CanCom

MULTIMODUL 64 PWM V23

JÖRGENSEN

Performance level: b

IP65

Specifikation	Specification		
Matningsspänning	Power supply	10-30	VDC
Spänningsrippel	Voltage ripple	<3	V t-t
CAN protokoll	CAN protocol	2.0B	150Kbit
CAN drivkrets	CAN driver	82C251	Philips
Antal I/O	Number of I/O	56	I/O
I/O adress (låst)	I/O address (fixed)	4-12 alt 13-21	CAN-ID
Modulkontaktdon	Module connectors	G4A5M	Hirschmann
Kabelkontaktdon	Cable connectors	G4W1F	Hirschmann
I/O kontaktdon	I/O connectors	DIN EN 175 301-801	
Operativsystem	Operating system	CanCom	CanPro
CPU	CPU	MC9s12DG256	Freescale
Flashminne	Flash memory	256	kB
Kapsling	Housing	Grey	Aluminium
Egenförbrukning	Internal consumtion	80	mA
Vikt	Mass	1130	g
Omgivningstemp.	Operating temp.	-30 - +50	Celcius
Omgivningstemp.Radio	Operating temp.Radio	-10 - +50	Celcius
Antenn kontakt	Antenna connector	BNC	
Mått (HxLxB)	Size (HxLxW)	110x144x58	mm
Utgångar	**Output**		
Antal digitala utgångar	No of digital outputs	16	Digital
Antal PWM utgångar	No of PWM outputs	4+4	PWM
Belastbarhet	Maximum load	4000	mA / IO*
Övertemp skydd.	Overtemp protected	+150	Celcius
Kortslutningsskydd	Short circuit protect	6	A
Återställning av skydd	Reset protection	Interupt power	Automatic
Aktiveringstid	I/O response time	20-80	ms
Ingångar	**Inputs**	* Max 20A totally for the module	
Antal ingångar	Number of inputs	24+8	Digital+Analog
Ingångs resistans (DI)	Input resistance (DI)	6,6	kohm
Ingångs resistans (AI)	Input resistance (AI)	28	kohm
ingång aktiv "0"	Input activated "0"	<3	VDC
Ingång aktiv "1"	Input activated "1"	>6	VDC
Buss uppdateringstid	Bus update time	5-50	ms
Tid mellan inläsningar	Input capture	20-80	ms
Frekvensingång	Frequency counter	0-255	Hz

EMC: 72/245/EEC, 2009/19/EC, (2004/104/EC, 2005/83/EC, 2006/96/EC)			
Emission	Emission	30-1000MHz	Broad, Narow
Immunitet	Immunity		2004 / 104 / EC
ISO 11452-4	Conducted immunity	100mA /80%	20-100MHz
ISO 11452-2	Radiated	50V/m 80%	100-2000MHz
ISO 10605	ESD	Air/Contact/ind.	8/4 KV
ISO 11452-2	Radiated immunity PM	100V/m	800-2000MHz
ISO 7637-2	24V system	Pulse	1,2a,2b,3a,3b,4

utgåva/issue 1

CanCom® Multi module 64 PWM V23

The module is moulded in a stable aluminium housing. The result is a hermitically sealed module that is resistant against the hard stresses in mobile environment that includes moisture and vibrations.
The module is programmed with ***CanPro*** V4.31 or later.

- CAN bus connection for programming and connection to other ***CanCom***® products.

- 8 Analogue inputs 0-5V
  +5V reference voltage out, max 20mA (pin D1)
  – connection in pin C1
  Note: Do not connect the reference output to an external voltage!

- 24 digital inputs of which 8 can be used for measuring frequency 0-255Hz.

- 16 digital outputs

- 4+4 proportional outputs of which 1 can be used as one proportional H-bridge. Note: No current feedback

- For article no 80-56010 and 80-56011:
  Built-in radio receiver, radio frequency 433,92 or 418 MHz
  Radio manoeuvring from e. g. HT-12 hand transmitter or with ***CanCom***® 721 card and Bluetooth via external receiver.
  BNC antenna connection.

Overview of functions for different article numbers:

Article no.	Radio	ID 4-10	ID 4-12	ID 13-19	ID 13-21
80-56010	x				x
80-56011	x		x		
80-56060		x			
80-56061				x	

IN / OUT puts on *CanCom*® Multimodule ID 4-10/12

Article numbers 80-56011 and 80-56060

Module ID 4 – Digital IN:

Port:	Module pin:	
1	C11	(Frequency counter)
2	C12	(-“-)
3	C13	(-”-)
4	C14	(-”-)
5	D11	(-”-)
6	D12	(-”-)
7	D13	(-”-)
8	D14	(-”-)

Module ID 5 – Digital IN:

Port:	Module pin:
1	A3
2	C2
3	C3
4	C4
5	C9
6	C10
7	C15
8	C16

Module ID 6 – Digital IN:

