Redundancy in Tallyman systems

– this section is intended to be read in conjunction with the Introduction

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Contents

1.0 Introduction

Within the studio environment there is often call for redundancy within critical systems such as the Tallyman controller. The varying degrees of redundancy available with the Tallyman system are outlined in this section.

Tallyman offers 3 levels of redundancy from dual redundant hot swappable power supplies to a complete backup system and monitoring solution.

This section assumes that the main introduction of this manual has been read.

2.0 Dual redundant power supplies

The simplest form of redundancy in Tallyman is the implementation of a unit with dual redundant power supplies. To meet this requirement TSL has two system controllers, the TM2+ and the TMC.

Details on the exact specification of these units can be found on the TSL website here:

http://www.tsl.co.uk/products.aspx

3.0 Using a second TMx as backup

This feature allows a backup TallyMan; this unit must be the same model as the main unit e.g. a pair of TM1s or a pair of TM2s etc, to shadow the main unit.

All GPI/O and serial connections must be paralleled to a switchable hub this can be a manual switch or an automated GPI controlled switch if the Watchman system is in place.

In the event of a failure of the main unit, the backup unit will continue to show the current tally and router state etc.

The backup unit may also be interrogated via the usual System Interface.

When an ESP-1R+ is present in the system this must also be duplicated, the backup ESP-1R+ must have the next sequential IP address after it's main counterpart, i.e. if the main ESP-1R+ has IP address 10.0.0.221 the backup **must** have IP address 10.0.0.222. When a configuration file is written to the Tallyman with a redundant backup system and an ESP-1R+ tallyman will automatically add this IP+1 ESP-1R+ to the backup system without the user adding it in the configuration file in any way.

Notes

This facility is available from TallyMan versions 1.55.

Warning: It is the responsibility of the user to ensure that the Backup unit is working correctly. The Backup unit is intended to provide a backup for the Main unit but equally the Backup unit could fail. The system should be designed so that the outputs from both the Main and Backup controllers are monitored.

The Backup unit should have its own connections to the Mixer, Router etc.

To set the Backup Unit as active, de-power or disconnect the main unit. It is possible to change the configuration directly on the backup unit but it will be overridden when the main unit returns to the system.

The main unit may also be shut down when online by selecting **Comms > Shutdown System**.

The backup unit is 100% mirrored, and any label may be edited when this system is the active system.

From TallyMan V1.59, there is the option of presetting the connection details of a number of TMx's, in the Connect dialogue box.

Program two entries, one for the Default Interface on the main TMx and one for the Backup Interface on the Backup TMx

Either unit can always be accessed regardless of what file is currently loaded.

3.1 Setting up the two TMx units

Both Tallyman units must be running the same version of Tallyman and Version 1.55 or higher.

<u>For the unit that is to be declared the backup unit</u>

Connect serially via a terminal program, such as HyperTerminal or TeraTerm Pro, to set the unit as Redundant Backup and give it an appropriate IP address.
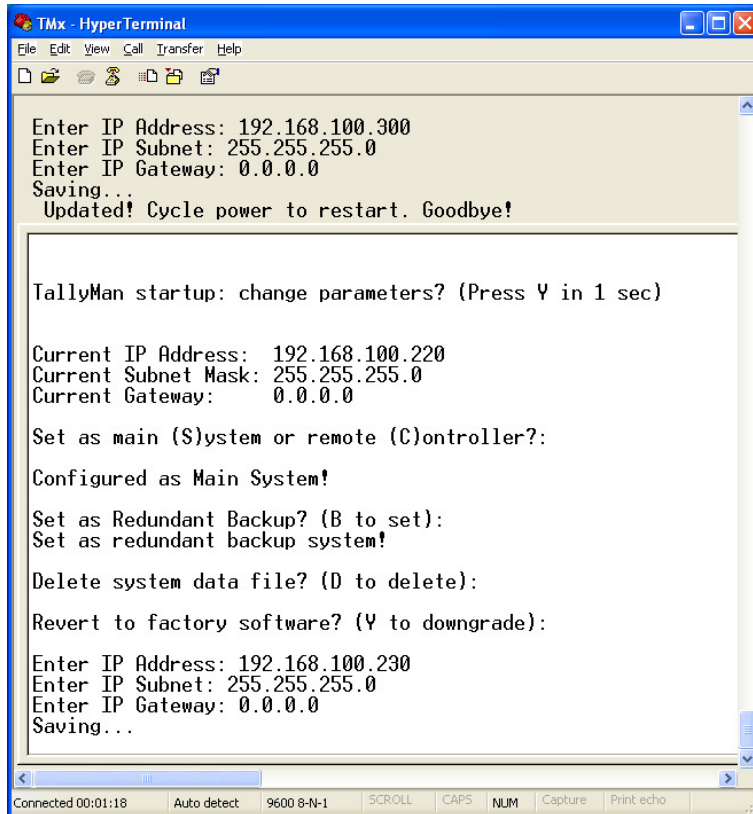

F<small>IG</small>.1

It is seen that this unit has been set as a Redundant Backup system with the IP address as 192.168.100.230. The Subnet mask is 255.255.255.0

Note: The last valid IP Address in this range that may be used is 192.168.100.254.

To go to the next menu item just press **Enter** on the PC's keyboard. The current TallyMan settings will then remain unchanged if no changes are made.
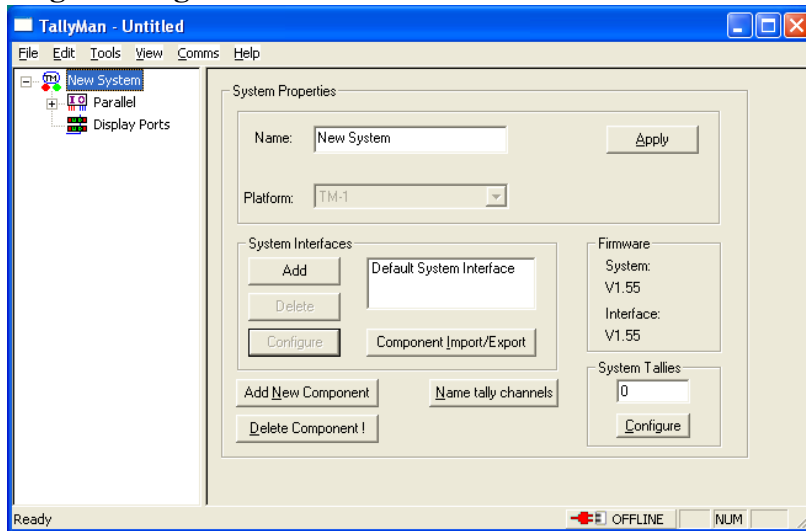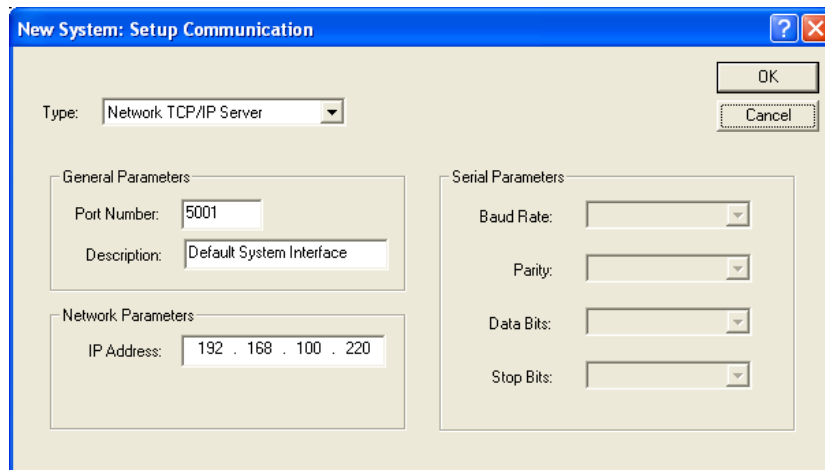
3.2 Entering the Program Parameters

