Product Specification And Subassembly Report

Easy Life Co.

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1. Product Definition

Easy Life Panel provides a platform for disabled and elderly people to get their basic shopping needs easily and helps them to reach some crucial contacts such as ambulance and fire-fighter. By this panel, people will be able to order frequently used goods from the dealers without any computer knowledge and internet connection. Easy Life Panel basically includes a touch-screen display, a mini PC and a GSM/GPS module. There is a Java run time environment that runs the software on the mini PC. All the shopping system, frequently used goods and emergency contacts are already defined in the software. This software has a user friendly interface that allows customers to prepare their shopping orders through the already defined goods and to reach the emergency contacts. The GSM/GPS module of the Easy Life Panel processes all the information prepared by the software and takes action. It either sends the customer's shopping cart to the dealer or sends emergency signal to the authorities via the base station using EDGE/3G infrastructure.

Easy Shop Panel also includes a Braille alphabet keypad and a loudspeaker in order to make the usage easier for elderly and blind people.

2. Operations and functions of the product:

2.1. Functions of the Product:

Easy Shop Panel basically provides 2 main functions.

2.1.1 Shopping:

The fundamental function of Easy Life Panel is its shopping system. Most frequently used goods by the target group are grouped under these categories:

- Meat & Meat Products
- Drinks
- Charcuterie
- Fruit & Vegetables
- Bakery
- Detergents & Personal Care
- Legumes & Oil
- Water

These categories are defined in the software. There are offerings from one brand for each product listed under each category.

2.1.2 Emergency Call:

Easy Life Panel also includes necessary contact information to reach emergency authorities in an emergent case. The customer can use this function to call an ambulance or fire fighter.

2.2 System Block Diagram:

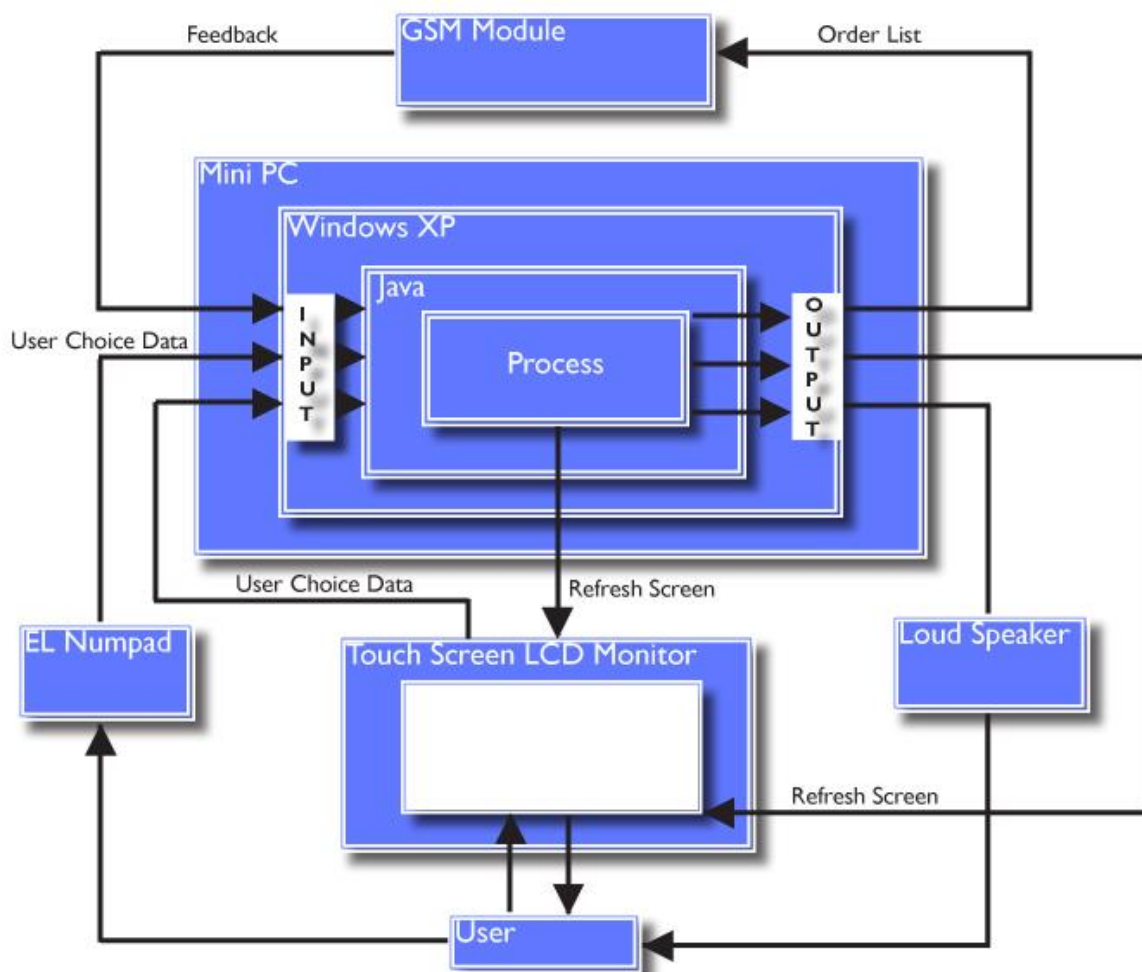Easy Life system block diagram is given in figure 1.

