DCM –
Dynamic Contact Measuring

The fast and safe way of testing your HV Circuit breakers using

DCM
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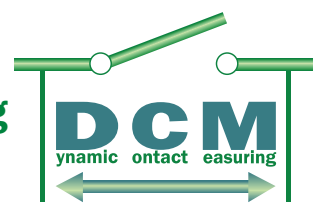
With the new tool for the Elcon products Switch Analyzers SA10 and SA5, the DCM (Dynamic Contact Mesurment) ,will it be possible to do all the tests and analyzes you are used too ,but faster and even both side grounded.

The SA10 itself can only measure dynamic contact on one contact a time, but with the new DCM tool it is possible to measure at the same time up to 2 contacts in series for each phase , total 6 contacts at the same time. Or a single phase operated CB with up to six contacts in series.
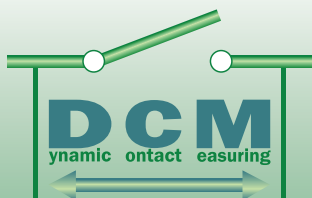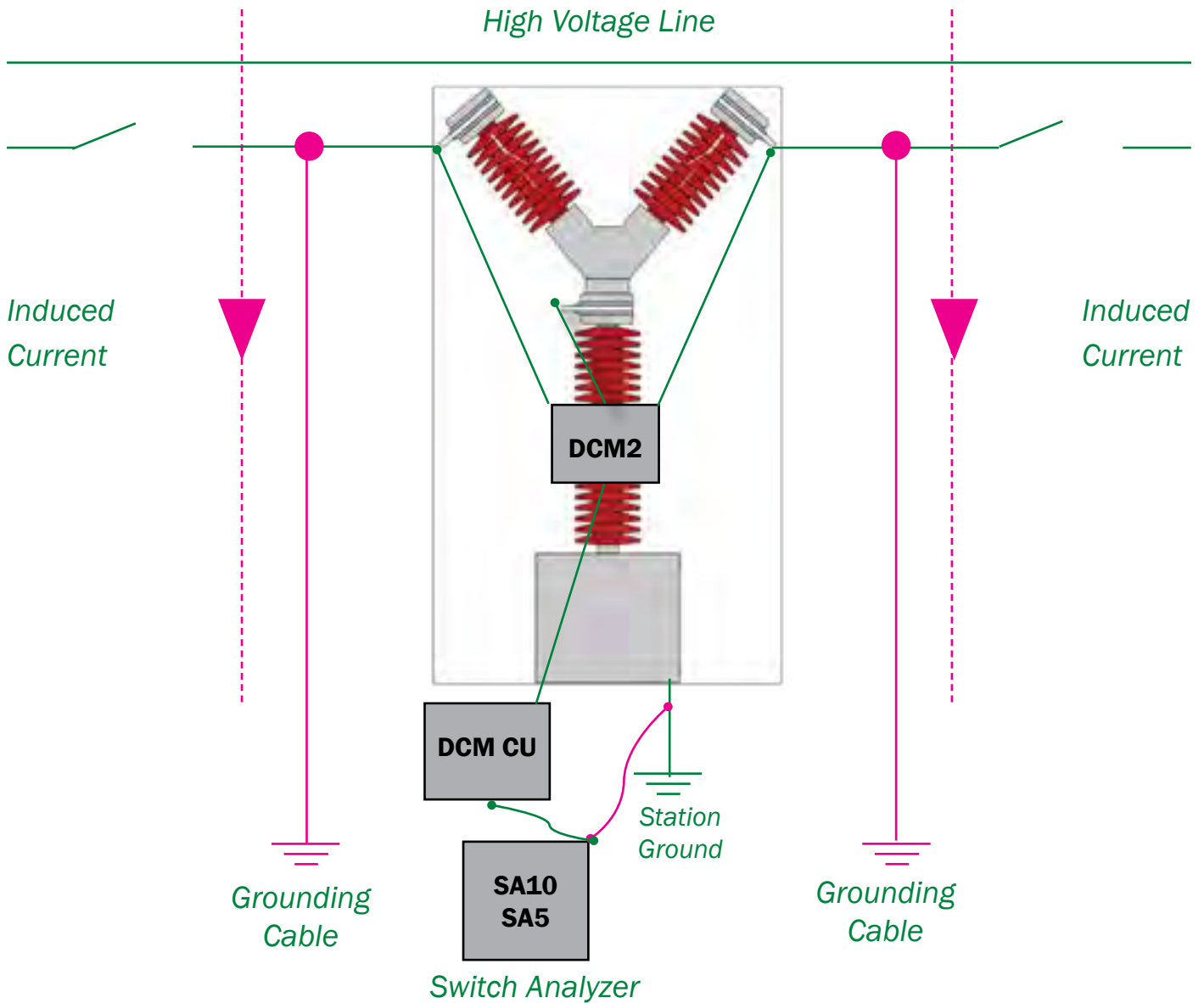
You can perform tests with both sides of the circuit breaker grounded and you don't need to rewire between the single tests. This is a great safety advantages for the maintenance personal, since they do not need to go up and done so many times to do rewiring. The personal will not so often be exposed to danger, like live bus bars or induction.

