

QUICK CAMP

DESIGNED BY:

KENDALL WILLIAMSON

DAKOTA ROBERSON

SPECIAL THANKS TO:

DON WILLIAMSON

ELECTROFAB INC.

MATTHEW BURKHART

SURESH MUKNAHALLIPATNA

VOLPI & CUPAL SENIOR DESIGN FUND

INTRODUCTION

- Problem:
 - Campgrounds need camp host
 - Campsites not accessible 24/7
- Solution:
 - Automated Campground
 - Includes Power, Water, Sewer, and WIFI
 - Around the clock secure access

INTRODUCTION

- Motivation

- Client requested design
- Learn unfamiliar software package
 - National Instruments LabView
 - Becoming more common in industry
 - Designers had no prior experience

INTRODUCTION

- Summary of Results
 - Goals Met
 - Graphical User Interface
 - Charge credit cards
 - Secure facility w/ gate system
 - Automated power and water sources
 - Verification of sources
 - WIFI and gate passcodes provided to user
 - Goals Not Met
 - Site and gate sensors

CHOICE OF PRODUCTS

- National Instruments

- LabView

- Software allows seamless GUI & Hardware interaction
 - Allows modular development (use of sub-VI)
 - Designers had limited knowledge but desire to learn

- Hardware

- NI6509 DAQ board meets requirements for digital I/O
 - Easily interfaced through USB to LabView software

CHOICE OF PRODUCTS

- MagTek MagneSafe Card Reader
 - Competitively priced vs. 'plug and play' units
 - Durable
 - 2-way swipe capability
 - Access to source code from manufacturer

CHOICE OF PRODUCTS

- Phoenix Contact

- CB100 I/O connector block & B5 Ribbon Cable

- Necessary to interface with NI6509
 - Allows for DIN rail mounting
 - Increases modularity of system

- 5V Relay

- For demonstration, 5V relay necessary
 - Competitively priced and readily available

CHOICE OF PRODUCTS

- Various Hardware Components
 - Plumbing, sensors, etc. were acquired for demonstration
 - Client supplied parts for demo board (i.e. parts were readily available, economical)

PROGRAMMING - GUI

- Primary goal of product
- Necessary to interact with customer
 - Assumes touchscreen interface
 - Step-through processes to eliminate customer confusion
 - Timeout that clears information due to inactivity

Quick Camp

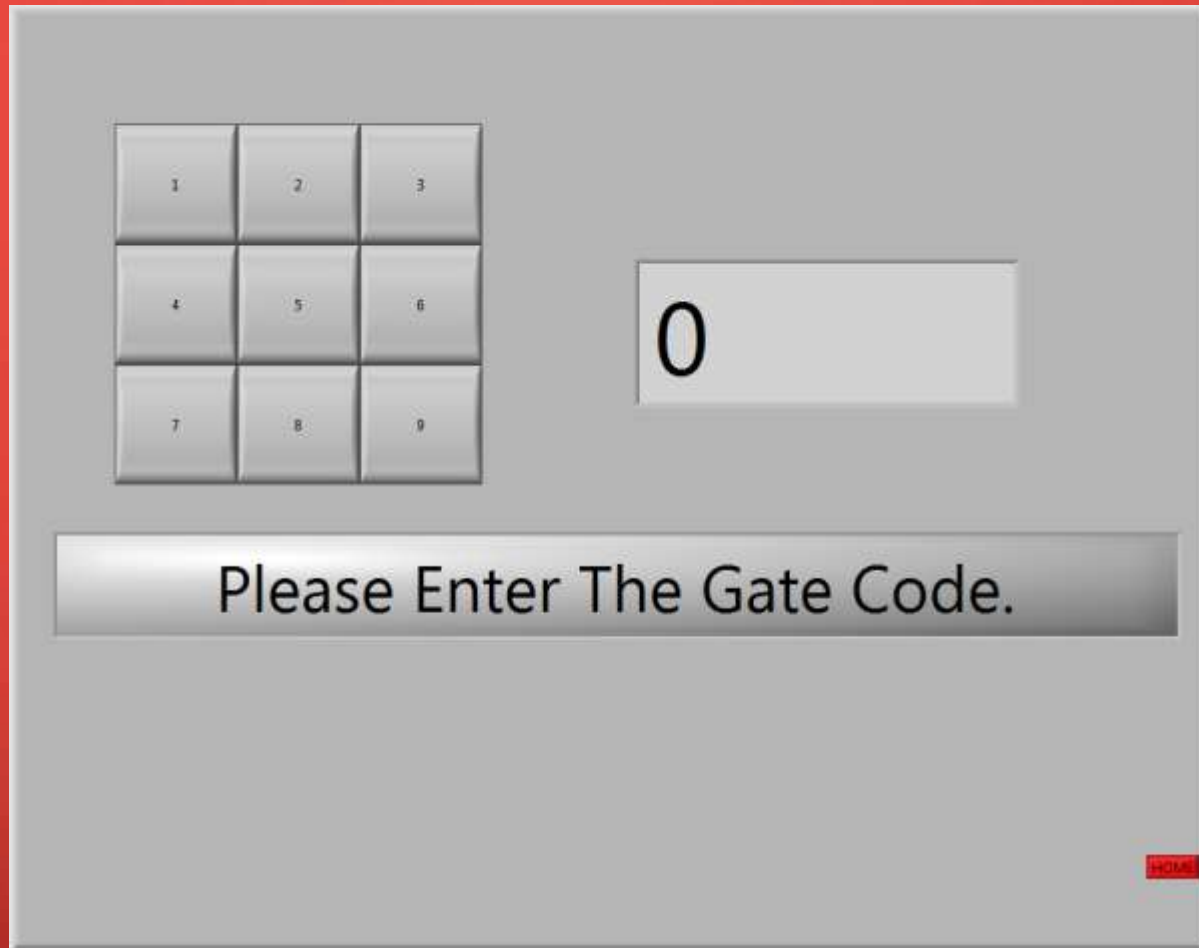
Welcome to Quick Camp! Please select an option.

