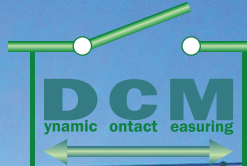


DCM –



Dynamic Contact Measuring



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



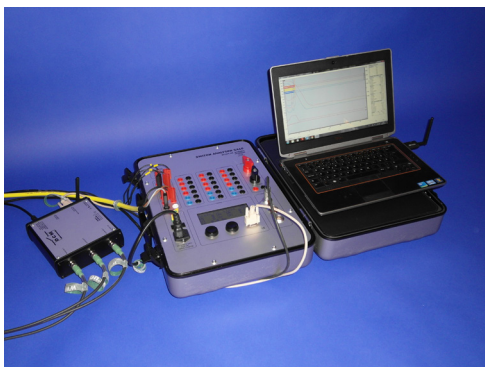
With the new tool for the Elcon products Switch Analyzers SA10 and SA5, the DCM (Dynamic Contact Measurement) ,will it be possible to do all the tests and analyzes you are used too ,but faster and even both side grounded.

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.



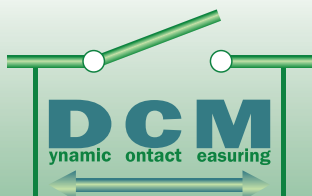
You can perform tests with both sides of the circuit breaker grounded and you don't need to rewire between the single tests. This is a great safety advantages for the maintenance personal, since they do not need to go up and done so many times to do rewiring. The personal will not so often be exposed to danger, like live bus bars or induction.

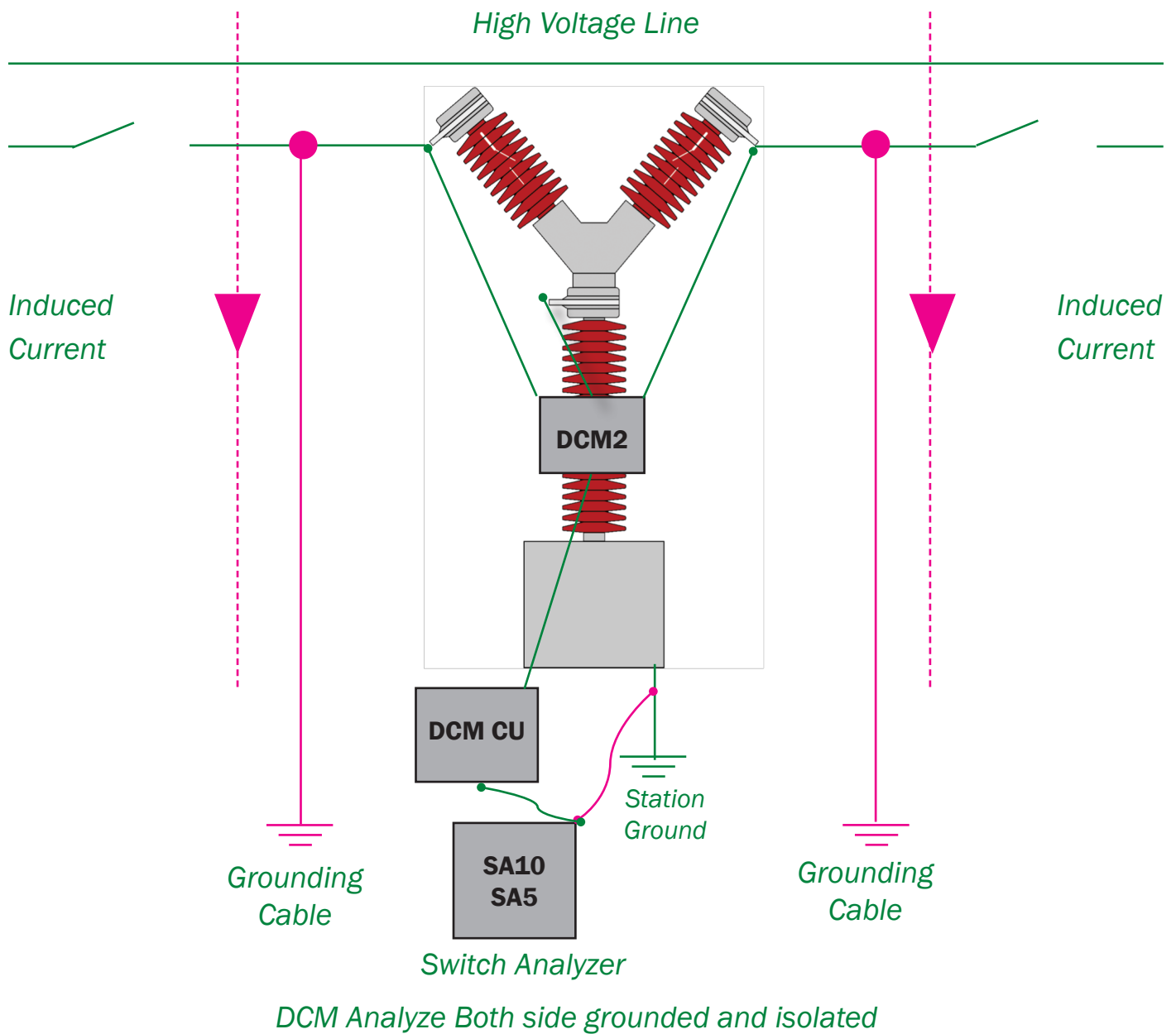
**Upgrade your existing SA10
or SA5 to the future of circuit
breaker testing!**