Upgrade your existing SA10 or SA5 to the future of circuit breaker testing!

One close and open operation will give you all the information you need to do the analyze in the BTS11 software, such as;

» Operation time

» Coil current

» Coil voltage

» Travel

» Speed

» Damping

» Static and Dynamic resistance

» And much more.....

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High Voltage Line

Induced Current

Induced Current

DCM2

DCM CU

Station Ground

SA10 SA5

Grounding Cable

Grounding Cable

Switch Analyzer

DCM Analyze Both side grounded and isolated

Connection example

The DCM Kit consists of one DCM-CU-unit and, three DCM-2 -units, and all necessary cables and connector's in a transport case.

DCM-CU-unit is connected to the SA10 or SA5 wireless or with a communication cable.

DCM-2-units are hooked up at each phase close to the contact chambers, and the measuring cables from the DCM-2-units are connected to the CB.

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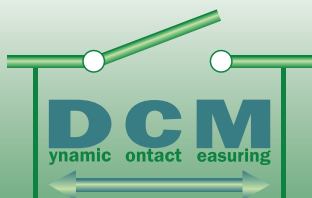
Order information

All kits come complete with system software BTS11 with free upgrades, manuals, main cable, communication cable, connection accessories, soft cable bag and free support.

DCM   S160

Weight 32 Kg / 70.5 lb

S161		Dynamic Contact Monitoring DCM-CU
S162	3 pcs	DCM Measuring unit DCM2
S163	5 pcs	Communication cable for DCM 10m
S113		Transporting Case with wheels
S170	3 pcs	- Current sense cable for DCM 0,5m
S171	6 pcs	+Current sense cable for DCM 3m
S172	3 pcs	Hanging bag for DCM2
S201		Mains cable 2m
S202		RS232 Communication Cable
S114		Soft Cable Bag
S202-F		Bluetooth 2.1 USB Adapt

9.3 DCM KIT (ITEM NUMBER S160) INCLUDES

DCM CU

Quantity	1
Description	Dynamic Contact Monitoring DCM CU
Art. no	S161

DCM 2

Quantity	3
Description	DCM Measuring unit
Art.no	S162

Connection cable DCM-2

Quantity	5
Description	Multi cable 8 pole M12 plug in connector
Standard	IEC 61076-2-101
Part number	SAC 8P-M12MS/10- PUR/M12FS SH
Length	10 meters
Art. no	S163

Connection cable, breaker T element

Quantity	6
Description	special designed cable for current and voltage drop measurement
Length	3 meters
Art. no	S171

Connection cable, breaker base

Quantity	3
Description	special designed current and reference for voltage drop measurement
Length	0.3 meters
Art. no	S170

Mains power connection

Quantity	1
Description	Standard Europe mains power cord
Type	CEE 7/7 to IEC 60320 C13 250V/10A, L=2m
Length	2 meters
Art. no	S201

Ferrite for mains power cord

Quantity	1
Description	Broadband EMI Ferrite Split/Snap-On Core in Plastic Cases
Value	240 Ω @ 100MHz
Part number	28A0640-0A2
Art. no	S201-F

Serial connection cable DB9

Quantity	2
Description	Standard RS232 cable DB9 male/female
Length	2 meters
Art. no	S202

Bluetooth antenna	Quantity	2
	Description	Broadband RP-SMA
	Value	240 Ω @ 100MHz
	Part number	MAF94028-WRR2400-RPSMA-B
	Frequency	2.4 – 2.5 GHz
	Gain	1.3 dBi (2.45 GHz)
	Polarization	Vertical, Omnidirectional
	Nominal Impedance	50 ohms
	VSWR	2:1 max across all bands
	Size	Length 10.9 cm @ 180° or 8.8 cm @ 90°
	Art. no	S202-G

USB Bluetooth 2.1 EDR stick	Quantity	1
	Description	BLUETOOTH 2.1 USB ADAPT, CLS1, ANT, IVT
	Part number	LM540-0546
	Connector type	USB2 and BLUETOOTH ANTENNA SMA MALE
	Communication type	Serial communication via Bluetooth ® version 2.1
	Communication protocols	Support for version 2.1 + Enhanced Data Rate (EDR)
		Backward compliant with Bluetooth version 2.0, 1.2, 1.1
	Scope	< 100 meters (Line of sight)
	Art. no	S202F
	Export restrictions	This product is subject to export control when exported from the European Union.
		Valid countries outside the E.U. is
		Australia, Japan, Canada, New Zeeland, Norway, Switzerland, Liechtenstein and USA.