Open
Gate

Make
New
Reservation

HOMESCREEN

- View of homescreen with vacancy



GATE ACCESS SCREEN

- View of gate access screen – proper key code entry ¹¹ operates gate

Enter # of Nights:

Nightly Rate:

Total (taxes included):

Total Correct: No Yes

Please enter your name and email address:

Email Address: Name:

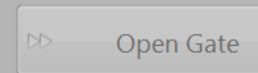
[HOME](#)

RESERVATION INFORMATION

- View of program parameters set by user – contingent upon user input

To select a site:

1. Touch a site that is not grayed out to test
2. Wait 5 seconds for indication of site validation
3. If site ok, proceed to open gate.
4. If stays as failure, select different site.



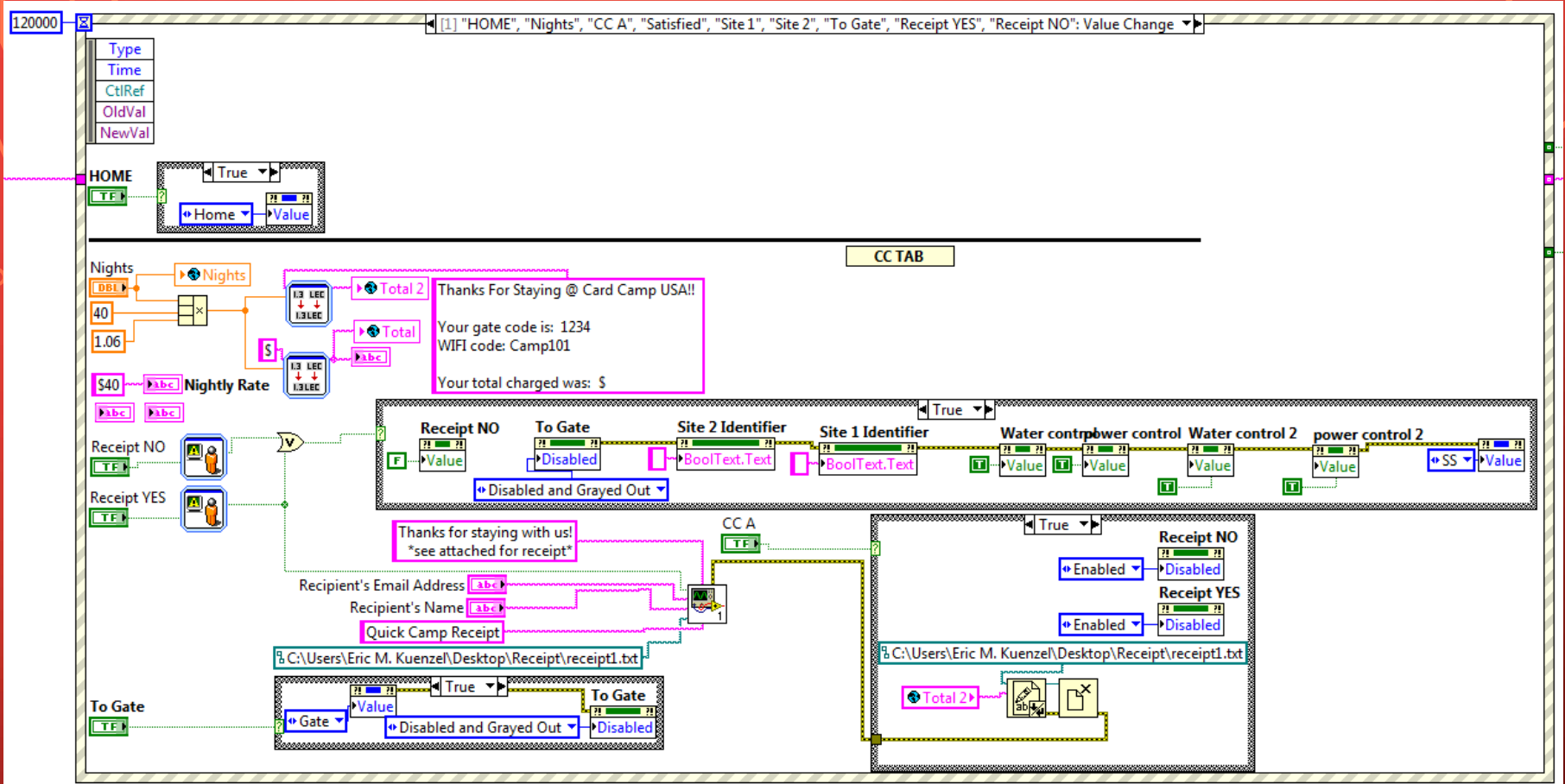
HOME

CAMPSITE SELECTION

