Quick-Start Programming

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September 30, 2019

Qualified Persons

⚠ WARNING

Only qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of special precautionary techniques, personal protective equipment, insulated and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment

These instructions are intended ONLY for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

NOTICE

Thoroughly and carefully read this instruction sheet and all materials included in the product's instruction handbook before installing or operating a Micro-AT Source-Transfer Control. Familiarize yourself with the Safety Information and Safety Precautions on pages 3 and 4. The latest version of this publication is available online in PDF format at **sandc.com/en/support/product-literature/**.

Retain this Instruction Sheet

This instruction sheet is a permanent part of the S&C Micro-AT Source-Transfer Control. Designate a location where it can be easily retrieved and refer to.

Proper Application

⚠ WARNING

The equipment in this publication is only intended for a specific application. The application must be within the ratings furnished for the equipment. Specifications for the S&C Micro-AT Source-Transfer Control are listed in Specification Bulletin 515-31.

Warranty

The warranty and/or obligations described in S&C's Price Sheet 150, "Standard Conditions of Sale–Immediate Purchasers in the United States," (or Price Sheet 153, "Standard Conditions of Sale–Immediate Purchasers Outside the United States"), plus any special warranty provisions, as set forth in the applicable product-line specification bulletin, are exclusive. The remedies provided in the former for breach of these warranties shall constitute the immediate purchaser's or end user's exclusive remedy and a fulfillment of the seller's entire liability. In no event shall the seller's liability to the immediate purchaser or end user exceed the price of the specific product that gives rise to the immediate purchaser's or end user's claim. All other warranties, whether express or implied or arising by operation of law, course of dealing, usage of trade or otherwise, are excluded. The only warranties are those stated in Price Sheet 150 (or Price Sheet 153), and THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY EXPRESS WARRANTY OR OTHER OBLIGATION PROVIDED IN PRICE SHEET 150 (OR PRICE SHEET 153) IS GRANTED ONLY TO THE IMMEDIATE PURCHASER AND END USER, AS DEFINED THEREIN. OTHER THAN AN END USER, NO REMOTE PURCHASER MAY RELY ON ANY AFFIRMATION OF FACT OR PROMISE THAT RELATES TO THE GOODS DESCRIBED HEREIN, ANY DESCRIPTION THAT RELATES TO THE GOODS, OR ANY REMEDIAL PROMISE INCLUDED IN PRICE SHEET 150 (or PRICE SHEET 153).

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the Micro-AT Source-Transfer Control. Familiarize yourself with these types of messages and the importance of these various signal words:

⚠ DANGER

"DANGER" identifies the most serious and immediate hazards that will likely result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ WARNING

"WARNING" identifies hazards or unsafe practices that can result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ CAUTION

"CAUTION" identifies hazards or unsafe practices that can result in minor personal injury if instructions, including recommended precautions, are not followed.

NOTICE

"NOTICE" identifies important procedures or requirements that can result in product or property damage if instructions are not followed.

Following Safety Instructions

If you do not understand any portion of this instruction sheet and need assistance, contact your nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C's website **sandc.com**, or call the S&C Global Support and Monitoring Center at 1-888-762-1100.

NOTICE

Read this instruction sheet thoroughly and carefully before installing a Micro-AT Source-Transfer Control.

Replacement Instructions and Labels

If additional copies of this instruction sheet are needed, contact your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

⚠ DANGER

The equipment controlled by the Micro-AT Source-Transfer Control operates at high voltage. Failure to observe the precautions below will result in serious personal injury or death.

Some of these precautions may differ from your company's operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.

