

FR0: Egg Alert and Real-time Logistics (EARL)

- FR1: Presentation Layer
  - FR1.1: Shall have a GUI.
    - FR1.1.1: Shall have a Configuration Interface.
      - FR1.1.1.1: Shall allow changing of alarm parameters.
        - FR1.1.1.1.1: Shall allow changes to sample size.
        - FR1.1.1.1.2: Shall allow changes to sample variance.
        - FR1.1.1.1.3: Shall allow changes to alarm snooze length.
        - FR1.1.1.1.4: Shall allow alarm sound file to be changed.
        - FR1.1.1.1.5: Shall allow changes to sound volume.
      - FR1.1.1.2: Shall allow changing of collector parameters.
        - FR1.1.1.2.1: Shall allow changes to the number of sensor arrays displayed.
        - FR1.1.1.2.2: Shall allow changes to the number of sensors per array displayed.
      - FR1.1.1.3: Shall allow changing of serial communication parameters.
        - FR1.1.1.3.1: Shall allow change to the serial port number.
        - FR1.1.1.3.2: Shall allow changes to the timeout length.
    - FR1.1.2: Shall have a Visual Alert.
    - FR1.1.3: Shall have an Audio Alarm.
    - FR1.1.4: Shall have a Statistics interface.
      - FR1.1.4.1: Shall display the address of each module.
      - FR1.1.4.2: Shall display the egg count for each sensor.
      - FR1.1.4.3: Shall display the total egg count for each module.
      - FR1.1.4.4: Shall display the total egg count.
      - FR1.1.4.5: Shall allow changes to module address.
    - FR1.1.5: May allow viewing of past log files.
    - FR1.1.6: Shall have a Status interface.
      - FR1.1.6.1: Shall show the status of each sensor.
      - FR1.1.6.2: Shall display the status of each sensor array.
      - FR1.1.6.3: Shall allow sensor arrays to be disabled.
      - FR1.1.6.4: Shall allow the alarm to be disabled.
    - FR1.1.7: Shall allow viewing of the log since activation.
    - FR1.1.8: Shall allow disabling of changes.
    - FR1.1.9: Shall require confirmation for reenabling changes.
    - FR1.1.10: Shall allow the GUI to be closed and program shut down.
    - FR1.1.11: Shall allow the GUI to be resized.
    - FR1.1.12: Shall allow the GUI to be minimized.
    - FR1.1.13: Shall allow the GUI to be maximized.
  - FR1.2: Shall utilize touch screen interface.
- FR2: Business Layer
  - FR2.1: Shall run on Windows OS.
    - FR2.1.1: Primary Application
      - FR2.1.1.1: Shall have an interface between the PC and the communication hardware.
      - FR2.1.1.2: Shall have a Hardware Polling Process.
      - FR2.1.1.3: Shall have a State Logic Process.
      - FR2.1.1.4: Shall have a GUI Build/Update process.
    - FR2.1.2: Shall utilize a Serial Communication Driver.
    - FR2.1.3: Shall utilize communication standards compatible with the microcontrollers.
    - FR2.1.4: Shall utilize communication standards compatible with distance constraints.
    - FR2.1.5: May incorporate error correction.
  - FR2.2: Sensors (Microcontrollers)
    - FR2.2.1: Shall communicate in a standard appropriate to the microcontroller.
    - FR2.2.2: May buffer incoming communication.
    - FR2.2.3: Shall utilize Communication Software.
    - FR2.2.4: Shall have Counting Software.
- FR3: Data Access Layer
  - FR3.1: Primary Application
    - FR3.1.1: Shall be able to write log files.
    - FR3.1.2: Shall be able to read log files.
    - FR3.1.3: Shall be able to write configuration files.
    - FR3.1.4: Shall be able to read configuration files.
- FR4: Persistence Layer
  - FR4.1: Primary Application
    - FR4.1.1: Shall record Configuration Settings.
    - FR4.1.2: Shall maintain log files of system status changes.
    - FR4.1.3: Shall have State Values.
    - FR4.1.4: May maintain egg counts for each sensor.
    - FR4.1.5: May maintain egg counts for the system as a whole.
    - FR4.1.6: May store status changes in a database.
    - FR4.1.7: May store egg counts in a database.
  - FR4.2: Microcontroller
    - FR4.2.1: Shall maintain a unique address.