Port:	Module pin:
1	B3
2	D2
3	D3
4	D4
5	D9
6	D10
7	D15
8	D16

Module ID 7 – Analogue IN:

Port:	Module pin:
1	C5
2	C6
3	C7
4	C8
5	D5
6	D6
7	D7
8	D8

Module ID 8 – Digital OUT:

Port:	Module pin:
1	A9
2	A10
3	A11
4	A12
5	A13
6	A14
7	A15
8	A16

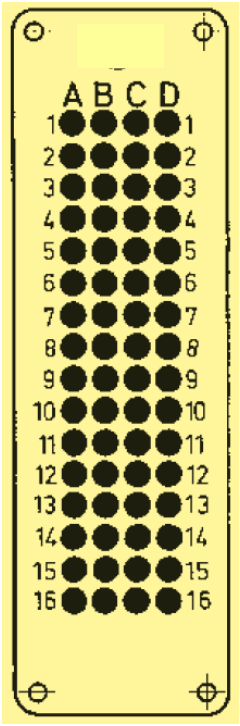
Module ID 9 – Digital OUT:

Port:	Module pin:
1	B9
2	B10
3	B11
4	B12
5	B13
6	B14
7	B15
8	B16

Module ID 10 – PWM OUT:

Port:	Module pin:	
1	A5	(H-bridge)
2	B5	(-”-)
3	A6	
4	B6	
5	A7	
6	B7	
7	A8	
8	B8	

Module ID 11, 12 – Radio
(only for article no: 80-56011)



Supply and GND:	**Module pin:**
Supply for analogue inputs (5V)	D1 (max 20mA)
GND (-)	C1
Power supply +10-30V	A1,B1
GND (-)	A2,B2
CAN:	
CAN High	A4
CAN Low	B4

IN / OUT puts on *CanCom*® Multimodule ID

Article numbers 80-56010 and 80-56061

Module ID 13 – Digital IN:

Port:	Module pin:	
1	C11	(Frequency counter)
2	C12	(-“-)
3	C13	(-”-)
4	C14	(-”-)
5	D11	(-”-)
6	D12	(-”-)
7	D13	(-”-)
8	D14	(-”-)

Module ID 14 – Digital IN:

Port:	Module pin:
1	A3
2	C2
3	C3
4	C4
5	C9
6	C10
7	C15
8	C16

Module ID 15 – Digital IN:

Port:	Module pin:
1	B3
2	D2
3	D3
4	D4
5	D9
6	D10
7	D15
8	D16

Module ID 16 – Analogue IN:

Port:	Module pin:
1	C5
2	C6
3	C7
4	C8
5	D5
6	D6
7	D7
8	D8

Module ID 17 – Digital OUT:

Port:	Module pin:
1	A9
2	A10
3	A11
4	A12
5	A13
6	A14
7	A15
8	A16

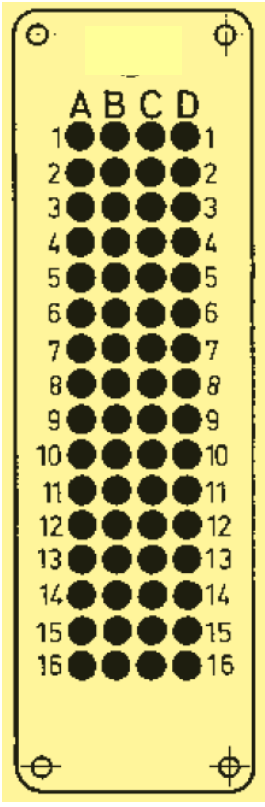
Module ID 18 – Digital OUT:

Port:	Module pin:
1	B9
2	B10
3	B11
4	B12
5	B13
6	B14
7	B15
8	B16

Module ID 19 – PWM OUT:

Port:	Module pin:	
1	A5	(H-bridge)
2	B5	(-”-)
3	A6	
4	B6	
5	A7	
	B7	
7	A8	
8	B8	

Module ID 20, 21 – Radio
(only for article no: 80-56010)



Supply and GND:

Supply for analogue inputs (5V)	D1 (max 20mA)
GND (-)	C1
Power supply +10-30V	A1,B1
GND (-)	A2,B2

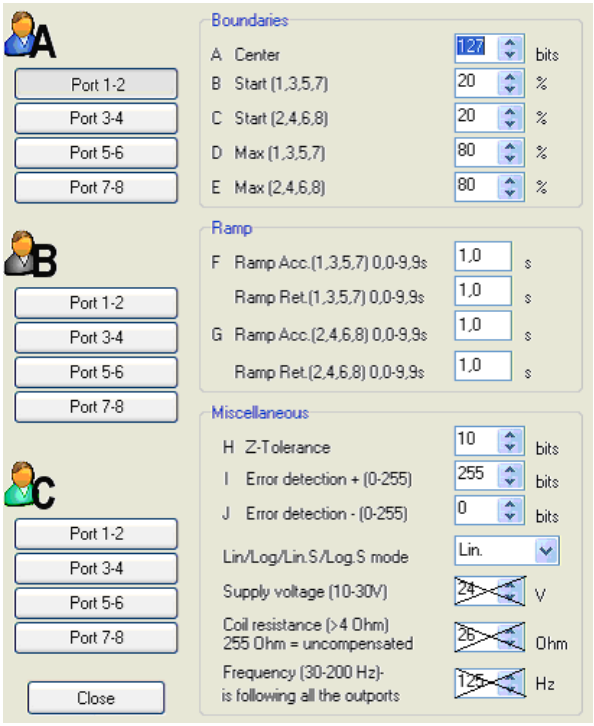
CAN:

CAN High	A4
CAN Low	B4

Analogue inputs
Analogue inputs 0-5V x 8bit
When connecting a 120 kΩ resistor in series with the analogue input you will have 0-255 bits at 0-26V.

Digital inputs
Digital inputs 6-30V

PWM outputs
Fixed PWM-frequency 183Hz. No current feedback. Crossed boxes in the picture has therefore no function in this module.



The PWM module have possibility to several driver selections controlled by the modules internal flags 30,31,32. To make the flags work as driver selection flags, flag 30 must have the comment ABC. Otherwise the flags 30, 31 and 32 will work as ordinary flags.

If no conditions are fulfilled in any of the flags, the driver selection will automatically be set to driver A
If more than one flag have fulfilled conditions the driver will be A.

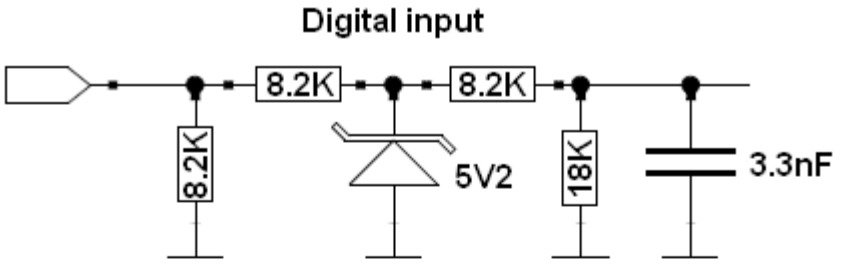
Fulfilled conditions in flag 30 sets the driver selection to A
Fulfilled conditions in flag 31 sets the driver selection to B
Fulfilled conditions in flag 32 sets the driver selection to C

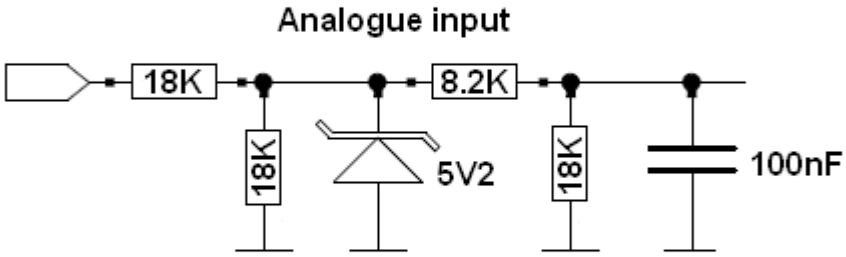
The PWM actuation is stated as a percentage (0-100%) in port 5-8 in the analysis of Canpro. The value specified in port 5 is the value of port 1 and so on.

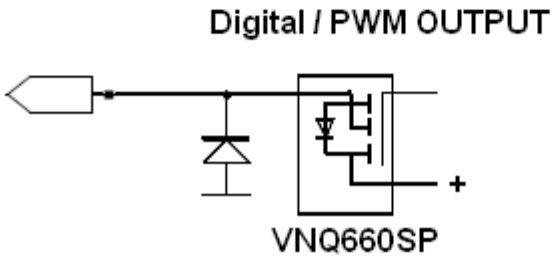
Radio
The radio is programmed with the following id:
Article no: 80-56010 - id 20 and 21 (in the ID-box in CanPro).
Article no: 80-56011 - id 11 and 12 (in the ID-box in CanPro).

NOTE: If the radio is used, then the radio id must be used in any condition for the module.
Otherwise it can be strange values in the analyse in CanPro.

Data to the Multi module from the CAN connector with the abobe ID
has priority before data that comes from the radio input.







Power supply and CAN signals are connected to the **4-pole Hirschmann connector**

1 CAN HI

2 CAN LOW

3 + 10-30VDC (+ Can also be connected to the **64 pole connector**)

4 – (- Can also be connected to the **64 pole connector**)

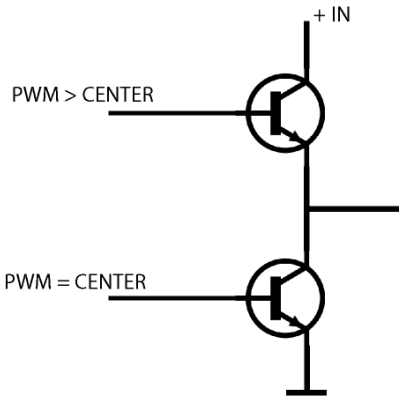
General information about the module

- All digital ID has 64 internal flags each.
- Load, Max 4A / output, but not over 20A totally for the whole module.
- The outputs are protected against overload and short circuit.
- If an output may be subjected to an externally applied voltage, e.g. by an external push button, connect a diode that prevents current from flowing into the output.
- Fuse max 20A.
- Make sure that the module is mounted in such a way, that water can not get into the connector.