1. **QUALIFIED PERSONS.** Access to a Micro-AT Source-Transfer Control must be restricted only to qualified persons. See the "Qualified Persons" section on page 2.
2. **SAFETY PROCEDURES.** Always follow safe operating procedures and rules.
3. **PERSONAL PROTECTIVE EQUIPMENT.** Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, and flash clothing, in accordance with safe operating procedures and rules.
4. **SAFETY LABELS.** Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels.
5. **OPERATING MECHANISMS.** Do not remove or disassemble operating mechanisms or remove access panels on the Micro-AT Source-Transfer Control unless directed by S&C Electric Company.
6. **ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded. The Integrated Power Module (IPM) contains components that can retain a voltage charge for many days after the Micro-AT Source-Transfer Control has been de-energized and can derive a static charge when in close proximity to a high-voltage source. Voltage levels can be as high as the peak line-to-ground voltage last applied to the unit. Units that have been energized or installed near energized lines should be considered live until tested and grounded.
7. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.

To perform the field adjustment and programming procedures outlined in the following steps, the correct access-code number must be entered when so directed. Please contact S&C Electric Company for the access-code number.

NOTICE

Always normalize the left and right sources and set the base voltages on Phase 2 of the left and right sources after executing **CONFIG: RESTORE VALUES.** The following parameters (even if the display shows correct values) also must be manually configured: Loss of Source, Return of Source, Over Voltage, and Unbalance. Failure to do so may result in erratic operations.

NOTICE

To ensure any changes to the factory settings in all menus are stored in memory, press the <Next> item key before the <Quit> key.

NOTICE

When changing the **Select Bus Type** or **Select Preferred** settings in the **Configure** menu, the Micro-AT control will power down and reboot. A System Startup event will be recorded in the event log.

STEP 1. Place the MANUAL/AUTOMATIC operation selector switch in **Manual** mode to prevent automatic operation during adjustment and programming.

STEP 2. Set the operating characteristics of the Micro-AT control using the following procedure:

(a) Press the <Configure> menu key. The following display will appear:

```
CONFIG:
  PRESS  LAST/NEXT  ITEM
```

(b) Press the <Next> item key. The first item of the **Configure** menu will appear on the first line of the display:

```
CONFIG:  SELECT  BUS  TYPE
```

(c) Press the <Next> item key repeatedly to scroll to each field adjustable item of the **Configure** menu, as listed in the Table 1 on page 6.

Table 1. Field adjustable items in the Configure menu.

Field Adjustable Item CONFIG:	Description	Displayed If	Operating State or Range①
SELECT PREFERRED	Assignment of “Left” Or “Right” as preferred source	CONFIG: SELECT BUS TYPE has been factory set for “COMMON,” “PAD MNT,” “VISTA COM,” or “SPLT COM” bus type	**LEFT**, RIGHT
UNBALANCE DETECT	Selection of **Unbalance Detection** feature “On” or “Off”	CONFIG: UNBALANCE INSTALL has been factory-set for the **In** setting	**ON**, OFF
SELECT RETURN	Selection of **Hold, Auto,** or **Window** option as the means by which return-of-source transfer will be effected	Displayed at all installations	HOLD, **AUTO**, WINDOW
SELECT TRANSITION	Selection of **Open** or **Closed** option as the type of transition by which automatic return-of-source transfer will be effected	CONFIG: SELECT RETURN has been set for the **Auto** or the **Window** return setting	**OPEN**,CLOSED
RESTORE VALUES②③	Sets all numeric field-adjustable items back to the factory-settings	Displayed at all installations	PRESS ENTER
DWELL TIMER	Selection of transition-dwell time delay “IN” or “OUT”	Displayed at all installations	IN, **OUT**
NORMALIZE LEFT	Means of compensating for any output-voltage magnitude unbalance and/or phase-angle unbalance between voltage-sensing devices on the left source	CONFIG: VOLTAGE SENSING has been factory-set for the **4 Wire** voltage sensing setting	PRESS ENTER
NORMALIZE RIGHT	Means of compensating for any output-voltage magnitude unbalance and/or phase-angle unbalance between voltage-sensing devices on the right source	CONFIG: VOLTAGE SENSING has been factory set for the **4 Wire** voltage sensing setting	PRESS ENTER
SET BASE LEFT	Means of calibrating control to a known voltage on Phase 2 of the left source	Displayed at all installations	105-130 VOLTS **(120 VOLTS)**
SET BASE RIGHT	Means of calibrating control to a known voltage on Phase 2 of the right source	Displayed at all installations	105-130 VOLTS **(120 VOLTS)**
ACCESS CODES	Selection of alternative access code	Displayed at all installations	4 DIGITS MIN., 7 DIGITS MAX.
COM Ø BIT RATE	Selection of communication port data transfer bit rate	Optional communications card has been installed	2400, 4800, 9600, 19200, or 38400 BPS **(19200 BPS)**