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.....





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.

Order information



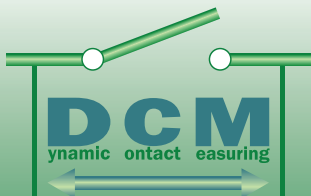
All kits come complete with system software BTS11 with free upgrades, manuals, main cable, communication cable, connection accessories, soft cable bag and free support.

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		Hanging straps for DCM2
S201		Mains cable 2m
S202		RS232 Communication Cable
S114		Soft Cable Bag



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 intentions 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



Example of operations done with the DCM tool

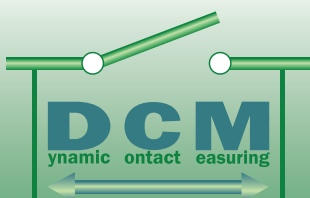
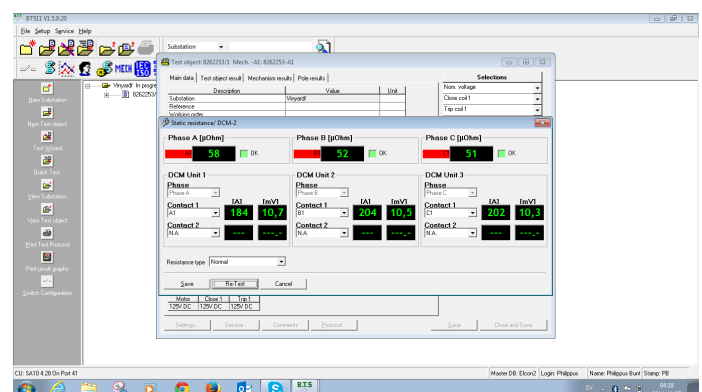
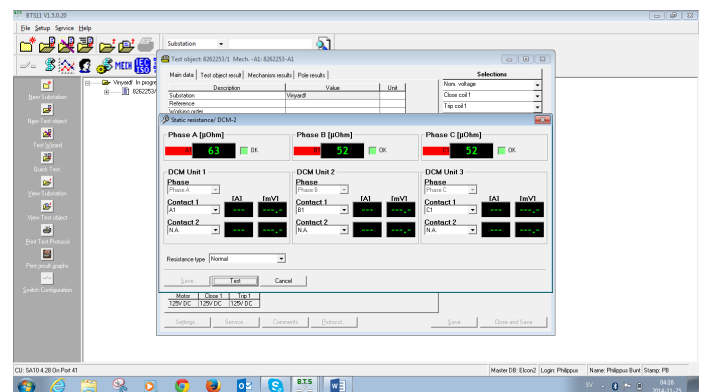
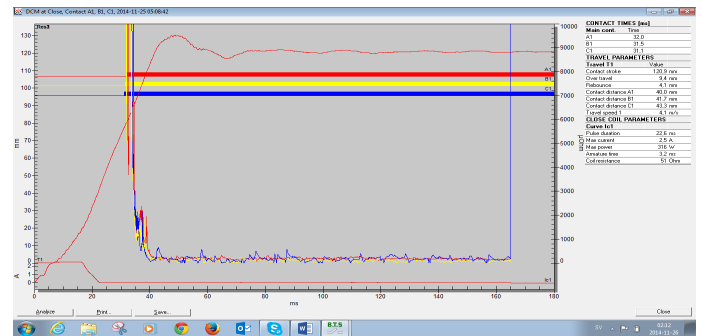
- » Close
- » Open
- » C-O
- » Min function coil voltage
- » Spring charge(motor current)
- » Slip coupling
- » Damping curve
- » Static resistance
- » Dynamic resistance

