DEWETRON

DAQP-CFB2 Module

TECHNICAL REFERENCE MANUAL

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Look forward to the easy handling and the flexible and modular use of your DEWETRON product and draw upon more than 30 years of DEWETRON expertise in measurement engineering.

ISO9001

EN ISO 14001

THE MEASURABLE DIFFERENCE.

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Please refer to the page bottom for printing version.

Notice

Safety symbols in the manual

	*Indicates hazardous voltages.*

WARNING	*Calls attention to a procedure, practice, or condition that could cause bodily injury or death.*

CAUTION	*Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.*

WARNINGS

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. DEWETRON Elektronische Messgeraete Ges.m.b.H. assumes no liability for the customer's failure to comply with these requirements.

All accessories shown in this document are available as option and will not be shipped as standard parts.

Safety instructions for DEWETRON amplifiers

- The DEWETRON data acquisition systems and amplifiers may only be installed by experts.
- Read your manual carefully before operating.
- Observe local laws when using the amplifiers.
- Ground the equipment: For Safety Class 1 equipment (equipment having a protective earth terminal), a non interruptible safety earth ground must be provided from the mains power source to the product input wiring terminals or supplied power cable.
- DO NOT operate the product in an explosive atmosphere or in the presence of flammable gases or fumes.
- DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to a DEWETRON sales and service office for service and repair to ensure that safety features are maintained.
- Keep away from live circuits: Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers or shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.
- No modifications are allowed at the amplifiers.
- DO NOT service or adjust alone. Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.
- DO NOT substitute parts or modify equipment: Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to a DEWETRON sales and service office for service and repair to ensure that safety features are maintained.
- DO NOT touch internal wiring!
- DO NOT use higher supply voltage than specified!
- Use only original plugs and cables for harnessing.
- Safety of the operator and the unit depend on following these rules.

Support

For any support please contact your local distributor first or DEWETRON directly.

For Asia and Europe, please contact:

DEWETRON GmbH
Parkring 4
8074 Grambach
AUSTRIA
Tel.: +43 316 3070
Fax: +43 316 307090
Email: support@dewetron.com
Web: http://www.dewetron.com

The telephone hotline is available Monday to Friday between 08:00 and 12:00 CET (GMT -1:00) and Monday to Thursday between 13:00 and 17:00 CET.

For the Americas, please contact:

DEWETRON, Inc.
2850 South County Trail, Unit 1
East Greenwich, RI 02818
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Tel.: +1 401 284 3750
Toll-free: +1 866 598 3393
Fax: +1 401 284 3755
Email: us.support@dewetron.com
Web: http://www.dewetron.us

The telephone hotline is available Monday to Friday between 08:00 and 17:00 GST (GMT +5:00)

Calibration information

All DEWETRON modules are calibrated at 25 °C after a warmup time of 30 minutes and meet their specifications when leaving the factory.
The time interval for recalibration depends on environmental conditions. Typically, the calibration should be checked once a year.

Calibration certificates are available from DEWETRON as an option. DEWETRON offers two types:

- ISO traceable DEWETRON certificate
- Calibration certificate according to ÖKD (equivalent to DKD)

This manual contains no calibration information. For self calibration, there is a separate calibration kit for the DAQ series modules available. The CAL-KIT contains the required cables, software and instructions.

General module specifications

Module dimensions:	20 x 65 x 105 mm (W x H x D without front cover and connectors)	(0.79 x 2.56 x 4.13 in.)
Frontcover:	20 x 87 x 2 mm (W x H x D without connector)	(0.79 x 3.43 x 0.08 in.)
Environmental:		
Temp. range storage:	-30 °C to +85 °C	(-22 °F to 185 °F)
Temp. range operating:	-5 °C to +60 °C	(23 °F to 140 °F)
Relative humidity (MIL202):	0 to 95 % at 60 °C, non-condensing (unless otherwise noticed)	
RFI susceptibility:	±0.5 % span error at 400 MHz, 5 W, 3 m	

All specifications within this manual are valid at 25 °C!

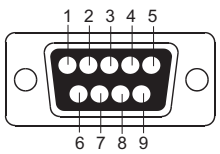
All modules are produced according ISO9001 and ISO14001.

Module connectors

Frontpanel connector: Accessable to the user. The connector type and pin assignment varies from module to module. Detailed pin assignment of each module is shown in the appropriate module description.

Rear connector: 9-pin male SUB-D, interface to the DEWE-System, not accessable to the user.

HSI/DAQx and PAD module rear view



9-pin male SUB-D connector

Interface pin assignment:

1 Module output (±5 V)
2 RS-485 (A)
3 RS-485 (B)
4 GND
5 +9 V power supply
6 +12 V power / sensor supply
7 Module input (from D/A converter of the A/D board)[1)]
8 reserved
9 -9 V power supply

[1)] Triggerout at DAQP-FREQ-A

General Module Information

RS-232/485 interface

HSI/DAQP modules can be configured via RS-485 interface, PAD modules require this interface for all data transfers.

For all DEWETRON systems, an internal RS-232/485 converter is available (standard with DEWE-800, -2000, -2500, -3000, -4000, -5000 series systems). This converter allows communication with HSI/DAQP and PAD modules.

