BankGuard PLUS™
Control

Product Description

S&C Electric Company
6601 North Ridge Blvd.
Chicago, Illinois 60626 USA

1011-500 5-17-04

Instruction Sheets Include:

Product Description	1011-500 explains important product features.
Installation	1011-510 describes how to install and connect the BankGuard PLUS Control.
Setup	1011-530 describes how to use the Setup software to configure the BankGuard PLUS Control, check the present settings, and view real-time data.
Operations	1011-540 describes how to view historical data, how to generate reports, and how to update the Control software. This instruction sheet also explains how the BankGuard PLUS Control works during normal operation.
Troubleshooting	1011-550 describes how to diagnose and correct various BankGuard PLUS Control problems.

Latest Release of This Document

The latest release of this instruction sheet is available online at www.sandc.com.

Select: Support/ Product Support Documents. Documents are posted in PDF format.

Safety Information

⚠ WARNING ⚠

The equipment covered by this publication must be installed, operated, and maintained by qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead electric power distribution equipment along with the associated hazards. A qualified person is one who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from non-live 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 the special precautionary techniques, personal protective equipment, insulating 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

Thoroughly and carefully read this instruction sheet before programming, operating, or maintaining your S&C BankGuard PLUS™ Control. Familiarize yourself with "SAFETY INFORMATION" on pages 3 through 5.

Retain this Instruction Sheet

This instruction sheet is a permanent part of your BankGuard PLUS Control. Designate a location where you can easily retrieve and refer to this publication.

Warranty

The standard warranty contained in S&C's standard conditions of sale, as set forth in Price Sheet 150, is applicable to the BankGuard PLUS Control.

Understanding Safety-Alert Messages

There are several types of safety-alert messages which may appear throughout this instruction sheet as well as on labels attached to the BankGuard PLUS Control. Familiarize yourself with these types of messages and the importance of the various signal words, as explained below.

⚠ DANGER ⚠

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

⚠ WARNING ⚠

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

⚠ CAUTION ⚠

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

⚠ NOTICE ⚠

"NOTICE" identifies important procedures or requirements that, if not followed, 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 call S&C Headquarters at (773) 338-1000, Monday through Friday between 8:30 AM and 5:00 PM Central Standard Time. (In Canada, call S&C Electric Canada Ltd. at (416) 249-9171.)

⚠ NOTICE ⚠

Thoroughly and carefully read this instruction sheet before programming and operating your BankGuard PLUS Control.

Replacement Instructions and Labels

If you need additional copies of this instruction sheet, contact your nearest S&C Sales Office, 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 Headquarters, or S&C Electric Canada Ltd.

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Introduction

Overview of the S&C BankGuard PLUS™ Control

The BankGuard PLUS Control is a member of the S&C Electric Company family of automation and control products. The BankGuard PLUS Control protects large shunt capacitor banks from the cascading overvoltage stress caused by the loss of capacitor units, and protects shunts reactors from turn-to-turn faults. It is a complete, factory-integrated package, designed for maximum accuracy, reliability, and versatility.

Your BankGuard PLUS Control includes the following major components, as shown in Figures 1 and 2.

