EVENTS INSTRUMENT AND
RELAY EXTENSION

SERIES 9015

OPERATIONS MANUAL

Super Systems Inc.
USA Office
Corporate Headquarters:
7205 Edington Drive
Shipping Address:
7245 Edington Drive
Cincinnati, OH 45249
Phone: (513) 772-0060
http://www.supersystems.com

Super Systems Europe
Unit E, Tyburn Trading Estate,
Ashold Farm Road, Birmingham
B24 9QG
UNITED KINGDOM
Phone: +44 (0) 121 306 5180
http://www.supersystemseurope.com

Super Systems México
Sistemas Superiores Integrales S de RL de CV
Acceso IV No. 31 Int. H Parque Industrial
Benito Juarez
C.P. 76120 Queretaro, Qro.
Phone: +52 442 210 2459
http://www.supersystems.com.mx

Super Systems China
No. 369 XianXia Road
Room 703
Shanghai, CHINA
200336
Phone: +86 21 5206 5701/2
http://www.supersystems.cn

Super Systems India Pvt. Ltd.
A-26 Mezzanine Floor, FIEE Complex,
Okhla Indl. Area, Phase – 2
New Delhi, India 110 020
Phone: +91 11 41050097
http://www.supersystemsindia.com

Table of Contents

Introduction

The 9015 Events Module and Relay Extension is designed to expand the event and relay capabilities of a 92XX controller. The 9015 is based on the 9010 eSPP with events hardware. This provides 8 output event relays and 4 event inputs (dry contact). A second 9015 can be connected to the first 9015 to seamlessly provide 16 outputs and 8 inputs.

Additional features have been added to the 9015 to provide digital I/O, combination logic, and counters to the Video Recorder.

Specifications

The following specifications are applicable to the 9015 instrument.

Item	Specification
Power Input	24VDC +/- 20% at 300 Ma
Relay Contacts	24VDC at 200 mA max
Temp Range	32˚F - 132˚F
Input	Dry contact or open collector sinking common to 24VDC supply. Protected from overvoltage.
Ethernet	10-base T Modbus TCP (factory default IP 192.168.0.222)
RS-232	Modbus, 8N1, baud rates from 1200 to 115200 (factory default 19200)
RS-485 Host	Modbus, 8N1, baud rates from 1200 to 115200 (factory default 19200)
RS-485 Slave 1	Modbus, 8N1, baud rates from 1200 to 115200 (factory default 19200)
RS-485 Slave 2	Modbus, 8N1, baud rates from 1200 to 115200 (factory default 19200)
RS-485 Modbus host address	1 to 249 (factory default 222)
RS-485 Slave 1 setup	Slave instrument 1 is forced to SSI 8-8 address 222

Table 1 - 9015 Instrument Specifications

Instrument Terminals

Correct use of instrument terminals is crucial for use of the 9015 instrument. The 32 instrument terminals are pictured below in Figure 1.
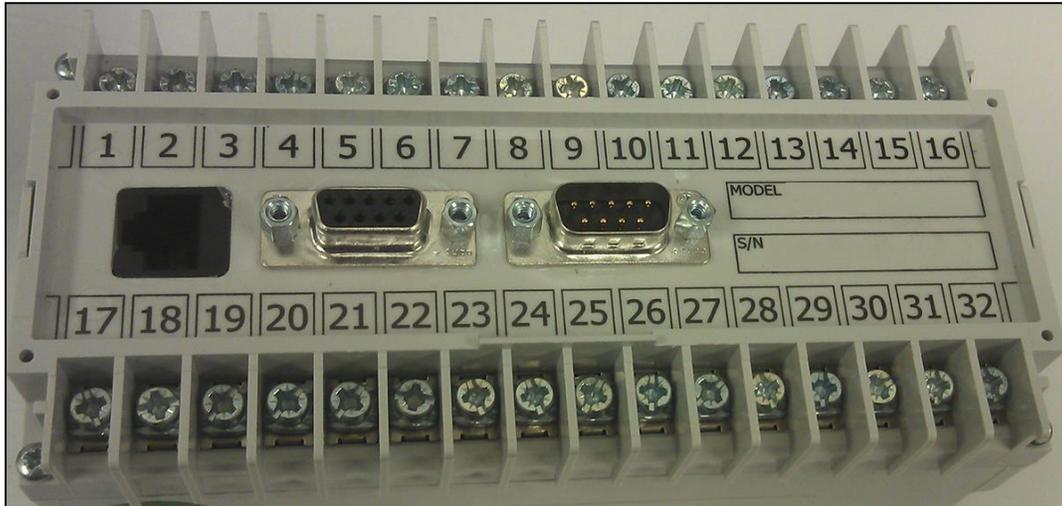
Figure 1 - Instrument Terminals

Table 2 shows the function of each terminal.

