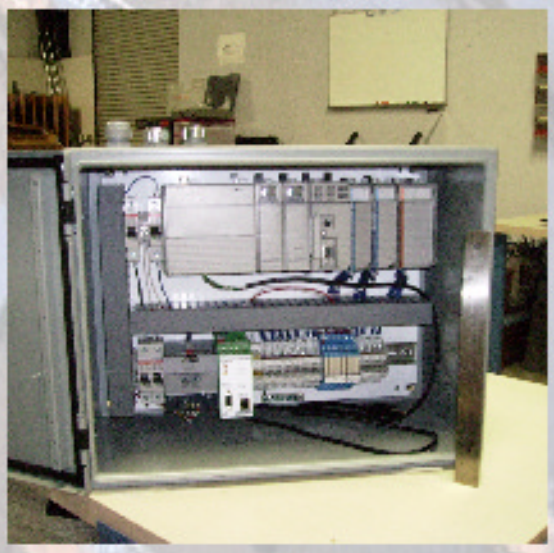
Industrial Control Systems Online Inc.

www.icsonlineinc.com

AGC Wireless Traffic Control System

ICS AGC's System was designed to operate specifically for NUMMI. Unlike other systems it is not PC based. The system consists of three different types of controllers; The ACU, RCU, and TCU. Each unit contains an Allen Bradley PLC. Wireless controllers also have an Ethernet radio that is configured to communicate with the existing Cisco wireless AP's using Ethernet IP.



To reduce traffic on the wireless network the AGC's communicate to the route controller on a report by exception basis. To make the network deterministic all messages written to the RCU from the AGC's are re-read for verification. Addition to ensure the commands being sent to the AGC from the RCU are all last messages written with a transaction code to ensure messages are complete.

The route is defined by using magnetic tape mounted on the plant floor, command tapes for Stopping and floor mounted RFDI tags for route zone locations to provide route parameters / direction to the AGC via the local on board PLC. The RCU provides traffic control for staging, route intersection, route merging, as well as interfaces AGC to traffic lights and line side equipment wired to TCU's.

The RCU is pre-programmed for 64 routes and up to 256 connection points such as ACU or TCU. Each route is configured by entering route parameters (not programmed) via the route table which can be imported/exported as a CSV or edited directly with ICS configuration software. Each route's directions, forward, reverse, left, right, obstacle sensor view, function, loading/uploading options are entered into the RCU and passes down to the AGC's on the routes to remote start form parts call systems, route intersections, route merging, route reflections, and look ahead clear functions are all stored in the route controller.

ACU (AGC Control Unit):

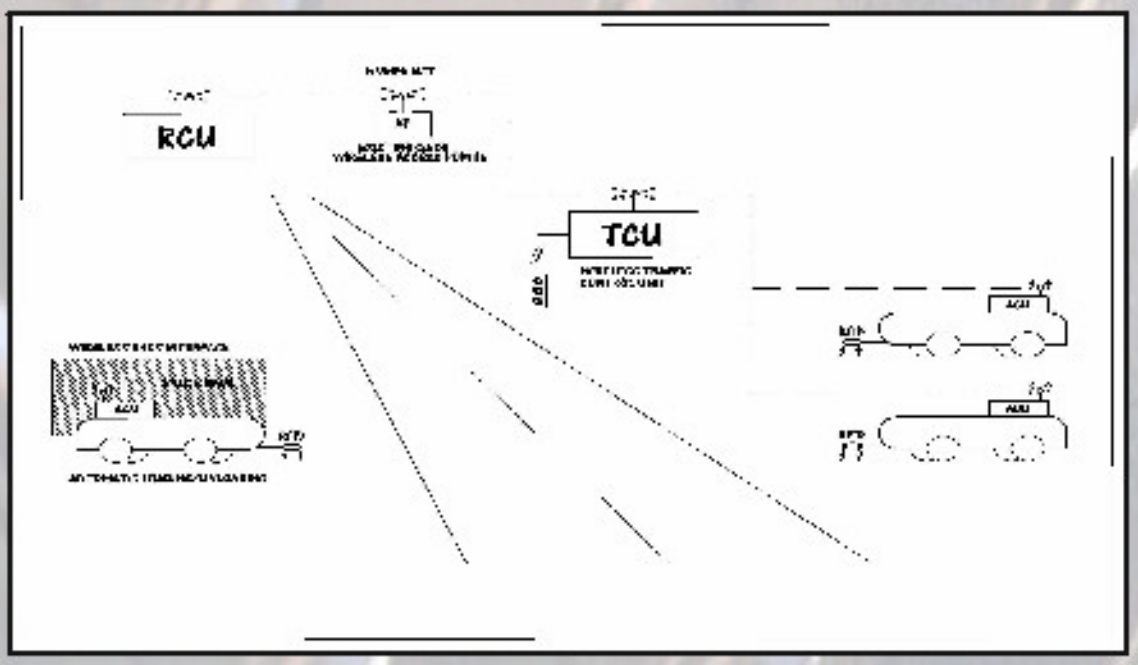
The ACU will be custom designed to bolt on and plug into the Creform A47, A50, B49 or BST AGC. The AGC System will be a distributed control system with each AGC having it's own ACU. The AGC Zone location on the route will be identified using floor mounted RFID Tags The ACU shall follow a magnetic tape that is already installed by NUMMI. There are two sensor heads located on the AGC unit. One will read the North/South tapes for tape commands and the other sensor head will will read the RFID tags. These RFID tags will identify the zone location of the AGC. The route table stored in the ACU PLC will determine the function of the AGC in that zone.