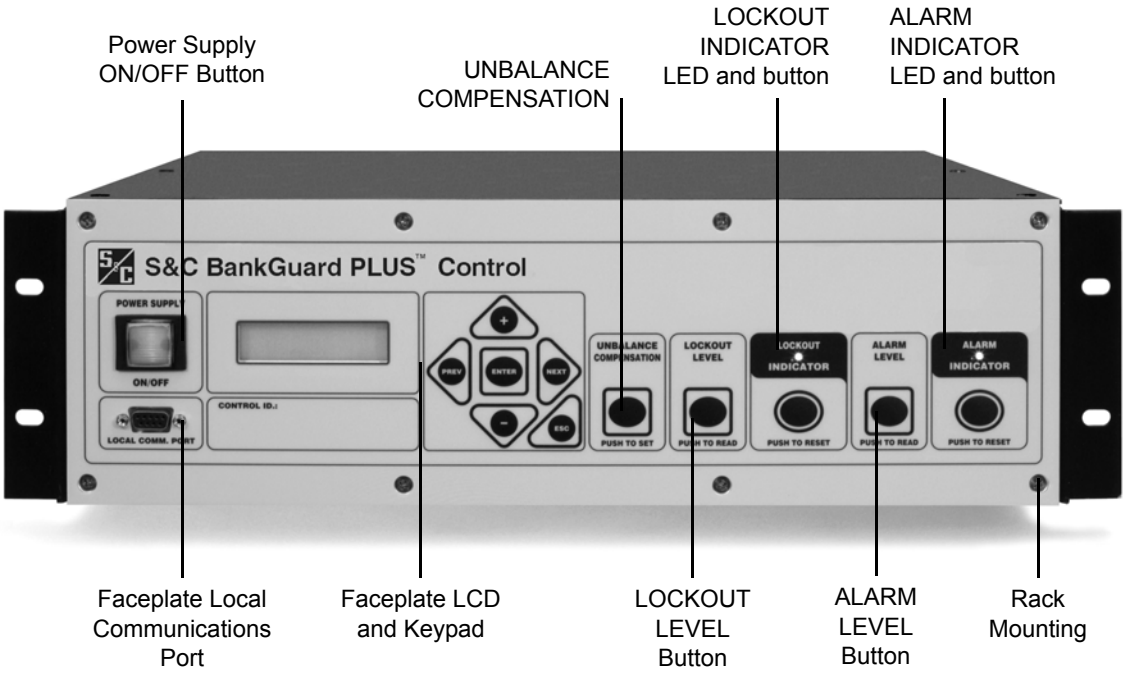

Figure 1
Control Faceplate

- *Faceplate local communications port* – Allows you to connect your computer to the control with a DB9 cable, then use the IntelliLINK™ software to view data, change setpoints, download logged data, and update the Control software.
- *Faceplate LCD and keypad*– Permit local, easy viewing of real-time data and setpoint values, without the need for a portable computer. Also allow you to change setpoint values from the faceplate.

- *Faceplate LEDs and buttons*– Clearly labeled LEDs and buttons give you access to information about the present state of the control device.

  UNBALANCE COMPENSATION button – Lets you display and set the unbalance compensation value.

  LOCKOUT LEVEL button – Lets you display the “Lockout Level,” “Lockout Time Delay,” and “Phase/Tap-Point-to-Neutral Ratio” setpoints.

  LOCKOUT INDICATOR LED – Turns ON when the capacitor bank is locked out based on the “Lockout Voltage” and “Lockout Time Delay.”

  LOCKOUT INDICATOR button – Clears the LOCKOUT INDICATOR LED.

  ALARM LEVEL button – Lets you display the “Alarm Level” and “Alarm Time Delay” setpoints.

  ALARM INDICATOR LED – Turns ON when the capacitor bank is locked out based on the “Alarm Voltage” and “Alarm Time Delay.”

  ALARM INDICATOR button – Clears the ALARM INDICATOR LED.

- *Rack mounting* – The control is suitable for mounting in a standard 19” relay rack.