Terminal	Function	Terminal	Function
1	24VDC (COM)	17	EVENT IN 0
2	24VDC (+)	18	EVENT IN 1
3	RS485 RT (-)	19	EVENT IN 2
4	RS485 RT (+)	20	EVENT IN 3
5	SLAVE 1 RS485 (-)	21	EVENT IN COM
6	SLAVE 1 RS485 (+)	22	SLAVE 2 RS485 (+)
7	RELAY COMMON	23	SLAVE 2 RS485 (-)
8	EVENT RELAY 0	24	*Not assigned*
9	EVENT RELAY 1	25	*Not assigned*
10	EVENT RELAY 2	26	*Not assigned*
11	EVENT RELAY 3	27	*Not assigned*
12	EVENT RELAY 4	28	*Not assigned*
13	EVENT RELAY 5	29	*Not assigned*
14	EVENT RELAY 6	30	*Not assigned*
15	ALARM RELAY NC	31	*Not assigned*
16	ALARM RELAY NO	32	*Not assigned*

Table 2 - Terminal List and Functions

Terminals 1 and 2 are used for powering the instrument. Terminals 3 and 4 are used to connect the instrument as a slave device to a 92XX controller. Terminals 5 and 6 are used to slave a second 9015 instrument to the first from the second 9015's terminals 3 and 4.

Setup: 9015 as Events Instrument

One of the two uses of the 9015 is its application as an Events Instrument. By connecting the 9015 as a slave instrument to a 92XX controller, you can extend the event monitoring capabilities of the 92XX controller.

A 9015 cannot be used with a 9220 running firmware revision 2.28 or newer. In this case, it must be set up as a relay extension (refer to page 11).

In normal situations, the factory default settings in the 9015 will not have to be changed. To use with a 92XX controller, determine which slave port on the 92XX you plan to use (slave 1, for example). Connect terminals 5 & 6 on the 92XX to terminals 3 & 4 on the 9015 (for slave 1).

Then, using Configurator, open the "Slave Instrument Setup" menu while communicating to the 92XX (Figure 2).

Parameter	Value	
Instrument 1		
Instrument 2		
Instrument 3		
Instrument 4		
Instrument 5		
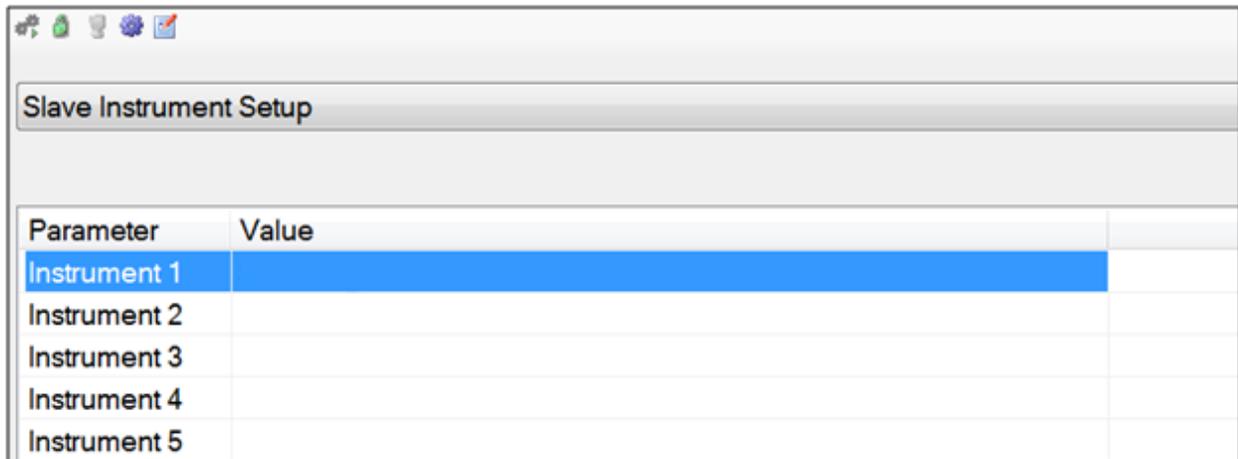
Figure 2 – Slave Instrument Setup menu (Configurator)