Figure 1: System Block Diagram

2.2.1 Operation of the system:

The Mini PC runs a Java software that holds all the systems functions and information. The mini processor reflects the interface on the screen. The user makes his/her choice on the software by using the numpad or touch-screen to control it. Braille alphabet numpad helps blind people to control the software, whereas the loudspeaker sounds each option and selection to help elderly people who have difficulties to see the screen. According to the user choices, the software creates a request that is a shopping order or emergency call. The java program on the mini processor processes this information and transforms it into a fax data. This fax data is transmitted to the GSM/GPS module through the USB serial port. GPS/GSM module includes a SIM card in it, so when it receives a fax data, it can pass this data to the nearest base station of the telecommunication service provider. This fax data is to be sent to the fax number of the shopping dealer or emergency contact. This flow is shown in figure 1 system block diagram as above.
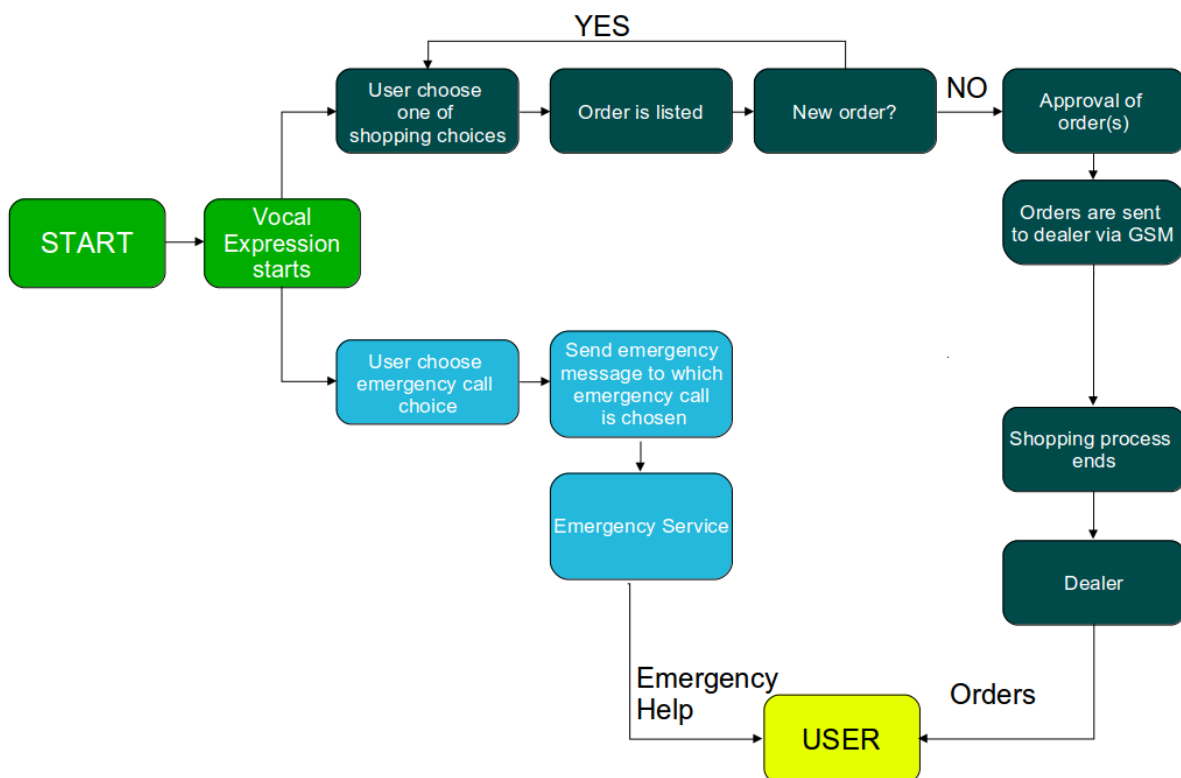
2.2.2 Flow Chart of the System:

Figure 2: Flowchart of the Work Principle of Easy Life Panel

Work Principle of the Software:

Working principle of software of the product is given at Figure-2. Process of Product starts with User's "START" command by using ON/OFF button. Then software of the product starts the process and vocal expression starts with the process. User interface of the program starts at the Touch-screen monitor. User has 2 main types of choices, one is shopping options and the other is emergency call options. If user chooses one of shopping options, the shopping list of a product category which is chosen by user. For example, user chooses "Meat and Meat Products", a list of products will be given to the user. This list will list main products of that category. After user chooses one product, program add that product to the list and waits for another shopping choice. If user chooses another category, shopping process continue until the user finishes shopping and approving/accepting the order list. After order list is approved, an order list will be generated by the software. This order list contains a header part and order part. In header part, information of user (ID, Address, what type of physical handicap he/she has) is added by the software. These information will be added to Easy Life Panel when user gets the Easy Life Panel from Easy Life Co. In the order part, the orders of the user lists. If user directly chooses emergency call options list of emergency calls will be occured and if user chooses one of them, Easy Life Panel directly send emergency call to the service which is selected.

Identification of user to system:

Each new user should be recorded in the system when they buy the Easy Life Panel. Information should be kept: name, surname, date of birth, address, contact number, disability, blood type, chronic diseases, and contact information of a relative.

Getting the orders from user:

User will select for her/his needs from the menu in the panel.

Delivering the order to concerning dealer:

This module gets the order information from program at mini-pc and forwards orders to the dealers by SMS and/or Fax. Java runtime program generates a text file, which includes order list and location information of the user. By using GSM part of the module text file will be sent to dealer.

3.Product Specifications:

Figure 3: Main Parts of the Easy Life Panel

3.1 Brief Description of the Components:

3.1.1 Mini PC

Mini-Computer part is the main part of the product. In this part, a linux distro will be operated. By using linux distribution, java program which will be used for both main program and user interface of the product. Mini-computer will be controlled by both numpad and touch screen (optionally). User interface will be optimized for touch screen drivers. Mini-computer will only include basic parts to be able to run Linux Distribution, Java, USB connection.

- Using a Mini PC will helps us to get a higher performance and prevent heating problem since it consumes less power.

- In Mini PC, we will use a very basic linux distro, java environment and will process very simple applications. Therefore, the CPU should have around 1-1,66 Ghz of speed.

- In order to provide connection with the monitor, numpad and GPS module, it must have USB and RGB output ports.

3.1.2 Monitor

- A bright and thin LCD monitor, which will be mounted on the operating hardware part, will be used.

- The monitor is thought to be a 15 inch monitor for convenience of elderly people. And to obtain a good view of user-interface and we have 800x600 resolutions for the "best" display.

