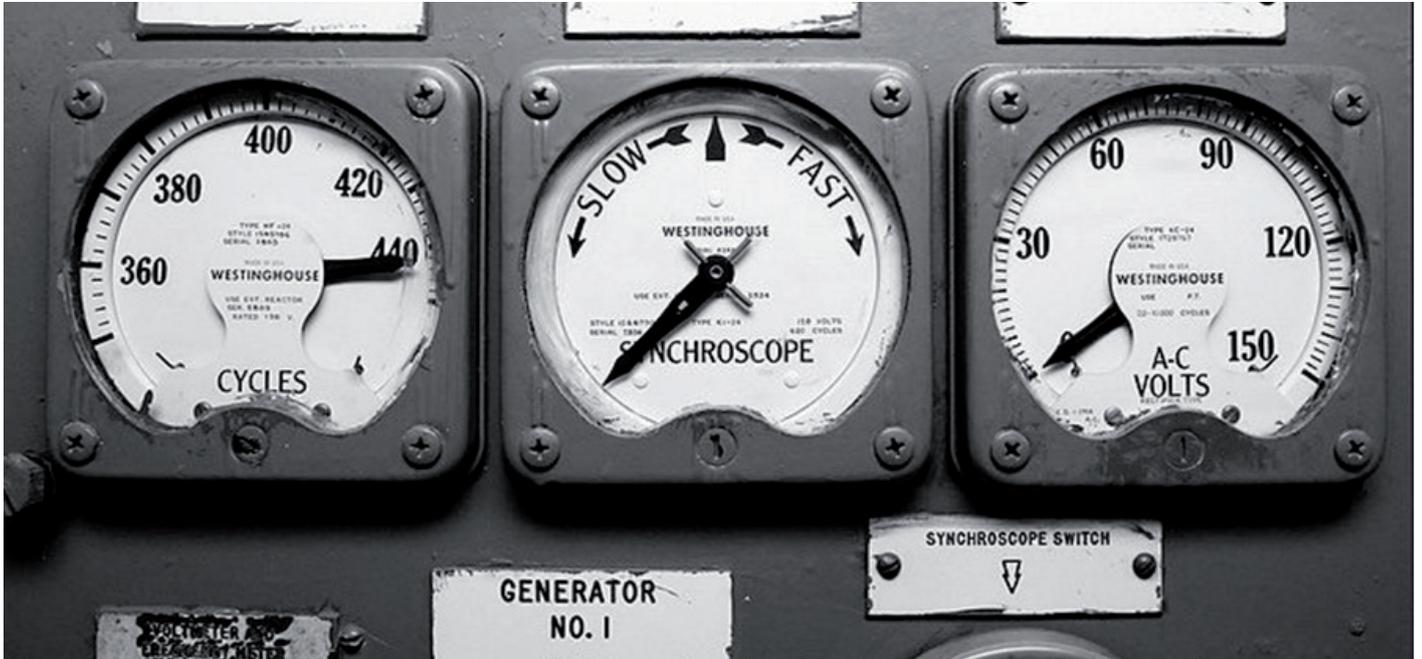


Ekip Synchrocheck module

Combined power circuit breaker and synchronizing relay in a single device



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Ekip Synchrocheck module overview

One of the functions of switchgear and control panels is ensuring power synchronism – phase angle, frequency, and voltage – before closing tie circuit breakers, whether between sources in multiple-generator networks or between switchgear frames in multiple-source-switchgear applications. This sync-check function has long been provided by an external door- or panel-mounted ANSI-25 sync-check protective relays.

ABB now offers the Emax 2 low voltage power circuit breaker that integrates the synch-check function. Used with the Ekip Synchrocheck module, the Emax 2 breaker provides many benefits:

Fewer external components - Simplifies installation, reduces total installation space, and improves system reliability.

Cleaner, simpler switchgear - Fewer door cutouts and less-confusing instrumentation means simpler, safer operation.

Reduced component count - Fewer components to buy, stock, and install.

Reduced panel space - Fewer internal components means less space required.

UL listings must be considered when choosing components for ANSI switchgear assemblies. As a UL Listed circuit breaker accessory (E194191), the Ekip Synchrocheck module meets equipment UL certifications.

The Ekip Synchrocheck module is an accessory module that plugs into a slot in the terminal box of the circuit breaker and monitors synchronism conditions. When it senses synchronism, it permits closing the tie breaker between two sources. It can be used with distribution and generator-protection versions of the Ekip Touch and Hi-Touch trip units equipped with the Ekip Measuring or Ekip Measuring Pro module.

Module installation and operation

The Ekip Synchrocheck module is plugged into the terminal box of the circuit breaker or onto the fixed part of the withdrawable circuit breaker, in the first free slot after the Ekip Supply module. For additional installation instructions, see ABB Document [1SDH001000R0513](#), Ekip Synchrocheck.

There are several installation options for the Ekip Measuring/Measuring Pro Module. To ensure two different sources are being monitored, the installed configuration of the Ekip Measuring/Measuring Pro Module must be known since the internal source can be connected to the top terminal of the circuit breaker, bottom terminal of the circuit breaker, or via an external connection to the circuit breaker.

The Ekip Synchrocheck module compares the voltages, frequencies, and phase angles from two phases of one line through an external potential transformer. It compares the results to the measured voltages at the internal contacts of the circuit breaker via the Ekip Measuring or Measuring Pro Module.

The Ekip Touch or Hi-Touch trip unit indicates when conditions have reached synchronism and enables the two sources to be closed by means of an electrical output contact. The output contact can be configured as normally open or normally closed. The module provides feedback of power condition via a visual display indicating synchronism of voltage, frequency, and phase angle.