To communicate with the modules, the RS-232 interface has to be set to the following parameters:

baud rate:	9600 bps
data bits:	8
parity:	no parity
stop bits:	1
handshake:	not required

HSI/DAQP module configuration

1. Push button selection

All ranges and filters can be selected directly by pressing the push buttons on the module. Approx. 15 sec. after changing range and / or filter, the range and filter information is stored in an EEPROM. This procedure increases the livetime of the EEPROM.

The current input range setting is shown all the time by LED. To change the range just press ***RANGE*** button a few times until the required range is displayed.

To see the current filter setting just press the ***FILTER*** button once. The corresponding LED is flashing for approx. 3 seconds. Within this time, the filter can be selected by pressing the ***FILTER*** button again. Approx. 3 seconds after the last key activity, the information will be stored, the LED stops flashing and shows the input range again.

CAUTION: Power loss during this time leaves the module in the former settings.

2. RS-232/485 programming

All ranges and filters can also be selected via RS-232/485 interface. All new DEWE-800, -2000, -2500, -3000, -4000, -5000 series systems are prepared as a standard to work with HSI/DAQP modules.

The easiest way to change the configuration is to use the DEWEConfig software, which comes as a standard with the DEWETRON data acquisition system.

Detailed information about HSI/DAQP modules programming for customer applications is available in the *DEWE-Modules Programmers Reference Manual*.

CAUTION: All range and filter changes which are done via RS-232/485 interface are not stored in the EEPROM of the HSI/DAQP modules! You have to store this information in a separat initialisation file to keep settings information for next system start!

PAD module communication

All PAD modules are only working through the RS-232/485 interface. All new DEWE-800, -2000, -2500, -3000, -4000, -5000 series systems are prepared as a standard to work with PAD modules. The easiest way to change the configuration is to use the DEWEConfig software, which comes as a standard with the DEWETRON data acquisition system.

Detailed information about PAD modules programming for customer applications is available in the *DEWE-Modules Programmers Reference Manual*.

Carrier frequency amplifier

- Bandwidth: max. 9.6 kHz
- Input ranges: Bridge: 0.1 mV/V to 1000 mV/V
  LVDT: 5 mV/V to 1000 mV/V
  Capacity: 20 pF to 1 µF
- Sensor Excitation: Programmable voltage and frequency up to 5 V_{RMS} / 20 kHz; remote sense support
- Bridge completion: Internal completion for ½ and ¼ bridge (120 and 350 Ω)
- Shunt: Two internal shunts (50 kΩ, 100 kΩ)
- TEDS: Support for TEDS sensors

Module specifications

	DAQP-CFB2
Bridge input ranges	0.1 mV/V to 1000 mV/V
Inductive bridge input ranges	5 mV/V to 1000 mV/V
Capacitive input Ranges	20 pF to 1 µF
Bridge resistance	60 - 5000 Ω depending on excitation voltage
Excitation voltage level	1, 2, 5 V_{RMS} sensed excitation provided
Excitation voltage accuracy	0.05 % of value ± 200 µV
Excitation voltage frequency	0.6; 1; 2.5; 5; 10; 20 kHz sine wave ±100 ppm
Maximum excitation current	50 mA_{RMS} short circuit protected
Excitation voltage synchronisation	internal crystal oscillator or external
Excitation voltage drift	typically 20 ppm/K
Excitation frequency drift	typically 2 ppm/K
Nonlinearity	±0.02 % FS
Accuracy bridge mode	typically ±0.1 % of reading ±0.05 % of range
Max. offset drift	±0.003 µV/V/K ±40 ppm of Range/K
Max. gain drift	±30 ppm/K
Balance adjusting range	±400 % of Range (±200 % at 1 V excitation)
Phase adjustment range	±90° (inductive mode only)
Balance adjusting accuracy	within ±0.1 % FS
Supported sensors	4- or 6-wire full bridge 3- or 5-wire ½ bridge with internal completion (software programmable) 3-wire ¼ bridge with internal resistor for 120 and 350 Ω (software programmable) inductive full bridge inductive half bridge (typically LVDT Sensors)
Shunt calibration	internal 50 kΩ and 100 kΩ Shunt
Completion and shunt resistor accuracy	±0.05 %
-3 dB Bandwidth	max 9.6 kHz
Reconstruction filter	7th order Butterworth, automatically adjusted to excitation frequency * 0.48
Signal filters (low pass)	10, 30, 100, 300, 1 kHz, 3 kHz
Filter characteristics	2nd order Bessel or Butterworth (40 dB/ decade)
Typ. SNR @ 1000 Hz [100 Hz] and 2 V_{RMS} excitation	78 dB [85 dB] @ 1 mV/V 80 dB [87 dB] @ 100 mV/V
Over voltage protection	±10 V
Output voltage	±5 V
Out current	±5 mA
Output protection	continuous short to ground
Power consumption	max. 1.5 W
Supported TEDS chips	DS2406, DS2430, DS2432, DS2433, DS2431
Weight	within 250 (±30) g

DAQP-CFB2

General description

The signal path of the DAQP-CFB2 is completely analog. This reduces the signal delay to the absolute minimum, which is a huge advantage in comparison to a DSP based bridge amplifier with AD and DA conversion. DSP based bridge amplifiers always have a delay due to the calculation. The analog design makes the DAQP-CFB2 a perfect choice for control loop applications, where a fast response is required.