- In order to make usage easier and eliminate the need for a mouse, the monitor will be a touch screen. The reaction time should be around 10 milliseconds. The touch screen should be sealed to resist dirt, dust and splashes.

- In order to connect this display to the mini-PC component, the monitor should have a RGB or USB input port.

3.1.3 Numpad

Numpad is for people who cannot use touch screen monitor or people who are visually impaired.

- For visually disabled people's usage, numpad will be modified with embossing stickers, which are prepared in Braille Alphabet.

- Numpad will be connected through USB port to the Mini-PC of the product.

- All of the buttons will be as easy as possible for usage of older and disabled people. Control buttons must be in a logical and reasonable placement with relatively large font sizes. To increase the convenience for visually impaired people, the numpad should be placed horizontally.

- The buttons that can be operated by pressing non-stop should be avoided for the convenience of elderly people. In addition, roll buttons should be avoided and

all controls must require one button press. Preventing non-stop operation means, any button of numpad will process 1 time when it's pressed, it's no continuous operation until another button is pressed. This operation is done in most of keyboards, numpads and other devices working by buttons. Since the coding of keyboard will be done by us, this operation will be added in order to prevent non-stop button operations.

- Numpad is modified by Braile alphabet and only numbers are used on numpad in order to provide simplicity. While user starts operation, user-interface will start a vocal expression and express the situation of user on process. For example, product says:"Press 1 for meat and frozen foods, or press 0 complete order."

3.1.4 Loudspeaker

Basic loudspeaker will help user to command the program. The main reason to use a loudspeaker is helping visually impaired people. Sound system will repeat all of the actions, which are made by user and the program. So, user can follow the process of shopping. This system also helps older people, who cannot use monitor and numpad, to follow the process.

- Having an output power for 60-70 dB is enough for a good sound level.

3.1.5 GSM GPS Module + External SIM Card

This module gets the order information from program at mini-pc and forwards orders to the dealers by SMS and/or Fax. Java runtime program generates a text file, which includes order list and location information of the user. By using GSM part of the module text file will be sent to dealer.

- The size of this module must be small enough to be mounted inside the mini PC used.

- Updates are necessary especially for price and good changes. Updates will be provided by the company. Easy Life device will check once a week whether there is an update or not. If there is an update, the device will get all necessary information via GSM infrastructure and update itself

3.2 Product Block Diagram:

Figure 4: Product Block Diagram

3.3 Operating Modes

3.3.1. ON mode: will be used when the user wants to order something, ON mode is controlled by the user with one simple button.

3.3.2. OFF mode: will be used when our product is not in use, OFF mode is controlled by the user. When the user wants the system to be closed, user make system off by a switch.

3.3.3. STANDBY mode: when the system is not used for a definite time like 15 minutes, system will be automatically turn to standby mode in order to save battery usage. The time interval to pass STANDBY mode will be again user defined, production setting is calibrated to 15 minutes. In standby mode, search will take place from time to time.

3.4 Interfaces of the product

3.4.1 Human Interface: Controlling ON/OFF Button, LCD Screen, Loudspeaker, Numpad which is modified by Braile Alphabet, Touch-Screen.

3.4.2 Software Interface: The software will be based on Java Runtime Environment 1.6.0.17 in order to achieve user interface. Python will be used in order to control GSM Module. The design of the software interface is to as follows in figure 5.