Safety of personnel can be enhanced using the remote Ekip Multimeter display or Ekip Control Panel. This enables operators to monitor the synchronization process away from the front of the equipment.

The module can operate in two modes: Live Bus and Dead Bus.

Live Bus

In systems where two sources are both energized, synchronism is enabled when:

- Voltage of the two sources above the U_{live} threshold for the t_{ref} set time
- Difference of the voltages between the two sources below the threshold ΔU
- Difference of the frequency between the two sources below the threshold Δf
- Difference of the phase angle of the two voltages below the threshold $\Delta \Phi$
- All required synchronism conditions maintained for the programmed amount of time t_{syn}
- The circuit breaker is open

The search for synchronism starts if the external voltage is greater than or equal to a minimum ($0.5 U_n$ by default) for a minimum time (1 second by default). Synchronism is confirmed if the difference between the RMS values of the frequency and the voltage phases is less than or equal to the



Figure 1 - Ekip Supply Module and Ekip Synchrocheck Module



Figure 2 - Ekip Synchrocheck and Supply Modules installed in terminal box

specified maximum parameters ($0.12 U_n$, 0.1 Hz and 50° by default).

Frequency and phase controls can be disabled in applications where the desired frequency and phase angle between the internal and external voltage sources exist.

Dead Bus

In systems with a de-energized source (dead bus), synchronism is enabled by the simultaneous occurrence of the following conditions for the specified set time:

- Voltage of the energized source (live bus) above the specified threshold U_{live}
- Voltage of the de-energized source (dead bus) below the threshold U_{dead}
- Circuit breaker open

Dead Bus mode has both Standard and Reversed configurations. In Standard configuration, the search for synchronism is started if the internal voltage is greater than or equal to a minimum ($0.5 U_n$ by default) for a minimum time (1 second by default). Synchronism is considered to be reached if the external voltage is less than or equal to a maximum ($0.2 U_n$ by default) for a minimum time (1 second by default). In Reversed configuration, the roles of the internal and external voltage sources are reversed.

In both modes, synchronism consent is activated when the synchronism condition is reached and sustained for at least 200ms. Synchronism consent is deactivated when any one of the listed conditions is absent for more than 200 milliseconds.

Synchronism is activated directly from the Ekip Synchrocheck module by an electrical output contact that is integral to the module. Upon synchronism, the output contact (terminals KS1 and KS2), which can be configured as normally open or normally closed, changes state. This function is enabled by connecting the module to any Ekip Touch or Hi-Touch trip unit provided with an Ekip Measuring or Measuring Pro module and Ekip Supply module. The Ekip Supply module must be installed in the first slot of the circuit breaker terminal box.

Module specifications

This is an accessory module that monitors the synchronism conditions and permits closing two sources in parallel only when the conditions are safe to do so. It can be used with distribution and generator protection versions of the Ekip Touch and Hi-Touch trip units equipped with the Ekip Measuring or Ekip Measuring Pro module. The Ekip trip unit gives an easy to read visual display of the synchronism conditions. Each of the three synchronism conditions; voltage, frequency and phase angle, changes from red to green on the display as the condition comes into the acceptable range for synchronism (see figures 3 & 4).

Ekip Synchrocheck measures the voltages from two phases of one line through an external transformer and compares them to the measured voltages at the breaker utilizing the Ekip Measuring or Measuring Pro Module. An output contact is activated upon reaching synchronism and enables the circuit breaker to be closed by means of wiring with the closing coil. The output contact is user configurable to be normally open or normally closed. There are several installation options for the Ekip Measuring/Measuring Pro Module. To ensure two different sources are being monitored, the installed configuration of the Ekip Measuring/Measuring Pro Module must be known since the internal source can be connected to the top terminal of the circuit breaker, bottom terminal of the circuit breaker, or via an external connection to the circuit breaker.

The Ekip Synchrocheck module must be mounted on the terminal box of the circuit breaker, or on the fixed part of the withdrawable circuit breaker, in the first free slot after the Ekip Supply module (see Figure 2 - Ekip Synchrocheck and Supply Modules installed in terminal box). For additional installation instructions on the Ekip Synchrocheck module, reference ABB Document [1SDH001000R0513](#).

The ABB Emax 2 circuit breaker also accommodates the ability to monitor the synchronization process away from the front of the equipment via ABB displaying and monitoring solutions such as the Ekip Multimeter display and Ekip Control Panel. These options can be mounted away from the equipment to reduce the possibility of electrical hazards to personnel.



Figure 3 - Ekip Trip Unit Display (in sync)

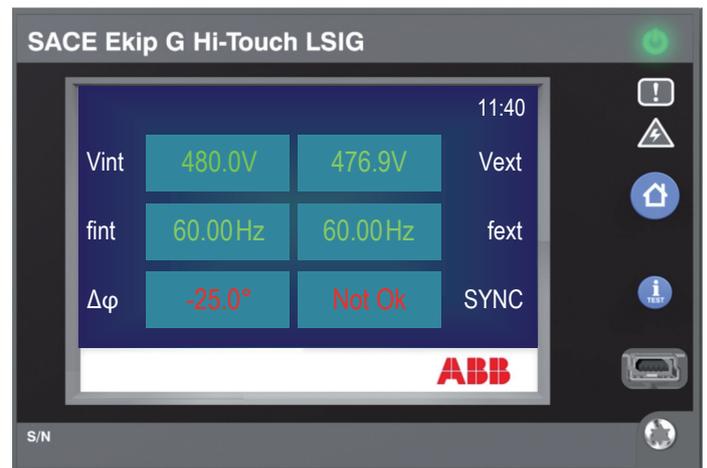


Figure 4 - Ekip Trip Unit Display (out of sync)