Transporting case	Quantity	1
	Description	With wheels and retractable handle
	Art. no	S113

Soft cable bag	Quantity	1
	Description	Bag for cables
	Art. no	S114

DCM2 Fastening kit	Quantity	3
	Description	Bags for hanging
	Art. no	S172

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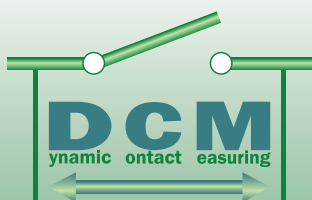
System software BTS11

Test program BTS11

For complete testing of the circuit breakers, the analyzing software BTS11 is used. The software is free and delivered together with the SA10. This software is used for Elcons field test equipments as well as factory end test equipments. Data between the two different systems can easily be imported/exported. All updates are free and are distributed from our webpage.

To test circuit breakers in general, is to operate the breaker and check the contact timing. However in factory testing and at field service some other tests are necessary. For field testing these other tests can also be very useful in diagnostics purpose.

Common operation tests, can be done, with result timing diagrams for up to three phases each with one travel curve, up to twelve contact curves and a common coil current curve. All common tests are performed and evaluated according to established industrial standard. A new test, mainly for field diagnostic, is to take dynamic resistance test curves of an operating main contact. A spring tension motor test, with current timing diagram is also included.

One of the main intensions with our software is to allow any level of user to be able to test the circuit breaker. This is done by creating a database of your breaker types and allowing the user to just choose his breaker from that database and by doing that everything (test plan, test reports, parameters etc.) is automatically adjusted to comply with that test. Let's keep it simple.

SOME BTS11 FEATURES

» Simple operating control function for all possible tests

» Quick test. No settings needed.

» Possibility to perform automatic test sequences

» Test guides for new tests and test objects

» Curve analyzing window with many possibilities and tools

» Data analyzing function with limit supervision and possibilities to do comparison with a previous test. (Reference characteristics IEC62271-100).

» Possibility to customize any operation in order to adapt the software to any type of breaker

» Statistics analyzing

» SQL or Access database with several users and user-levels

» Import and export test data

» Automatic unit conversion, (ex: kg to lb or mm to inches)

» Test against function values (measurement limits)

» Easily set up your own test profile

» Attach pictures or reference documents to assist the user

ECC - Elcon Competence Center

ECC offers different levels of software and hardware training.
We believe in true hands-on experience, much better than any manuals. Students perform actual testing under instructor supervision.
Choose between different levels, Basic or Advanced. ECC offers the training in our facility in Sweden. Customer can also choose ECC FLEX, means that we send our instructor to you; also the program can be more adapted to your special testing needs.
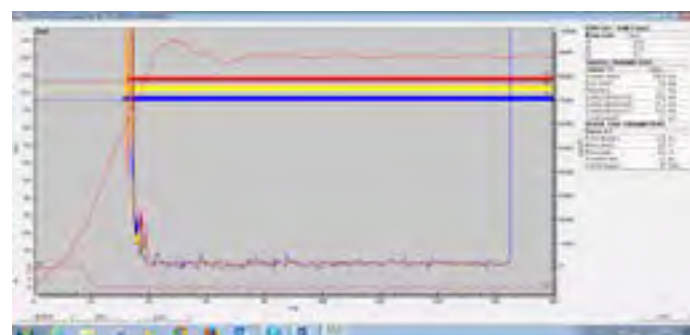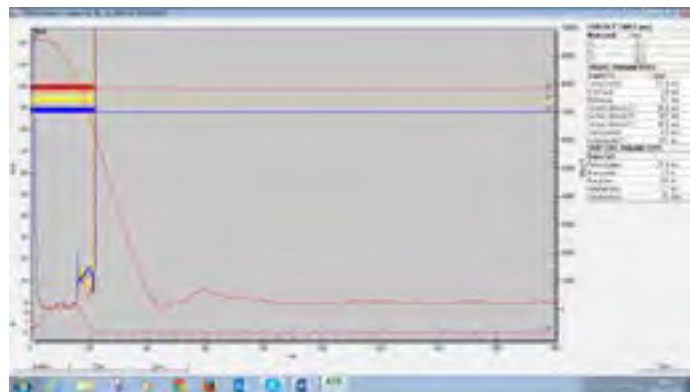Please contact us for more information and a quote.