The main advantages of the carrier frequency technology are:

- eliminating thermo voltages
- extremely low 1/f noise
- electrical disturbances like the 50/60 Hz signal are totally suppressed
- very high offset stability

The typical applications for this module are:

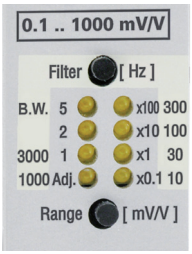
- Long term strain measurement
- Strain gage measurement in harsh electromagnetic environment
- LVDT sensor measurement
- Capacitive sensor measurement
- Frontend amplifier for control loops
- Test-bed signal conditioning

The DAQP-CFB2 replaces the older DAQP-CFB module. The new module has a higher accuracy and supports many more features. Despite of all improvements, it is still compatible with the older DAQP-CFB. Even the standard command set, except custom range settings, is downward compatible. Replacing the old CFB by the new one should not require any changes in terms of sensor connection.

Front panel control

LED indication:

Filter	Range
B.W.	5 mV/V
	2 mV/V
3000 Hz	1 mV/V
10000 Hz	Cust.



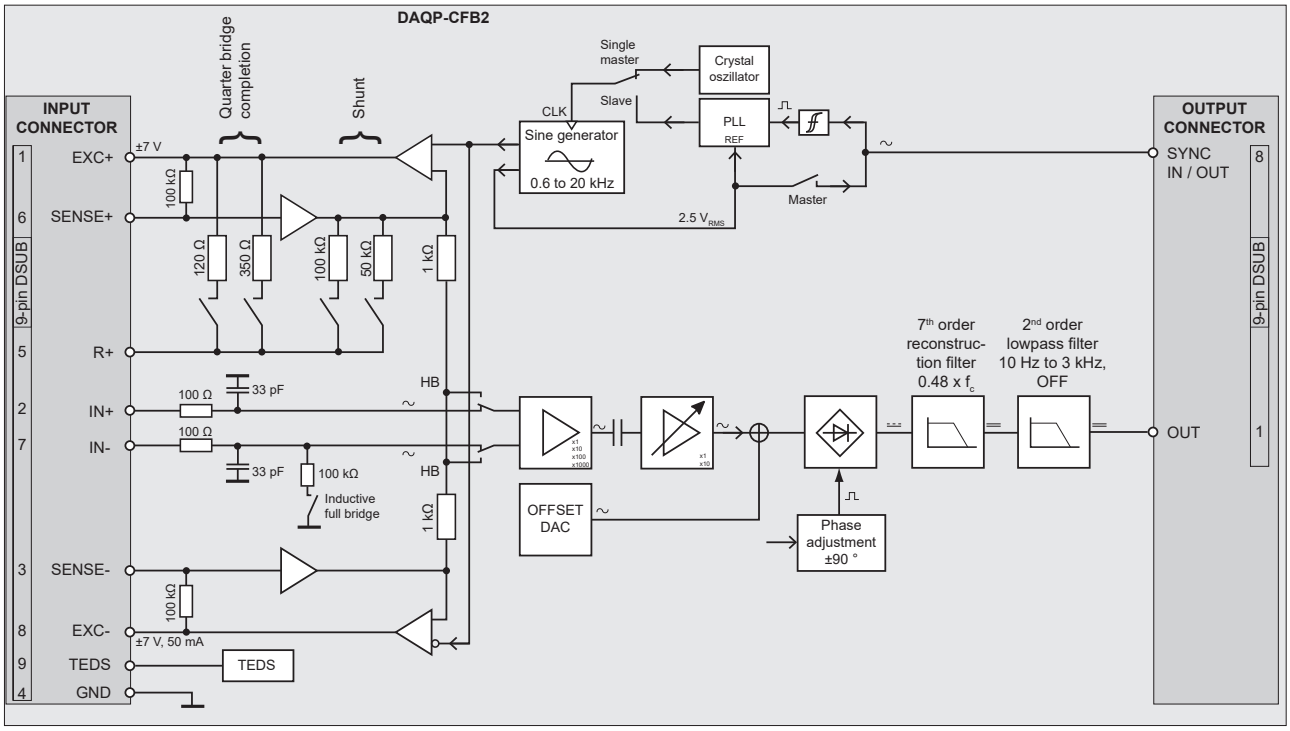
Range	Filter
x100	300 Hz
x10	100 Hz
x1	30 Hz
x0.1	10 Hz

The DAQP-CFB series module has a set of 8 LEDs showing the current input range (constant active) and filter range setting (flashing). Functions are described below.

Push button operation:

- Assign module address: Press the ID button for allowing the software to change the address.
- Select range : Push the ***RANGE*** button several times shortly until the LED displays the desired input range.
- Select Filter: Push the ***FILTER*** button once - the LEDs will flash for approx. 3 seconds and display the current filter setting. Push the ***FILTER*** button within the three seconds several times until the flashing LED displays the desired filter range.