- View of available and unavailable campsites

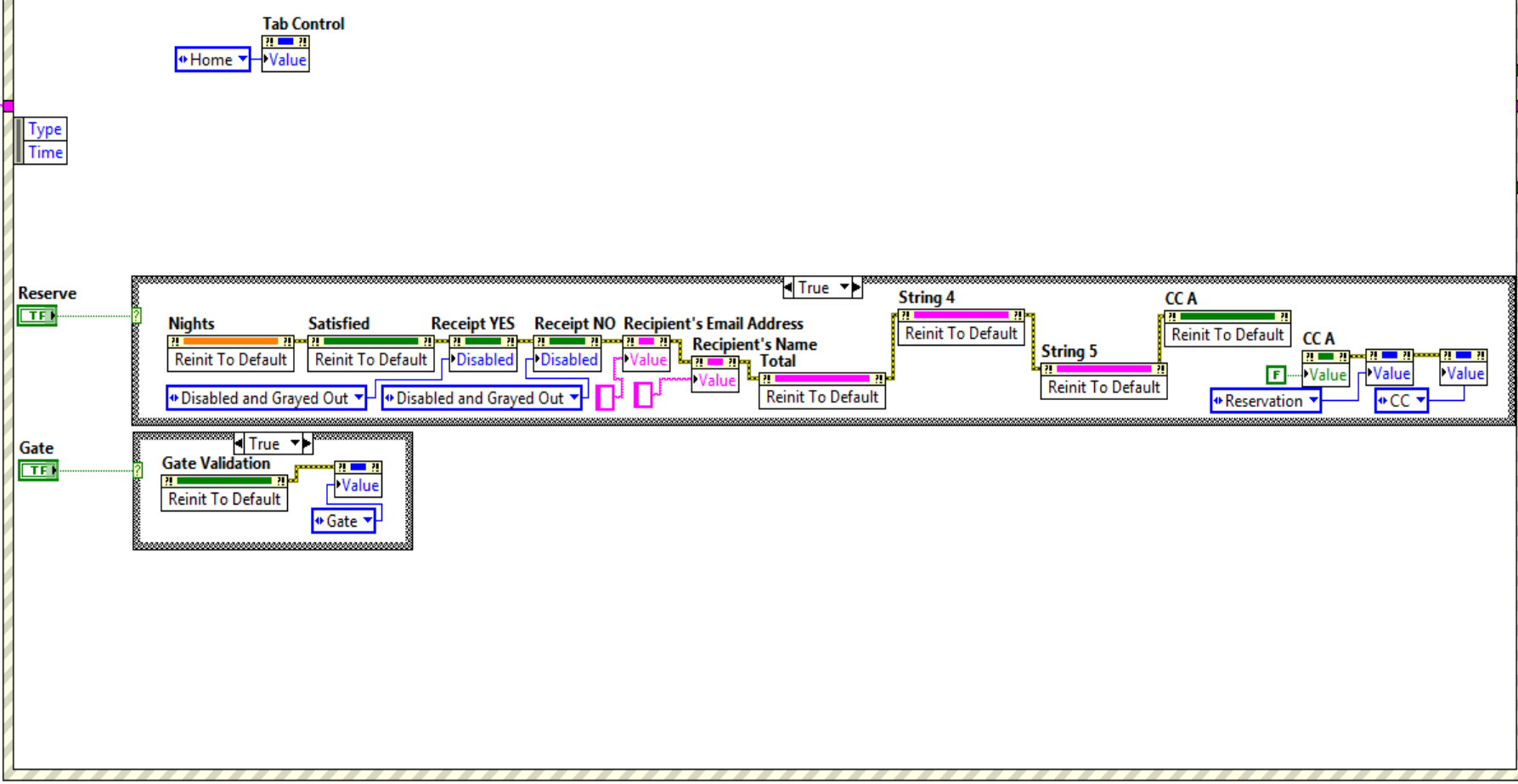
PROGRAMMING

- Producer – Consumer Design
 - Separates duties of producer and consumer
 - Producer:
 - Takes inputs and data manipulation
 - Consumer:
 - Uses producer's data and controls outputs



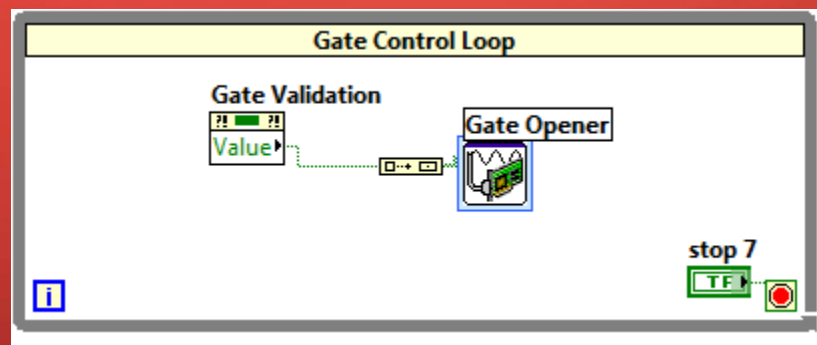
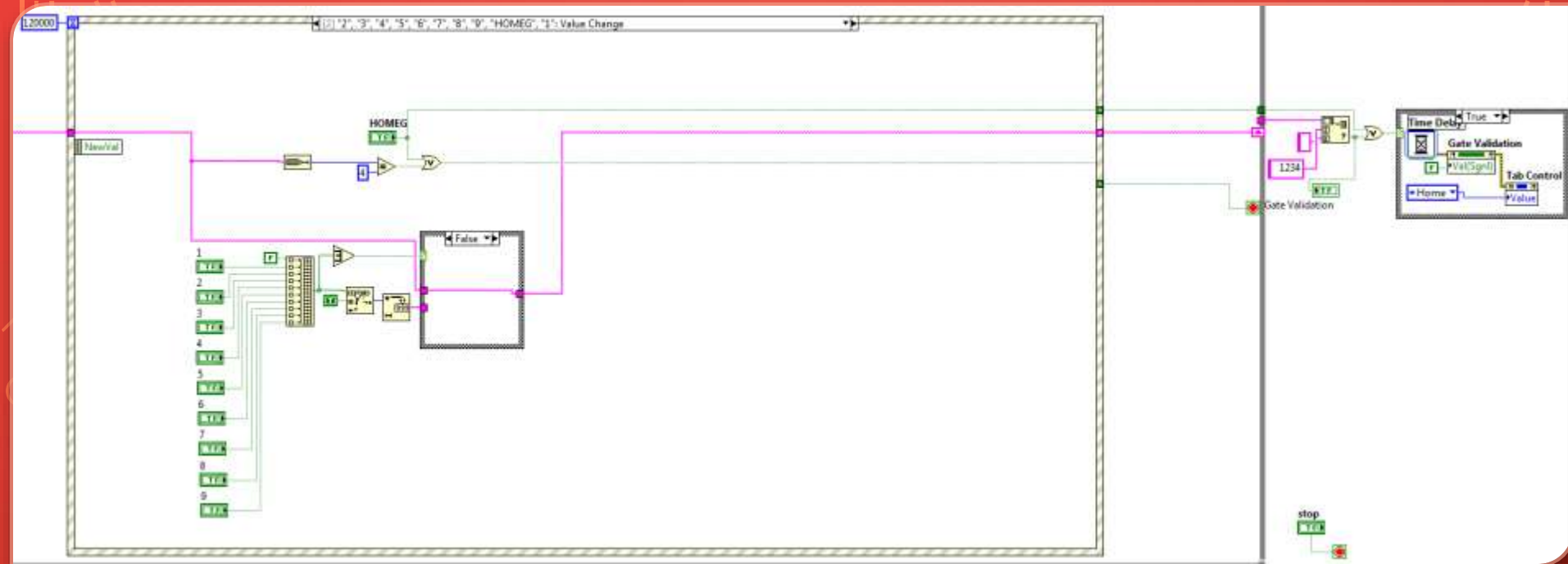
RESERVATION CODE