Fig.2

Fig.3

Adding the Backup TallyMan unit
• Select **Add New Component**
• Select **System Controller**
• Set as **Redundant Backup System**
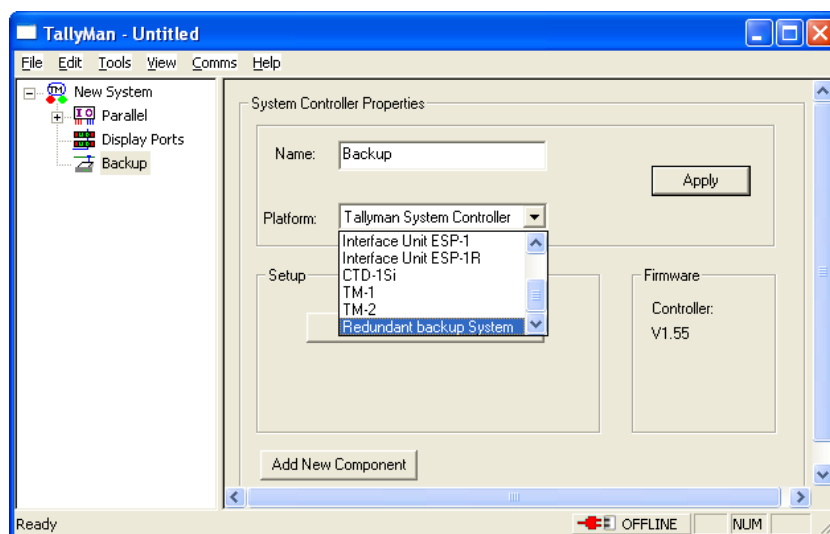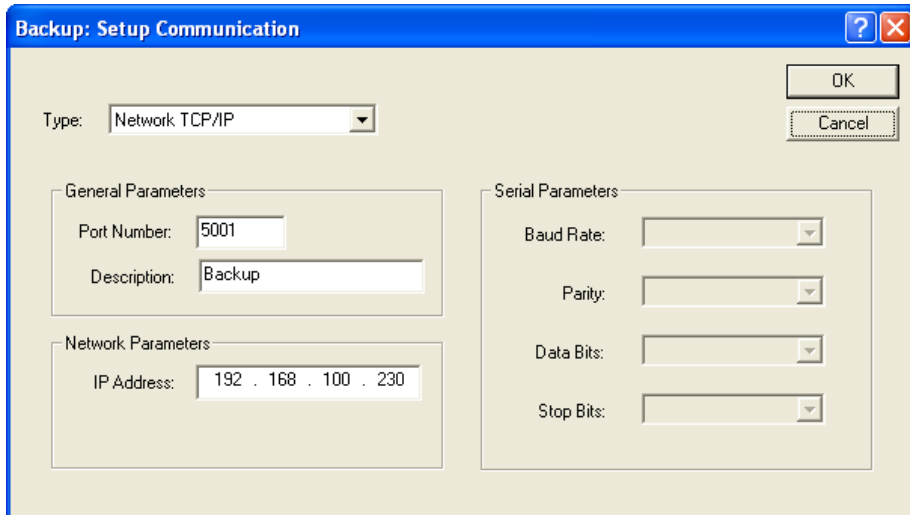

Fig.4

Fig.5

Set the **Port Number** to the main system **Port Number** which is 5001

3.3   Setting an additional System Interface

This needs to be done where the Backup unit needs to be read when the Main Unit is connected.
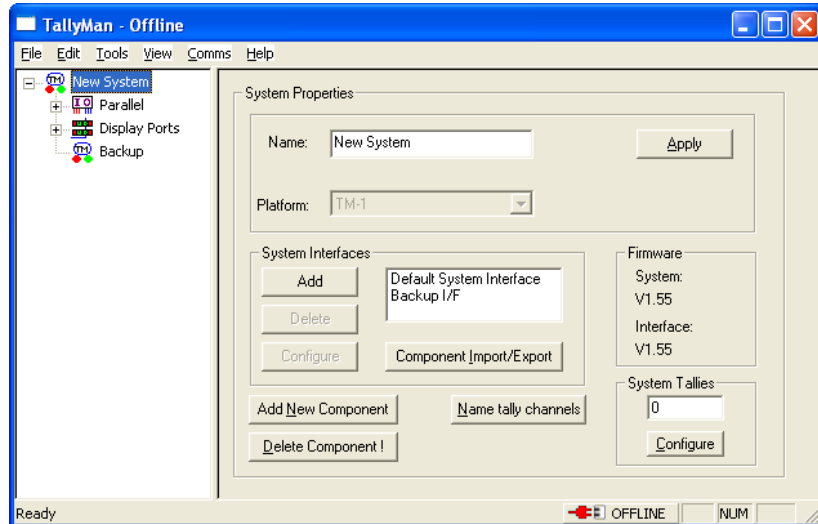