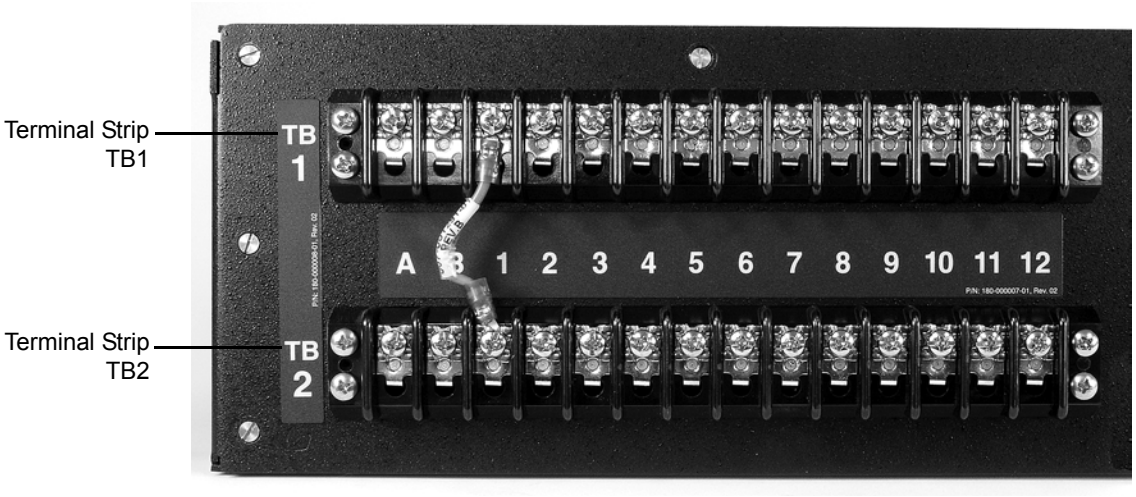

Figure 2
Terminal Strips on Rear of the Control

- *Terminal strips* – Numbered terminal strips on the back of the control device provide connection points for the external control wiring.
- *SCADA port* – An RS232 port is available for remote communications.
- *Communications equipment (optional)* – S&C BankGuard PLUS Controls support a variety of software protocols, for 2-way communication between the control and a SCADA master station.
- *Control software* – Resides in the control and manages the moment-by-moment functioning of the installation. You can update the application software easily, using the IntelliLINK software and a PC – no need to change chips to update the software.
- *IntelliLINK software* – Lets you verify and change all setup and configuration parameters, monitor real-time operating data, perform troubleshooting, and export data for use in spreadsheets. Resides on your portable computer and runs in the Microsoft® Windows® environment.

BankGuard PLUS Control Features

All BankGuard PLUS Controls include the following features:

- *Dependable quality* – Electronics manufactured in an ISO 9002-certified plant.
- *Toughness and reliability* – Designed to withstand the difficult environmental and electrical conditions found in electric distribution applications.
- *Rugged, well-proven core electronics design* – Microprocessor, memory, and all related components based on technology developed for S&C's full range of control products (with over 100,000 units in the field since 1985).
- *Sophisticated automatic control logic* – Ensures effective monitoring and protection of the capacitor bank.
- *Flexible communications capabilities* – Has a "local" communications port (for local communication with your portable computer) and a "SCADA" port (for remote communications applications).
- *Setpoint control of operating parameters* – Automatic operation options, address information, and other operating parameters can be viewed and changed as needed.
- *Non-volatile memory* – Programming, setpoints, and data are stored in non-volatile memory for maximum field functionality and reliability.
- *Real-time clock* – Crystal-controlled clock provides accurate time for timestamping of real-time data.
- *Unbalance compensation* – Compensates for the system voltage imbalance plus the inherent capacitor bank imbalances, or for inherent capacitor bank imbalances only.
- *Alarm* – Responds to the loss of fewer capacitor units than the lockout level. When the alarm is set, an LED on the faceplate comes ON and the remote-alarm contacts operate. There are two sets of normally open and normally closed (a & b) contacts, that can be configured to indicate capacitor bank or reactor neutral over-voltage, and for relay trouble or the loss of control power.
- *Lockout command* – The lockout voltage level, tap-point voltage percent imbalance, and lockout time delay are software programmable.

- S&C Type UP Automatic Control Device Features supported by the BankGuard PLUS:

UP OPTION	***BankGuard Plus Standard Feature***
B, D, E	AC or DC Power Supplies / BGP operates on 115 - 390 Vdc, 80 - 280 Vac
H	Alarm Option / BGP standard feature
K	Unbalance Compensation / BGP standard feature
L or M	Mounting Bezels
N or P	Card Extender / No longer required for testing BGP
S118	Digital voltmeter & dual redundant lock out relays / BGP standard feature
S172	Trip replaces lockout, DC control voltages / BGP standard feature
S186	Trip replaces lockout, AC control voltages / BGP standard feature
S194	Percent unbalance display / BGP standard feature
S224	50 Hz Operation, trip replaces lockout / BGP standard feature
S226	Digital Voltmeter / BGP standard feature
S229	Digital Voltmeter & switching power supply / BGP standard feature