- Stores user inputs



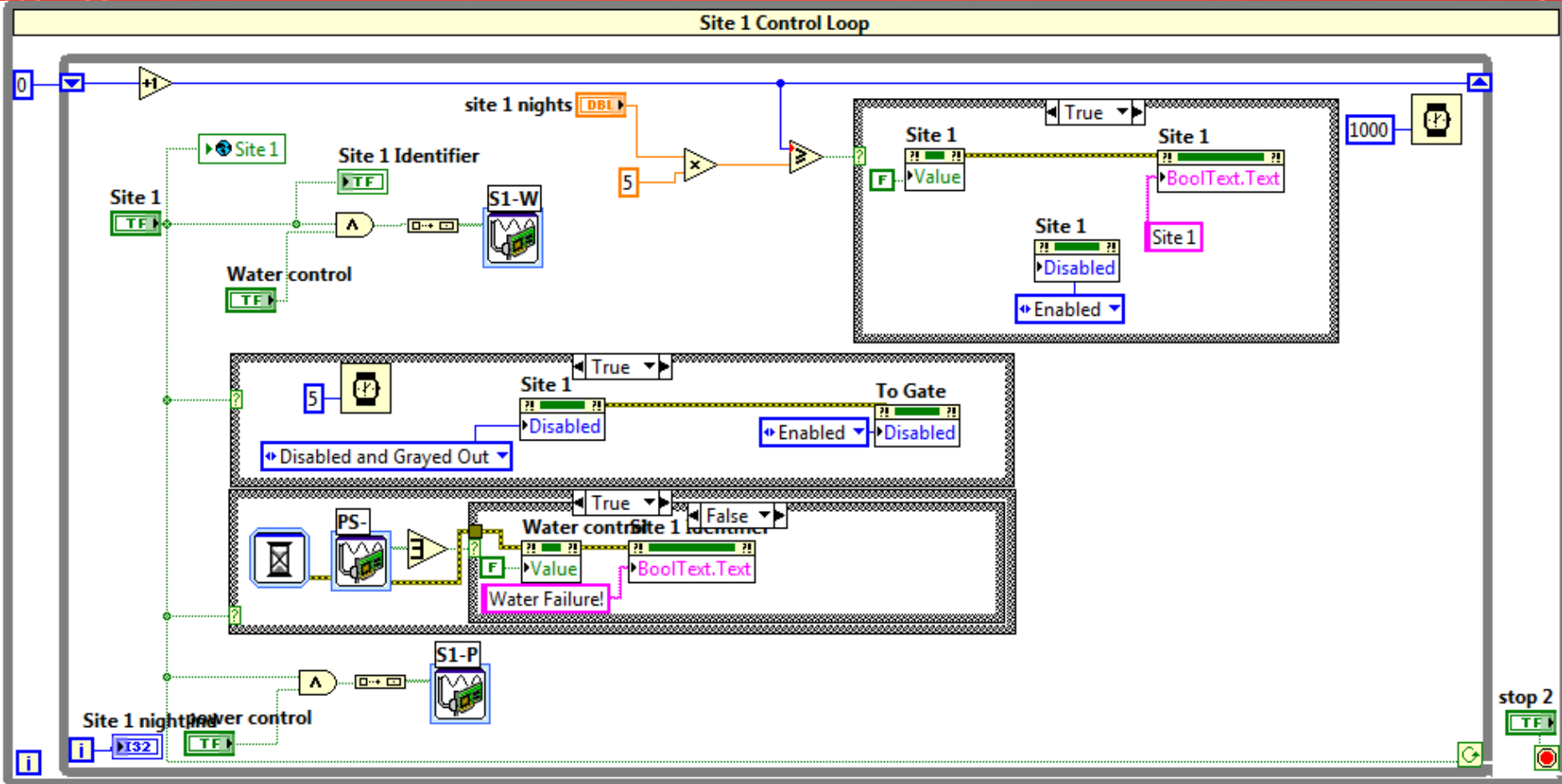
TIMEOUT OPERATION

- Allows system to reset user input after period of customer inactivity



GATE CODE VERIFICATION

Gate Key Code is entered and verified in this loop



SITE CONTROL

- Controls operation and feedback of site

CREDIT CARD PROCESSING

- Card Reading Steps
 - Tracks are read
 - Separated into pertinent information
 - Sent to ASP.NET program and manipulated by stripe.com
 - Confirmation sent to Quick Camp
- Error checking handled in LabView

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;Program MagTek USB Magnesafe Mini to read as a Keyboard Emulator
;Dakota Roberson
;Modified 3/20/2013
;EE4820 - 01 Senior Design

;Get the device's firmware number
0000 ; command to get the device's firmware number
delay 5 ; wait for 5 seconds

02 ; reset
delay 5 ; wait for four seconds

; English (United States) Keyboard Translation
AUTOLENGTH=TRUE
01 10 01 ; change to keyboard mode
02 ; reset
DELAY 5 ; Allow reset to complete

04 31 1E 00 ; 1 2 31 1 sets values for encryption in keyboard mode
04 32 1F 00 ; 2 3 32 2
04 33 20 00 ; 3 4 33 3
04 34 21 00 ; 4 5 34 4
04 35 22 00 ; 5 6 35 5
04 36 23 00 ; 6 7 36 6
04 37 24 00 ; 7 8 37 7
04 38 25 00 ; 8 9 38 8
04 39 26 00 ; 9 10 39 9

05 ; saves values to memory
01 11 01 ; set active map to custom
02 ; reset
DELAY 5 ; wait for 5 seconds