    - FR4.2.2: Shall maintain state values.
    - FR4.2.3: Shall store egg counts per sensor.

Requirement	DP1.1.1	DP1.1.2	DP1.1.3	DP1.1.4	DP1.1.5	DP1.1.6	DP1.1.7	DP1.1.8	DP1.1.9	DP1.1.10	DP1.1.11	DP1.1.12	DP1.1.13	DP2.1.1	DP2.1.2	DP2.1.3	DP2.1.4	DP2.1.5	DP2.1.6	DP2.1.7	DP2.1.8	DP2.1.9	DP2.1.10	DP2.1.11	DP2.1.12	DP2.1.13	DP2.1.14	DP2.1.15	DP2.1.16	DP2.1.17	DP2.1.18	DP2.1.19	DP2.1.20	DP2.1.21	DP2.1.22	DP2.1.23	DP2.1.24	DP2.1.25	DP2.1.26	DP2.1.27	DP2.1.28	DP2.1.29	DP2.1.30	DP2.1.31	DP2.1.32	DP2.1.33	DP2.1.34	DP2.1.35	DP2.1.36	DP2.1.37	DP2.1.38	DP2.1.39	DP2.1.40	DP2.1.41	DP2.1.42	DP2.1.43	DP2.1.44	DP2.1.45	DP2.1.46	DP2.1.47	DP2.1.48	DP2.1.49	DP2.1.50	DP2.1.51	DP2.1.52	DP2.1.53	DP2.1.54	DP2.1.55	DP2.1.56	DP2.1.57	DP2.1.58	DP2.1.59	DP2.1.60	DP2.1.61	DP2.1.62	DP2.1.63	DP2.1.64	DP2.1.65	DP2.1.66	DP2.1.67	DP2.1.68	DP2.1.69	DP2.1.70	DP2.1.71	DP2.1.72	DP2.1.73	DP2.1.74	DP2.1.75	DP2.1.76	DP2.1.77	DP2.1.78	DP2.1.79	DP2.1.80	DP2.1.81	DP2.1.82	DP2.1.83	DP2.1.84	DP2.1.85	DP2.1.86	DP2.1.87	DP2.1.88	DP2.1.89	DP2.1.90	DP2.1.91	DP2.1.92	DP2.1.93	DP2.1.94	DP2.1.95	DP2.1.96	DP2.1.97	DP2.1.98	DP2.1.99	DP2.1.100	DP2.1.101	DP2.1.102	DP2.1.103	DP2.1.104	DP2.1.105	DP2.1.106	DP2.1.107	DP2.1.108	DP2.1.109	DP2.1.110	DP2.1.111	DP2.1.112	DP2.1.113	DP2.1.114	DP2.1.115	DP2.1.116	DP2.1.117	DP2.1.118	DP2.1.119	DP2.1.120	DP2.1.121	DP2.1.122	DP2.1.123	DP2.1.124	DP2.1.125	DP2.1.126	DP2.1.127	DP2.1.128	DP2.1.129	DP2.1.130	DP2.1.131	DP2.1.132	DP2.1.133	DP2.1.134	DP2.1.135	DP2.1.136	DP2.1.137	DP2.1.138	DP2.1.139	DP2.1.140	DP2.1.141	DP2.1.142	DP2.1.143	DP2.1.144	DP2.1.145	DP2.1.146	DP2.1.147	DP2.1.148	DP2.1.149	DP2.1.150	DP2.1.151	DP2.1.152	DP2.1.153	DP2.1.154	DP2.1.155	DP2.1.156	DP2.1.157	DP2.1.158	DP2.1.159	DP2.1.160	DP2.1.161	DP2.1.162	DP2.1.163	DP2.1.164	DP2.1.165	DP2.1.166	DP2.1.167	DP2.1.168	DP2.1.169	DP2.1.170	DP2.1.171	DP2.1.172	DP2.1.173	DP2.1.174	DP2.1.175	DP2.1.176	DP2.1.177	DP2.1.178	DP2.1.179	DP2.1.180	DP2.1.181	DP2.1.182	DP2.1.183	DP2.1.184	DP2.1.185	DP2.1.186	DP2.1.187	DP2.1.188	DP2.1.189	DP2.1.190	DP2.1.191	DP2.1.192	DP2.1.193	DP2.1.194	DP2.1.195	DP2.1.196	DP2.1.197	DP2.1.198	DP2.1.199	DP2.1.200	DP2.1.201	