Configuration	Measurement	Description
With live busbar	Ext Side Voltage	Voltage measured by Ekip Synchrocheck
	Int Side Voltage	Voltage measured by Ekip Measuring ⁽¹⁾
	Ext Side Frequency	Frequency measured by Ekip Synchrocheck
	Int Side Frequency	Frequency measured by Ekip Measuring ⁽¹⁾
With busbar dead	Phase difference	Phase difference between the sources
	Ext Side Voltage	Voltage measured by Ekip Synchrocheck
	Int Side Voltage	Voltage measured by Ekip Measuring ⁽¹⁾

⁽¹⁾ For the characteristics of the voltage and frequency (internal) measurements of the Ekip Measuring, refer to those of the Ekip Measuring module.

The above table illustrates the measurements related to the synchronism function (see figures 3 & 4)

Ekip Synchrocheck electrical details

Electrical characteristics

The following table lists the electrical characteristics of the module:

Component	Characteristics
Input voltage	0...120 V AC nominal
Frequency input	30...80 Hz
Output contact	<ul style="list-style-type: none"> – Maximum switching power ⁽¹⁾: 1250 VA – Maximum switching voltage ⁽¹⁾: 150 V DC / 250 V AC – Breaking power ⁽¹⁾: 2 A @ 30 V DC, 0.8 A @ 50 V DC, 0.2 A @ 150 V DC, 4A@ 250 V AC – Dielectric strength between open contacts: 1000 V AC (1 minute @ 50 Hz) – Dielectric strength between each contact and coil: 1000 V AC (1 minute @ 50 Hz)

⁽¹⁾ Data related to a resistive load.

Isolation transformer

Between the external contacts of the circuit breaker and the inputs of the module, an isolation transformer must always be installed that has the characteristics listed in the following table:

Characteristics	Description
Mechanical	<ul style="list-style-type: none"> – Mounting: EN 50022 DIN43880 guide – Material: self-extinguishing thermoplastic – Protection class: IP30 – Electrostatic protection: with screen to be connected to earth
Electrical	<ul style="list-style-type: none"> – Precision class: ≤ 0.5 – Performance: ≥ 5 VA – Overload: 20% permanent – Insulations: 4 kV between inputs and outputs, 4 kV between screen and outputs, 4 kV between screen and inputs – Frequency: 45...66 Hz

Measurements

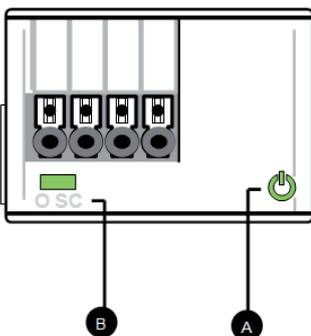
The following table lists the measurement precision for the module: installed that has the characteristics listed in the following table:

Quantity	Interval	Accuracy
Voltage	10...120 V AC	± 1 % ⁽¹⁾
Frequency ⁽²⁾	30...80 Hz	± 0.1 % ⁽³⁾
Phase ⁽⁴⁾	-180...+180 °	± 1 °

⁽¹⁾ With live busbar. ⁽²⁾ With a live busbar, the frequency measurement is started with a voltage measured ≥ 36 V AC, and is stopped with a voltage measured ≤ 32 V AC. ⁽³⁾ In the absence of harmonic distortion. ⁽⁴⁾ The phase measurement refers to the difference in phase between internal and external voltage.

Signals

The following table illustrates the possible signals and their meaning:



Pos.	Description
A	<p>Power LED, green. The possible states are:</p> <ul style="list-style-type: none"> – Off: power supply absent – On fixed power supply and communication with the release present (with a release with the Alive LED option disabled) – On, with one flash per second (synchronized with that of the green LED on the release): power supply and communication with release present (with a release with the Alive LED option enabled) – On, with two quick flashes per second (not synchronized with those of the green LED on the release): power supply present, and communication with release absent (for example: because Local Bus disabled)
B	<p>LED O SC, green. The possible states are:</p> <ul style="list-style-type: none"> – Off: contact K open (with contact normally open, synchronization not OK; with contact normally closed, synchronization OK) ⁽¹⁾ – On fixed: contact K closed (with contact normally open, synchronization OK; with contact normally closed, synchronization not OK) ⁽¹⁾

⁽¹⁾ For the configuration of the contact, go to Settings – Modules – Ekip Synchrocheck – Contacts NO.

Hardware requirements

- ABB Emax 2 offers many of the accessories necessary to accomplish the synchronization function. Below is a bill of material for ABB accessories needed for a synchronization application.
- Required ABB Emax 2 circuit breaker [E1.2, E2.2, E4.2, or E6.2], fixed mounted or withdrawable, equipped with the following accessories:

#	Description	Part Number ⁽¹⁾
1	Ekip Synchrocheck module	ZEASYNCHK ⁽³⁾
2	Ekip Measuring or Ekip Measuring Pro modules	ZE_MEAS ⁽²⁾⁽³⁾ or ZE_MEASPRO ⁽²⁾⁽³⁾
3	Ekip Supply Module 110-240VAC/DC or 24-48VDC	ZEAPWRS ⁽³⁾ or ZEAPWRS ⁽³⁾
4	Ekip Touch, Ekip Hi-Touch, Ekip G Touch, or Ekip G HI-Touch trip unit	14 available trip units with LI, LSI, or LSIG functions - reference ABB Emax 2 UL Catalog 1SXU200040C0201 pg. 9/59
5	Closing Coil (YC)	12 available voltages - reference ABB Emax 2 UL Catalog 1SXU200040C0201 pg. 9/52

⁽¹⁾ All ABB Emax 2 accessories can be include in the base circuit breaker part number at order placement. Part numbers shown can be ordered for field installation. ⁽²⁾ The 3rd digit in the part number for the Ekip Measuring and Measuring Pro module is based on the frame of the ABB Emax 2 the module will be placed in 1 = E1.2, 2 = E2.2, 4 = E4.2, or 6 = E6.2. ⁽³⁾ The part number only needs to be ordered in instances where the original ABB Emax 2 circuit breaker does not include the necessary functions.

