

## Data sheet

SM 031 (031-1CA20)

## Technical data

Type         SM 031           Modulo ID         0841 1899           General Information           Note         -           Features         Direct connection of a resister full bridge (DMS) or load cell Activation (EQL) Bit resident (I) (4) Bit	Order no.	031-1CA20
Note	Туре	SM 031
Note - Features	Module ID	0841 1809
Features Direct connection of a resistor full bridge (DMS) or load cell 4- or 6-wire connection 16 (24) Bit resolution and start of the Carbon Service of	General information	
A- or 6-wire connection 16 (24) Bit resolution   Autos all calibration zero prior tand final value   Absolute exactness radical error ±0.1 % (e 0.01 %) conboard power supply 2.5 V, 5 V, 7.5 V, 10 V und 12 V	Note	-
Current consumption from backplane bus         55 mA           Power loss         1 W           Technical data strain gauge DMS inputs         Image: Control of the part of inputs         1           Cable length, shielded         200 m         Canded Control of	Features	4- or 6-wire connection 16 (24) Bit resolution Auto self calibration zero point and final value Absolute exactness radical error ±0,1 % (± 0,01 %)
Power loss 1 W  Technical data strain gauge DMS inputs  Number of inputs 1 1 Cable length, shielded 200 m Rated load voltage 200 m Rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Reverse polarity protection of rated load voltage 300 m Residential limit Using 300 m Reverse polarity 100	Current consumption/power loss	
Number of inputs 1 Cable length, shielded 200 m Rated load voltage DC 24 V Reverse polarity protection of rated load voltage yes Current consumption from load voltage L+ (without load) 18 mA Relative accuracy according to self-calibration +/-0.01% Operational limit Usense +/-0.2% Basic error limit Usense +/-0.1% Basic error limit Usense +/-0.1% Basic error limit Usig +/-0.1% Destruction limit voltage max. 12V External bridge supply possible - Internal bridge supply possible yes Configurable bridge supply Sesible yes Resolution in bit 4 Measurement principle successive approximation Basic conversion time 1 ms cycle, 10ms39ms depending on the filter input filter Hardware Low pass 10kHz 3rd order Input filter software on filter setting augue DMS sensor Bridge supply voltage EXC 012V Rated output 4 wire connection possible (24mV/V Reconnection possible (24mV/V)	Current consumption from backplane bus	55 mA
Number of inputs         1           Cable length, shielded         200 m           Rated load voltage         DC 24 V           Reverse polarity protection of rated load voltage         yes           Current consumption from load voltage L+ (without load)         18 mA           Relative accuracy according to self-calibration         +/-0.01%           Operational limit Usense         +/-0.2%           Basic error limit Usinse         +/-0.1%           Basic error limit Usig         +/-0.1%           Destruction limit voltage         max. 12V           External bridge supply possible         -           Configurable bridge supply possible         yes           Configurable bridge supply possible         2.5V / max. 120mA           Resolution in bit         3V / max. 120mA           Measurement principle         successive approximation           Basic conversion time         1ms cycle, 10ms330ms depending on the filter           Input filter Hardware         Low pass 10kHz 3rd order           Input filter software         Jupamic IIR filter or 1Hz 1000Hz configurable	Power loss	1 W
Cable length, shielded     200 m       Rated load voltage     DC 24 V       Reverse polarity protection of rated load voltage     yes       Current consumption from load voltage L+ (without load)     18 mA       Relative accuracy according to self-calibration     +/-0.01%       Operational limit Usense     +/-0.2%       Operational limit Using     +/-0.2%       Basic error limit Usig     +/-0.1%       Basic error limit Usig     max. 12V       External bridge supply possible     -       External bridge supply possible     yes       Configurable bridge supply possible     yes       Configurable bridge supply possible     yes       Resolution in bit     24       Measurement principle     successive approximation       Basic conversion time     1ms cycle, 10ms330ms depending on the filter       Input filter Hardware     Low pass 10kHz 3rd order       Input filter software     Dynamic IIR filter 0.1Hz1000Hz configurable FIR filter 50Hz/60Hz       Initial data size     4 Byte       Data for selection of the strain gauge DMS sensor       Bridge supply voltage EXC     012V       Bridge differential voltage SIG     +/-29mV       Rated output     0.54mV/V       4 wire connection possible     yes	Technical data strain gauge DMS inputs	
Reted load voltage Polarity protection of rated load voltage yes Current consumption from load voltage L+ (without load) 18 mA Relative accuracy according to self-calibration +/-0.01% Operational limit Usense +/-0.2% Operational limit Usig +/-0.1% Basic error limit Usig +/-0.1% Basic error limit Usig +/-0.1% Basic error limit usig +/-0.1% Destruction limit voltage max. 12V External bridge supply possible yes Configurable bridge supply possible yes Configurable bridge supply possible yes Configurable bridge supply possible yes Resolution in bit 24 Measurement principle successive approximation Basic conversion time 1 ms cycle, 10ms330ms depending on the filter Input filter Hardware Low pass 10kHz 3rd order Input filter software configurable FIR filter 50Hz/60Hz Initial data size 4 Byte  Data for selection of the strain gauge DMS sensor  Bridge supply voltage EXC 012V  Rated output 4 wire connection possible yes	Number of inputs	1
Reverse polarity protection of rated load voltage Current consumption from load voltage L+ (without load) Relative accuracy according to self-calibration Poperational limit Usense Phylogena Phylog	Cable length, shielded	200 m
Current consumption from load voltage L+ (without load) Relative accuracy according to self-calibration Poperational limit Usense Phy-0.2% Operational limit Usense Phy-0.2% Basic error limit Usense Phy-0.1% Basic error limit Usig Postruction limit voltage  External bridge supply possible Postruction limit yotage supply possible Postruction limit yotage supply possible Postruction limit yotage supply possible Postruction in bit Postruc	Rated load voltage	DC 24 V