DP2.1.202	DP2.1.203	DP2.1.204	DP2.1.205	DP2.1.206	DP2.1.207	DP2.1.208	DP2.1.209	DP2.1.210	DP2.1.211	DP2.1.212	DP2.1.213	DP2.1.214	DP2.1.215	DP2.1.216	DP2.1.217	DP2.1.218	DP2.1.219	DP2.1.220	DP2.1.221	DP2.1.222	DP2.1.223	DP2.1.224	DP2.1.225	DP2.1.226	DP2.1.227	DP2.1.228	DP2.1.229	DP2.1.230	DP2.1.231	DP2.1.232	DP2.1.233	DP2.1.234	DP2.1.235	DP2.1.236	DP2.1.237	DP2.1.238	DP2.1.239	DP2.1.240	DP2.1.241	DP2.1.242	DP2.1.243	DP2.1.244	DP2.1.245	DP2.1.246	DP2.1.247	DP2.1.248	DP2.1.249	DP2.1.250	DP2.1.251	DP2.1.252	DP2.1.253	DP2.1.254	DP2.1.255	DP2.1.256	DP2.1.257	DP2.1.258	DP2.1.259	DP2.1.260	DP2.1.261	DP2.1.262	DP2.1.263	DP2.1.264	DP2.1.265	DP2.1.266	DP2.1.267	DP2.1.268	DP2.1.269	DP2.1.270	DP2.1.271	DP2.1.272	DP2.1.273	DP2.1.274	DP2.1.275	DP2.1.276	DP2.1.277	DP2.1.278	DP2.1.279	DP2.1.280	DP2.1.281	DP2.1.282	DP2.1.283	DP2.1.284	DP2.1.285	DP2.1.286	DP2.1.287	DP2.1.288	DP2.1.289	DP2.1.290	DP2.1.291	DP2.1.292	DP2.1.293	DP2.1.294	DP2.1.295	DP2.1.296	DP2.1.297	DP2.1.298	DP2.1.299	DP2.1.300	DP2.1.301	DP2.1.302	DP2.1.303	DP2.1.304	DP2.1.305	DP2.1.306	DP2.1.307	DP2.1.308	DP2.1.309	DP2.1.310	DP2.1.311	DP2.1.312	DP2.1.313	DP2.1.314	DP2.1.315	DP2.1.316	DP2.1.317	DP2.1.318	DP2.1.319	DP2.1.320	DP2.1.321	DP2.1.322	DP2.1.323	DP2.1.324	DP2.1.325	DP2.1.326	DP2.1.327	DP2.1.328	DP2.1.329	DP2.1.330	DP2.1.331	DP2.1.332	DP2.1.333	DP2.1.334	DP2.1.335	DP2.1.336	DP2.1.337	DP2.1.338	DP2.1.339	DP2.1.340	DP2.1.341	DP2.1.342	DP2.1.343	DP2.1.344	DP2.1.345	DP2.1.346	DP2.1.347	DP2.1.348	DP2.1.349	DP2.1.350	DP2.1.351	DP2.1.352	DP2.1.353	DP2.1.354	DP2.1.355	DP2.1.356	DP2.1.357	DP2.1.358	DP2.1.359	DP2.1.360	DP2.1.361	DP2.1.362	DP2.1.363	DP2.1.364	DP2.1.365	DP2.1.366	DP2.1.367	DP2.1.368	DP2.1.369	DP2.1.370	DP2.1.371	DP2.1.372	DP2.1.373	DP2.1.374	DP2.1.375	DP2.1.376	DP2.1.377	DP2.1.378	DP2.1.379	DP2.1.380	DP2.1.381	DP2.1.382	DP2.1.383	DP2.1.384	DP2.1.385	DP2.1.386	DP2.1.387	DP2.1.388	DP2.1.389	DP2.1.390	DP2.1.391	DP2.1.392	DP2.1.393	DP2.1.394	DP2.1.395	DP2.1.396	DP2.1.397	DP2.1.398	DP2.1.399	DP2.1.400	DP2.1.401	DP2.1.402	DP2.1.403	DP2.1.404	DP2.1.405	DP2.1.406	DP2.1.407	DP2.1.408	DP2.1.409	DP2.1.410	DP2.1.411	DP2.1.412	DP2.1.413	