"Who stops to learn stops to live"
Henry Ford

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Example of operations done with the DCM tool

» Close

» Open

» C-O

» Min function coil voltage

» Spring charge(motor curent)

» Slip coupling
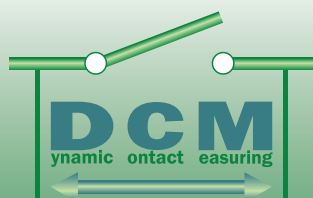
» Damping curve

» Static resistance

» Dynamic resistance

Other testing possibilities and features

» Define the trig conditions. Contact, coil, travel or analogue trig

» Choose sampling rate. Up to 50 kHz

» Up to three analogue and/or digital transducers used simultaneously

» Complete curve customizability. Colour, visibility, filled or regular, scale etc

» Easy functions/guides for calibration

» Speed and acceleration curves

» Define any number of Speed, Distance or Time measurements

Test reports

» Create your own test report templates using the dynamics that MS word provides. Multi lingual

» Extensive protocol functions to meet any customers demands

» Digital signing options

» Automatic compressing and preparing protocols for email or web-publishing

» Built in pdf support

DCM CU TECHNICAL SPECIFICATION

Power supply	Quantity	1
	Marked	"Input"
	Connector type	IEC 950 entry module
	Fuses	2*1.5A slow
	Voltage range	100 - 240VAC, 50/60 Hz, Max70W
Control output	Quantity	3
	Marked	"DCM UNIT 1","DCM UNIT 2","DCM UNIT 3"
	Connector type	M12, 8 pole Female
	Standard	IEC 61076-2-101
	Output voltage	18-24VDC
	Max output current	2.5A
	Communication	RS485, baud rate 921.6 K Baud
	Trig signal	5-24VDC
Communication PC	Quantity	1
	Marked	"RS232 TO COMPUTER"
	Connector type	9-pole D-sub, female
	Communication type	RS232, baud rate 115.2 K Baud
	Isolation	1000 V DC
Communication SA	Quantity	1
	Marked	"RS-232 TO SWITCH ANALYZER"
	Connector type:	9-pole D-sub, male
	Communication type:	RS232, baud rate 115.2 K Baud
	Isolation:	1000 V DC
Communication Network	Quantity	1
	Marked	"ETHERNET"
	Connector type:	RJ45
	Communication type:	ETHERNET 100 Mb/s
Communication Bluetooth	Quantity	1
	Marked	"BLUETOOTH"
	Connector type	BLUETOOTH ANTENNA SMA MALE
	Communication type	Serial communication via Bluetooth ® version 2.1
	Communication protocols	Support for version 2.1 + Enhanced Data Rate (EDR)
		Backward compliant with Bluetooth version 2.0, 1.2, 1.1
	Scope	< 100 meters (Line of sight)
	Baud rate	115.2 K baud
	Data size	8-bit
	Parity	None
	Stop bits	1
	Flow control	None
Environment	Dimensions	165*50*175 (With*Height*Depth)
	Weight	about 1.2 kg
	Operating temperature	-20 - 40 °C
	Storing temperature	-20 - 70 °C
	Relative humidity	20 - 85% non-condensing
	Altitude operating	< 2 000 m
	Altitude non-operating	< 12 000 m

DCM 2 TECHNICAL SPECIFICATION

Control input	Quantity	1
	Marked	"CONNECT TO CONTROL UNIT"
	Connector type	M12, 8 pole Male
	Standard	IEC 61076-2-101
	Charge voltage	18-24VDC
	Max charge current:	2.5A
	Communication	RS485, baud rate 921.6 K Baud
	Trig signal:	5-24VDC
Current output	Quantity	2 + 1 Return
	Marked	"+ CURRENT 1", "+ CURRENT 2", "- CURRENT 1, 2"
	Connector type	High current sockets with locking, nom 100A
		type: ID/B6AR-N-S (Manufacturer: Multi Contact)
	Output	0-1.6VDC, 0-225A (Depends of cable resistance)
	Current pulse time:	max 200ms
	Current limitation:	By cable resistance.
Voltage Sense Input	Quantity	2 + 2 Reference
	Marked	"+ SENSE 1","+ SENSE 2","- SENSE 1","- SENSE 2"
	Connector type	Isolated banana socket
	Measurement range 1	± 0.15VDC
	Analog resolution 1	14 bits Resolution about 0,0000185 V DC / Bit
	Measurement range 2	± 1.5VDC
	Analog resolution 2	14 bits Resolution about 0,000185 V DC / Bit
Measuring resistance	Range1	≤ 750 µΩ ± 1 µΩ @ 200A
	Measurement range 1	≤ 1.5 mΩ ± 10 µΩ @ 200A
	Measurement range 2	≤ 5.0 mΩ ± 10 µΩ @ < 200A
	Sample rate	50KHz
Environment	Dimensions	165*50*175 (With*Height*Depth)
	Weight	about 1.6 kg
	Operating temperature	-20 - 40 °C
	Storing temperature	-20 - 70 °C
	Relative humidity	20 - 85% non-condensing
	Altitude operating	< 2 000 m
	Altitude non-operating	< 12 000 m

Contact

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