- Apply shunt: Press the ***FILTER*** button for more than 3 seconds to apply the internal shunt resistor as long as you keep the button pressed.
- Apply Zero ref.: Press the ***RANGE*** button for more than 3 seconds to shortcurcuit the module input as long as you keep the button pressed.
- Amplifier balance: Press the ***RANGE*** button for more than 3 seconds (zero reference). Keep the ***RANGE*** button pressed and push the ***FILTER*** button in addition. This will set the module offset to zero. The calibration values will be stored in the module! This function is independent from the sensor and takes approx. 2 seconds!
- Sensor balance: Press both ***RANGE*** and ***FILTER*** button together for more than 2 seconds. This will set the offset of a connected sensor to zero. The sensor offset correction is working within ±400 % of full scale range.
- Factory default: Press both ***RANGE*** and ***FILTER*** button at power up for approx. 3 seconds to set the amplifier to factory default settings (full bridge, 100 mV/V, 5 V_{RMS}, Bessel, module address 0x00, 100 kΩ shunt, power-on-default off, manual control).



Free variable gain and offset

The programmable gain amplifier (PGA) combined with the variable gain amplifier (VGA) allow a wide input gain from 0.1 mV/V to 1000 mV/V. The offset is free programmable between ±400 % of the input with a resolution of 17 bit. So it is possible to normalize almost any sensor signal to the ±5 V amplifier output.

Excitation Voltage

The excitation voltage is programmable to 1, 2 or 5 V. The carrier frequency is programmable to 0.6,1, 2.5, 3, 5, 10 or 20 kHz. When the module is configured as “stand alone” or as “single” the frequency is based on a crystal oscillator. When it is switched to external clock a PLL synchronizes the excitation with the external signal. The EXC+ and EXC- voltage is always balanced around GND. That allows using the ground potential as shield. For high accuracy strain gage measurement it is recommended using lower frequencies. When higher bandwidth is required use higher carrier frequencies.

Remote Sense

The DAQP-CFB2 supports remote sense. That means that the excitation voltage loss in the sensor cable is compensated. The sense line terminals are internally connected to the excitation via a 100 kΩ resistor. For accurate voltage regulation there has to be also an external connection. Even if the remote sense function is not required. Sense has to be connected to EXC.

Phase adjustment

In inductive mode the phase of the amplifier needs to be adjusted to compensate the phase shift due to sensor and wiring. The DAQP-CFB2 is able to compensate ±90° with the phase sensitive rectifier.

Output offset

The output offset can be programmed from positive to negative full scale range. This is useful if the DAQP-CFB2 is used as an analog signal conditioner.

Input offset

The input offset can be set ±400 % of the input range. It is automatically recalculated when changing the measurement range. The input offset is automatically determined with the sensor balance function.

Internal Completion Resistors

The DAQP-CFB2 has internal half bridge completion and internal quarter bridge completion wiring for 120 Ω and 350 Ω strain gages. High precision resistors with low temperature drift allow a long-term stable measurement of almost every strain gage type without using an external completion network.

Internal Shunt

A 50 kΩ and a 100 kΩ shunt resistor can be applied to the bridge internally. This is called “shunt calibration”. With this technique the whole measurement chain (sensor, amplifier and analog-to-digital conversion) can be checked. The table below shows the shunt calibration results for typical strain gage resistance values.

Strain gage Resistor	Shunt resistor	Result
120 Ω	50 kΩ	0.6 mV/V
120 Ω	100 kΩ	0.3 mV/V
350 Ω	50 kΩ	1.74 mV/V
350 Ω	100 kΩ	0.87 mV/V

The shunt resistor check is not possible in inductive bridge operation mode.

Amplifier balance

Balance amplifier allows eliminating all internal amplifier offsets automatically. It switches the differential amplifier inputs IN+ and IN- to internal GND. Then the output offset of the module is adjusted to zero for all ranges. This function takes up to 8 seconds. Previously stored sensor offset values are cleared.

Sensor Balance

Typically every strain gage sensor has a certain offset. This arises from manufacturing tolerances or from sensor mounting. By performing a sensor balance the sensor offset can be removed on the analog side up to 400 % of the actual range. This allows using the full range of the AD board instead of losing resolution because of digital offset shifting. The maximum adjustable offset is mentioned in the range overview table. The sensor offset is stored in the module and is recalculated automatically when changing the range.