① Factory settings are shown in boldface type.

② Always normalize the left and right sources and set the base voltages on Phase 2 of the left and right sources after executing a **Config: Restore Values** command. The following parameters (even if the display shows correct values) also must be manually configured: Loss of Source, Return of Source, Over Voltage, and Unbalance. Failure to do so may result in erratic operations.

③ The **Config: Restore Values** command has been removed from firmware version 2.6.1 and subsequent releases.

Is the factory-setting for each item (shown in the last column of the table, in boldface type) appropriate for this installation? If not, change it.

For example, here is the display for **CONFIG: SELECT PREFERRED** with its factory setting, **LEFT**:

```
CONFIG:  SELECT  PREFERRED
LEFT                CHANGE
```

If the right source is the preferred source at this installation, press the <Change> key. The following display will appear:

```
CONFIG:  SELECT  PREFERRED
ENTER  ACCESS  CODE
```

Press each digit of the access-code number, then press the <Enter> key.

NOTICE

The access code number does not need to be re-entered until one of the following occurs:

- The <Quit> key is pressed.
- The MANUAL/AUTOMATIC operation selector switch is placed in **Automatic** mode.
- No keystroke of the keypad has been detected for 5 minutes.

Press the <→> key to select the other possible operating state for **CONFIG: SELECT PREFERRED**, the **RIGHT** source. Then press the <Enter> key. The display will now look like this:

```
CONFIG:  SELECT  PREFERRED
RIGHT               CHANGE
```

The other field-adjustable items of the **Configure** menu can be changed in the same manner. Procedures for normalizing the left and right sources, setting the base voltages on the left and right sources, selecting a custom access code, and selecting the communications card bit rate are discussed below.

(d) Normalize the left and right sources (unless **CONFIG: VOLTAGE SENSING** has been factory-set for **2 WIRE** voltage sensing).

Note: Each source must be normalized to compensate for any output-voltage magnitude unbalance and/or phase-angle unbalance between the voltage-sensing devices on that source. Each source should be in its known normal state, so that unusual system conditions aren't calibrated out.

Here, for example, is the display for **CONFIG: NORMALIZE LEFT:**

```
CONFIG:  NORMALIZE  LEFT
NORMALIZE           CHANGE
```

Press the <Change> key. If the display prompts you to reenter the access-code number, do so. The following display will appear:

```
CONFIG:  NORMALIZE  LEFT
                 NORMALIZE
```

Press the <Enter> key. The display will now look like this:

```
CONFIG:  NORMALIZE  LEFT
NORMALIZE           CHANGE
```

Normalize the right source the same way.

NOTICE

A source can be normalized only if each phase has measurable voltage and its sequence of rotation is the same as on the other source. If normalizing can't be performed, one of the following messages will be displayed:

CANNOT NORMALIZE PHASE VOLT(S) TOO LOW or **CANNOT NORMALIZE OPPOSITE PHASE ROTATION**

If either of these messages is displayed, contact your nearest S&C Sales Office.

(e) Set the base voltages on Phase 2 of the left and right sources.

Note: Each source should be in its known normal state so unusual system conditions aren't calibrated out.