- Optional ABB Emax 2 circuit breaker accessories:

Note: The accessories listed below are required as an addition to the Closing Coil (YC) in order to make the ABB Emax 2 Circuit breaker electrically operated.

#	Description	Part Number ⁽¹⁾
1	Spring Charging Motor - M	7 available voltages - reference ABB Emax 2 UL Catalog 1SXU200040C0201 pg. 9/53
2	Shunt / opening coil (YO)	12 available voltages - reference ABB Emax 2 UL Catalog 1SXU200040C0201 pg. 9/52

⁽¹⁾ All ABB Emax 2 accessories can be include in the base circuit breaker part number at order placement. Part numbers shown can be ordered for field installation.

Additional hardware

- ABB Emax 2 Circuit Wiring Diagrams # 32, 48, & 77 from ABB Document [1SDM000091R0001](#)
- Optional free ABB [EKIP Connect Software](#)
- EKIP Test & Program cable (required if utilizing EKIP Connect software)

Description
Voltage/Potential Transformer (VT/PT) with 120VAC secondary
Control wires size AWG 22-16 cables with a maximum external diameter of 1.4 mm (0.055 in.)
Customer supplied control power to the Ekip Supply Module; 110-240VAC/DC or 24-48VDC
Optional - Customer supplied programmable logic controller (PLC)

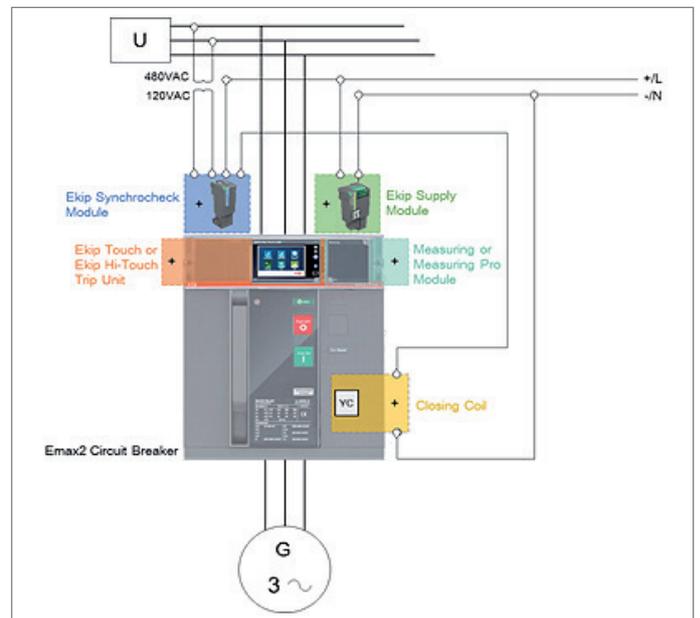


Figure 6 - Example Sync Check Application Reference

Wiring diagrams

Figure 7 details the wiring diagram of the Ekip Synchrocheck, Ekip Supply modules, and Closing Coil as provided by ABB. These wiring diagrams can also be referenced in the ABB Emax 2 circuit wiring diagrams document [1SDM000091R0001](https://www.abb.com/global/scd/scd000091r0001) diagrams 48, 32, & 77. All connections are made on the modules and terminal box of the ABB Emax 2. For external wiring, use AWG 22-16 cables with a maximum external diameter of 1.4 mm (0.055 in.).

Figure 8 provides one basic example of the control wiring connections that are possible utilizing the Ekip Synchrocheck and Ekip Supply modules to perform a synchronous closure of an ABB Emax 2 with two different sources. In any sync check application, it is critical to ensure you have appropriately identified the sources connected to the relay.