Figure 5: User Software Interface of Easy Life Panel

3.4.3 Electronically and Mechanical Interface: Product has conventional parts in order to establish mechanical structure. These conventional parts are given at Components of the Product. Monitor has touch screen aspect and it has a very short response time. Mini-pc is main part of the product. In this part, user interface software program, a linux distro are used. Also controls orders which are get from user, and send these orders by a USB Connection to GSM Module.
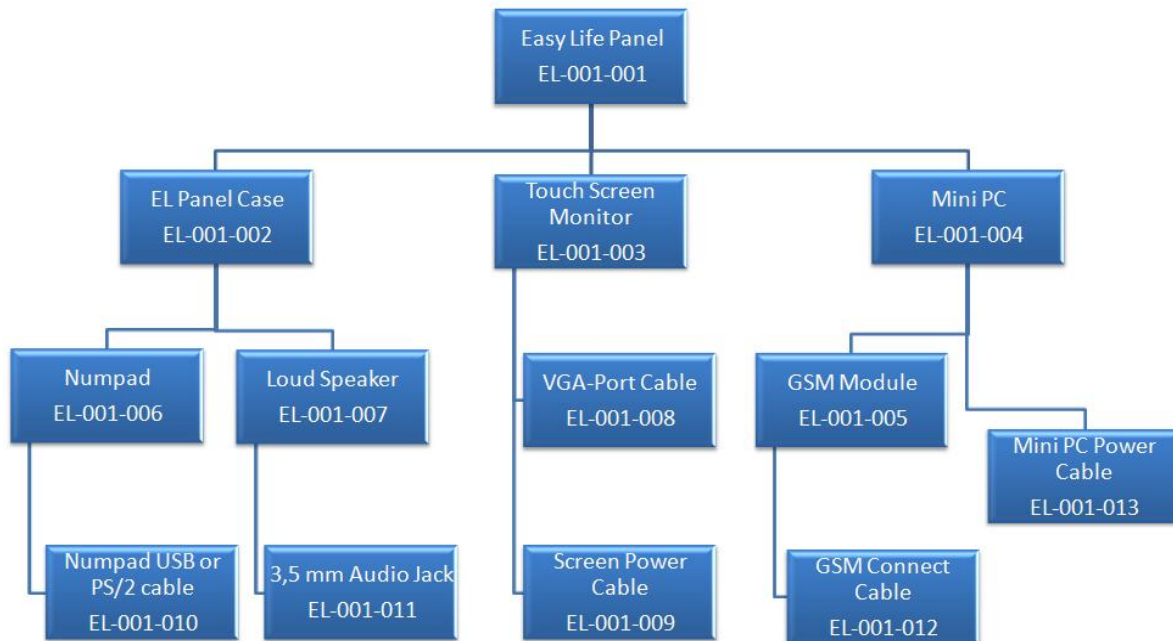
3.5 Product Tree:

Figure 6. Product Tree of Easy Life Panel

4. Subassembly Specifications

Components of the Product

4.1 Fixed Parts

    4.1.1 Screen

    4.1.2. Mini PC

    4.1.3. GSM GPS Module + External SIM Card

4.2 Optional Parts

    4.2.1. Numpad

    4.2.2. Loudspeaker

4.3 Software

SUBASSEMBLY SPECIFICATIONS

4.1.1 Screen Specifications

Working Voltage	DC 11.5V-13V
Working Temperature	0~60
Input configuration	1*VGA (AV/TV/DVI optional)
Screen size	15 inches (4:3 diagonal)
Display case(cm)	38X30.8X5
Resolutions	1024(H)×768(V) pixel
Brightness	400cd/ m2
Contrast	550:1
Electronic consumption	20W
Touch screen	4-wire resistive USB2.0
Visual angle	up/down 65-60Deg /---left/right 70-70Deg
Reaction time touch-panel (ms)	<10
Surface hardness	3H

Full Touch Function

Stand Optional

VGA Port

The Highest Resolution is to 1920×1200

Operation System is Windows, Linux, Apple MAC OSX

4.1.2 Mini PC Specifications

Features

VIA C7-M+VX855 is compatible with popular operation system and software.