Fig.6

- Press **Add**
- Enter the parameters into the boxes. Set a different **Port Number** to that of the main unit. However, the IP address <u>must</u> be the same as the main unit
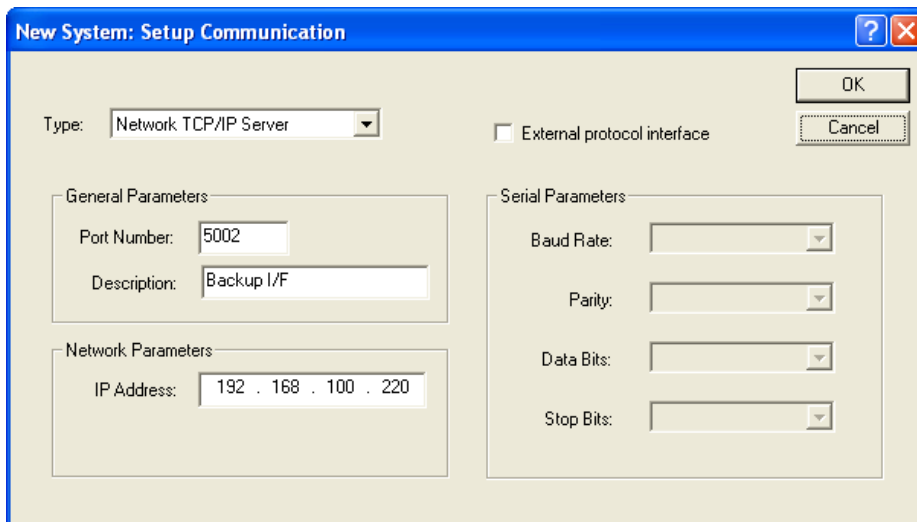- **Configure** will allow the reviewing of these settings

Fig.7

3.4   Reading the setup in the backup unit

It is possible to read only the configuration in the Backup unit when the Master Unit is On-Line.

To do this, the **Network Parameters** must be set so that the IP Address matches that of the Backup unit.
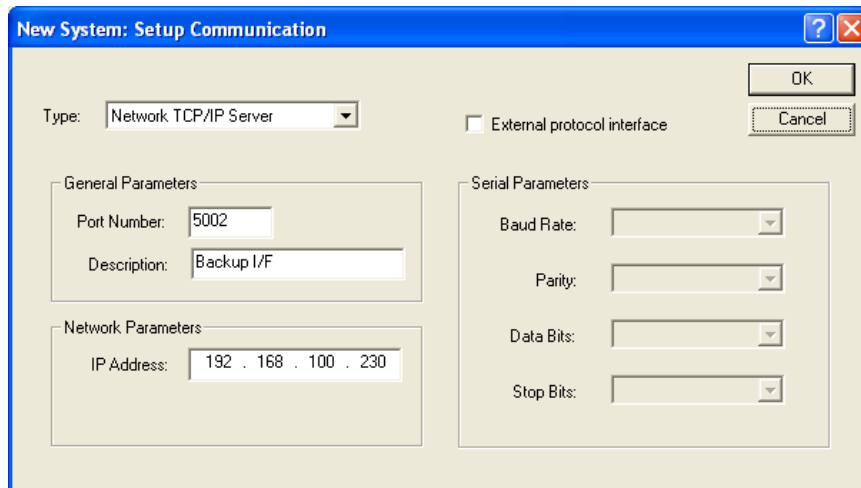

Fig.8

Connect to the Backup unit
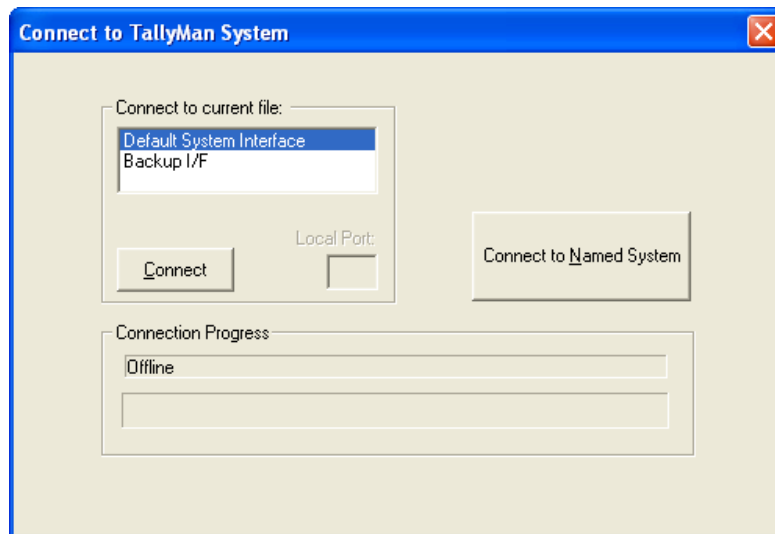
Fig.9

The view will be a mirror image of the main unit with no Backup Controller shown as it cannot see itself.

When connected to the Backup Controller, you are seeing an exact mirror of the Main Controller, including the Default System Interface.

Consider the backup system as a standalone TallyMan system in its own right that happens to be talking to the main system on its default interface whenever the main system is running.

Fig.10

To reconnect to the main unit, reset the IP Address to that of the main unit.

Using the Backup Unit as a main unit in an emergency situation.
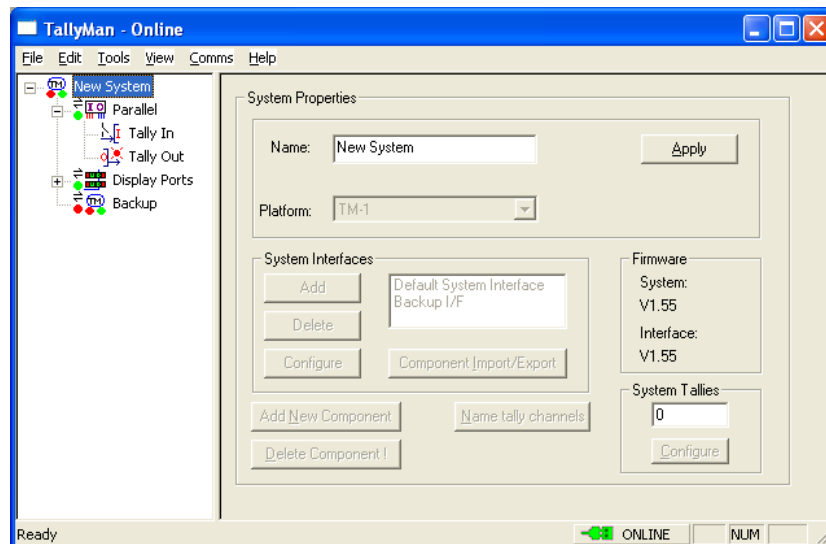
The Backup Unit is 100% mirrored but any label may be edited when this system is the active system.

Note: It is not possible to **Write** to the Backup unit when the Master Unit is connected as it has been set as a Backup unit via HyperTerminal.

However, to set the Backup Unit as active, de-power or disconnect the main unit. The main unit may also be shut down when online by selecting **Comms > Shutdown System.**

It is possible to change the configuration directly on the backup unit but it will be overridden when the main unit returns to the system.

To read/write to the Back Up unit when this is working in a stand-alone mode, use the Back Up unit's TCP/IP number and the Port No 5001

From TallyMan V1.59, there is the option of presetting the connection details of a number of TMx's, in the Connect dialogue box.