Relative accuracy according to self-calibration +/-0.01%  Operational limit Usense +/-0.2%  Departional limit Using +/-0.2%  Basic error limit Usense +/-0.1%  Basic error limit Using +/-0.1%  Basic error limit Using +/-0.1%  Destruction limit voltage max. 12V  External bridge supply possible -  Internal bridge supply possible yes  Configurable bridge supply \$\frac{2.5V / \text{ max. 120mA}}{5V / \text{ max. 120mA}}\$\frac{5V / \text{ max. 120mA}}{5V / \text{ max. 120mA}}\$\frac{5V / \text{ max. 120mA}}{12V / \text{ max. 190mA}}\$\frac{12V / \text{ max. 190mA}}{12V / \text{ max. 190mA}}\$\frac{12V / \text{ max. 190mA}}{12V / \text{ max. 190mA}}\$\frac{12V / \text{ max. 190mA}}{10V / \text{ max. 190mA}}\$	Reverse polarity protection of rated load voltage	yes
Operational limit Usense	Current consumption from load voltage L+ (without load)	18 mA
Derational limit Usig +/-0.2%  Basic error limit Usense +/-0.1%  Basic error limit Usig +/-0.1%  Destruction limit voltage max. 12V  External bridge supply possible -  Internal bridge supply possible yes  Configurable bridge supply \$\frac{2.5V}{\text{ max. 120mA}}\$\frac{5V}{\text{ max. 120mA}}\$\frac{7.5V}{\text{ max. 120mA}}\$\frac{7.5V}{\text{ max. 120mA}}\$\frac{1.0V}{\text{ max. 90mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\frac{1.0V}{\text{ max. 90mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\frac{1.0V}{\text{ max. 100mA}}\$\f	Relative accuracy according to self-calibration	+/-0.01%
Basic error limit Usense	Operational limit Usense	+/-0.2%
Basic error limit Usig	Operational limit Usig	+/-0.2%
External bridge supply possible  Internal bridge supply possible  Configurable bridge supply  \$2.5V / max. 120mA	Basic error limit Usense	+/-0.1%
External bridge supply possible Internal bridge supply possible  Configurable bridge supply  Configurable bridge supply  Sty / max. 120mA 7.5V / max. 120mA 7.5V / max. 120mA 7.5V / max. 100mA 10V / max. 90mA 12V / max. 80mA  Resolution in bit  24  Measurement principle  Basic conversion time  Imput filter Hardware  Low pass 10kHz 3rd order  Input filter software  Input filter software  Dynamic IIR filter 0.1Hz1000Hz configurable FIR filter 50Hz/60Hz  Initial data size  4 Byte  Data for selection of the strain gauge DMS sensor  Bridge supply voltage EXC  012V  Bridge differential voltage SIG  At-29mV  Rated output  4 wire connection possible	Basic error limit Usig	+/-0.1%
Internal bridge supply possible  Configurable bridge supply  \$2.5V / max. 120mA 5V / max. 100mA 7.5V / max. 100mA 7.5V / max. 90mA 12V / max. 100mA 12V / max. 100mA 12V / max. 90mA 12V / max. 100mA 12V	Destruction limit voltage	max. 12V
Configurable bridge supply  \$2.5V / max. 120mA	External bridge supply possible	-
Resolution in bit  24  Measurement principle Basic conversion time Input filter Hardware Input filter software Data for selection of the strain gauge DMS sensor  Bridge supply voltage EXC Bridge differential voltage SIG Resolution in bit  24  Measurement principle successive approximation Imms cycle, 10ms330ms depending on the filter Low pass 10kHz 3rd order Dynamic IIR filter o.1Hz1000Hz configurable IIR filter 0.1Hz1000Hz configurable FIR filter 50Hz/60Hz	Internal bridge supply possible	yes
Measurement principle  Basic conversion time  Input filter Hardware  Input filter software  Dynamic IIR filter 0.1Hz1000Hz configurable FIR filter 50Hz/60Hz  Data for selection of the strain gauge DMS sensor  Bridge supply voltage EXC  O12V  Bridge differential voltage SIG  Rated output  4 wire connection possible  successive approximation  Imms cycle, 10ms330ms depending on the filter  Low pass 10kHz 3rd order  Dynamic IIR filter 0.1Hz1000Hz configurable FIR filter 50Hz/60Hz  Dynamic IIR filter 0.1Hz1000Hz configurable FIR filter 50Hz/60Hz  O12V	Configurable bridge supply	5V / max. 120mA 7.5V / max. 100mA 10V / max. 90mA
Basic conversion time 1ms cycle, 10ms330ms depending on the filter Input filter Hardware Low pass 10kHz 3rd order Input filter software Dynamic IIR filter configurable IIR filter 0.1Hz1000Hz configurable FIR filter 50Hz/60Hz Initial data size 4 Byte  Data for selection of the strain gauge DMS sensor Bridge supply voltage EXC 012V Bridge differential voltage SIG +/-29mV Rated output 0.54mV/V 4 wire connection possible yes	Resolution in bit	24
Input filter Hardware  Input filter software  Dynamic IIR filter 0.1Hz1000Hz configurable IIR filter 50Hz/60Hz  Initial data size  4 Byte  Data for selection of the strain gauge DMS sensor  Bridge supply voltage EXC  012V  Bridge differential voltage SIG  +/-29mV  Rated output  0.54mV/V  4 wire connection possible  Low pass 10kHz 3rd order  Dynamic IIR filter 0.1Hz1000Hz configurable IIR filte	Measurement principle	successive approximation
Input filter software  Dynamic IIR filter configurable IIR filter 0.1Hz1000Hz configurable FIR filter 50Hz/60Hz  Initial data size 4 Byte  Data for selection of the strain gauge DMS sensor  Bridge supply voltage EXC 012V  Bridge differential voltage SIG +/-29mV  Rated output 0.54mV/V  4 wire connection possible yes	Basic conversion time	1ms cycle, 10ms330ms depending on the filter
Initial data size 4 Byte  Data for selection of the strain gauge DMS sensor  Bridge supply voltage EXC 012V  Bridge differential voltage SIG +/-29mV  Rated output 0.54mV/V  4 wire connection possible yes	Input filter Hardware	Low pass 10kHz 3rd order
Bridge supply voltage EXC  Bridge differential voltage SIG  Rated output  4 wire connection possible  O12V  012V  4 wire connection possible  O4mV/V  yes	Input filter software	configurable IIR filter 0.1Hz1000Hz
Bridge supply voltage EXC 012V Bridge differential voltage SIG +/-29mV Rated output 0.54mV/V 4 wire connection possible yes	Initial data size	4 Byte
Bridge differential voltage SIG +/-29mV  Rated output 0.54mV/V  4 wire connection possible yes	Data for selection of the strain gauge DMS sensor	
Rated output 0.54mV/V 4 wire connection possible yes	Bridge supply voltage EXC	012V
4 wire connection possible yes	Bridge differential voltage SIG	+/-29mV
	Rated output	0.54mV/V
6 wire connection possible yes	4 wire connection possible	yes
	6 wire connection possible	yes