Select an instrument number in the parameter list to use by clicking on the desired value or instrument number. Note the instrument number selected for later reference. Set the instrument number as shown in Figure 3 and Figure 4:

- Instrument: SSI 8-8
- Address: 222
- Port: Selected slave port (for example, Slave 1).
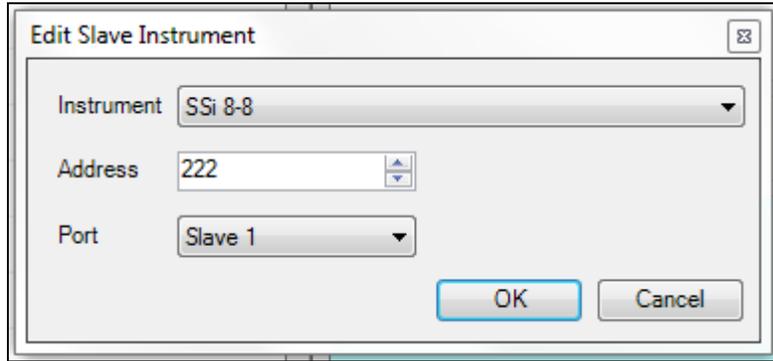
Figure 3 - Editing Slave Instrument Settings
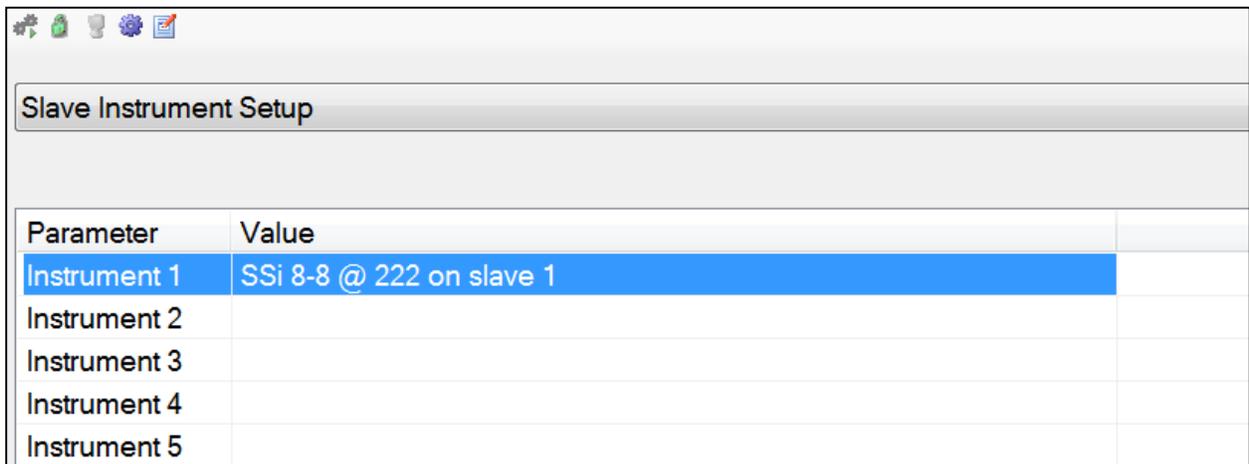
Figure 4 - Slave Instrument Setup Menu with Instrument 1 Configured

After you have completed the procedure above, "Instrument 1" under the "Slave Instruments" menu will read "Instrument 1 [OK]" in the Parameter column (see Figure 5). It may take up to 10 seconds for the indication to change to "Instrument 1 [OK]".

