*SCADA*MESH™

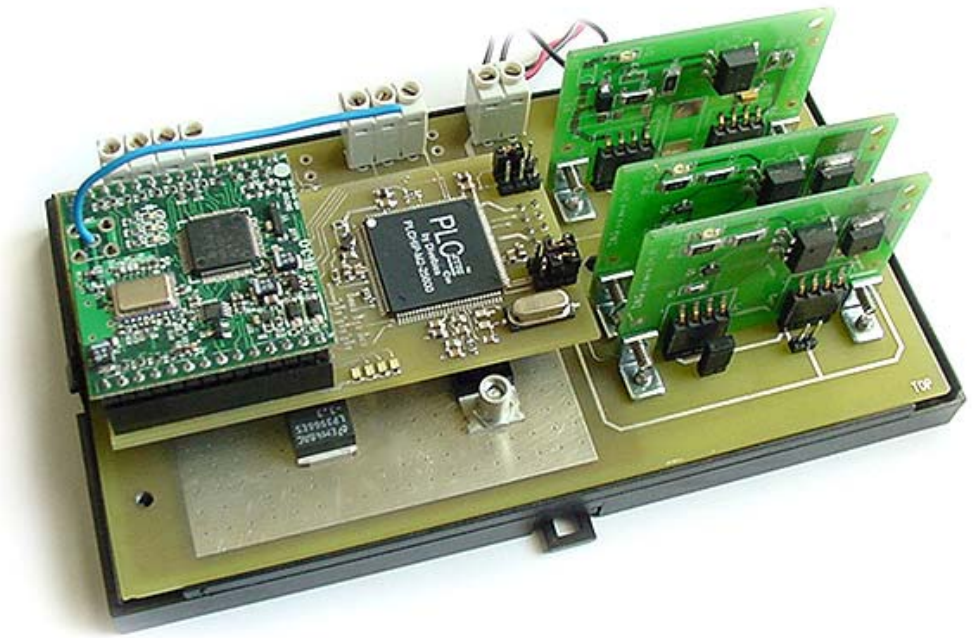
OVERVIEW

*SCADA*MESH™ is a complete wireless MESH radio system for process control and monitoring. It includes localized MESH radios, a processor and memory, and a PLC on a chip, all working together to provide what we call "SCADAless scada".

Normal SCADA systems are structured with a main computer system to which a variety of IO points and devices are hard wired. The SCADA system makes all the decisions required of it based on inputs from the various attached devices, and its programming. Essentially a computer is a processor and memory and software or firmware acting in concert. SCADA systems are "sized", as are computer systems, to whatever the task at hand is. The more IO and processes the SCADA must handle, the more powerful the processor and the more memory is required, along with other supporting elements.

Because we at ITI have strong backgrounds in Information Technology, we took another look at this and came up with what we call *SCADA*MESH.

We take the proportional amount of processor capacity and memory the SCADA required to support whatever number of local I/O we are dealing with, and move it out to the point of the I/O.



We either add a PLC on a chip to the same board, or connect to existing PLC's. Either way, we add our patented MESH radio to the mix, and each point then, becomes a mini-SCADA system of sorts.

What makes this all work is the recent availability of the patented MESH radios we use.

A MESH (Multi-point Enhanced Signal Handling) radio is a device which combines a transceiver and a repeater function in EACH radio. The result of deploying MESH radios, is that each MESH radio actually "helps" the other radios in the MESH to get the information packets through the network to the correct destination. Where conventional SCADA systems rely in wires to move the input to the computer, and wires to move commands back out to target devices, we use our processors to emulate the SCADA function on a localized basis, through distributed processing, and we use the MESH network to replace those cumbersome and ridiculously expensive wires.

We set the whole system up through our ***SCADA*MESH** software program by invoking what we call "IO Mapping". This technique allows the user to begin by laying out his communications between IO points by identifying the source IO and mapping it to one or more targets, which may actually include a legacy SCADA system. The result of the IO mapping is that the messages from the source are routed appropriately through the MESH to the correct destination or target. This step sets up the "packet addressing" schema we use to insure the link between source and target. It is up to the MESH to move the packets appropriately. True MESH is multi-point to multi-point, or peer-to-peer, and supports direct addressing to another radio without having to go back to the base station. This approach cuts the MESH traffic virtually in half and provides a much more efficient approach to packet handling.

After the IO Mapping step is completed, the drilldown starts. From the IO Mapping layer, we drill down to the next layer which is the PLC programming layer. Because we have processors and memory on board our patent pending ***SCADA*MESH's** software program, we can program the PLC remotely, MESH-transmit its compiled ladder logic code to the appropriate radio's on-board processor, and store it in the local memory for flashing or re-flashing the PLC. By locally flashing the PLC, we virtually eliminate PLC downtime for the process. This works because the PLC on the chip is built for such a task. Once the PLC is re-flashed, we download the companion source Ladder logic code, and the local processor stores it in local memory on board. If we ever want to see how a given PLC is programmed, or want to make changes to its source, we send a request through the MESH to that PLC's adjacent processor which retrieves the source from its localized memory and remits it to the requestor – all without interfering with running PLC functions, or taking the PLC off-line.

There are three ways to approach our system.

1. Stand alone. In this case, all the PLC's work only with other PLC's on our MESH network. This is good for a suitable new installation or a new application.

2. Parallel to a SCADA. Here, we have our server linked to the SCADA system in a way that the SCADA can poll our registers as with MODBUS, and retrieve information it needs to act upon, or merely store events passively. This is also required if the targets are on the SCADA and the source IO is on ***SCADA*MESH.**

3. Integrated with legacy SCADA. In this case we establish a base MESH station directly connected to the SCADA and all MESH routing is done to the SCADA. If a command is executed to a MESH node, then the routing is done via the MESH, otherwise it is done by wireline to those attached devices..