Possible bridge configuration	symmetric full bridge
Status information, alarms, diagnostics	
Status display	yes
Interrupts	yes, parameterizable
Process alarm	no
Diagnostic interrupt	yes, parameterizable
Diagnostic functions	yes
Diagnostics information read-out	possible
Module state	yes
Module error display	red LED
Channel error display	red LED
Isolation	
Between channels	-
Between channels of groups to	-
Between channels and backplane bus	yes
Between channels and power supply	-
Max. potential difference between circuits	-
Max. potential difference between inputs (Ucm)	-
Max. potential difference between Mana and Mintern (Uiso)	-
Max. potential difference between inputs and Mana (Ucm)	-
Max. potential difference between inputs and Mintern (Uiso)	DC 75 V/ AC 50 V
Max. potential difference between Mintern and outputs	-
Insulation tested with	DC 500 V
Datasizes	
Input bytes	5
Output bytes	1
Parameter bytes	30
Diagnostic bytes	20
Housing	
Material	PC / PPE GF10
Mounting	Profile rail 35 mm
Mechanical data	
Dimensions (WxHxD)	12.9 mm x 109 mm x 76.5 mm
Net weight	64 g
Weight including accessories	64 g
Gross weight	78 g
<b>Environmental conditions</b>	
Operating temperature	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C
Certifications	
UL certification	yes
KC certification	in preparation
	• •