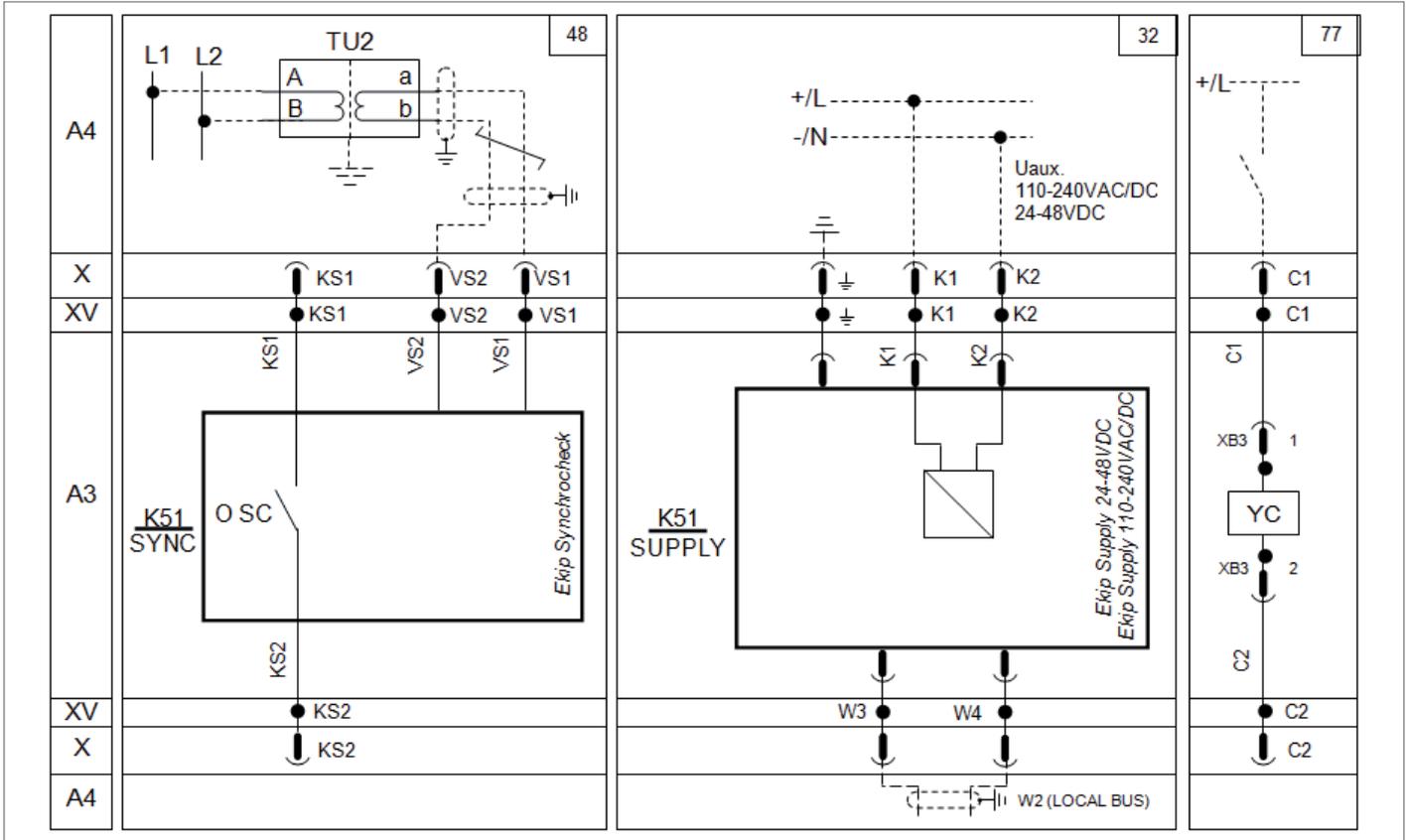


Figure 7 - Ekip Synchrocheck module wiring diagram 48 (left) Ekip Supply module wiring diagram 32 (middle) Closing Coil wiring diagram 77 (right)

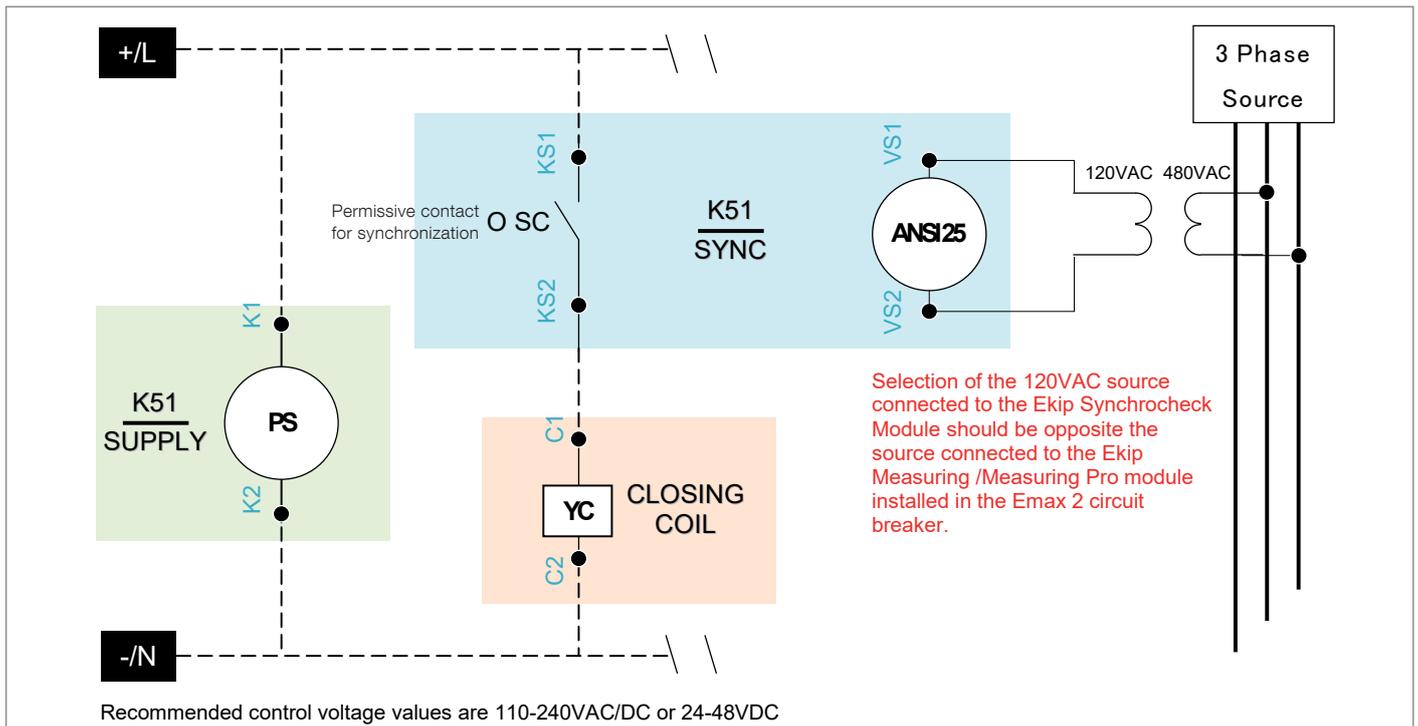


Figure 8 - Example Control Wire Schematic

Programing the Ekip Synchrocheck module

The Ekip Synchrocheck module can be programmed via the touch screen on the Ekip Touch or Hi-Touch trip unit or via the free Ekip Connect software.

