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 September 30th, 2019, 11:07 AM

#1

wperriman

Member



Offline

Join Date: Nov 2012
 Location: Ontario
 Posts: 25

CompactLogix communications

I have been given a communication problem that is out of my scope, I am hoping that someone will be able to help me with some insight.
 I have a conveyor system controlled by a CompactLogix L69-L30ER (5330)v20.12. Currently connected to HMI and VFDs through a Stratix switch. The customer is adding a Marel Checkweighing Hopper to the system and I need to communicate with it. I have some hardware and messaging questions that I cannot find the answers to. The following is the information I got from the manufacturer on the communication format and message style.
 "For communication between systems (Marel M2200 and PLC), we will use port 52212 on the M2200 and the M2200 is always a Server (PLC will therefore have to be Client).
 The PLC will thus need to send its messages to the IP address of the M2200 on port 52212 and listen for messages coming from the M2200.
 We use standard Ethernet!
 There basically would be no "timing" for these messages, they are simply sent upon their respective events (f.ex. your distribution conveyor is started -> you send me <STX>55<HT>11<HT>1<ETX>).
 Regarding the gateway, we always provide Marel-made network switches in our cabinets, and there should be one of those in the hopper cabinet. I am guessing a network (RJ45) cable goes from that switch into your system for communication, but it should be noted that our M2200 controllers use a 10Mbit/s half-duplex protocol."
 Is there anyone that can tell me if a Prosoft card added to the CompactLogix rack will be the best way to accomplish this?

 **quote**

 September 30th, 2019, 11:11 AM

#2

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Member



Offline

Join Date: Nov 2012
Location: Ontario
Posts: 25

Generating a string value for him is easy but the Message_ID and Field_ID I haven't seen before.

"The M2200 needs to receive a keep-alive message on the port and I think the max interval is 15 seconds, if it doesn't receive this message within these 15 sec, it will close the port. So I propose that you send the following keep-alive message every 10 seconds (just to be on the safe side):

<STX>66<HT>17<HT>"5"<HT>18<HT>"1"<ETX> - NB: the "5" and "1" are sent as strings (I do not need the quotes) and this message HAS to look like this.

When the M2200 receives this message, it will send back the following message:

<STX>5<HT>21<HT>"DEVICE_ID"<HT>22<HT>"DEVICE_TYPE"<HT>23<HT>"DEVICE_PROGRAM"<ETX>

Here, "DEVICE_ID", "DEVICE_TYPE" and "DEVICE_PROGRAM" are string values generated by the controller's firmware.

<STX>MSG_ID<HT>FIELD_1<HT>VAL_1<HT>...FIELD_N<HT>VAL_N<ETX> where MSG_ID is a (header) number, FIELD_X are number identifiers for field IDs and VAL_X are the values corresponding to the respective field IDs

I propose using the same message ID (55) but just with different field IDs and values, so for example every time your gate conveyor starts you would send me the following message:

<STX>55<HT>11<HT>1<ETX>

And whenever that conveyor stops, you could send:

<STX>55<HT>11<HT>0<ETX>

Then, for the infeed conveyor to the hoppers, I would send you the following message (for different speeds):

<STX>55<HT>102<HT>0<ETX> (request for the infeed to stop)

<STX>55<HT>102<HT>1<ETX> (request for infeed coarse/fast speed)

<STX>55<HT>102<HT>2<ETX> (request for infeed fine/slow speed)"

Has anyone seen this type of comms before and have any suggestions how I generate those signals in the logic?



September 30th, 2019, 12:31 PM

#3

Geospark

Lifetime Supporting Member



Offline



Join Date: Feb 2012
Location: Kildare
Posts: 3,011

I'm no Expert on these, but...

I've found this manual which may be of use?...

User Guide - M2200 P02 & M02 Packing Scale Marel hf.

Communication

The following communication options are available for the M2200 scale:

- CAN. The M2200 is specially designed to operate in a networked environment (CANopen). When the scale is connected to this type of network, the network can supply the power.

- RS-232. The M2200 can communicate with external equipment using RS-232 (serial connections). Weighing results can be printed on an external label printer or the data can be transmitted to a PC for storing and further processing.

