

**Interface modules
 for SQLab III
 (Code 3511 - 3533)**

Analog modules

- **DIC 20 - Line/ ICP® input (Code 3511)**
2-channel input module for direct signals and ICP® sensors
- **DIC 21 - Line/ ICP® input (Code 3527)**
2-channel input module for direct signals and ICP® sensors
- **MIC 20 - Microphone input (Code 3512)**
2-channel input module for microphones
- **SGC 21 - Strain gauge module (Code 3529)**
2-channel input module for strain gages
- **DIC 61 - Line/ ICP® input (Code 3526)**
6-channel input module for direct signals and ICP® sensors

- **CHG 20 - Charge input (Code 3513)**
2-channel input module for charge sensors

Analog output modules

- **OUT 20 - Analog output (Code 3517)**
2-channel analog output module to replay recorded analog signals (up to 50 kHz f_s)

High-speed modules

- **HSI 10 - High-speed input (Code 3533)**
1-channel high-speed input module

Special signal modules

- **EBU 20 - AES/EBU input and output (professional format) (Code 3515)**
2-channel record or replay module for AES/EBU digital signals
- **RPM 20 - Pulse input and output (Code 3530)**
2-channel record or replay module for RPM signals
- **CAN 10 - Bus input and output (Code 3531)**
1 channel record module for CAN-bus data



DIC 20 - Line/ ICP® input (Code 3511)

2-channel input module for direct signals and ICP® sensors

Input

- | | |
|---|---|
| Input signal: | analog signals or ICP® sensors |
| Signal ranges: | -30 dB (31.6 mV _{rms}) to +20 dB (10 V _{rms}) in 9 ranges |
| Coupling: | DC, AC or ICP® |
| ICP® current: | 4 mA constant current supply |
| Input impedance: | 1 MOhm |
| Sampling frequency (f_s): | 300 Hz - 50 kHz |
| Analog to digital conversion: | 18-bit Delta-Sigma, 16 bits recorded |
| Dynamic range: | > +90 dB, typical |
| Distortion: | < -90 dB, typical |
| Cross-talk: | < -90 dB, typical |
| Phase between channels: | < 0.2° |
| Cut-off frequency: | $f_s/2.0$, $f_s/2.4$ or $f_s/3.0$ |
| Signal bandwidth DC mode: | from DC to cut-off frequency |
| Signal bandwidth AC mode: | from 2 Hz to cut-off frequency |
| Signal bandwidth ICP® mode: | from 2 Hz to cut-off frequency |
| Pass-band ripple: | ±0.01 dB (0 Hz to 22.5 kHz) |
| AC accuracy: | ±0.1 % or ±1 mV |
| DC accuracy: | ±0.1 % or ±1 mV |
| Low-pass analog filter (optional, LPF 20): | 100 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz and 5 kHz, selectable |
| High-pass analog filter (optional, HPF 20): | 22 Hz, 300 Hz, A-filter, selectable |
| Connectors: | 2 x BNC |

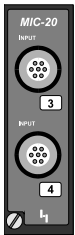


DIC 21 - Line/ ICP® input (Code 3527)

2-channel input module for direct signals and ICP® sensors

Input

Input signal:	analog signals or ICP® sensors
Signal ranges:	- 30 dB (31.6 mV _{rms}) to +31 dB (100 V _{pp}) in 17 ranges
Coupling:	DC, AC or ICP®
ICP® current:	4 mA constant current supply
Input impedance:	1 MOhm
Sampling frequency (f _s):	300 Hz - 100 kHz
Analogue to digital conversion:	24-bit Delta-Sigma, 16 bits recorded
Adjustable offset compensation:	±50 V in 0.01 V steps (offset compensation is only available in input ranges > 1 V _p)
Dynamic range:	> +80 dB, typical
Distortion:	< -80 dB, typical
Cross-talk:	< -80 dB, typical
Phase between channels:	< 0.2°
Input filter:	digital FIR filter with linear phase
Cut-off frequency:	f _s /2.1, f _s /2.4 or f _s /3.0
Signal bandwidth DC mode:	from DC to cut-off frequency
Signal bandwidth AC mode:	from 1 Hz to cut-off frequency
Signal bandwidth ICP® mode:	from 1 Hz to cut-off frequency
Pass-band ripple:	±0.01 dB (0 Hz to 22.67 kHz) ±0.04 dB (0 Hz to 45.35 kHz)
AC accuracy:	±0.1 % or ±1 mV
DC accuracy:	±0.1 % or ±1 mV
Connectors:	2 x BNC