Programing from the trip unit display

With the module energized and the Local Bus enabled, the presence of the module on the terminal box activates additional menus on the display:

- Configuration of the synchronism function.
- Display the measurements related to the function (voltage, frequency, and phase).
- Configuration of the module.
- Display information on the module and synchronism status.



Application notes:

- To enable the Local Bus, select "On" in the menu Settings - Modules - Local Bus, then enable the local bus by Display -> Settings -> Modules -> Local bus -> ON
- To make any change to settings, you must input the Emax 2 password. The default is 00001.
- To confirm any change, you must select the back arrow in the upper left corner until confirmation of the change is requested on the display.

The configuration parameters of the synchronism function are different depending on the status of the dead busbar option.

The following table illustrates the path from the display to access the configuration parameters of the function, and the parameters available with dead busbar disabled:

	...	
	Protection UP	
Advanced	Synchrocheck Protection ⁽¹⁾	Enable
		Delta U Threshold
		U Live Threshold
		Delta Frequency
		Delta Phase
		Stability time U
	Dead busbar option (Off)	
	Signalings	
	...	

⁽¹⁾ If Ekip Hi-Touch or Ekip G Hi-Touch trip unit is used, Dual settings are available and Set A & Set B options will appear after Advanced is selected. The user will have the ability to select both Set A and Set B to configure the settings for the Ekip Synchrocheck module. The setting will be active based on the entire group of settings that have been enabled (e.g. Set A or Set B). The trip unit will display which setting group is enabled on the main screen display.

The following table illustrates the path from the display to access the configuration parameters of the function, and the parameters available with dead busbar enabled:

	...	
	Protection UP	
Advanced	Synchrocheck Protection ⁽¹⁾	Enable
		U Dead Threshold
		U Live Threshold
		Stability time U
		Dead busbar option (On)
	Config. dead busbar	
	Signalings	
	...	

⁽¹⁾ If Ekip Hi-Touch or Ekip G Hi-Touch trip unit is used, Dual settings are available and Set A & Set B options will appear after Advanced is selected. The user will have the ability to select both Set A and Set B to configure the settings for the Ekip Synchrocheck module. The setting will be active based on the entire group of settings that have been enabled (e.g. Set A or Set B). The trip unit will display which setting group is enabled on the main screen display.



The following table illustrates the available configuration parameters of the synchronism function:

Parameter	Optional Values	Default	Default
Activate	OFF, ON	OFF	OFF = Function disabled ON = Function enabled
Delta U Threshold	0.02... 0.12 Un in steps of 0.001 Un	0.12 Un	With live busbar, 1 ^a synchronism condition: maximum difference between internal and external voltage ⁽¹⁾
U Dead Threshold	0,02...0,20 Un in steps of 0.001 Un	0.2 Un	With busbar dead, and "Standard" configuration, 1 ^a synchronism condition: external overvoltage ⁽²⁾
U Live Threshold	0.5.... 1.1 Un in steps of 0.001 Un	0.5 Un	Minimum voltage in order to start up monitoring of the voltages ⁽³⁾ : – With busbar live, external undervoltage – With busbar dead, and "Standard" configuration, internal undervoltage ⁽²⁾
Stability time U	100... 30000 ms in steps of 1 ms	1000 ms	Time minimum in which the condition must be satisfied "U Live Threshold", to start up monitoring of the voltages
Delta Frequency	0.1.... 1.0 Hz in steps of 0.1 Hz	0.1 Hz	With live busbar, 2 ^a synchronism condition: maximum difference between internal and external frequency
Delta Phase	5... 50° in steps of 5°	50°	With live busbar, 3 ^a synchronism condition: maximum difference between internal and external phase
Minimum matching Time ⁽⁴⁾	100... 3000 ms in steps of 10 ms	100 ms	With the busbar live, the minimum time within which the "Delta Phase" condition must be satisfied: this is not a synchronism condition, but a parameter that allows you to discriminate between correct combinations, rather than the "Delta Frequency" and "Delta Phase"
Dead busbar option	OFF, ON	OFF	OFF = busbar live ON = busbar dead
Frequency Check ^{(4) (5)}	ON, OFF	ON	With busbar live. "Delta Frequency" condition: – OFF = Disabled – ON = Enabled
Phase Check ^{(4) (5)}	ON, OFF	ON	With busbar live, "Delta Phase" condition: – OFF = Disabled – ON = Enabled
Evaluate Cb Status ⁽⁴⁾	NO, YES	NO	Circuit-breaker open condition (With busbar live 4 ^a synchronism condition, With busbar dead 2 ^a synchronism condition): – NO = Disabled – YES = Enabled
Config. dead busbar	Reversed, Standard	Standard	With busbar dead, and generator: – Reversed = Ekip Synchrocheck/external contacts connected to the generator ⁽¹⁾ – Standard = Ekip Synchrocheck/external contacts connected to the network

⁽¹⁾ The precision of measurement of the voltage difference is ±10%, except with the value of parameter equal to 0.02 Un, with which the precision is ±20%.