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"
Control output	Connector type	IEC 950 entry module
	Fuses	2*2A slow
	Voltage range	100 - 240VAC, 50/60 Hz, Max70W
	Quantity	3
	Marked	"DCM UNIT 1","DCM UNIT 2","DCM UNIT 3"
Communication PC	Connector type	M12, 8 pole Female
	Standard	IEC 61076-2-101
	Manufacturer	Phoenix contact
	Output voltage	18-24VDC
	Max output current	2.5A
Communication SA	Communication	RS485, baud rate 921.6 K Baud
	Trig signal	5-24VDC
	Quantity	1
	Marked	"RS232 TO COMPUTER"
	Connector type	9-pole D-sub, female
Communication Network	Communication type	RS232, baud rate 115.2 K Baud
	Isolation	1000 V DC
	Quantity	1
	Marked	"RS-232 TO SWITCH ANALYZER"
	Connector type:	9-pole D-sub, male
Communication Bluetooth	Communication type:	RS232, baud rate 115.2 K Baud
	Isolation:	1000 V DC
	Quantity	1
	Marked	"ETHERNET"
	Connector type:	RJ45
Environment	Communication type:	ETHERNET 100 Mb/s
	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
	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

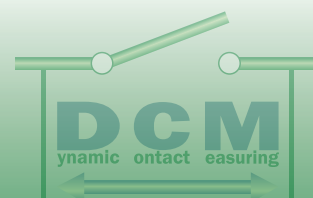
DCM CU ACCESSORIES INCLUDED

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
	Supplier	ELCON AB
	Order number	

Ferrite for mains power cord	Quantity	1
	Description	Broadband EMI Ferrite Split/Snap-On Core in Plastic Cases
	Value	240 Ω @ 100MHz
	Manufacturer	Laird Technologies
	Part number	28A0640-OA2
	Weight	24 Grams
	Supplier	ELCON AB
Serial connection cable DB9	Order number	
	Quantity	2
	Description	Standard RS232 cable DB9 male/female
	Length	2 meters
	Supplier	ELCON AB
Bluetooth antenna	Order number	
	Quantity	2
	Description	Broadband RP-SMA
	Value	240 Ω @ 100MHz
	Manufacturer	Laird Technologies
	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
USB Bluetooth 2.1 EDR stick	VSWR	2:1 max across all bands
	Size	Length 10.9 cm @ 180° or 8.8 cm @ 90°
	Supplier	ELCON AB
	Order number	
	Quantity	1
	Description	BLUETOOTH 2.1 USB ADAPT, CLS1, ANT, IVT
	Manufacturer	LM TECHNOLOGIES
	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)
	Supplier	ELCON AB
	Order number	

DCM 2 TECHNICAL SPECIFICATION

Control input	Quantity	1
	Marked	"CONNECT TO CONTROL UNIT"
	Connector type	M12, 8 pole Male
	Standard	IEC 61076-2-101
	Manufacturer	Phoenix contact
	Charge voltage	18-24VDC
	Max charge current:	2.5A
	Communication	RS485, baud rate 921.6 K Baud
	Trig signal:	5-24VDC
	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	$\pm 0.15\text{VDC}$
Measuring resistance	Analog resolution 1	14 bits Resolution about 0,000185 V DC / Bit
	Measurement range 2	$\pm 1.5\text{VDC}$
	Analog resolution 2	14 bits Resolution about 0,000185 V DC / Bit
	Range1	$\leq 750 \mu\Omega \pm 1 \mu\Omega @ 200\text{A}$
Environment	Measurement range 1	$\leq 1.5 \text{ m}\Omega \pm 10 \mu\Omega @ 200\text{A}$
	Measurement range 2	$\leq 5.0 \text{ m}\Omega \pm 10 \mu\Omega @ < 200\text{A}$
	Sample rate	50KHz
	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

The following standards and/or technical specifications, which comply with good engineering practice in safety matters in force within the EEA, have been applied:

Standard EMC

EN 61000-4-2:2009
 EN 61000-4-3:2006 + A1 + A2
 EN 61000-4-4:2004 + A1
 EN 61000-4-5:2006
 EN 61000-4-6:2009
 EN 61000-4-11:2004
 CISPR 16-2-1:2008
 CISPR 16-2-3:2006
 ETSI EN 300 220-1:2010

Standard LVD

EN 61010-1:2010
 Overvoltage category III
 Pollution degree II

Warranty: 2 years

DCM 2 ACCESSORIES INCLUDED

Connection cable DCM-2	Quantity	2
	Description	Multi cable 8 pole M12 plug in connector
	Standard	IEC 61076-2-101
	Manufacturer	Phoenix contact
Connection cable, breaker T element	Part number	SAC 8P-M12MS/10- PUR/ M12FS SH
	Length	10 meters
	Supplier	ELCON AB
	Order number	
Connection cable, breaker base	Quantity	2
	Description	special designed cable for current and voltage drop measurement.
	Length	3 meters
	Supplier	ELCON AB
	Order number	
	Quantity	1
	Description	special designed current and reference for voltage drop measurement.
	Length	0.3 meters
	Supplier	ELCON AB
	Order number	

Contact

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