+ 10-30V in pin A1 and B1 in the 64 pole contact.
- in pin A2 and B2 in the 64 pole contact.
(The modules housing is galvanic insulated.)

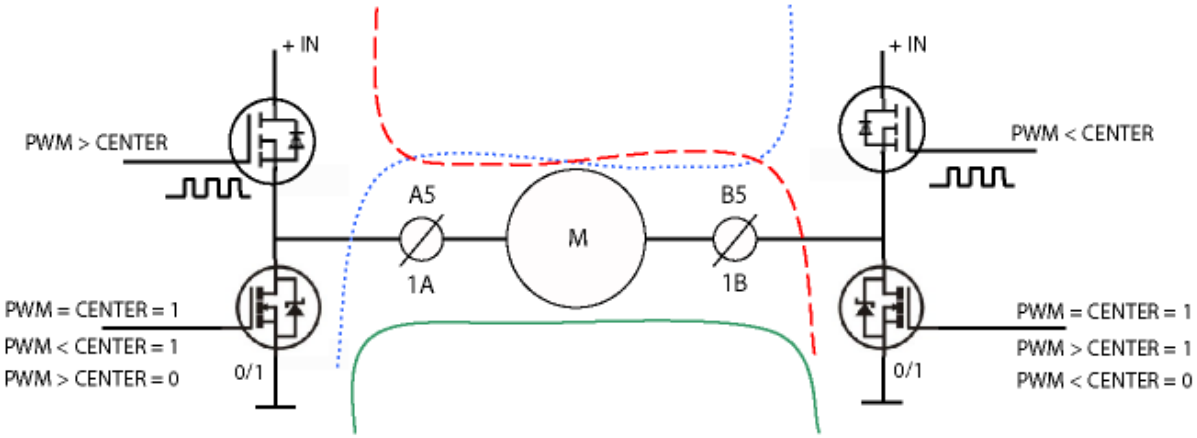
Push-Pull outputs

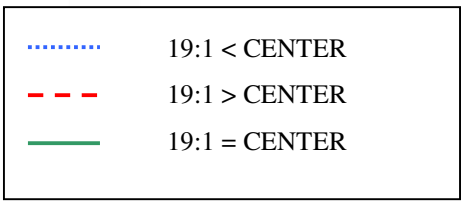
Push-Pull output means that you either give or lowers the voltage.



H-bridge

A5, B5 Pins connected to the H-bridge is connected to ground (GND) when the output is öff. An DC-motor can then be connected between those pins in order to run in different directions depending on which output is on (1A or 1B).