⁽²⁾ With busbar dead, and "Reversed" configuration, the roles of the internal and external voltages are inverted.

⁽³⁾ On the condition of minimum voltage, a hysteresis of 10% is applied. Once reached, the condition is lost if the voltage drops below 90% of the set limit.

⁽⁴⁾ Parameter available only with the Ekip Connect application.

⁽⁵⁾ If the Frequency Check is disabled ("OFF"), the Phase Check is also off, but not vice versa.

The following table illustrates the path from the display for viewing the measurements related to the synchronism function:

Measurement	...
	Harmonic distortion
	Ekip Synchrocheck
	Network Analyzer
	...

The following table illustrates the path for accessing the configuration parameters of the module from the display:

Settings	...				
	Network frequency				
	Modules	Local/Remote			
		Local Bus			
		...			
		Ekip Synchrocheck	Primary voltage		
			Secondary voltage		
			Network voltage Ref		
	Contacts NO				
	...				
Functions					
Power Controller					
...					

The following table illustrates configuration parameters of the Ekip Synchrocheck module:

Parameter	Values	Default	Description
Primary voltage	100 V, 110 V, 120 V, 190 V, 208 V, 220 V, 230 V, 240 V, 277 V, 347 V, 380 V, 400 V, 415 V, 440 V, 480 V, 500 V, 550 V, 600 V, 660 V, 690 V, 910 V, 950 V, 1000 V, 1150 V	400 V	Primary voltage of the isolation transformer
Secondary voltage	100 V, 110 V, 115 V, 120 V	100 V	Secondary voltage of the isolation transformer
Network voltage Ref	V12, V23, V31	V12	Input phase-to-phase voltage to the module
Contacts NO	No, Yes	Yes	Status of the contact: No = Normally closed Yes = Normally open

The following table illustrates the path from the display to view information on the module and synchronism status:

About	Protection Unit	
	Circuit breaker	
	Modules	...
		Ekip Synchrocheck
		...
	Power Controller	

The information that can be displayed is as follows:

- The serial number and the software version.
- The overall synchronism status (“Ok” or “Not OK”).
- The correspondence between the voltage, frequency, and phase values (“Ok” or “Not OK”).

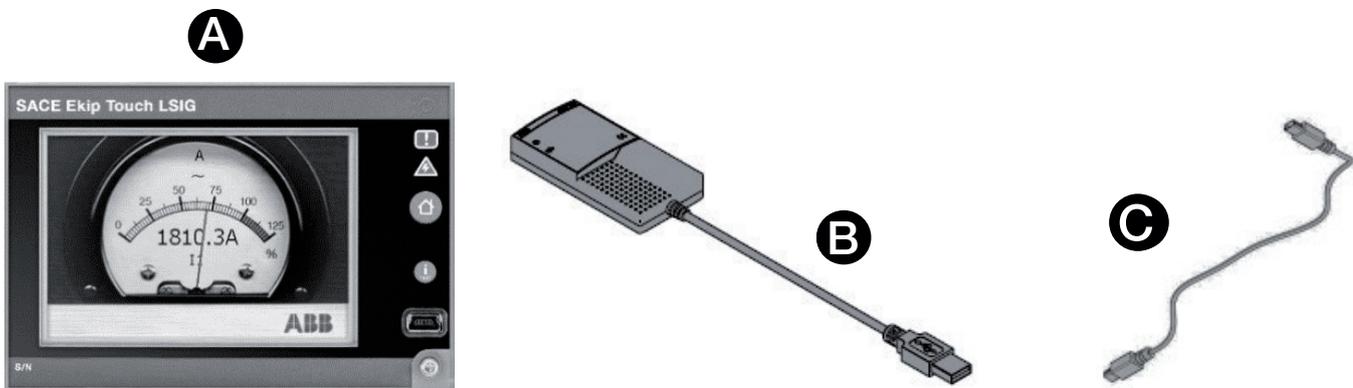
Programming from Ekip Connect software

With the module energized, and the Local Bus enabled, the presence of the module on the terminal box activates additional menus within the Ekip Connect software.

1. Apply the appropriate control voltage to power up the Ekip Supply module. If the ABB Emax 2 circuit breaker is a withdrawable type, rack the breaker into the test position.
2. Launch the free Ekip Connect software (downloadable [here](#)) on the customer supplied laptop.

3. Connect one side of the micro USB cable **C** to the Ekip T&P module **B**. Connect the other side of the micro USB cable **C** to the Ekip Touch trip unit **A**. Connect the USB connection on the Ekip T&P module **B** to the customer supplied laptop.

You can confirm the proper connection is made when the green power LED  is on. Active communication will be indicated via the orange transmission indicator  blinking on the Ekip T&P module **B**.



Note: It is necessary to scan for the trip unit via the ABB Key  before the connected circuit breaker will communicate with the Ekip Connect software.