Program two entries, one for the Default System Interface on the main TMx and one for the Backup Interface on the Backup TMx.
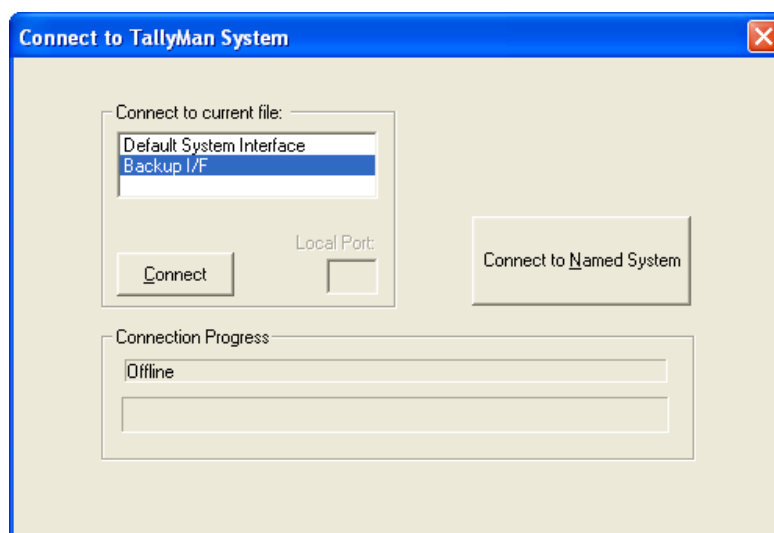
Fig.11

<u>Notes</u>

Either unit can always be accessed regardless of what file is currently loaded.

The Back Up always functions just like the Main. Assuming there is a spare system interface, you can always connect directly to the backup and change it's configuration e.g. labels etc.

If the Main controller is restarted, it will compare the Back Up config with its own. If they are not the same it will update and restart the Back Up so that it is the same as the Main controller.

4.0 Watchman

This Section is intended to be read in conjunction with Section 3, Watchman is an extension to the existing dual redundant system.

Watchman is a PC application that allows the main and backup systems to be switched automatically in the event of failure. Watchman presents the current status of the system to the user with the option to manually switch for maintenance etc.
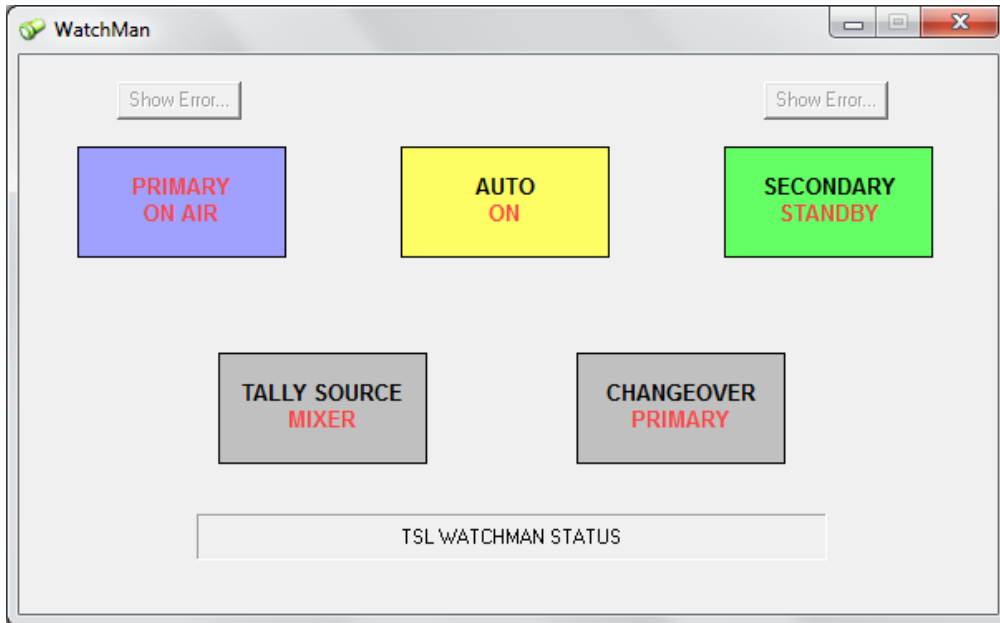

Fig.12

In the above we see the Watchman front screen indicating that both the Primary and Secondary Tallyman units are connected and that the Primary is currently "On Air" while the Secondary is on Standby.We also see that the Auto switching system is currently set to "On", in the event of a fault in thePrimary system Watchman will automatically switch to the Secondary.

This switching takes the form of GPI/O outputs from a dedicated ESP1-R+ expansion device equipped with Watchman firmware. **This device is required for the Watchman system to operate.**

To Switch between main and backup serial connections and GPI/O automatically, switches that may be activated by GPI are required. These must be purchased seperately, TSL does not currently provide these devices.

4.1 Setting up a Watchman system

To set up a dual redundant system with Watchman, initially set up the dual system as instructed in section 3. Configure the IP settings of the Watchman enabled ESP1-R+ device as you would a normal ESP1-R+, a manual describing this operation is available at:

www.tsl.co.uk/support_productmanuals.aspx

Add a system interface in the manner described in Section 3.3 in addition to the existing Default and Backup interfaces. Name this interface "Watchman" and assign it a unique port number.
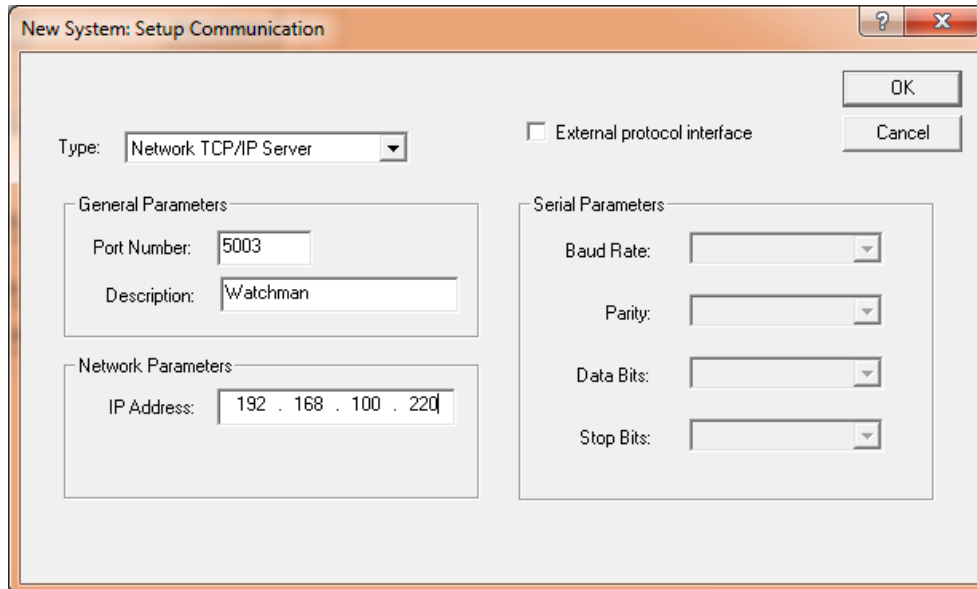