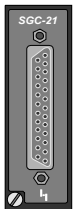


MIC 20 - Microphone input (Code 3512)

2-channel input module for microphones

Input

Input signal:	microphone signals
Signal ranges:	-30 dB (31.6 mV _{rms}) to +20 dB (10 V _{rms}), in 9 ranges
Coupling:	AC (-3 dB at 2 Hz)
Input impedance:	1 MOhm, single-ended
Sampling frequency (f _s):	300 Hz - 50 kHz
Analogue to digital conversion:	18-bit Delta-Sigma, 16 bit recorded
Dynamic range (SNR):	> +90 dB, typical
Distortion:	< -90 dB, typical
Cross-talk:	< -90 dB, typical
Phase between input channels:	< 0.2°
Cut-off frequency:	f _s /2.0, f _s /2.4 or f _s /3.0
Polarization power supply:	0 V or 200 V regulated
Pre-amplifier power supply:	+28 V or ±60 V
Absolute noise floor:	2 μV _{rms} , typical
AC accuracy:	±0.1 % or ±1 mV
DC accuracy:	±0.1 % or ±1 mV
High-pass analog filter (optional, HPF 20):	22 Hz, 300 Hz, A-filter, selectable
Connectors:	2 x 7-pin LEMO 1 B

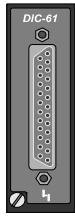


SGC 21 - Strain gauge module (Code 3529)

2-channel input module for strain gages

Input

Input signal:	strain gage
Sensitivity:	±1 mV _p to ±10 V _p in 9 ranges
Coupling:	DC
Sampling frequency (f _s):	300 Hz - 50 kHz
Cut-off frequency:	f _s /2.1, f _s /2.4 or f _s /3.0
Bridge type:	Half, full or quarter bridge
Bridge resistor:	120 Ohm, minimum
Bridge supply voltage:	Programmable from 0.5 V to 10 V in steps of 0.1 V
Auto-offset capability:	14-bit D/A converter
Remote shunt calibration:	with external resistor possible
Low-pass analog filter (optional, LPF 22):	100 Hz, 200 Hz, 500 Hz, selectable
Connectors:	25-pin D-Sub



DIC 61 - Line/ ICP® input (Code 3526)

6-channel input module for direct signals and ICP® sensors

Input

Input signal:	analog signals or ICP® sensors
Signal ranges:	-30 dB (31.6 mV _{rms}), to +20 dB (10 V _{rms}), in 14 ranges
Coupling:	DC, AC or ICP® _{rms}
Input impedance:	1 MOhm
Sampling frequency (f _s):	300 Hz - 100 kHz
Analog to digital conversion:	24-bit Delta-Sigma, 16 bits recorded
Dynamic range (SNR):	> +80 dB, typical
Distortion:	< -80 dB, typical
Cross-talk:	< -80 dB, typical
Phase between channels:	< 0.2°
Input filter:	digital FIR filter with linear phase
Cut-off frequency:	f _s /2.1, f _s /2.4 or f _s /3.0
Signal bandwidth DC mode:	from DC to cut-off frequency
Signal bandwidth AC mode:	from 2/22 Hz to cut-off frequency
Signal bandwidth ICP® mode:	from 2/22 Hz to cut-off frequency
Pass-band ripple:	±0.01 dB (0 Hz to 22.67 kHz) ±0.04 dB (0 Hz to 45.35 kHz)
AC accuracy:	±0.1 % or ±1 mV
DC accuracy:	±0.1 % or ±1 mV
Connectors:	25-pin D-Sub

[Including: CDB II.1 (Code 3556), Cable 6 x BNC > D-sub XX-pin for DIC 61 (Input), 1 m (3.28 ft)]



CHG 20 - Charge input (Code 3513)

2-channel input module for charge sensors

Input

Input signal:	charge sensor
Sensitivity:	1 pC to 10000 pC in 9 ranges
Coupling:	AC (-3 dB at 2 Hz)
Sampling frequency (f _s):	300 Hz - 50 kHz
Cut-off frequency:	f _s /2.0, f _s /2.4 or f _s /3.0
Low-pass analog filter (optional, LPF 21):	100 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz and 5 kHz, selectable
Connectors:	2 x Micro dot (10 - 32 UNF)



OUT 20 - Analog output (Code 3517)