Short

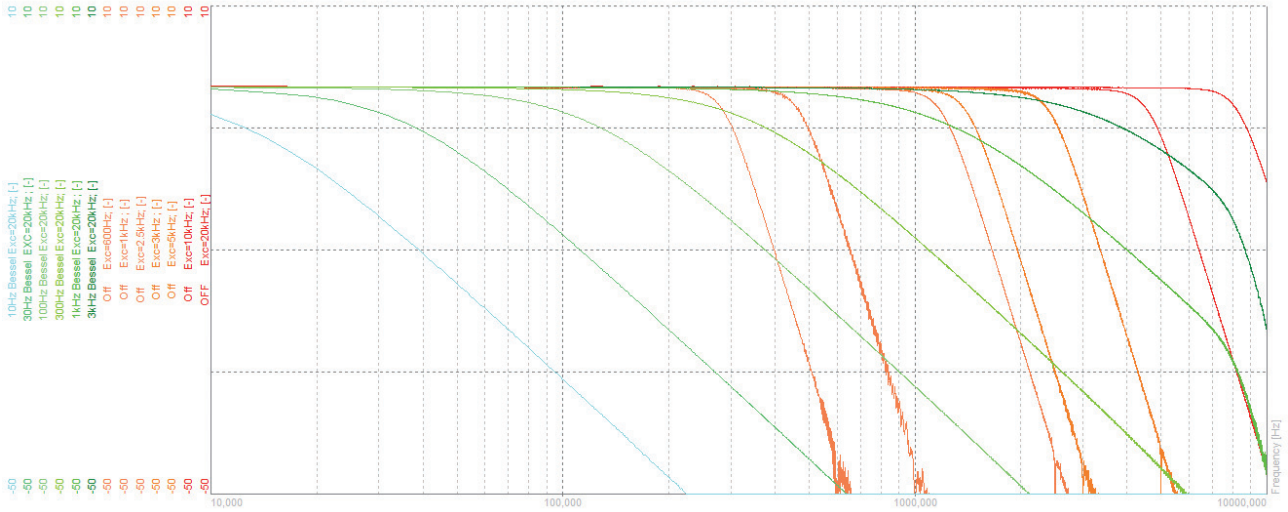
It switches the differential amplifier inputs IN+ and IN- to internal GND. With this function the absolute sensor offset can be determined.

Cal

Independently from the input signal this function sets the output to 80 % of the actual range. The calibration signal is based on the excitation voltage. So this is a simple check of the excitation voltage. Typical reason why the excitation is not working are short circuit of the excitation at the cabling or sensor defects, too high load for the excitation amplifier (please decrease the excitation voltage) or incorrect setting of the synchronisation mode (no master assigned).

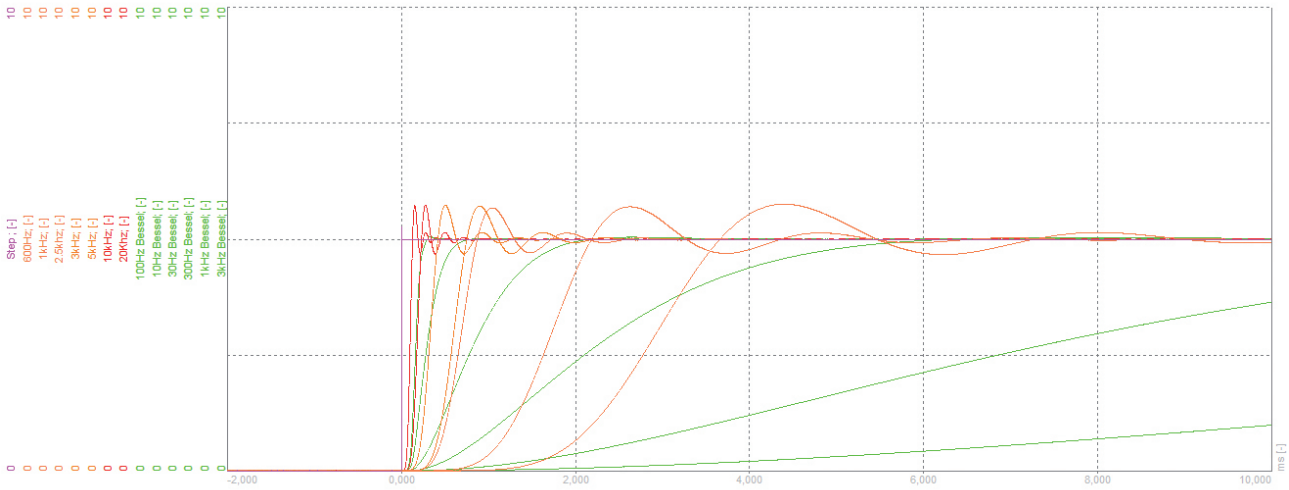
Filter

The DAQP-CFB has two filters. The first is a 7th order Butterworth filter for signal reconstruction. The cut off frequency of this filter is automatically 0.48* carrier frequency. The second filter stage is a programmable 2nd order filter. The characteristic can be chosen between Bessel and Butterworth. This filter is compatible to most other DAQP series modules. OFF-mode means bypassing the 2nd order filter.



DAQP-CFB2 Step Response

The 7th order Butterworth filer has an overshoot of 14 % in time domain. Bessel filters do not have any overshoot.



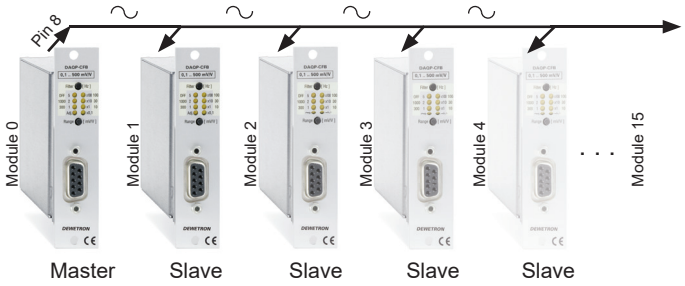
Synchronizing multiple amplifiers

The high amplification of strain gage amplifiers requires to synchronize the excitation voltage if multiple channels are used. This is done with pin 8 of the back plane connector. When mixing DAQP-CFB and DAQP-CFB2 modules please consider that the DAQP-CFB amplifier only support 5 kHz excitation.