Fig.13
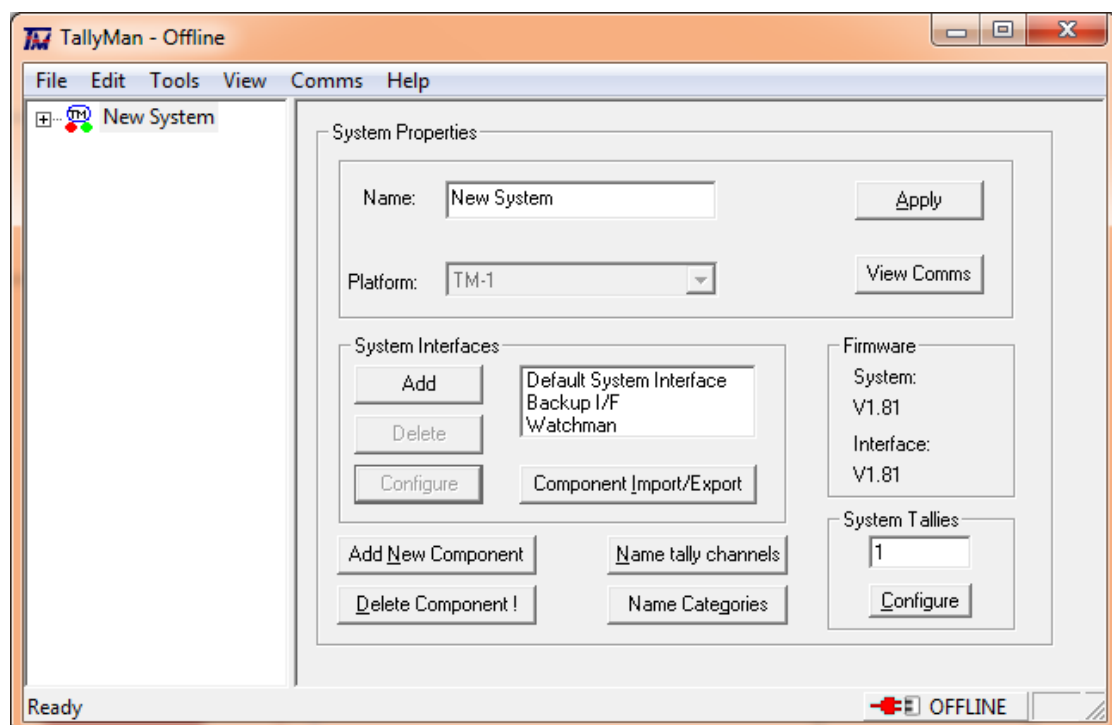
Fig.14

Start Watchmen.exe and you will see the main screen

Fig.15

Right Click on the title bar and select configure, you will see the below:

Fig.16

Enter the IP addresses of the connected devices ensuring that you enter the port number that corresponds to the Watchman interface in the Tallyman software. The ESP1-R+ is set to its default of 6231. Click OK and you will return to the main screen, Watchman will then attempt to establish communications with the devices.

4.2 Watchman Features
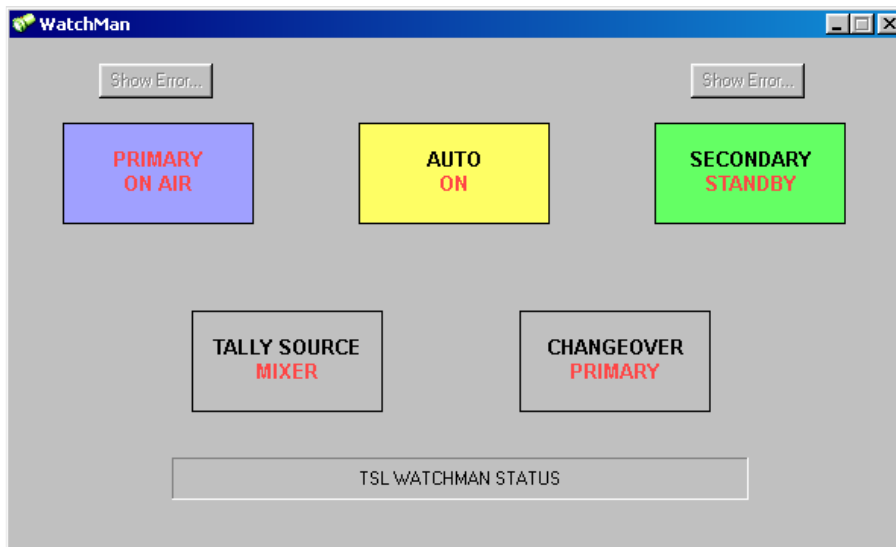
Fig.17

The front screen provides live system status information.