SPECIAL FEATURES

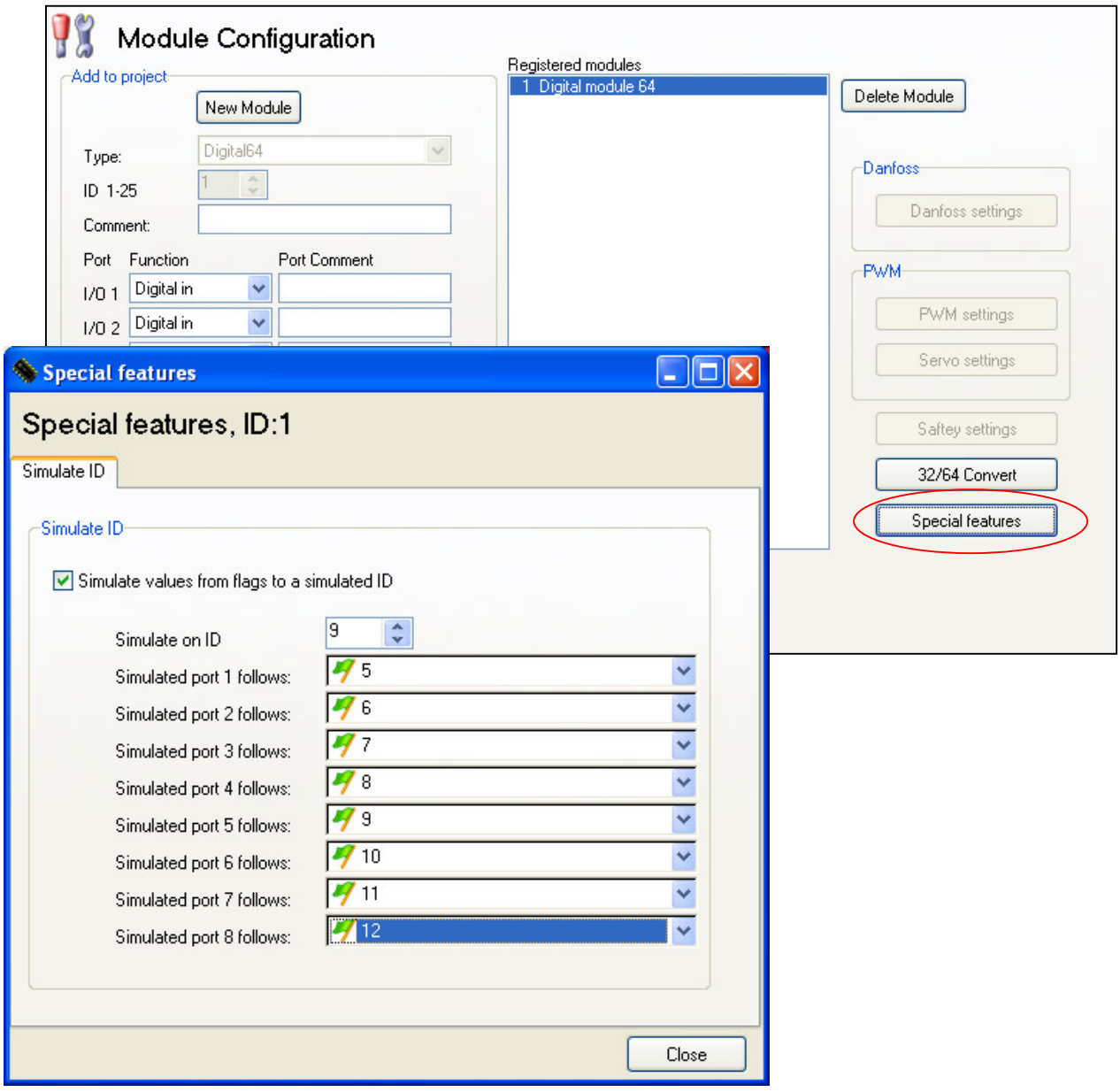
Function SIM (simulate module)

For article number 80-56010 and 80-56061 the function is in ID 13-15 and 17-19.
For article number 80-56011 and 80-56060 the function is in ID 4-6 and 8-10.

The function SIM can be used to send out eight flags from each digital and PWM ID on the bus with optional ID. There can maximum be six simulated ID, one per ID. To active the SIM function use CanPro. This function is only available in CanPro 4.28 or later.

Example:
Flag 5 and forward you want on ID 9.
In CanPro: choose digital 64 module and click on special features in the corner at the bottom right.
Choose the tab Simulate ID.
Then you put the simulated modules ID to 9 and choose flag 5-12 for port 1-8.
Then flag 5-12 will be sent out on ID 9 port 1-8.

Flags can be chosen freely between 1 and 64.



SPECIAL FEATURES

Function Increase / Decrease (PWM64)