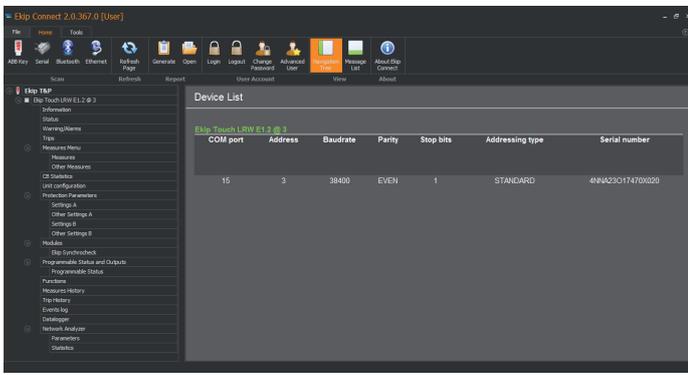


Figure 12 - Ekip Connect initial view

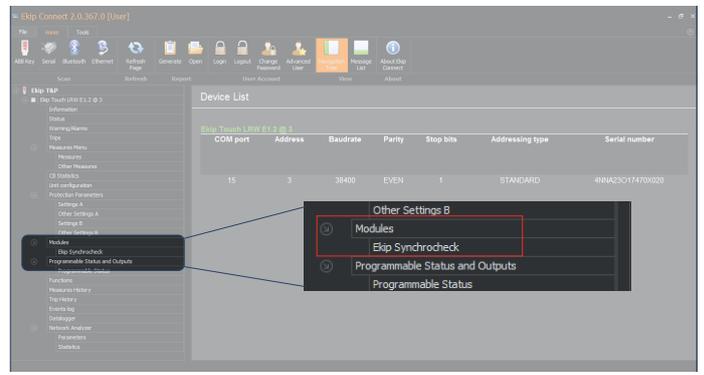


Figure 13 - Ekip Connect navigation to Ekip Synchrocheck

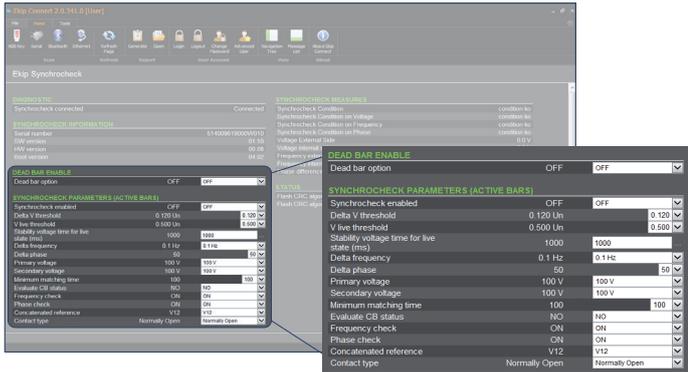


Figure 14 - Ekip Connect view with Dead Bar Enable OFF

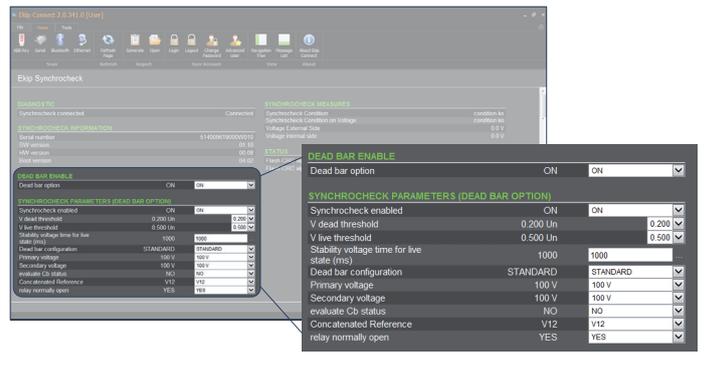


Figure 15 - Ekip Connect view with Dead Bar Enable ON

4. The initial window display will appear with a navigation view on the left side as shown in Figure 12.

5. Login to the ABB Emax 2 circuit breaker with the default password of 0001.

6. Once your connection is established, utilize the Navigation Tree to select Modules > Ekip Synchrocheck (reference Figure 13)
Note: Your list of modules may appear different than shown in Figure 13 if additional modules are installed on the ABB Emax 2 circuit breaker.

7. Once you've selected Ekip Synchrocheck in the Navigation Tree, the configuration parameters associated with the Ekip Synchrocheck function will be displayed in the section to the right of the Navigation Tree. The values to the left of the dropdowns display the current value at which each parameter is currently set. The configuration parameters displayed will change based on the status of the Dead Bar Enable selection (i.e. Dead Bar Enable = ON/OFF will determine if all delta settings are available for adjustments). Reference figures 15 & 16 for a view of the configuration parameters.

8. Once all configuration parameters have been adjusted, select the submit button on the lower right portion of the screen.

9. A confirmation window will open. Reference Figure 16.

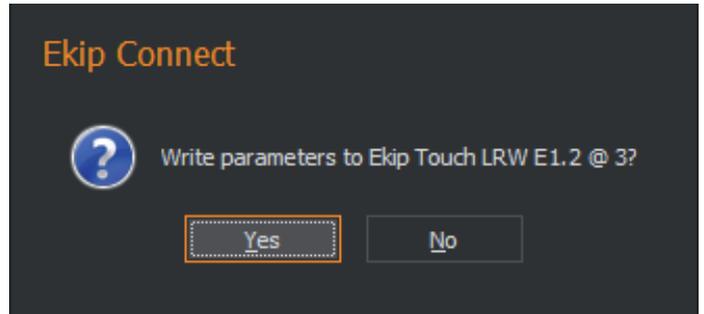


Figure 16 - Ekip Connect change confirmation window

10. You may verify the ABB Emax 2 circuit breaker has accepted your new setting via the value displayed to the left of the dropdown of each configuration parameter within the Ekip Connect software or by navigating to the configuration parameter on the trip unit display of the Emax 2 circuit breaker.

References

Download the Ekip Synchrocheck Module installation guide:
[Ekip Synchrocheck Installation Manual, 1SDH001000R0513.](#)

View the Ekip Synchrocheck Installation Video: [Ekip Synchrocheck Video Installation Manual.](#)

Ekip Synchrocheck demonstration

To watch a video demonstration of the Ekip Synchrocheck in action click on the link, <http://new.abb.com/low-voltage/products/circuit-breakers/emax2/microgrid> then select, Live video demonstration.

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