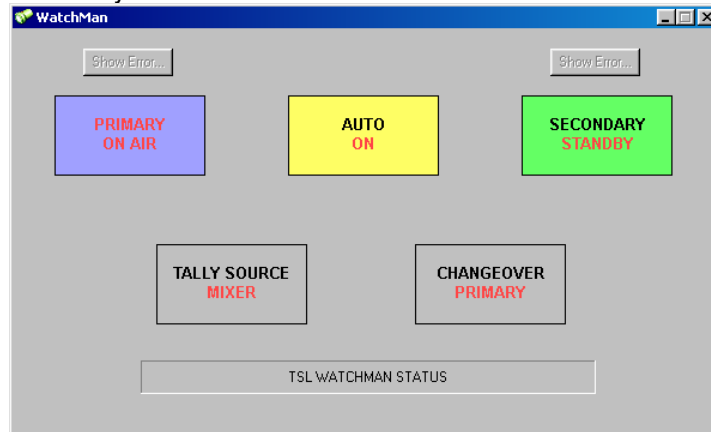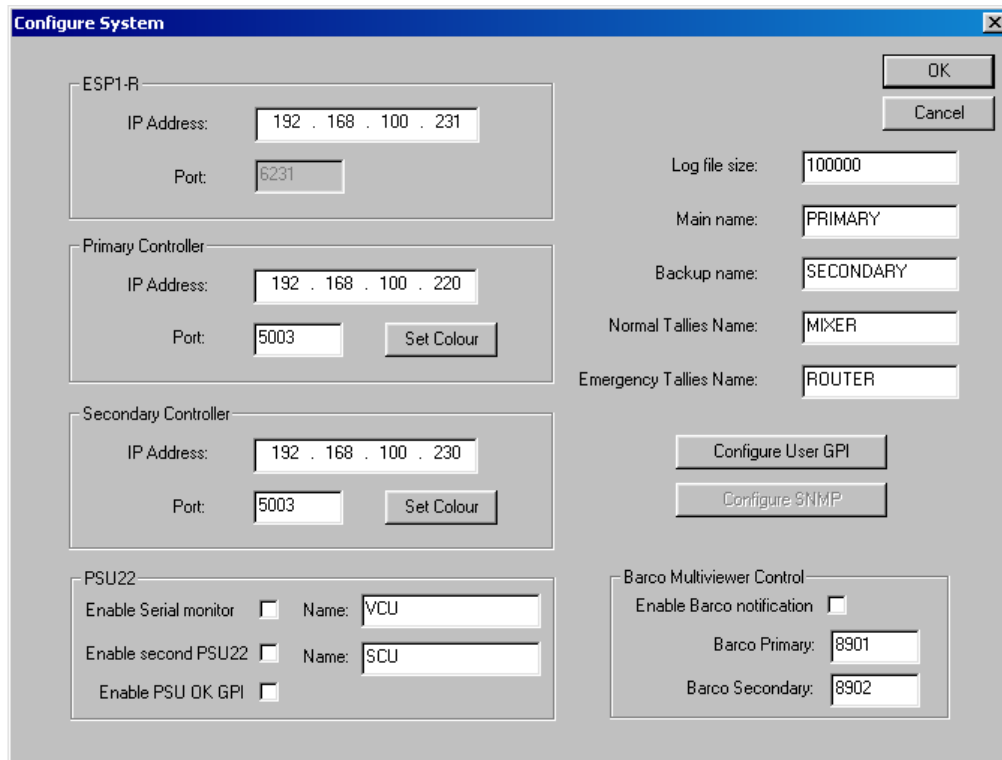In this screen we can see from the information on the buttons that both Tallyman units are active and the Primary is On Air. The currently on air unit can be switched by clicking the button of the unit you wish to bring on air. Automated switching in the case of an error can be toggled by clicking the "Auto" button.

Should an error occur with either unit, for example loss of comms with a connected device such as a router, the corresponding button will turn red and if Auto is enabled the system will switch over to the backup system automatically.

The "tally source" and "changeover" indicators are activated by conditions set in the configuration screen accessed by right clicking the title bar of the main screen.
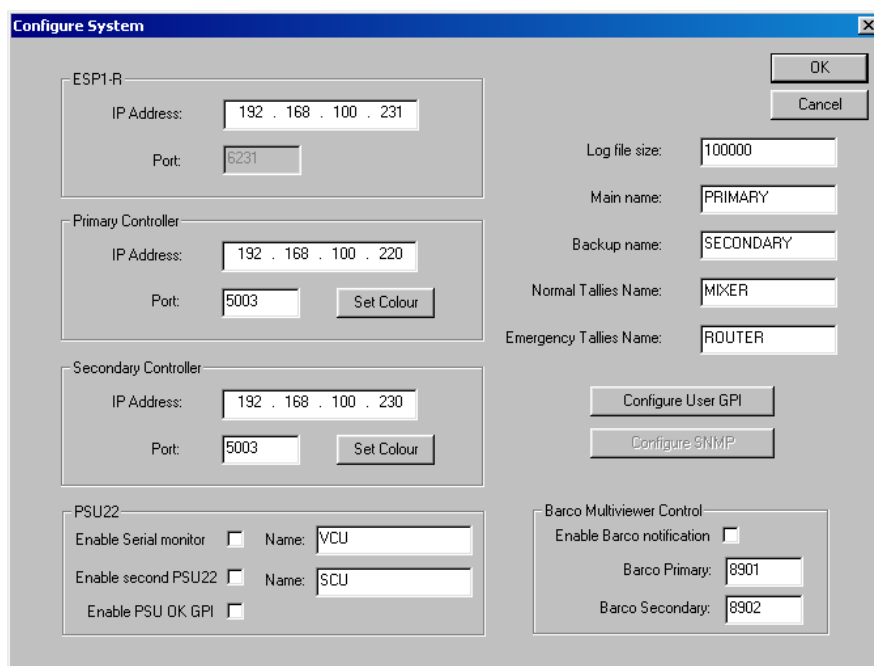
Fig.18

This is where the communications settings are entered, this includes the ESP1-R+ with Watchman firmware, two Tallyman units, user GPI and up to 2 PSU22 devices (these units have the ability to switch between two serial sources from the Tallyman units and can be switched by Watchman).
Clicking the "Configure User GPI button" will open the following screen

Fig.19

Here 8 incoming GPI may be assigned to display error messages on the Watchman screen including activating the "tally source" and "change over" indicators. The pin out is available in the next section "ESP-1R+ Pin Out and functions".

4.3 ESP-1R+ Pin Out and functions

An ESP-1R+ with Watchman firmware acts as the Watchman system's physical interface and thus the system can be controlled and monitored via GPI/O, **The Watchman application must be running on a PC on the network for this to operate**.

Inputs
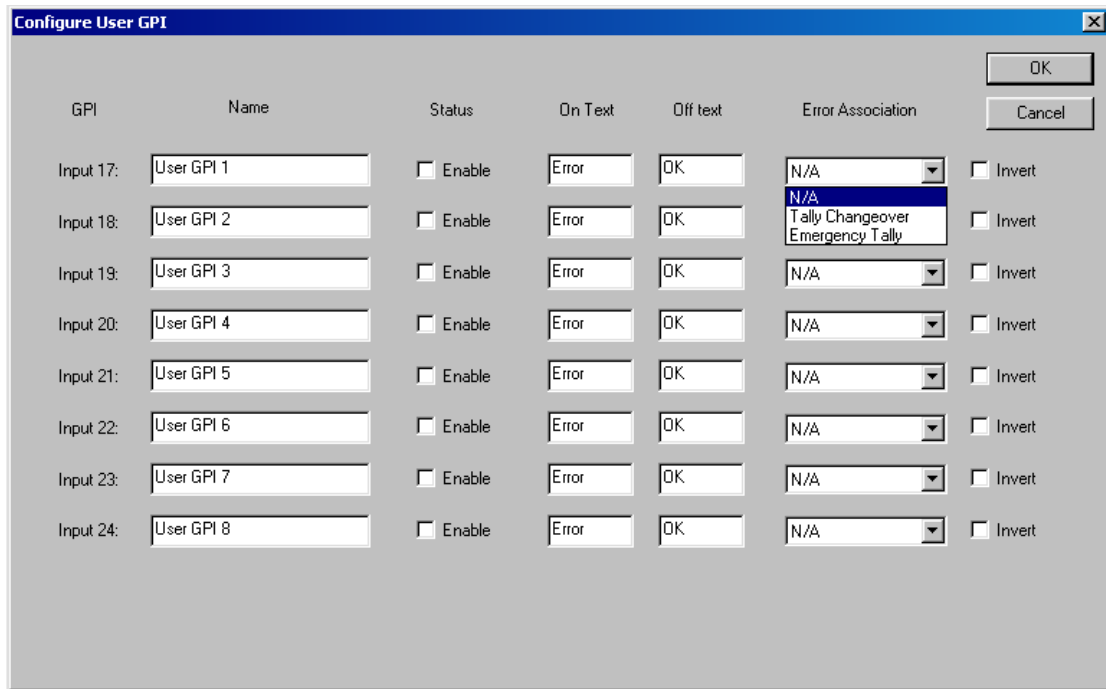
Tally	Function
9	Manually bring Main TM on air
10	Manually bring Backup TM on air
11	Toggle automated switching
17-24	User configurable GPI