DP2.1.414	DP2.1.415	DP2.1.416	DP2.1.417	DP2.1.418	DP2.1.419	DP2.1.420	DP2.1.421	DP2.1.422	DP2.1.423	DP2.1.424	DP2.1.425	DP2.1.426	DP2.1.427	DP2.1.428	DP2.1.429	DP2.1.430	DP2.1.431	DP2.1.432	DP2.1.433	DP2.1.434	DP2.1.435	DP2.1.436	DP2.1.437	DP2.1.438	DP2.1.439	DP2.1.440	DP2.1.441	DP2.1.442	DP2.1.443	DP2.1.444	DP2.1.445	DP2.1.446	DP2.1.447	DP2.1.448	DP2.1.449	DP2.1.450	DP2.1.451	DP2.1.452	DP2.1.453	DP2.1.454	DP2.1.455	DP2.1.456	DP2.1.457	DP2.1.458	DP2.1.459	DP2.1.460	DP2.1.461	DP2.1.462	DP2.1.463	DP2.1.464	DP2.1.465	DP2.1.466	DP2.1.467	DP2.1.468	DP2.1.469	DP2.1.470	DP2.1.471	DP2.1.472	DP2.1.473	DP2.1.474	DP2.1.475	DP2.1.476	DP2.1.477	DP2.1.478	DP2.1.479	DP2.1.480	DP2.1.481	DP2.1.482	DP2.1.483	DP2.1.484	DP2.1.485	DP2.1.486	DP2.1.487	DP2.1.488	DP2.1.489	DP2.1.490	DP2.1.491	DP2.1.492	DP2.1.493	DP2.1.494	DP2.1.495	DP2.1.496	DP2.1.497	DP2.1.498	DP2.1.499	DP2.1.500	DP2.1.501	DP2.1.502	DP2.1.503	DP2.1.504	DP2.1.505	DP2.1.506	DP2.1.507	DP2.1.508	DP2.1.509	DP2.1.510	DP2.1.511	DP2.1.512	DP2.1.513	DP2.1.514	DP2.1.515	DP2.1.516	DP2.1.517	DP2.1.518	DP2.1.519	DP2.1.520	DP2.1.521	DP2.1.522	DP2.1.523	DP2.1.524	DP2.1.525	DP2.1.526	DP2.1.527	DP2.1.528	DP2.1.529	DP2.1.530	DP2.1.531	DP2.1.532	DP2.1.533	DP2.1.534	DP2.1.535	DP2.1.536	DP2.1.537	DP2.1.538	DP2.1.539	DP2.1.540	DP2.1.541	DP2.1.542	DP2.1.543	DP2.1.544	DP2.1.545	DP2.1.546	DP2.1.547	DP2.1.548	DP2.1.549	DP2.1.550	DP2.1.551	DP2.1.552	DP2.1.553	DP2.1.554	DP2.1.555	DP2.1.556	DP2.1.557	DP2.1.558	DP2.1.559	DP2.1.560	DP2.1.561	DP2.1.562	DP2.1.563	DP2.1.564	DP2.1.565	DP2.1.566	DP2.1.567	DP2.1.568	DP2.1.569	DP2.1.570	DP2.1.571	DP2.1.572	DP2.1.573	DP2.1.574	DP2.1.575	DP2.1.576	DP2.1.577	DP2.1.578	DP2.1.579	DP2.1.580	DP2.1.581	DP2.1.582	DP2.1.583	DP2.1.584	DP2.1.585	DP2.1.586	DP2.1.587	DP2.1.588	DP2.1.589	DP2.1.590	DP2.1.591	DP2.1.592	DP2.1.593	DP2.1.594	DP2.1.595	DP2.1.596	DP2.1.597	DP2.1.598	DP2.1.599	DP2.1.600	DP2.1.601	DP2.1.602	DP2.1.603	DP2.1.604	DP2.1.605	DP2.1.606	DP2.1.607	DP2.1.608	DP2.1.609	DP2.1.610	DP2.1.611	DP2.1.612	DP2.1.613	DP2.1.614	DP2.1.615	DP2.1.616	DP2.1.617	DP2.1.618	DP2.1.619	DP2.1.620	DP2.1.621	DP2.1.622	DP2.1.623	DP2.1.624	DP2.1.625	