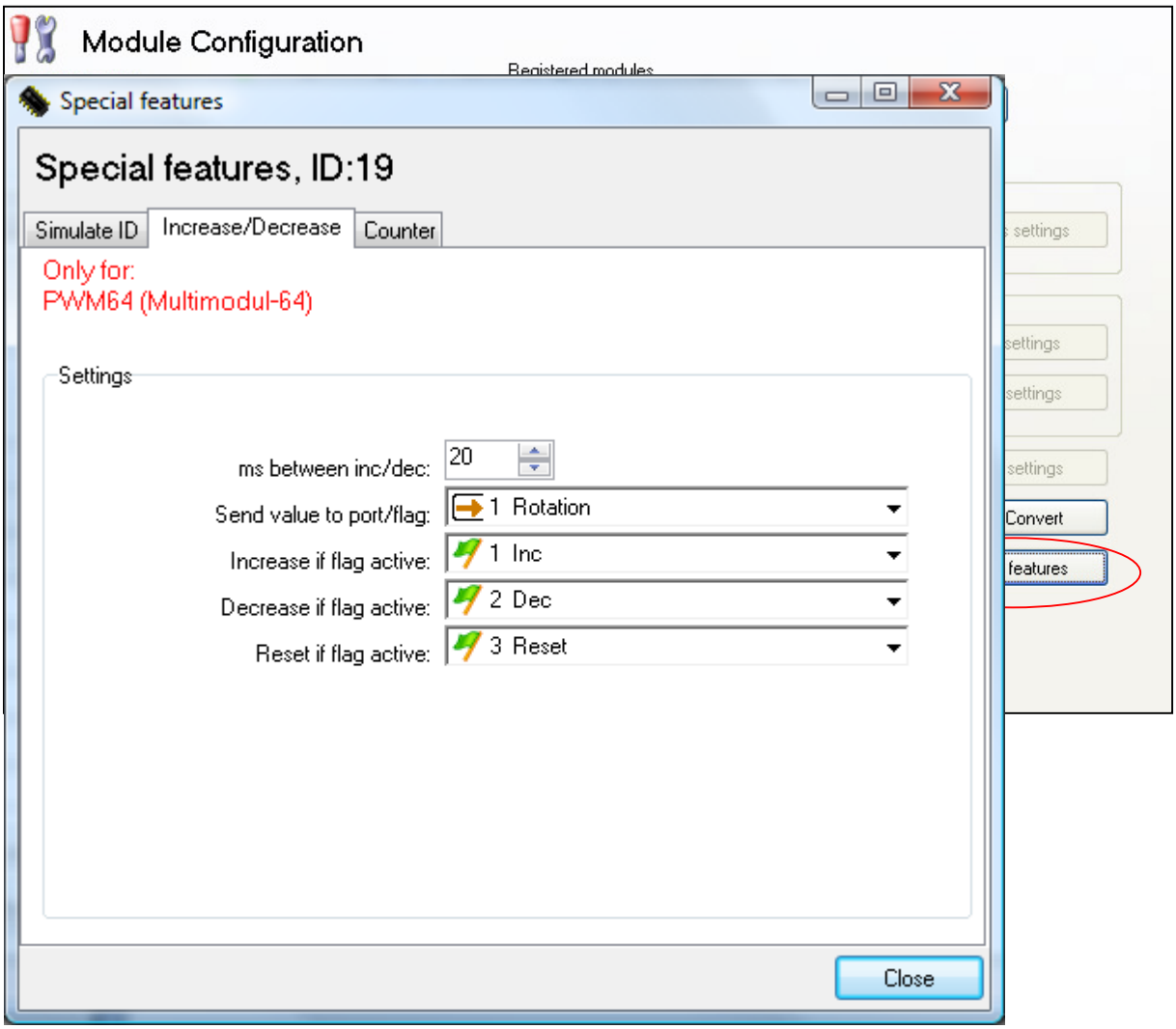
For article number 80-560xx with PWM

The function INC/DEC can be used to change a value up and down, by just having push buttons.
The module will remember this value until it is restarted.

Example:
A concrete mixer want to rotate the concrete at a certain speed. They have one button to increase the speed and one button to decrease the speed of rotation. The third button is used to stop the rotation.

Statements for the flags:
Flag1: Button 1= 1 (inc)
Flag2: Button 2= 1 (dec)
Flag3: Button 3= 1 (stop)

Flags can be chosen freely between 1 and 64.



SPECIAL FEATURES

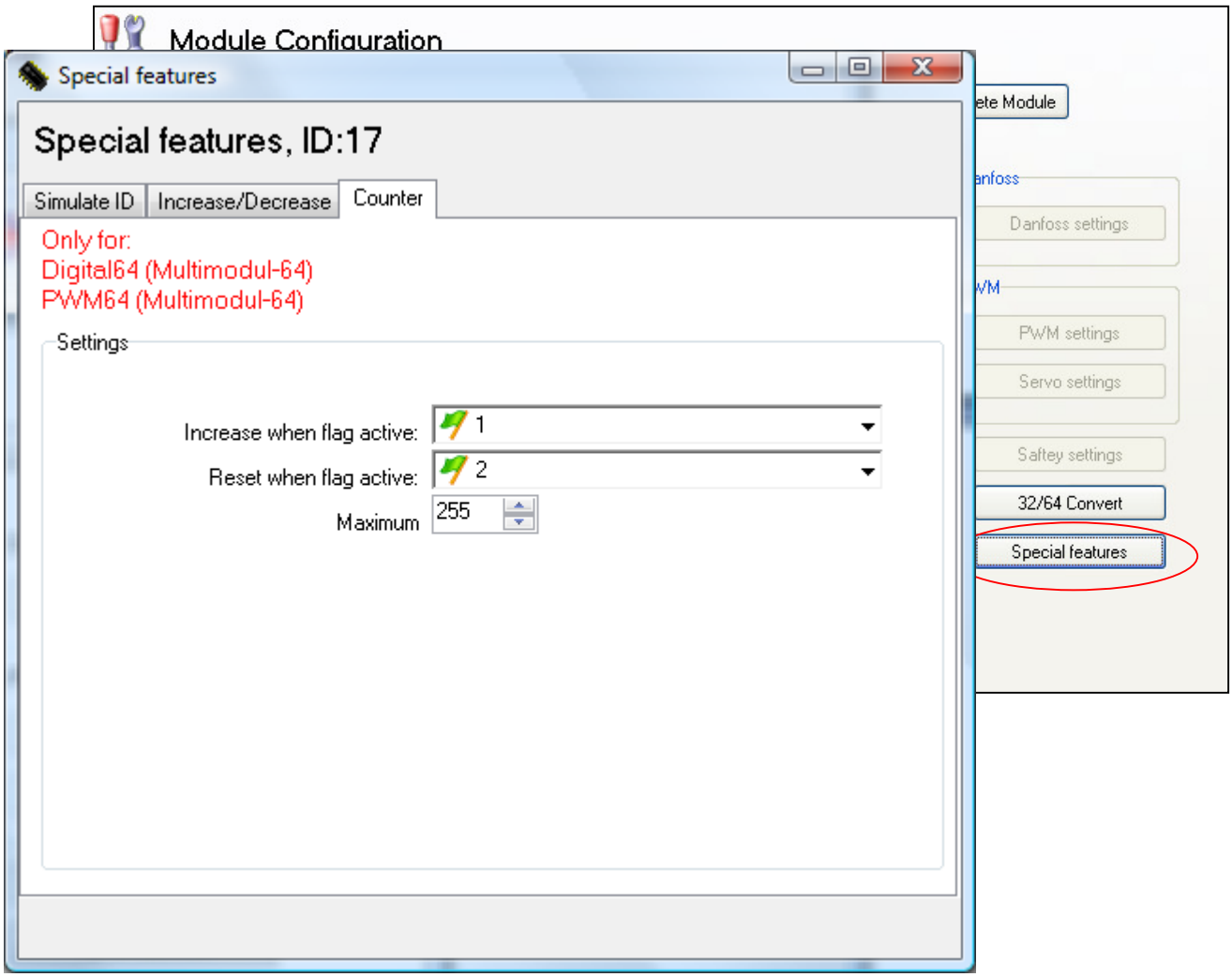
Function COUNTER (Digital64 and PWM64)