The DAQP-CFB2 offers three synchronisation modes:

- Single: DAQP-CFB2 uses the internal crystal oscillator and outputs no synch signal.
- Master: DAQP-CFB2 uses the internal crystal oscillator and serves a synch signal.
- Slave: DAQP-CFB2 synchronises the excitation voltage to the synchronisation signal. No sync amplifier is required anymore when DAQP-CFB2 is used in slave mode. When switching into slave mode the frequency is auto detected and cannot be changed anymore.

Sync of up to 16 channels:



Synchronisation of the carrier frequency is required when:

- Sensor cables of different CFBs are nearby
- Sensors are mounted on the same metal structure (capacitive signal coupling)

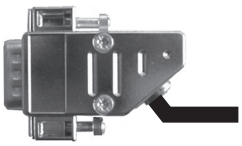
No synchronisation is required when:

- Isolated sensors are on non-conductive structures
- For ranges above 100 mV/V because of the low amplification and therefore less influence of crosstalk between wires and cables.

In some special DEWETRON Racks pin 8 is already in use for customized sensor supply voltage level. If so, only single mode operation is possible.

Bridge mode accuracy				
Excitation	1 V_{RMS}	2 V_{RMS}	5 V_{RMS}	
	Input ranges			
Amplifier gain	mv/V	mv/V	mv/V	Accuracy
5	1000	500	200	0.1% of reading ±0.05% of range
10	500		100	0.1% of reading ±0.05% of range
12.5		200		0.1% of reading ±0.05% of range
20			50	0.1% of reading ±0.05% of range
25	200	100		0.1% of reading ±0.05% of range
50	100	50	20	0.1% of reading ±0.05% of range
100	50		10	0.1% of reading ±0.05% of range
125		20		0.1% of reading ±0.05% of range
200			5	0.1% of reading ±0.05% of range
250	20	10		0.1% of reading ±0.05% of range
500	10	5	2	0.1% of reading ±0.05% of range
1000	5		1	0.1% of reading ±0.05% of range
1250		2		0.1% of reading ±0.05% of range
2000			0.5	0.1% of reading ±0.05% of range
2500	2	1		0.1% of reading ±0.05% of range
5000	1	0.5	0.2	0.1% of reading ±0.05% of range
10000	0.5		0.1	0.2% of reading ±0.2uV/V*
12500		0.2		0.2% of reading ±0.2uV/V*
25000	0.2	0.1		0.2% of reading ±0.2uV/V*
*) only specified for 5 kHz excitation frequency.				

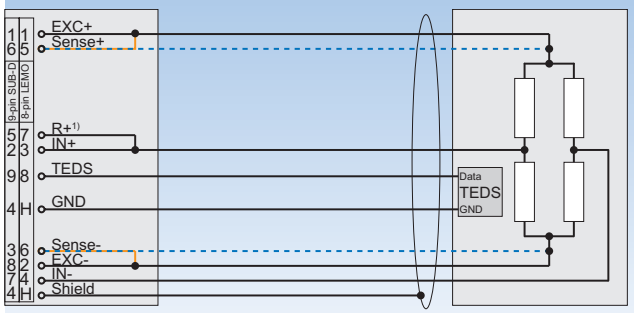
Signal connection

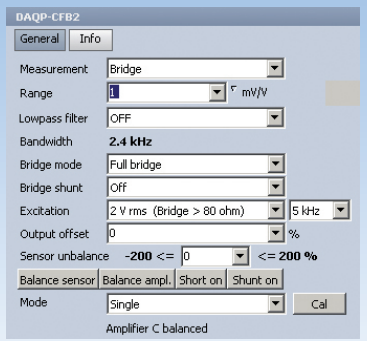


1 EXC+
2 IN+
3 SENSE -
4 GND
5 R+ / Shunt
6 SENSE+
7 IN-
8 EXC-
9 TEDS

Full bridge signal connection

6-wire and 4-wire sensor connection

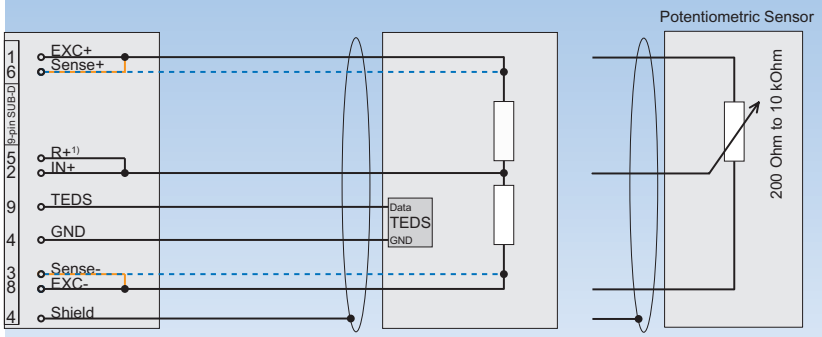


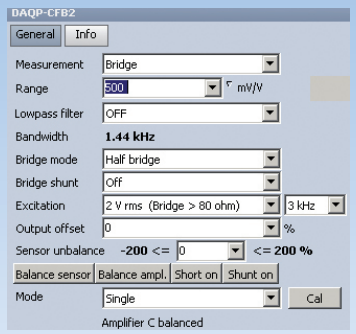


Voltage or current excitation is allowed.
Sense terminals have to be connected to excitation also when 4-wire connection is used.