DP2.1.626	DP2.1.627	DP2.1.628	DP2.1.629	DP2.1.630	DP2.1.631	DP2.1.632	DP2.1.633	DP2.1.634	DP2.1.635	DP2.1.636	DP2.1.637	DP2.1.638	DP2.1.639	DP2.1.640	DP2.1.641	DP2.1.642	DP2.1.643	DP2.1.644	DP2.1.645	DP2.1.646	DP2.1.647	DP2.1.648	DP2.1.649	DP2.1.650	DP2.1.651	DP2.1.652	DP2.1.653	DP2.1.654	DP2.1.655	DP2.1.656	DP2.1.657	DP2.1.658	DP2.1.659	DP2.1.660	DP2.1.661	DP2.1.662	DP2.1.663	DP2.1.664	DP2.1.665	DP2.1.666	DP2.1.667	DP2.1.668	DP2.1.669	DP2.1.670	DP2.1.671	DP2.1.672	DP2.1.673	DP2.1.674	DP2.1.675	DP2.1.676	DP2.1.677	DP2.1.678	DP2.1.679	DP2.1.680	DP2.1.681	DP2.1.682	DP2.1.683	DP2.1.684	DP2.1.685	DP2.1.686	DP2.1.687	DP2.1.688	DP2.1.689	DP2.1.690	DP2.1.691	DP2.1.692	DP2.1.693	DP2.1.694	DP2.1.695	DP2.1.696	DP2.1.697	DP2.1.698	DP2.1.699	DP2.1.700	DP2.1.701	DP2.1.702	DP2.1.703	DP2.1.704	DP2.1.705	DP2.1.706	DP2.1.707	DP2.1.708	DP2.1.709	DP2.1.710	DP2.1.711	DP2.1.712	DP2.1.713	DP2.1.714	DP2.1.715	DP2.1.716	DP2.1.717	DP2.1.718	DP2.1.719	DP2.1.720	DP2.1.721	DP2.1.722	DP2.1.723	DP2.1.724	DP2.1.725	DP2.1.726	DP2.1.727	DP2.1.728	DP2.1.729	DP2.1.730	DP2.1.731	DP2.1.732	DP2.1.733	DP2.1.734	DP2.1.735	DP2.1.736	DP2.1.737	DP2.1.738	DP2.1.739	DP2.1.740	DP2.1.741	DP2.1.742	DP2.1.743	DP2.1.744	DP2.1.745	DP2.1.746	DP2.1.747	DP2.1.748	DP2.1.749	DP2.1.750	DP2.1.751	DP2.1.752	DP2.1.753	DP2.1.754	DP2.1.755	DP2.1.756	DP2.1.757	DP2.1.758	DP2.1.759	DP2.1.760	DP2.1.761	DP2.1.762	DP2.1.763	DP2.1.764	DP2.1.765	DP2.1.766	DP2.1.767	DP2.1.768	DP2.1.769	DP2.1.770	DP2.1.771	DP2.1.772	DP2.1.773	DP2.1.774	DP2.1.775	DP2.1.776	DP2.1.777	DP2.1.778	DP2.1.779	DP2.1.780	DP2.1.781	DP2.1.782	DP2.1.783	DP2.1.784	DP2.1.785	DP2.1.786	DP2.1.787	DP2.1.788	DP2.1.789	DP2.1.790	DP2.1.791	DP2.1.792	DP2.1.793	DP2.1.794	DP2.1.795	DP2.1.796	DP2.1.797	DP2.1.798	DP2.1.799	DP2.1.800	DP2.1.801	DP2.1.802	DP2.1.803	DP2.1.804	DP2.1.805	DP2.1.806	DP2.1.807	DP2.1.808	DP2.1.809	DP2.1.810	DP2.1.811	DP2.1.812	DP2.1.813	DP2.1.814	DP2.1.815	DP2.1.816	DP2.1.817	DP2.1.818	DP2.1.819	DP2.1.820	DP2.1.821	DP2.1.822	DP2.1.823	DP2.1.824	DP2.1.825	DP2.1.826	DP2.1.827	DP2.1.828	DP2.1.829	DP2.1.830	DP2.1.831	DP2.1.
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