(If communications with the slave instrument are not working, "Instrument 1 [BAD]" will be shown.
If communications are being established, "Instrument 1 [N/A]??" will be shown before the indication changes to "[OK]".)
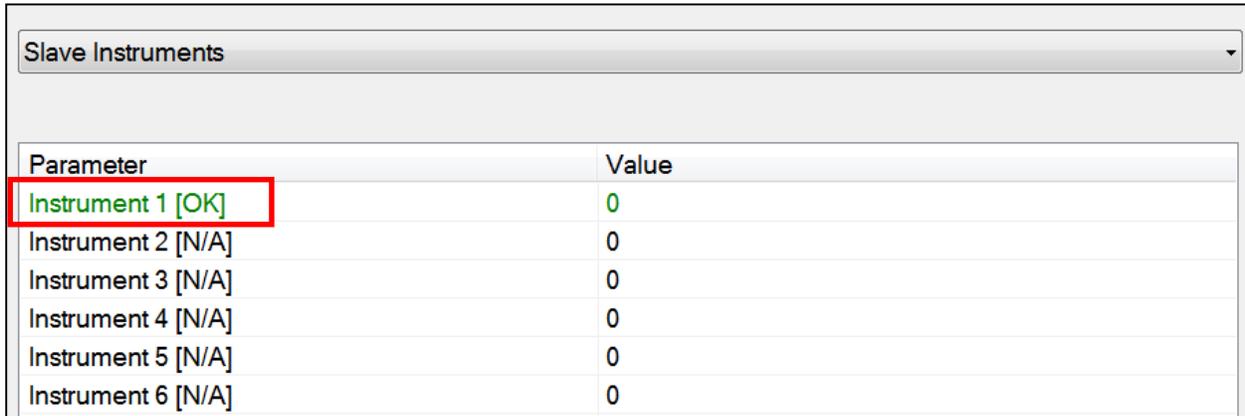
| Slave Instruments	
Parameter	**Value**
Instrument 1 [OK]	0
Instrument 2 [N/A]	0
Instrument 3 [N/A]	0
Instrument 4 [N/A]	0
Instrument 5 [N/A]	0
Instrument 6 [N/A]	0

Figure 5 – "[OK]" Indication on Slave Instrument

NOTE: The "Instrument *number* [OK]" indication can <u>also</u> be observed on the 92XX touch screen under the main menu item "Slave Communications Status" (Figure 6).
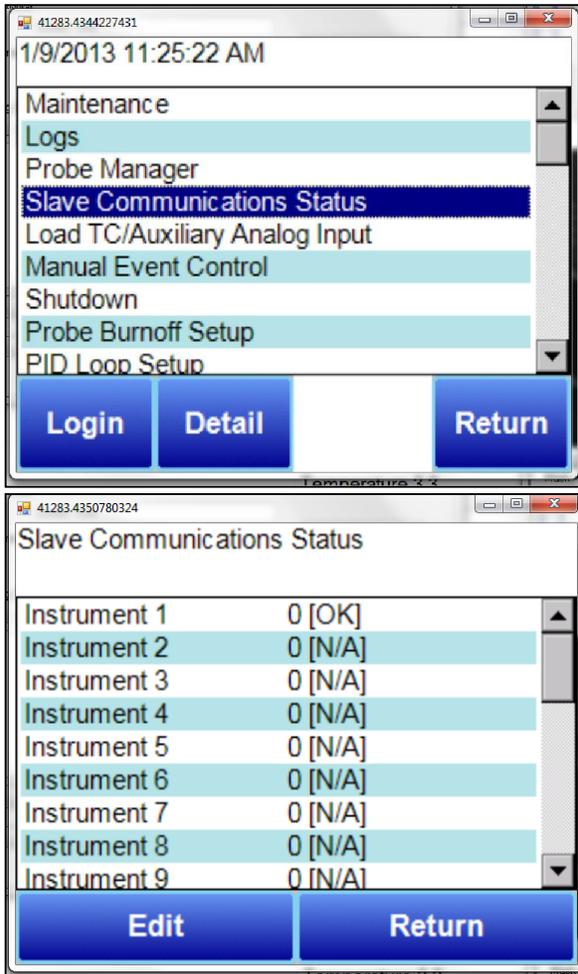
Figure 6 – Slave Communications Status on 92XX Touch Screen