; total configuration time just over 20 seconds
; reconfigure device

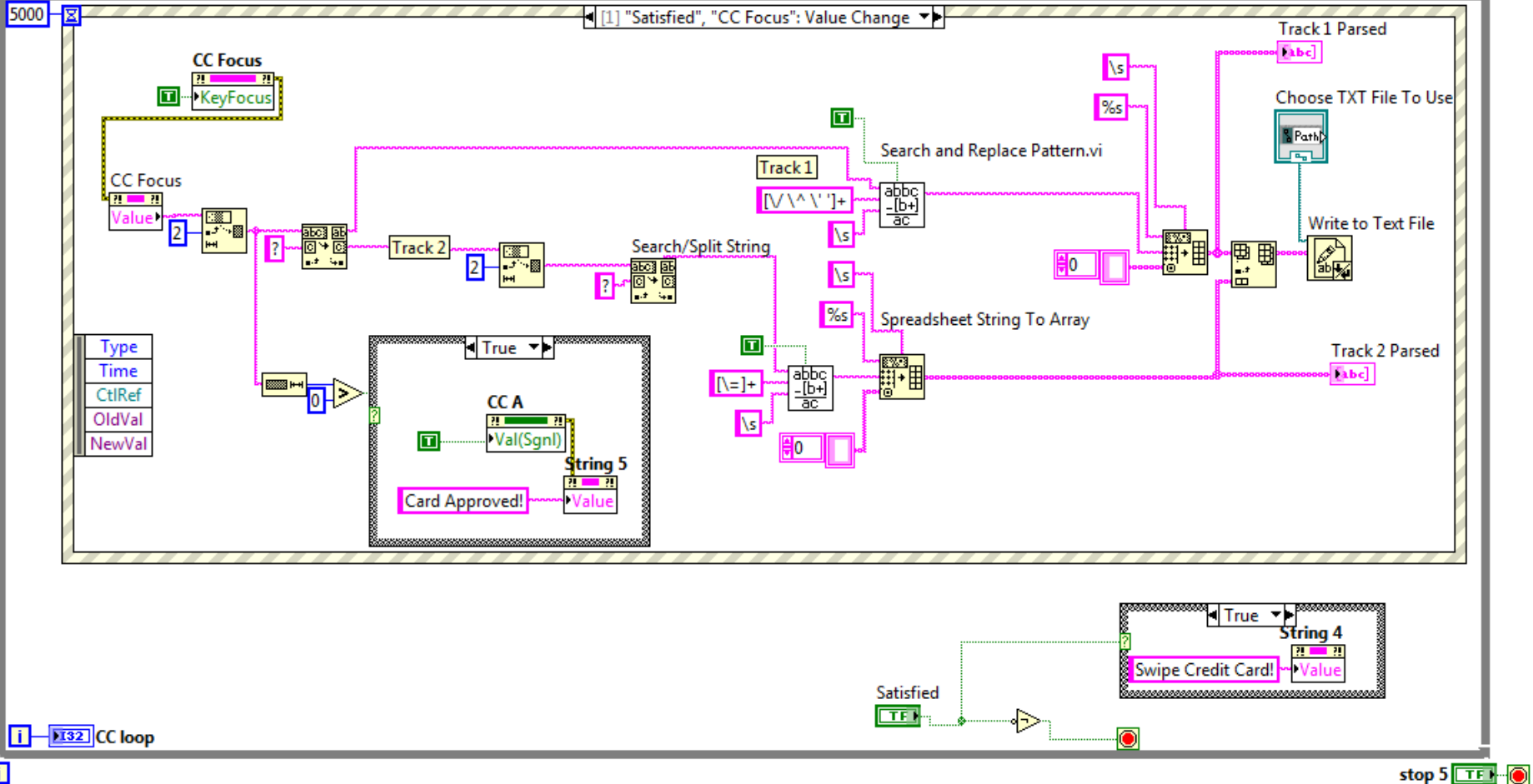
[0001]
Name=HID\SRkeyboardEmu ;device name in hex 0001
MagnePrint=No
Encrypted=No
Clear=No
Insert=No
Keyboard=Yes ; mod to allow keyboard for hex 0001
Sequence=No
[0002]
Name=HID\SRvendef ; device name in hex 0002
MagnePrint=No
Encrypted=No
Clear=No
Insert=No
Keyboard=No ; disallow keyboard w/out hex = 0001
Sequence=No
[0003]
Name=InsertRdr ;when hex 0003 insert reader
MagnePrint=No
Encrypted=No
Clear=No
Insert=Yes
Keyboard=No
Sequence=No
[0009]
Name=MagnePrint ;hex 0009 not encrypted magprint
MagnePrint=Yes
Encrypted=No
Clear=No
Insert=No
Keyboard=No
Sequence=Yes
[000E]

```

CREDIT CARD PROCESSING

- Modifications to original source code to properly interface w/ LabView

Credit Card Processing Loop



CREDIT CARD PROCESSING

- Takes input of credit card string & processes it

DIGITAL I/O & HARDWARE INTERACTION

- NI6509
 - Input/Output lines are pulled low by default
 - LabView used to configure specific ports as necessary
 - Ports control gate, pressure sensors, water valves, power relays
- Gate operation will be handled by 3rd party

OTHER CONSIDERATIONS

- Time Considerations

- Tasks unfinished due to time constraints:

- Individual site sensors
 - Acquiring an account with stripe.com

- Monetary Considerations

- Demo system and future system differ in parts selection
 - Final implementation will require industrial PC or equivalent

OTHER CONSIDERATIONS

- Programming Adjustments
 - Limit number of gate access code attempts before lockout
 - Add additional confirmation before processing user credit card
 - Small glitches/logistics cleanup

CONCLUSION

- Project meets primary goals required by design contract and client request
- Client satisfied with preliminary product
- Demonstration operates appropriately on PC, and designers are confident that deployment with industrial PC will be nearly seamless

QUESTIONS