Half bridge signal connection

5-wire and 3-wire sensor connection, potentiometric sensors





Sense terminals have to be connected to excitation also when 4-wire connection is used.
A potentiometer works like a half bridge sensor with ±500 mV/V sensitivity. The scaling is:

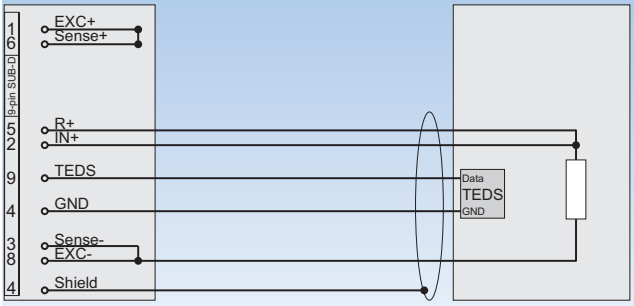
0 % position equals -500 mV
100 % position equals +500 mV

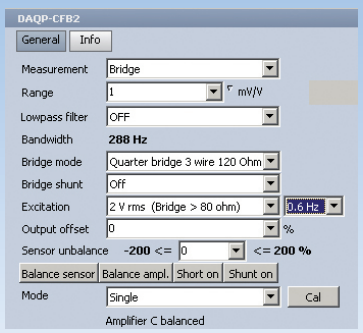
1) 'R+' has to be connected only if shunt check is required, otherwise it can be left unconnected.

Quarter bridge signal connection

3-wire sensor connection

(Sense+ is connected to EXC+ at the connector)



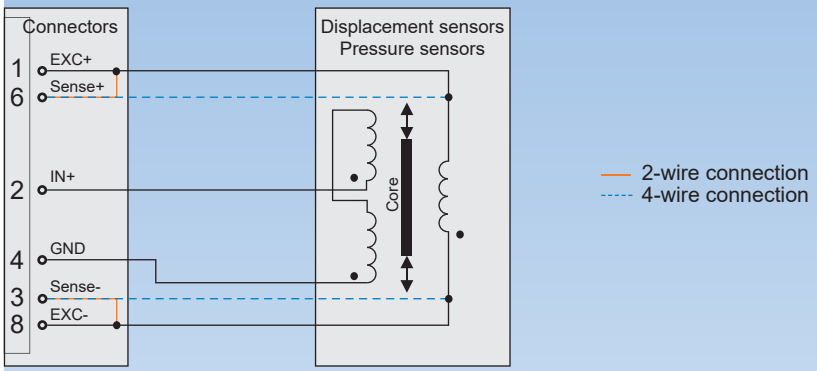


Sense leads (D-SUB: pin 3 and 6) have to be connected!

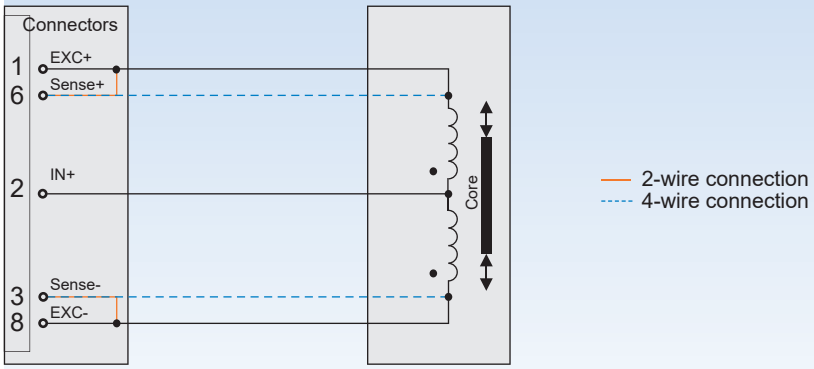
3-wire quarter bridge is only able to compensate symmetric wire resistance!

Inductive bridge sensors (LVDT)