In the Furnace Setup menu, set the "Event Instrument" as the instrument number you defined for 9015 in the "Slave Instrument Setup" (see Figure 7).
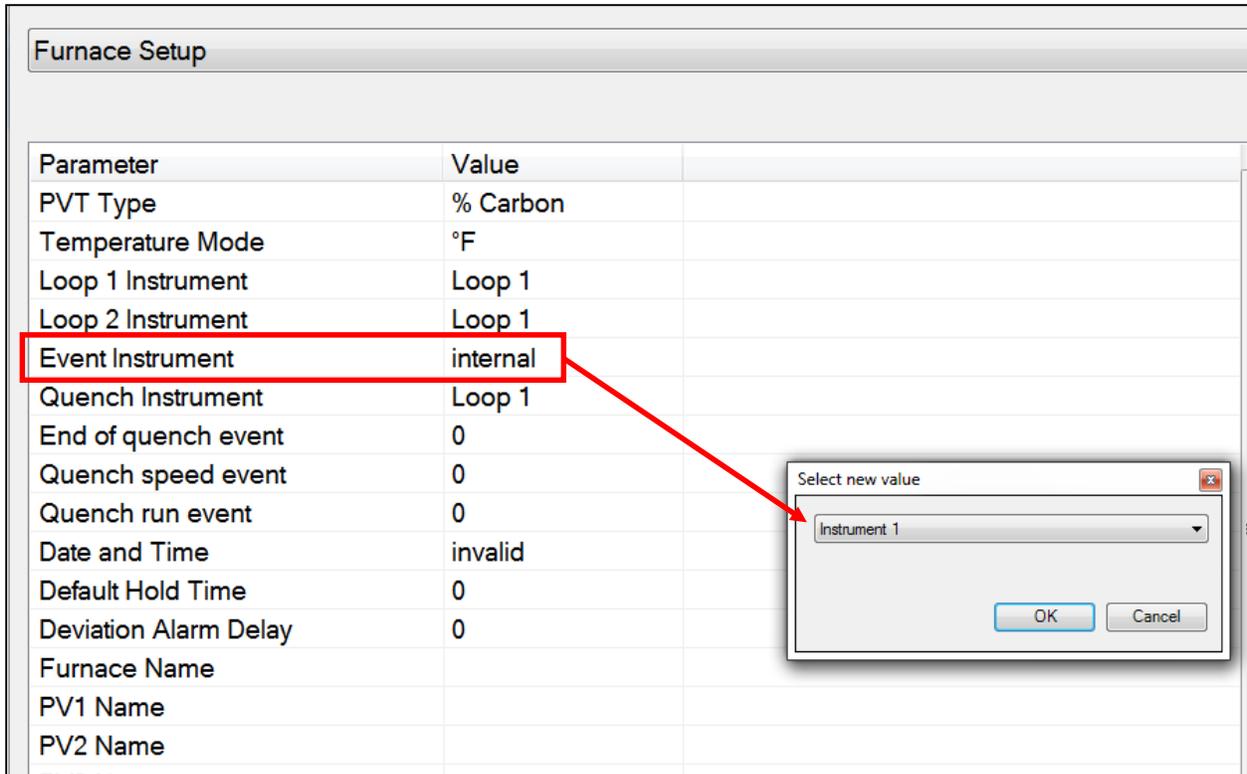
Figure 7 - Event Instrument Setup in Furnace Setup Menu

Adding a Second 9015 Instrument

To use a second 9015 for additional events, connect slave port 1 (terminals 5 & 6) to the second 9015's host port (terminals 3 & 4). In the 92XX, the event outputs of the first 9015 will be events 0 to 7 and the outputs of the second 9015 will be events 8 to 15. Likewise, the event inputs of the first 9015 are events 0 to 3 and the event inputs of the second 9015 are events 4 to 7.

Setup: 9015 as Relay Extension

In normal situations, the factory default settings in the 9015 will not have to be changed.

IMPORTANT: To use a 9015 as a relay extension, you must have a 9205 or 9220 controller with the latest firmware revision for that controller as well as an up-to-date version of SSi's Configurator 2 software.

If there is more than one 9015 instrument wired as a relay extension, then the serial address of each unit will have to be set up uniquely in order for them to be identifiable to the host instrument: Set the serial addresses as follows:

- 1st module: 222
- 2nd module: 223
- 3rd module: 224
- 4th module: 225

The wiring must be in series from the host unit (terminals 22 & 23 Slave 2 port) to all of the items that are connected on this port.