The AGC Control system will provide on-board and remote controls of the following items.

● Start I Stop ● Right / Left Turn ● Obstacle Sensor Zone Control ● Speed Change ●

The AGC Control system will monitor and track the following items.

● Zone Number from RFID Tag ● Running Status ● Fault ● Command North / South from sensor ●
● Obstacle Trouble ● Battery Level ●



RCU (Route Control Unit):

RCU will receive status information form the ACU's and will coordinate and monitor multiple routes. The ACU's will report to the RCU as its status changes or after a predetermined time period. The RCU will receive status messages from all the ACU's The purpose of the RCU is to act as a data concentrator, buffering data and insuring quick and reliable communications to the plant floor. One RCU can monitor multiple Routes and ACU's The RCU will coordinate different routes for starting and stopping of the AGC's

TCU (Traffic Control Unit):

The TCU will act as a wireless I/O to interface with traffic lights, operator push buttons and line side equipment. The TCU may be custom programmed to meet the specific requirements of loading and unloading.

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AGC Components and Specifications

ITEM	DESCRIPTION
AGV_ACU_A47	CREFORM A47 AGV CONTROL UNIT - ETHERNET IP CONTROLLER W/ REMOTE RFID ANTENNA AND WIRELESS 802.11B/G - IN ADDITION TO RF READER THERE ARE 18 INPUTS, AND 22 OUTPUTS TO INTERFACE WITH AGV (1 PER AGV) 7.87 X 15.75 X 5.91 ENCLOSURE W/ WINDOW/PAINTED STEEL (1.7A @ 24VDC) *Patent Pending*
AGV_ACU_BST	CREFORM BST AGV CONTROL UNIT - ETHERNET IP CONTROLLER W/ REMOTE RFID ANTENNA AND WIRELESS 802.11G - IN ADDITION TO RF READER THERE ARE 26 INPUTS, AND 14 OUTPUTS PROGRAMMED TO CONTROL THE FWD,REV,STOP, SPEED , TOW PIN AND VIEW AS WELL AS MONITOR FAULT,RUNNING,AND BATTERY VOLTAGE. ROUTE TABLE CONFIGURABLE BY WEB UTILITY. INCLUDES IO AND RFID CABLE. 11.25 x 7.5 X6 CUSTOM ENCLOSURE W/ WINDOW/PAINTED STEEL. (1.7A @ 24 VDC) *Patent Pending*
AGV_ACU_B49	CREFORM B-49 AGV CONTROL UNIT - ETHERNET IP CONTROLLER W/ REMOTE RFID ANTENNA AND WIRELESS 802.11G - IN ADDITION TO RF READER THERE ARE 26 INPUTS, AND 22 OUTPUTS PROGRAMMED TO CONTROL THE FWD , REV , STOP , SPEED AND VIEW AS WELL AS MONITOR FAULT,RUNNING,AND BATTERY VOLTAGE. DOES NOT INCLUDE RFID BRACKET, INCLUDES IO AND RFID CABLE. ROUTE TABLE CONFIGURABLE BY WEB UTILITY. 7.87 X 23 X 6 ENCLSOSURE W/ WINDOW/PAINTED STEEL. (1.7A @ 24VDC) *Patent Pending*
AGV_ACU_50034	CREFORM A-50 AGV CONTROL UNIT - ETHERNET IP CONTROLLER W/ REMOTE RFID ANTENNA AND WIRELESS 802.11G - IN ADDITION TO RF READER THERE ARE 26 INPUTS, AND 22 OUTPUTS PROGRAMMED TO CONTROL THE FWD , STOP , SPEED , AND VIEW AS WELL AS MONITOR FAULT, RUNNING , AND BATTERY VOLTAGE. ROUTE TABLE CONFIGURABLE BY WEB UTILITY. *Patent Pending*
AGV_RCU_64	ROUTE CONTROL UNIT - ALLEN BRADLEY PLC W/ WIRELESS ETHERNET IP 802.11G 802.11B 120 VAC SUPPLY W/ 24 VDL IO FOR EQUPMENT INTERFACE - 16 INPUTS, AND 16 OUTPUTS TO INTERFACE WITH EQUIPMENT UP TO 64 AGC'S /TCU'S ON 16 ROUTES *Patent Pending*
AGV_RCU_128	ROUTE CONTROL UNIT - ETHERNET IP CONTROLLER W/ WIRELESS 802.11/G - INCLUDES 16 DI 24VDC AND 16 DO TO INTERFACE WITH LINE SIDE EQUIPMENT UP TO 128 AGC'S/TCU'S ON 32 ROUTES UNCLUDES WEB SERVER MODULE FOR CUSTOM WEB PAGES (6MB) *Patent Pending*
AGV_RCU_256	ROUTE CONTROL UNIT - ETHERNET IP CONTROLLER W/ WIRELESS 802.11/G - INCLUDES 16 DI 24VDC AND 16 DO TO INTERFACE WITH LINE SIDE EQUIPMENT UP TO 256 AGC'S/TCU'S ON 64 ROUTES UNCLUDES WEB SERVER MODULE FOR CUSTOM WEB PAGES (6MB) *Patent Pending*