LSB	T1.MSB	T2.LSB	T2.MSB
768 + NodeID	8	T3.LSB	T3. MSB	T4.LSB	T4. MSB	T5.LSB	T5.MSB	T6.LSB	T6.MSB

B0 - Bit 0-5: Relay on/off 1 to 6

B1 - Bit 0-5: Trip Reset 1 to 6

B2 - Bit 0-5: GFD Measurement on/off on channel 1 to 6

B3 - Bit 0: Must be set to 0 for the board to run. If this is set to 1 the board will be in programming mode.

T1-6: Trip level in mA for relay 1 to 6

Reboot:

Send this message to reboot the microcontroller on the board.

ID	DLC	B0	B1	B2	B3	B4	B5	B6	B7
7	3	Type	NodeID	0					

Reboot All:

Send this message to reboot all iCsys nodes on the bus.

ID	DLC	B0	B1	B2	B3	B4	B5	B6	B7
7	3	0	0	1					