Here, for example, is the display for **CONFIG: SET BASE LEFT** with its factory setting, **120 Volts:**

```
CONFIG:  SET BASE LEFT
120  VOLTS          CHANGE
```

If the left-source base voltage is to be set to some other value, press the <Change> key. If the display prompts you to reenter the access code number, do so. The display will now look like this:

```
CONFIG:  SET BASE LEFT
120  VOLTS          _____
```

Enter the desired left-source base voltage. If, for example, 117 volts is the desired value, the <1>, <1>, and <7> keys would be pressed—followed by the <Enter> key. The display will change to:

```
CONFIG:  SET BASE LEFT
117  VOLTS          CHANGE
```

Set the right-source base voltage the same way.

(f) The Micro-AT control can be programmed to accept a custom access code number of your choosing, using the following procedure.

Note: If you don't wish to enter a custom access-code number, proceed to Step 2(g).

Here's the display for **CONFIG: ACCESS CODES:**

```
CONFIG:  ACCESS CODES
                CHANGE
```

Press the <Change> key. The following will be displayed:

```
CONFIG:  ACCESS CODES
ENTER ACCESS  CODE _
```

Press each digit of the standard access code number, and then press the <Enter> key. The display will change to:

```
CONFIG:  ACCESS CODES
USER  ENTER  NEW  CODE _
```

Enter the desired custom access code number (4 digits minimum, 7 digits maximum). The display will change to:

```
CONFIG:  ACCESS CODES
USER REENTER  NEW  CODE _
```

To make sure the number entered is the custom access-code number desired, the same number must be reentered.

NOTICE

If a different custom access-code number was accidentally entered the second time, the following message will appear: **REENTRY FAILED.**

If attempting to enter a custom access-code number that is already in use, the following message will appear: **CODE IN EFFECT.**

In either case, the procedure must be repeated.

The Micro-AT control will now accept *either* the custom access-code number just entered or the standard access-code number.

(g) If the Micro-AT control has been furnished with the optional communications card feature (catalog number suffix "-Y8"), the communication port data transfer bit rate may need to be changed using the following procedure. Refer to Instruction Sheet 515-606.

Note: If the Micro-AT control has not been furnished with the communications card, proceed to Step 3.

Here's the display for **CONFIG: COM Ø BIT RATE** with its factory setting, **19200 BITS PER SECOND:**

```
CONFIG:  COM 0 BIT RATE
 19200                CHANGE
```

If a different data transfer bit rate is needed to establish communications between the Micro-AT control and personal computer, press the <Change> key. The following display will appear:

```
CONFIG:  COM 0 BIT RATE
ENTER ACCESS CODE   _
```

Press each digit of the access-code number, and then press the <Enter> key. The display will change to:

```
CONFIG:  COM 0 BIT RATE
 19200 ◄— OR —► 38400
```

Press the <—►> key to select the other possible selections: 2400, 4800, 9600, or 38400 bits per second. Then, press the <Enter> key.

STEP 3. Set the voltage-related operating parameters of the Micro-AT control using the following procedure.

(a) Press the <Voltage> menu key. The following display will appear:

```
VOLTAGE:
   PRESS LAST/NEXT ITEM
```

(b) Press the <Next> item key. The first item of the <Voltage> menu will appear on the first line of the display:

```
VOLTS:  LOSS OF SOURCE
```

(c) Press the <Next> item key repeatedly to scroll to each field-adjustable item of the **Volts** menu, as listed in Table 2.

Is the factory setting for each item (shown in the last column of the table, in boldface type) appropriate for this installation? If not, change it.