2-channel analog output module to replay recorded analog signals (up to 50 kHz f_s)

Output

Output signal:	Single-ended analog voltage
Signal range:	1 V _p , 1 V _{rms} , 3.16 V _p , 3.16 V _{rms} , 5 V _p
Impedance:	75 Ohm
Output load:	> 10 kOhm
Output resolution:	16 bit
Dynamic range:	> +90 dB, typical
Distortion:	< -90 dB, typical
Cross talk:	< -90 dB, typical
Connectors:	2 x BNC

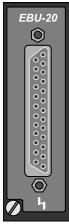


HSI 10 - High-speed input (Code 3533)

1-channel high-speed input module

Input

Input signal:	high-frequency analog signals
Signal range:	0.1 V _p , 0.2 V _p , 0.5 V _p , 1 V _p , 2 V _p , 5 V _p DC or AC (-3 dB at 2 Hz)
Coupling:	DC or AC (-3 dB at 2 Hz)
Input impedance:	100 kOhm, single-ended or symmetrical
Sampling frequency (f _s):	53 kHz - 420 kHz
Analog to digital conversion:	24-bit Delta-Sigma, 16 bits recorded
Dynamic range (SNR):	> +80 dB, typical
Distortion:	< -80 dB, typical
Cross-talk:	< -80 dB, typical
Phase between channels:	< 1°
Cut-off frequency:	f _s /2.1, f _s /2.4 or f _s /3.0
Absolute noise floor:	10 μV _{rms} , typical
AC accuracy:	±0.1 %
DC accuracy:	±0.2 % or ±1 mV
Connectors:	BNC for single-ended

**EBU 20 - AES/EBU input and output (professional format) (Code 3515)**

2-channel record or replay module for AES/EBU digital signals

Input

Input signal: AES/EBU standard digital data, 16 MSB recorded
 Signal level: RS-422
 Coupling: galvanically isolated (transformer-coupled)
 Input termination: 100 Ohm or 20 kOhm, switchable
 Connector: 25-pin D-sub type female

Output

Output signal: AES/EBU standard digital data, 16 MSB replayed
 Signal level: RS-422
 Input synchronization: empty AES/EBU frame supported on the outputs for synchronization of the input signal
 Connector: 25-pin D-sub type female

[Including: CDX II.1 (Code 3551), Cable D-sub 25-pin > 2 x XLR 3-pin for EBU 20 (Input/Output), 1 m (3.28 ft)]

**RPM 20 - Pulse input and output (Code 3530)**

2-channel record or replay module for RPM signals

Input

Input signal: pulses
 Coupling: galvanically isolated via optical coupling
 Signal range: max. ± 40 V
 Input pulse threshold: 100 mV, 250 mV, 500 mV, 1 V, 2.5 V, 5 V and 10 V
 Hysteresis: ± 10 % of the threshold level
 Input frequency: max. 100 kHz
 Impedance: 100 kOhm
 Sampling frequency: max. 840 kbit/s
 Measured RPM range: 60 - 12.000 RPM
 Accuracy: better than 1 RPM
 Phase error: $< 1^\circ$
 Connectors: 2 x BNC

Output

Output signal: pulses as recorded
 Output level: TTL
 Impedance: 75 Ohm
 Connectors: 2 x BNC

**CAN 10 - Bus input and output (Code 3531)**

1 channel record module for CAN-bus data

Input

Input signal: CAN-bus data
 Bus frame identifier: CAN 2.0A, CAN 2.0B (11 or 29 bit)
 Galvanic isolation: via optocoupler
 Impedance: min. 50 k, switchable
 Maximum bus bit rate: 1 MBPS, bitrate selectable by user
 Recorded information: message time, identifier field (selectable), control field, data field, CRC field, acknowledge field
 Error detection: bit, bit stuffing, CRC, form, acknowledge
 Message time accuracy: 1 ms
 Message time resolution: 1 μ s
 Input connector: 9 pin D-sub, male termination resistor 124 Ohm

Accessories (not included)

- SCU T6 (Code 3390)
Signal Conditioning Unit for Thermo elements, 6 channels for DIC 20, DIC 61
- LPF 20 (Code 3520)
Low-Pass Filter for DIC 20
- HPF 20 (Code 3521)
High-Pass Filter for DIC 20 / MIC 20
- LPF 21 (Code 3522)
Low-Pass Filter for CHG 20
- LPF 22
Low-Pass Filter for SGC 21