Terminals 1(-) and 2(+) are used for powering the 9015 instruments. Terminals 3 and 4 are used to connect the 9015 units as slaves devices back to a 92XX host controller. (See example to right)
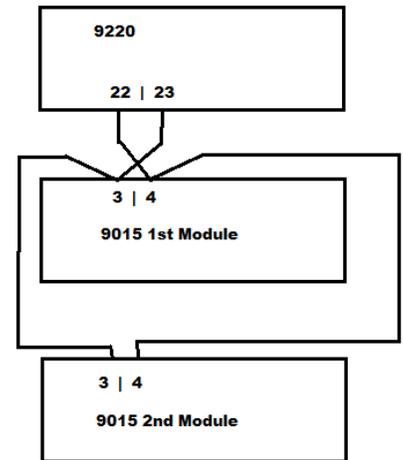
Use Slave 2 in order to make the 9015 a relay extension.
Connect terminals 22 & 23 on the 9205 or 9220 to terminals 3 & 4 on the 9015.

In the Configurator menu drop-down list, select "Port Setup". Then click on "Slave 2 Mode" and change this setting to "SSi Analog Input Board" (Figure 8).

Port Setup

Parameter	Value
Host 232 Baud	19200
Host 232 Mode	Modbus
Host 485 (3,4) Baud	19200
Host 485 (3,4) Mode	Modbus
Host 485 Address	1
Slave 1 (5,6) Baud	19200
Slave 1 (5,6) Mode	Modbus
Slave 2 (22,23) Baud	19200
Slave 2 (22,23) Mode	SSi Analog Input Board
PLC Type	DF1 Slik
Host 232-2 Baud	19200
Host 232-2 Mode	Modbus

Figure 8 – Changing of "Slave 2 Mode" Setting in Port Setup Menu

Next, under the "Furnace Setup" menu, change "Slave Event Boards" to the number of 9015 instruments that you are slaving to the 9205 or 9220 (Figure 9).

Parameter	Value	
PV1 Name	Temperature 1 1 dD	
PV2 Name	Temperature 2 2	
PV3 Name	Temperature 3 3	
Clear Events, end of recipe	yes	
Start Quench	On recipe opcode	
Quench hold event	none	
Quench transfer time configuration	Event 1 active to event 2 active	
Slave Event Boards	1	
Prog 2 Loop 1 Instrument	Loop 1	
Prog 2 Loop 2 Instrument	Loop 2	
Prog 2 Event Instrument	internal	

Figure 9 – Setting the Number of Slave 9015 Instruments

Next, under "Relay Assignments", change the relay assignments for the 9015 instrument module (Figure 10). Module 1 is the first 9015, starting with relay 1, instrument terminal 8.

Relay Assignments		▼
Parameter	**Value**	
Relay 1	loop 2 fwd	
Relay 2	loop 1 fwd	
Relay 3	loop 1 rev	
Relay 4	burn off	
Relay 5	alarm 1	
Relay 6	alarm 2	
Relay 7	event 0	
Relay 8	alarm 3	
Module 1 Inputs	Inputs 0 - 3	
Module 1 Relay 1	loop 1 fwd	
Module 1 Relay 2	loop 1 fwd	
Module 1 Relay 3	loop 1 fwd	
Module 1 Relay 4	loop 1 fwd	
Module 1 Relay 5	loop 1 fwd	
Module 1 Relay 6	loop 1 fwd	
Module 1 Relay 7	loop 1 fwd	
Module 1 Relay 8	loop 1 fwd	
Module 2 Inputs	not assigned	
Module 2 Relay 1	loop 1 fwd	
Module 2 Relay 2	loop 1 fwd	
Module 2 Relay 3	loop 1 fwd	
Module 2 Relay 4	loop 1 fwd	
Module 2 Relay 5	loop 1 fwd	
Module 2 Relay 6	loop 1 fwd	
Module 2 Relay 7	loop 1 fwd	
Module 2 Relay 8	loop 1 fwd	

Figure 10 - Changing Relay Assignments

Revision History

Rev.	Description	Date	MCO #
A	November 2012 Release	11/21/2012	2110
B	Updated manual to include use of instrument as relay extension, new figures, and added functional explanations	05/08/2013	2119
C	Added operating range	7/28/2018	2235
D	Added relay extension setup instructions	2/8/2019	2253