For example, here is the display for **VOLTS: LOSS OF SOURCE** with its factory setting, 85 Volts:

VOLTS:	LOSS OF SOURCE
85.0 VOLTS	CHANGE

If the loss-of-source voltage is to be set to some other value, press the <Change> key. If the display prompts the need to reenter the access-code number, do so. The display will now look like this:

VOLTS:	LOSS OF SOURCE
85.0 VOLTS	_____

Enter the desired loss-of-source voltage. If, for example, 102 Volts is the desired value, the <1>, <0>, and <2> keys would be pressed—followed by the <Enter> key. The display will change to:

VOLTS:	LOSS OF SOURCE
102 VOLTS	CHANGE

The other field adjustable items of the **Volts** menu can be changed in the same manner.

Table 2. Field adjustable items in the Volts menu.

Field Adjustable Item VOLTS:	Description	Displayed If	Operating Range①
LOSS OF SOURCE	Voltage level on source serving the load (or voltage level on source serving one of the bus sections, in split-bus switchgear) which, if reduced below, will result in control initiating automatic loss-of-source transfer. Also, if the **Hold** return setting has been selected, voltage level on alternate source (or voltage level on source in use, in split-bus switchgear) which, if reduced below, will result in control initiating automatic return-of-source transfer	Displayed at all installations	10-105 Volts **(85 Volts)**
RETURN OF SOURCE	Voltage level on source formerly serving the load (or voltage level on source formerly serving one of the bus sections, in split-bus switchgear) which, if equaled or exceeded, will result in control initiating automatic return-of-source transfer. (Applicable only if the **Auto** or the **Window** return setting has been selected)	Displayed at all installations	100-120 Volts **(105 Volts)**
OVERVOLT DETECT	Voltage level on a source which, if equaled or exceeded, will result in the control posting an entry in the event log	Displayed at all installations	120-140 Volts **(135 Volts)**
UNBALANCE DETECT	Unbalance level on source serving the load (or unbalance level on source serving one of the bus sections, in split-bus switchgear) which, if equaled or exceeded, will result in control initiating automatic transfer. Also, if the **Hold** return setting has been selected, unbalance level on alternate source (or unbalance level on source in use, in split-bus switchgear) which, if equaled or exceeded, will result in control initiating automatic return transfer	CONFIG: UNBALANCE INSTALL has been factory-set for the **In** setting	12-60 Volts **(18 Volts)** in switchgear, weatherproof enclosure, or Vista® Underground Distribution Switchgear 30-60 Volts **(30 Volts)** in pad-mounted gear

① Factory settings are shown in boldface type.

STEP 4. If the **Config: Lockout** option has been factory set for **Internal** mode, set the lockout level of the Micro-AT control using the following procedure.

(a) Press the <Current> menu key. The following display will appear:

```
CURRENT:
    PRESS  LAST/NEXT  ITEM
```

(b) Press the <Next> item key. The following display will appear for **CURRENT: LOCKOUT LEVEL**:

```
CURRENT: LOCKOUT LEVEL
1200 AMPS            CHANGE
```

Lockout level has been factory-set for 1200 amperes but may be field adjusted to any value between 200 and 1500 amperes.

(c) Is the factory-setting appropriate for this installation? If not, change it.

If the lockout level is to be set to some other value, press the <Change> key. If the display prompts that the access-code number to be reentered, do so. The display will now look like this:

```
CURRENT: LOCKOUT LEVEL
1200 AMPS                -----
```

Enter the desired lockout level. If, for example, 600 amperes is the desired value, the <6>, <0>, and <0> keys would be pressed followed by the <Enter> key.

```
CURRENT: LOCKOUT LEVEL
600 AMPS             CHANGE
```

STEP 5. Set the time-related operating parameters of the Micro-AT control using the following procedure:

(a) Press the <Time> menu key. The following display will appear:

```
TIME:
    PRESS LAST/NEXT ITEM
```

(b) Press the <Next> item key. The first item of the **Time** menu will appear on the first line of the display:

```
TIME: LOSS OF LEFT SOURCE
```

(c) Press the <Next> item key repeatedly to scroll to each item of the **Time** menu, as listed in Table 3. Each item of the **Time** menu is field-adjustable.