Fig.20

Outputs

Tally	Function
1	Switching/Backup device 1
2	Switching/Backup device 2
3	Switching/Backup device 3
9	Main TM on air
10	Backup TM on air
11	Auto Switching "ON"
13	Error in Main TM
14	Error in Backup TM
15	Auto switching "OFF"

Fig.21

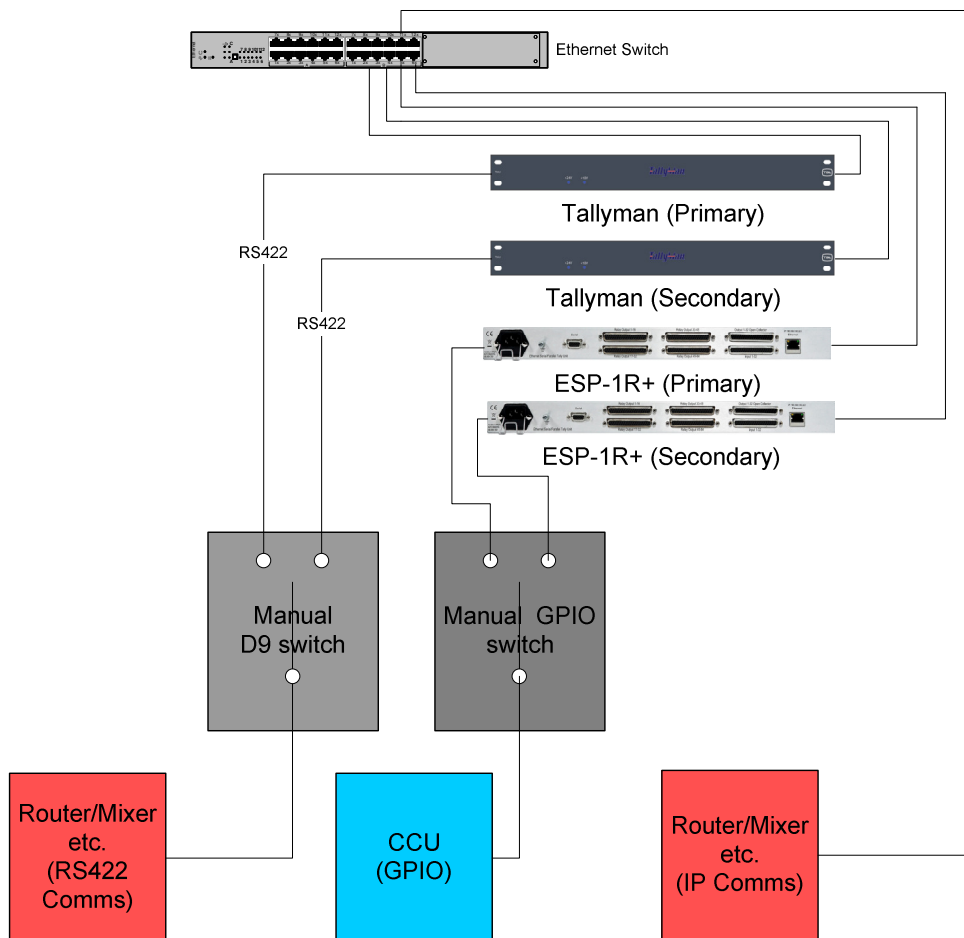| INPUT CONNECTOR D37 SOCKET			
Pin		**Pin**	
1	Tally 1	18	Tally 18
2	Tally 2	19	Tally 19
3	Tally 3	20	Tally 20
4	Tally 4	21	Tally 21
5	Tally 5	22	Tally 22
6	Tally 6	23	Tally 23
7	Tally 7	24	Tally 24
8	Tally 8	25	Tally 25
9	Tally 9	26	Tally 26
10	Tally 10	27	Tally 27
11	Tally 11	28	Tally 28
12	Tally 12	29	Tally 29
13	Tally 13	30	Tally 30
14	Tally 14	31	Tally 31
15	Tally 15	32	Tally 32
16	Tally 16	33	0v
17	Tally 17	36	0v
		37	GND
OUTPUT 1 –32 OPEN COLLECTOR CONNECTOR D37 SOCKET			
Pin		**Pin**	
1	Tally 1	18	Tally 18
2	Tally 2	19	Tally 19
3	Tally 3	20	Tally 20
4	Tally 4	21	Tally 21
5	Tally 5	22	Tally 22
6	Tally 6	23	Tally 23
7	Tally 7	24	Tally 24
8	Tally 8	25	Tally 25
9	Tally 9	26	Tally 26
10	Tally 10	27	Tally 27
11	Tally 11	28	Tally 28
12	Tally 12	29	Tally 29
13	Tally 13	30	Tally 30
14	Tally 14	31	Tally 31
15	Tally 15	32	Tally 32
16	Tally 16	33	0v
17	Tally 17	36	0v
		37	GND