For article number 80-560xx

The function Counter can be used to count how many times a signal has been activated.
First you select what flag that will trigger the counter to increase. This flag will also get the value of the counter. Then you select a flag that will reset the counter.
Last you select how high the counter can count. When the maximum value is reached the counter will stay on the maximum value.

Example:
In the example below, the counter will increase each time flag1 is active.
The counter will reset as soon as flag2 is active.
The value of the counter is saved in flag1.
The counter can be useful in sequence programs or to count

Flags can be chosen freely between 1 and 64.



SPECIAL FEATURES

Function PID controller (PWM64)

For article number 80-560xx with PWM

The PWM64 module has four separate and independent PID controllers. These are configured in CanPro (from version 4.30), under the Module Configuration tab, Special Features.

The PID controller can be used to keep e.g. a speed, a position or a temperature at a desired value. It measures the actual value, process value, and compares it with the desired value, setpoint. The difference between process value and setpoint is called control error. The output is calculated and controls e.g. a motor, an actuator or a heater, in order to minimize the control error.

The PID controller output is the sum of three parts:

- The proportional part is the control error, it becomes greater the more process value and setpoint differ. Often, the proportional part alone can not completely remove the control error.
- The integral part is the sum of all previous control errors, the output signal will increase or decrease as long as there is a control error. The integral part makes any remaining control error disappear.
- The derivative part senses the rate of change of the process value. It tries to predict changes in the process value, so that the controller can compensate for them before they become too big. The derivative part has a dampening effect and can make the control both faster and more stable.

The behavior of the controller can be changed by adjusting the three parameters:
Gain (Kp), Integral time (Ti) and Derivative time (Td).

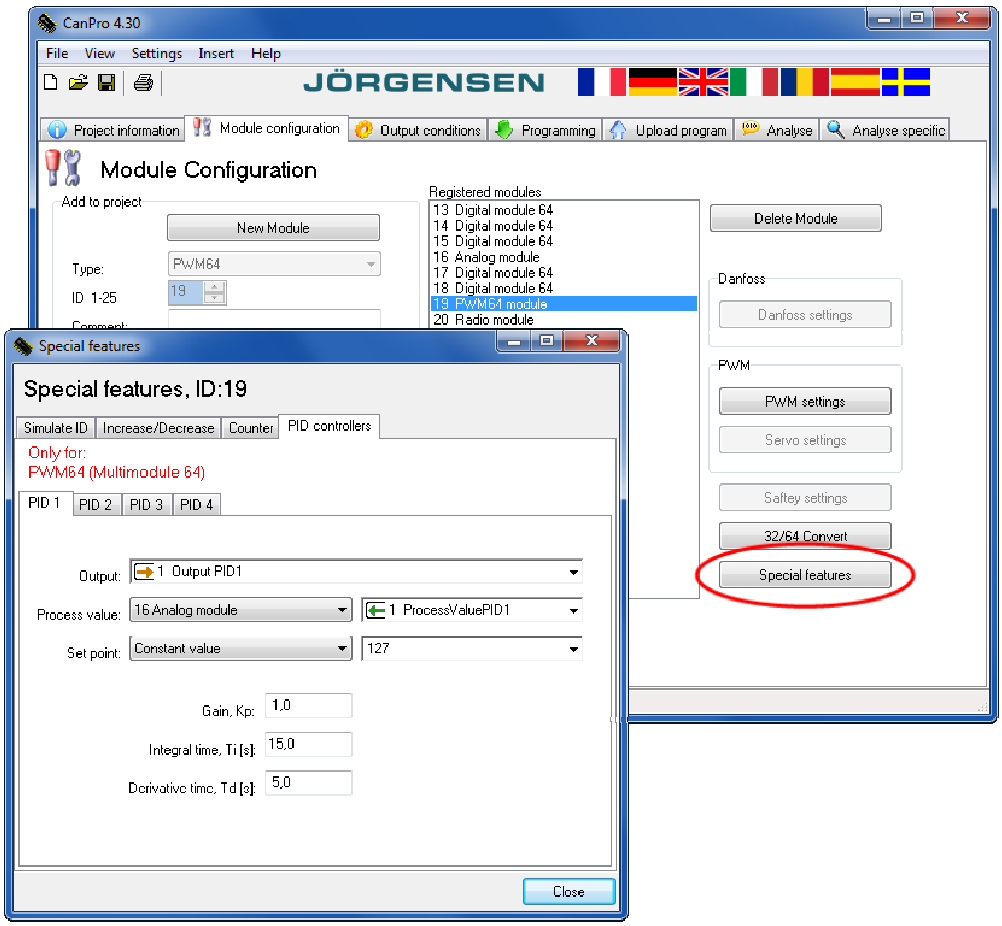
Finding appropriate values for these parameters often involves trial and error.