Linear **V**ariable **D**ifferential **T**ransformers

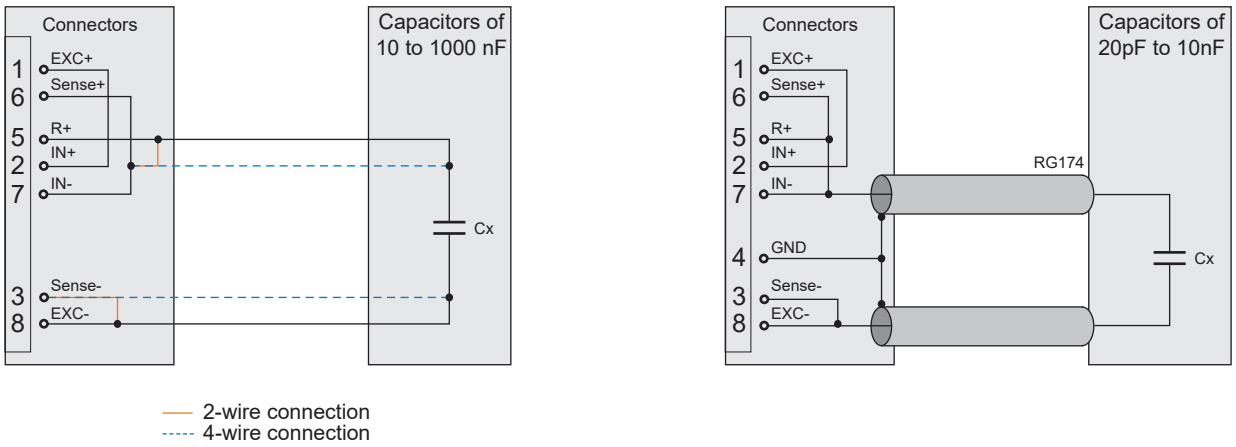


Inductive half-bridge sensors



Capacitance measurement

Capacitance measurement of the DAQP-CFB2 works with the following technology. It applies a determined excitation AC voltage with 5 kHz to the capacitor. The module measures the current through the capacitor by using the 120 Ω completion resistor as a shunt. Depending of the unknown impedance, this current is phase shifted to the excitation voltage. The 90° component of this current is proportional to the unknown capacitance. Only this component is amplified and rectified.



Sensor connection:

4-wire connection only makes sense for the ranges from 10 nF to 1 µF. For ranges below 10 nF use two shielded cables for the measurement leads to avoid measuring parasitic capacitances.
Connect shield to pin 4 (GND).

Measuring small capacitances:

To improve measurement accuracy of small capacitances, perform a sensor balance with the test leads open to subtract the residual capacitance of the DAQP-CFB2 and the leads.

CAUTION: To avoid possible damage to the DAQP-CFB, disconnect circuit power and discharge all high-voltage capacitors before measuring capacitance.

Capacitance measurement accuracy		
Range	**Excitation voltage**	**DC accuracy**
[nF]	[V_{RMS}]	
1000	0.25	1 nF±0.3 % of reading
500	0.25	500 pF ±0.3 % of reading
200	0.25	200 pF ±0.3 % of reading
100	0.25	100 pF ±0.3 % of reading
50	4	50 pF ±0.3 % of reading
10	5	10 pF ±0.3 % of reading
5	5	5 pF ±0.3 % of reading
1	5	1 pF ±0.3 % of reading
0.5	5	0.5 pF ±0.3 % of reading
0.2	5	0.2 pF ±0.3 % of reading
0.1	5	0.2 pF±0.3 % of reading
0.05	5	0.2 pF ±0.3 % of reading
0.02	5	0.2 pF ±0.3 % of reading

Why use more wire technology

- Sensitivity: For sensor wiring typically copper cables are used. For example a 120 Ω full bridge connected with a 4 x 0.14 mm² cable will have an sensitivity error of 2.1 % just because of the 1.27 Ω wire resistance. By using the 6 wire technology, this can be completely compensated.
- Temperature drift: Copper has a temperature drift of 0.4 % /°C.This is especially a problem at quarter bridges, because also the offset changes with the wire resistance. The following table shows the difference between the 3 wiring methods for a 120 Ω strain gage with a 50 m cable 0.25 mm².

	Initial error		Drift because of 10 °C warm-up	
	Offset	Sensitivity	Offset	Sensitivity
2-wire	25183 µm/m	-4,97 %	956 µm/m	-0.18 %
3-wire	0 µm/m	-2.6 %	0 µm/m	-0.01 %

Cables

To keep the influence of electromagnetic disturbances as small as possible shielded twisted pair cables are strongly recommended. Connect the shield to the GND or the housing (pin 4).

The twisted pairs for all bridge modes are:

EXC+ PIN1 and EXC- PIN8
Sense+ PIN6 and Sense- PIN3
IN+ PIN2 and In – PIN7
R + PIN5 and GNDisolated PIN4

For quarter bridge mode the pairs are:

IN+ PIN2 and Sense – PIN3
R + PIN5 and EXC- Pin8

If TEDS is used it is recommended mounting the TEDS chip nearby the module. The ideal case would be if the chip is mounted inside the D-SUB housing. The maximum distance between modules and TEDS chip is 20 m.

Notes

CE-Certificate of Conformity

CE

Manufacturer: **DEWETRON GmbH**

Address:

Parkring 4
8074 Grambach, Austria

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Fax: +43 316 3070 90
e-mail: sales@dewetron.com
http://www.dewetron.com

Name of product: **DAQP-CFB2**

Kind of product: *Signal conditioning module*

The product meets the regulations of the following EC-directives:

2014/35/EU
"Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits"

2014/30/EU
"Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast)"

The accordance is proved by the observance of the following standards:

LV	Safety	IEC 61010-1:2020	
EMC	Emissions	EN 61000-6-4	EN 55011 Class B
	Immunity	EN 61000-6-2	Group standard

Graz, October 30, 2013
Place / Date of the CE-marking

Ing. Thomas Propst / Manager Total Quality

NOTES