- Ethernet. Application programs in the scale can communicate with a computer network via Ethernet network.

It appears to use "Lua" programming...

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The M2200-P02 firmware accepts application software written in the Lua programming language.
Lua is a powerful light-weight programming language designed for extending applications.
Lua is also frequently used as a general-purpose, stand-alone language.
Lua combines simple procedural syntax with powerful data description constructs based on associative arrays and extensible semantics.
Lua is dynamically typed, interpreted from byte codes, and has automatic memory management with garbage collection, making it ideal for configuration, scripting, and rapid prototyping.

For more information on Lua see www.lua.org.

Model

The Model is a linear array of the parameters and system values built into the M2200-P02 firmware.

Each value is stored with its own checksum and attributes.

Some values are also stored in backup storage.

Some model values are readable and writable, some are read only.

Some model values are also protected by an audit trail using the CAL and CON event counters.

In some cases the names of model values can be changed, for example to support translation of the front panel interface.

The model can be accessed with dot commands through the command port TCP 52200.

The dot commands use two dimensions: the first is the model ID, the second is "1" for the name of the model entry, "2" for the value of the model entry, and "3" for the mode of the entry.

The Lua application has access to the Model with an API.

TCP Server Ports

The following is a list of TCP ports that can be used to communicate with the P02 firmware or the Lua application.

A small web server is also available on port 80.

The dot commands on port 52200 use the standard Marel dot command syntax and may be used to read or write all Model values.

- 52200 dot commands
- 52202 download Lua source, if allowed
- 52203 upload Lua source
- 52210 Lua standard output, for example using Lua print()
- 52211 message port "comm4" in Lua, persistent output queue
- **52212 terminal port "comm5" in Lua**
- 52213 remote host port "comm6" in Lua

Included in Manual...

Programmer's Guide – instructions for software programmers on how to create Lua scripts for the M2200

Registered Lua Functions

These functions can be called from the Lua code.

Some are for handling the display while others deal with the scale or the digital inputs and outputs.

In addition to these functions most of the standard Lua functions are also available.

Communication Port Functions

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CommFlush(comm-x) - Flush input buffers

CommActive(comm-x) - Say if port is active e.g. TCP port has been opened

PQueueFree() - Get free space on persistent record queue

PQueueUsed() - Get used space on persistent record queue

Acceptable values for comm-x:

- 1 - RS232-0
- 2 - RS232-1
- 3 - RS232-2
- 4 - Message port TCP 52211
- 5 - Terminal port TCP 52212
- 6 - Remote host port TCP 52213

Digital Input Functions

DICfgMode(n, mode) Mode: "low", "high", "direct", "invert", "count falling", "count rising", "count both", "toggle on fall", "toggle on rise"

DIGet(n) get status of input

DICr(n) clear edge counter

Digital Output Functions

DOCfgMode(n, mode, inv) Mode: "low", "high", "direct"

DOSet(n, state) Set output

DOGet(n) Get status of output

...and so on.

No examples of syntax to use for interfacing, although they are just using simple ASCII Code <STX> Start-of-Text, <ETX> End-of-Text, <HT> Horizontal Tab, etc.

Seeing as your controller's Ethernet port is already in use, I'd imagine you could stick in a ProSoft Generic ASCII Ethernet Interface Module (MVI69-GEC), which is a 1769 module, and communicate ASCII from the L30ER over the backplane and out to the checkweigher? Interfacing with weighers is one of the top application uses for the MVI69-GEC...

Generic ASCII Ethernet Interface Module - MVI69-GEC

There is also an AOP and Sample Ladder Logic under the Downloads tab.

The timing (or lack of?) of the data exchange/handshaking might be the tricky part here? You might have to figure that out more on the controller side, but should be doable.

That's just a quick assessment of the information that you/they have provided.

Regards,
George

"A little nonsense now and then is relished by the wisest men".

Last edited by Geospark; September 30th, 2019 at 12:33 PM.


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September 30th, 2019, 02:10 PM

#4

wperriman

Member



Offline


Join Date: Nov 2012

Location: Ontario

Posts: 25

Thank you for your help, I definitely needed an outside perspective.

Cheers

 quote

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