Here is a suggested approach:

1. Start with the integral and derivative part turned off, set the gain (Kp) to 1.0:
   - If the control is not fast enough, or if it's not sufficiently accurate, increase the gain.
   - If the control is not sufficiently stable, or if it oscillates, reduce the gain.

2. If the remaining control error is too large, the integral part can be used:
   - Appropriate value for Ti depends partly on how fast the system to be controlled responds to changes in the output: Fast reaction = small Ti, slow reaction = greater Ti.
   - If the control is not sufficiently stable, or if oscillates, increase Ti.
   - If it takes too long before the control error has disappeared, reduce Ti.

3. If the control is too slow or unstable, the derivative part can be used:
   - Appropriate value for Td depends partly on how fast the system to be controlled responds to changes in the output: Fast reaction = small Td, slow reaction = greater Td.
   - The derivative part can speed up control, by allowing the controller to have a higher gain without getting into oscillation.
   - Since the derivative part reacts to changes in the process value, the output will become more jumpy. An excessive value of Td can cause the control to become anxious.



Output
Selects where the controller output is sent, or if the controller should be turned off. The output can be sent to any port or flag in the PWM64 module, and takes precedence over any conditions in the selected port or flag. The controller output has its center value at 127.

Process value
The actual, measured value for the system to be controlled. Can be obtained from any port or flag in any module in the project, or be set to a constant value.

Setpoint
The desired value for the system to be controlled. Can be obtained from any port or flag in any module in the project, or be set to a constant value.

Gain, Kp
Gain of the controller, range 0.0-25.5 times.
A gain of 1.0 means that a change of the process value gives an equally large change of the output value (disregarding integral and derivative part). A gain of 2.0 gives a twice as large change of the output value.

Integral time, Ti
Integral time of the controller, range 0.0-25.5 seconds.
Specifies the time it will take before the integral part has contributed as much to the output as the proportional part has, at a constant control error. A larger value gives less integral action, while a low value gives more. The exception is if 0.0 is specified, then the integral part is turned off completely.

Derivative time, Td
Derivative time of the controller, range 0.0-25.5 seconds.
Specifies how far ahead in time the derivative part predicts changes. A larger value gives more derivative action, while the value 0.0 turns off the derivative part completely.

Declaration of Conformity according to the EMC directive:
Försäkran om överensstämmelse enligt EMC direktivet:

Type approval test according to council directive 72/245/EEC last amended by 2009/19/EC (includes 2004/104/EC, 2005/83/EC and 2006/96/EC) and type approval test according to UN ECE Regulation No. 10 Rev3:2008.

By signing this document the undersigned declares as manufacture that the equipment in question complies with the EMC protection requirements.

Genom att underteckna detta dokument försäkrar undertecknad såsom tillverkare att angiven utrustning uppfyller skyddskraven i EMC direktiv.

CanCom **Multi module 64**

CISPR 25:2002	**Radiated RF emission NB,BB**	**30-1000 MHz**
ISO 11452-4	**Conducted immunity**	**20-100 MHz 100mA/80%**
ISO 11452-2	**Radiated immunity**	**100-2000 MHz 50V/m 80%**
	Radiated immunity PM	**800-2000 MHz 100V/m**
ISO 10605	**ESD Air**	**+/- 4KV, +/- 8KV**
	ESD Contact	**+/- 4KV**
	ESD Indirect	**+/- 4KV, +/- 8KV**
ISO 7637-2:2002	**Transient immunity and emission**	**Pulse 1,2a,2b,3a,3b,4**

CE

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