Fig.22

4.4 Configuration examples

Some example of common setups below:
Basic dual redundant system
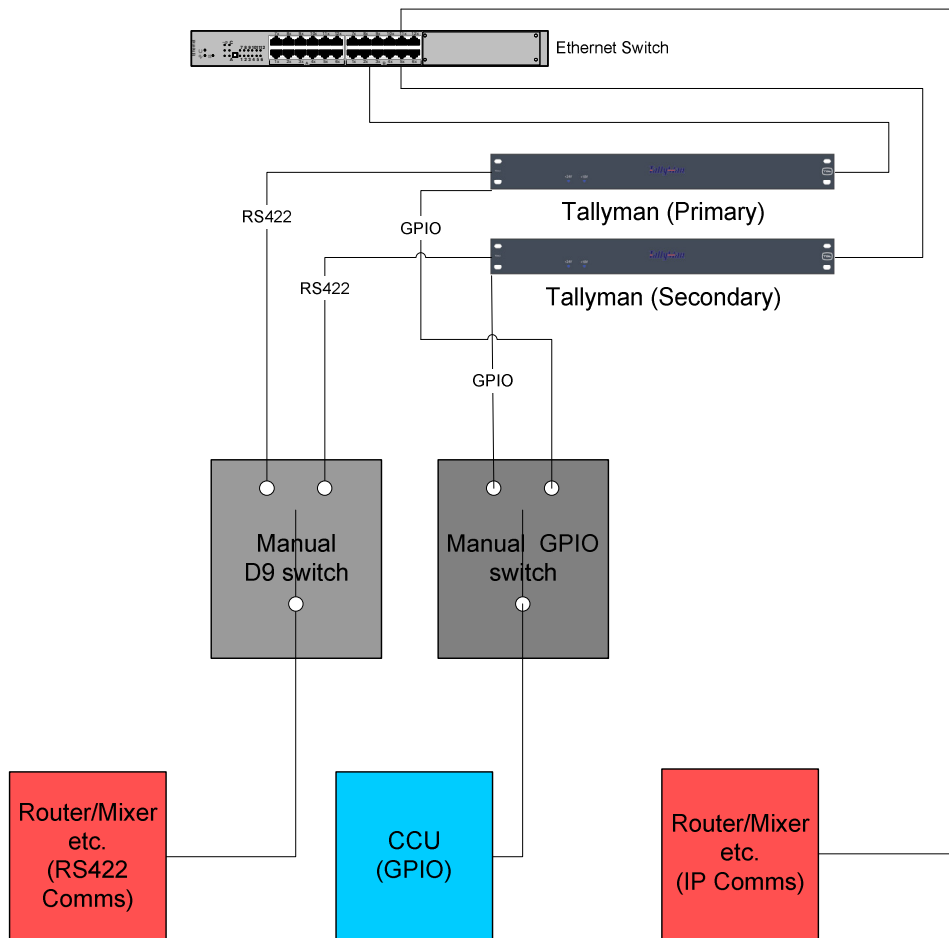
Dual redundant system with additional ESP-1R+

Ethernet Switch

Tallyman (Primary)

Tallyman (Secondary)

ESP-1R+ (Primary)

ESP-1R+ (Secondary)

RS422

RS422

Manual
D9 switch

Manual GPIO
switch

Router/Mixer
etc.
(RS422
Comms)

CCU
(GPIO)

Router/Mixer
etc.
(IP Comms)

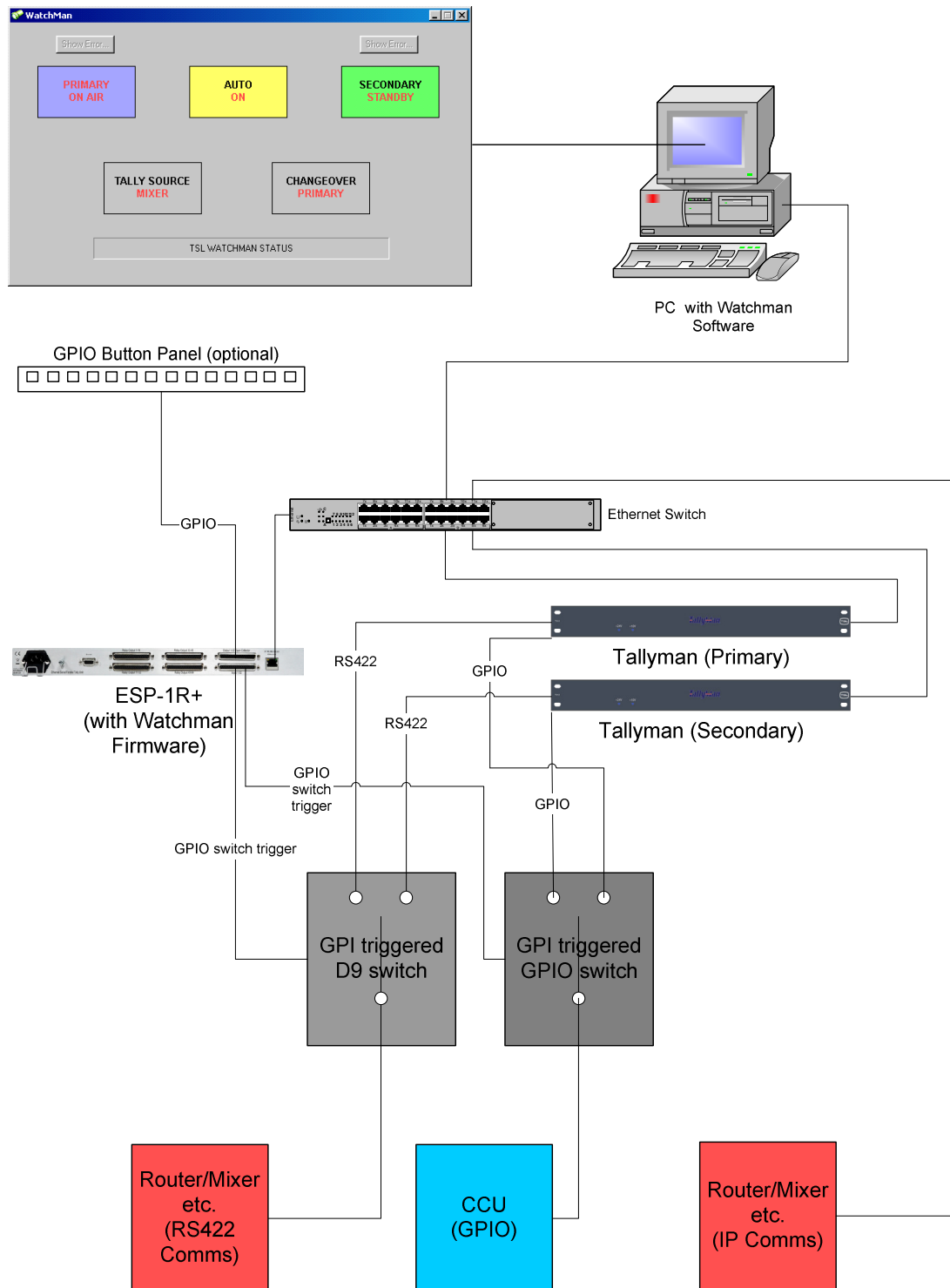Dual redundant system with Watchman

Fig.23

Example of dual redundant system with addition of ESP-1R+ expansion units

GPIO Button Panel (optional)

ESP-1R+
(with Watchman
Firmware)

PC with Watchman
Software

Ethernet Switch

Tallyman (Primary)

Tallyman (Secondary)

ESP-1R+ (Primary)

ESP-1R+ (Secondary)

GPIO

RS422

RS422

GPIO
switch
trigger

GPIO switch trigger

GPI triggered
D9 switch

GPI triggered
GPIO switch

Router/Mixer
etc.
(RS422
Comms)

CCU
(GPIO)

Router/Mixer
etc.
(IP Comms)