Implementing and Operating IP driven traffic signals (RLCS, Remote Lamp Control System) in Lincolnshire

Moving from traditional analogue to digital communications, the in-station to out-station data transfer and vice versa, now uses Internet Protocol UG405. Each site has become a mini Local Area Networks. Within these Local Area Networks we can now connect to the Outstation Transmission Unit, Controller, Detection and Closed Circuit Television using Internet Protocol compatible devices and maybe more things in the future.

With traffic signals using ELV (48v) LED aspects and indicators Dynniq have developed a traffic signals system that takes some of the elements from a traditional traffic controller; namely lamp control and detection and relocates these units into some (but importantly not all) of the signal heads.
The system uses a Remote Lamp Unit (RLU) to drive the signals and a Remote Input / Output (RIO) unit to interact with the detection equipment. By relocating these modules into some of the signal heads the amount of street cabling is significantly reduced and where suitable, road crossings can now be Micro-Trenched to allow installations to be undertaken at reduced costs and disruption.

Dixon Street, Lincoln

Following the type approval and successful testing of the PTC-1 RLCS (Remote Lamp Control System) at two installations off the public highway Dynniq approached Lincolnshire County Council to install the first site on a public highway at a recently refurbished junction (Dixon St / Boultham Park Rd, Lincoln). This is a single stream, 13 phase site with 6 stages and 14 poles.

As this was an existing fully ducted site the RLCS cabling was laid within the existing ducting along with the current street power cables. The existing signal heads and PTC-1 controller were then upgraded to include the “new” PTC1- RLCS equipment. There is no difference visually between the “conventional” and “RLCS” signal heads or controller.

The site acceptance tests were stringent and several scenarios of fault situations were vigorously tested. This site has both a green wave route passing through and also has bus priority. The PTC-1 RLCS utilises a web browser to view the configuration and within the web browser there is a live site overview. The site is using Clearview magnetometer detection with the Access Points being separately cabled back to the controller.
Although not shown here, I have addressed all the M120 cards with sequential IP Addresses and connected them via a network switch to the router on site to give access from the Instation. Software updates were carried out to improve certain features and functions. The site operated as would a normal site with no problems.

Manthorpe Road, Grantham

Last year, an opportunity arose to install a brand new pedestrian facility on a current major route near to a hospital at Grantham in Lincolnshire. Installing a complete site with traditionally ducted road crossings would have involved extensive civils, so we used the RLCS Micro Trenching option in which the cables are routed inside two 20mm Sub-Ducts and cut at a depth of 150mm within the road surface
Only two cables (1 power and 1 data) are required to cross the carriageway and utilising the RLCS Micro Trenching option allowed the complete road crossing to be installed within 3 hours whilst still keeping one lane of traffic running. Using the Micro-trenching option allowed the site to be installed with reduced disruption, congestion and cost due the reduced time and civils required.
Shown are some slides of the Micro Trenching and reinstatement procedure. The yellow infill resin around the sub ducts was requested to highlight the presence of the ducts in the event of any digging or road planning.

Following the commissioning of this site a FLIR Traficam X-Stream was fitted, replacing one of the MVDs. Not only did this detect the traffic approaching, but also allowed an additional SCOOT loop to be included at no extra cost and also provided a live video feed. This Traficam was connected to the controller using the RLCS Ethernet network via the RIO unit, which eliminated the need for any dedicated cables to be installed. A link was also included within the controller web browser to allow for easy access to view the live feed and to set or adjust detection areas remotely using FLIR software.

Recently a road traffic incident resulted in the knock down of a pole on the centre island reservation. The impact bent the pole and unfortunately damaged the cables. The operation of the site could have been restored using a specific RLCS Knock-Down Kit placed in a chamber that replicates the missing pole, however because the centre island had a primary signal head on it was not safe to operate without this. The pole and cabling were replaced in half a day’s work, demonstrating that the cable within the 20mm Sub-Duct could be easily replaced.

Wide Bargate, Boston

A third installation using three streams has more recently been completed. This replaced two controllers, a junction and a dual pedestrian facility, and re-used the existing ducting. Following a duct survey at the old site, formerly a Siemens ST200, the existing infrastructure only had use of single ducts crossing the carriageways. As RLCS only required minimal street cables it was decided to use RLCS rather than add additional road crossings, making the refurbishment quicker and less disruptive. The detection at this site is a mixture of above ground vehicle and pedestrian detection directly connected to the RIO units. FLIR Traficam have been separately cabled back to the controller to the standard 4Ti interface card. Connecting the 4Ti card to the router allows me to view the Traficams from my Instation. We can also watch live feed from one of the Traficams at a time. You can see that there is an external Chameleon fitted to the controller. This is so we can add additional facilities such as count and occupancy loops. Using the Chameleon, we can change the OTU

configuration without having to reconfigure the controller as you would if the OTU were integral.

In conclusion there are scenarios where the PTC-1 RLCS solution is beneficial, especially from a time and disruption point of view, where road crossing duct work can be reduced.
Development and testing from operating these sites demonstrated that longer cable runs can be used with close adjacent poles being driven from the nearby RLU and RIO units. Also generally IP comms encourages finding IP compatible devices to supplement monitoring the traffic environment.
We would be keen to try any offered to us.

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