HDMI output: support up to 720P/1080P

Supports HD media file

Supports LAN/WIFI

Built-in 3in1 card reader, support SD/MMC/MS memory card

Included 4 USB ports 2.0,

Included coaxial output

Specification

VIA C7-M + VX855

1G DDR2 (2G DDR2 as optional)

Built-in 2.5 160G SATA HDD

Included SD/MMC/MS card reader

4 USB HOST: USB 2.0 (2 on front and back panels)

Interface

HDMI, VGA

Network

10/100M RJ45

Built-in Wi-Fi 802.11b/g (optional)

Audio

Front panel: headphone, mic

Back panel: right/left channel, coaxial

Button and Indicator LED

Power ON/OFF, HDD indicator, Network indicator, Remote receiver

4.1.3 GSM GPS Module

Power Supply	3.4 to 4.2 Vdc
Physical	SIM interface 1.8V / 3V available
Antanna	RF Connector, External Antenna PAD
Operating Temperature	-20°C to 60°C
Dimension(mm)	44.5mm × 31.6mm × 3mm
Weight (g)	9.5g
Software	AT command Meet GSM 07.07
	SIM application toolkit Support SAT Class 3,

GSM R98, R99 Launch Browser supported.

Firmware update Download over USB

SMS	Point to point MT and MO
	Cell broadcast
FAX service	Direction : MO Call & MT Call
	Fax GSM TS3.45 fax transparent mode
	TS 61,62
	Transmission speed rate : 2400, 4800, 7200, 9600bps

Optional Parts

4.2.1 Numpad

19-key USB numeric keypad

Extra Backspace key

Plug-and-play

Come with extra usb2 port hub

Slim, compact and lightweight

Perfect for your notebook data entry

White box packaging

numeric keyboard

4.2.2 Loudspeaker

Lithium battery inside, USB power or recharge.

Dimension: W66.4xH65xD67mm

R.M.S: 1.5W x 2

Unit driver: 1.5" x 2

4.3 Software

Software part consists of two modules which are user interface and logic part. User interface conveys the information from touch screen to the logic part. On the other side, logic part will get the information as types of goods and their quantity from user via user interface and will produce a stream consists of this order information for the GSM module. On development level Java technologies will be used with JDK 6 update 17 and produced Java code will run on JRE 6 update 17. The software will be written on Netbeans IDE. Current interface language is Turkish but there will be language options in the future.

Touchscreen Driver

↓

User Interface

↓

Logic

↓

GSM Module Driver
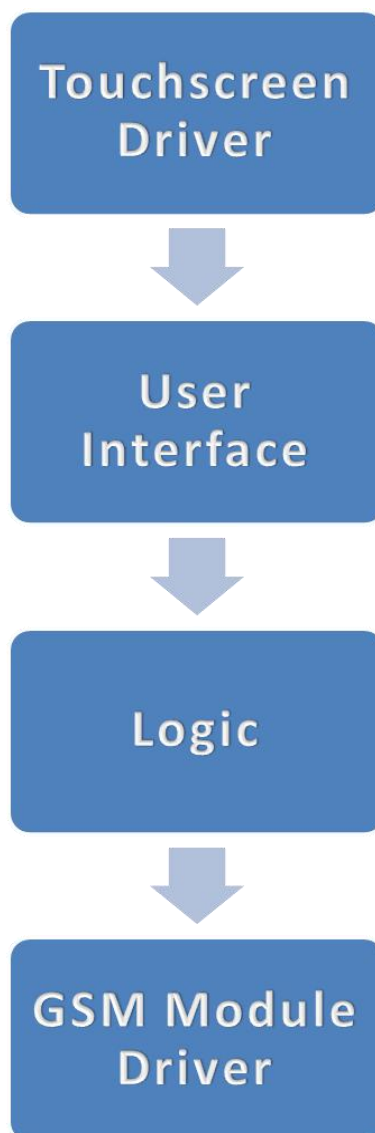
Touchscreen Driver: This module interprets the physical movements on the touchscreen into coordinates of the viewport of the software. Using those coordinates software will be able to determine the interacted interface components.

User Interface: Using the coordinates from touchscreen, the system will be able to provide visual feedback as a button click animation and vocal feedback for clicked button and follow up choices.

Logic: This module will interpret the interface interactions into orders. For example the number three from quantity component and the click event of bread button will be interpreted as three breads order. Also this module will prepare the order data to be sent to the GSM module.

GSM Module Driver: This module is a mediator between GSM module and Logic module. The data coming from Logic module will be properly conveyed to the GSM module.