Is the factory setting for each item (shown in the last column of the table, in boldface type) appropriate for this installation? If not, change it.

For example, here is the display for **TIME: LOSS OF LEFT SOURCE** with its factory-setting, 2.00 seconds:

```
TIME: LOSS OF LEFT SOURCE
2.00 SECONDS        CHANGE
```

If the loss-of-left source time is to be set to some other value, press the <Change> key. If the display prompts a need to reenter the access-code number, do so. The display will now look like this:

```
TIME: LOSS OF LEFT SOURCE
2.00 SECONDS     -----
```

Enter the desired loss-of-left source time. If, for example, 10.5 seconds is the desired value, the <1>, <0>,<.>, and <5> keys would be pressed—followed by the <Enter> key. The display will change to:

```
TIME: LOSS OF LEFT SOURCE
10.5 SECONDS         CHANGE
```

The other items of the **Time** menu can be changed in the same manner.

STEP 6. Perform the loss-of-source testing and overcurrent-lockout testing outlined in the "Operational Testing" section of Instruction Sheet 515-500 or Instruction Sheet 515-600.

Table 3. Field adjustable items in the Time menu.

Field-Adjustable Item Time:	Description	Displayed If	Operating Range①
LOSS OF LEFT SOURCE	Time delay between detection of loss of voltage on left source and initiation of automatic loss-of-source transfer	Displayed at all installations	0.25-240 seconds **(2.00 seconds)**
LOSS OF RIGHT SOURCE	Time delay between detection of loss of voltage on right source and initiation of automatic loss-of-source transfer	Displayed at all installations	0.25-240 seconds **(2.00 seconds)**
RETURN OF SOURCE	Time delay between return of preferred-source voltage (or voltage to the previously failed source, in split-bus switchgear) and initiation of automatic return-of-source transfer	CONFIG: SELECT RETURN has been set for the **Auto** or the **Window** return setting	5 seconds to 8 hours **(00:03:00)**
LOCKOUT RESET	Time delay that voltage must remain on load, following its resumption after a momentary overcurrent, before the **Lockout** feature is automatically reset	CONFIG: LOCKOUT OPTION has been factory set for the **Internal** or **External** setting	0.25-240 seconds **(20.0 seconds)**
OC LOCKOUT PICKUP	Time delay between detection of overcurrent and initiation of overcurrent lockout	CONFIG: LOCKOUT OPTION has been factory set for the **Internal** setting	3-100 milliseconds **(50 ms)**
TRANSITION DWELL	Time delay, during automatic loss-of-source transfer, between opening of a source interrupter switch and closing of the other source interrupter switch (or closing of the bus-tie interrupter switch, in split-bus switchgear). Also, time delay, during automatic return-of-source transfer, between opening of a source interrupter switch (or opening of the bus-tie interrupter switch, in split-bus switchgear) and closing of the other source interrupter switch	CONFIG: DWELL TIMER has been set for the **In** setting	0.25-10 seconds **(2.00 seconds)**
WINDOW BEGIN	The beginning of a time "window" in which an automatic return-of-source transfer can occur; the window is adjustable from 1 minute to 3 hours. (Transfer will take place after the return-of-source time delay has expired—provided that the time of day is within the window selected)	CONFIG: SELECT RETURN has been set for the **Window** return setting	hh:mm (hour: minute—24-hour format) **(01:00)**
WINDOW LENGTH (24 HR)	The time duration of the "window" in which an automatic return-of-source transfer can occur	CONFIG: SELECT RETURN has been set for the **Window** return setting	hh:mm (hour: minute—24-hour format) **(03:00)**
TODAY'S DATE	Month-day-year reference for event log	Displayed at all installations	mm/dd/yy (month/day/year)
TIME OF DAY (24 HR)	Hour-minute-second reference for event log	Displayed at all installations	hh:mm (hour: minute—24-hour format)

① Factory settings are shown in boldface type.