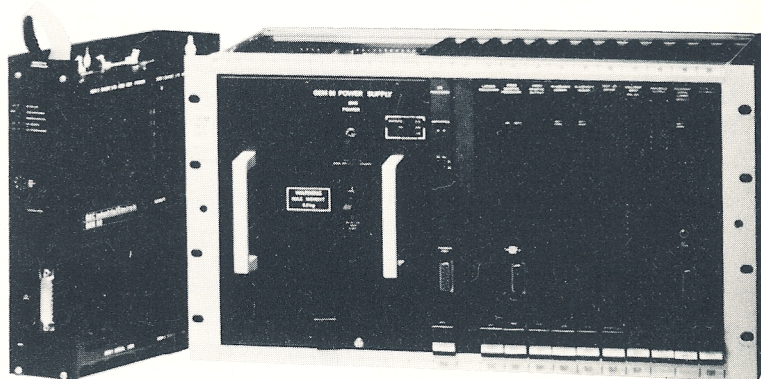
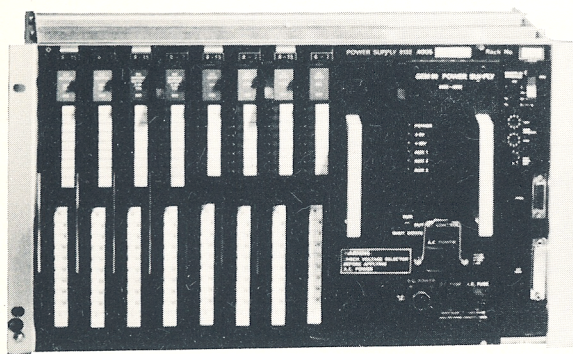


Remote I/O System

8981 and 8174



DESCRIPTION

A new system has been introduced to augment the GEM80 range. It enables I/O equipment to be located up to three kilometres from the host controller and is called the Remote I/O System. Cabling costs are reduced significantly since basic I/O equipment can be located near to the plant. In some installations the Remote I/O System reduces the number of controllers required because full use is made of the controllers I/O capacity.

The Remote I/O System comprises an 8981 Remote I/O Controller and a number of 8174 Remote I/O Interface Modules. The Remote I/O Controller is mounted in its own metal case. The Remote I/O Interface Module plugs into a 19 inch subrack with a power module and space for up to eight compact I/O modules.

In a typical Remote I/O System the host GEM80 controller links to the Remote I/O Controller via a concentrated basic I/O highway (such as available with GEM80/140 & 300 series controllers). The Remote I/O Controller encodes the parallel data of the concentrated basic I/O highway to high speed serial data which is transmitted through a single cable to one or more Remote I/O Interface Modules, which then interface to the basic I/O equipment at the remote location.

Simplicity is the keynote of this system and no extra programming is required for the Remote I/O System.

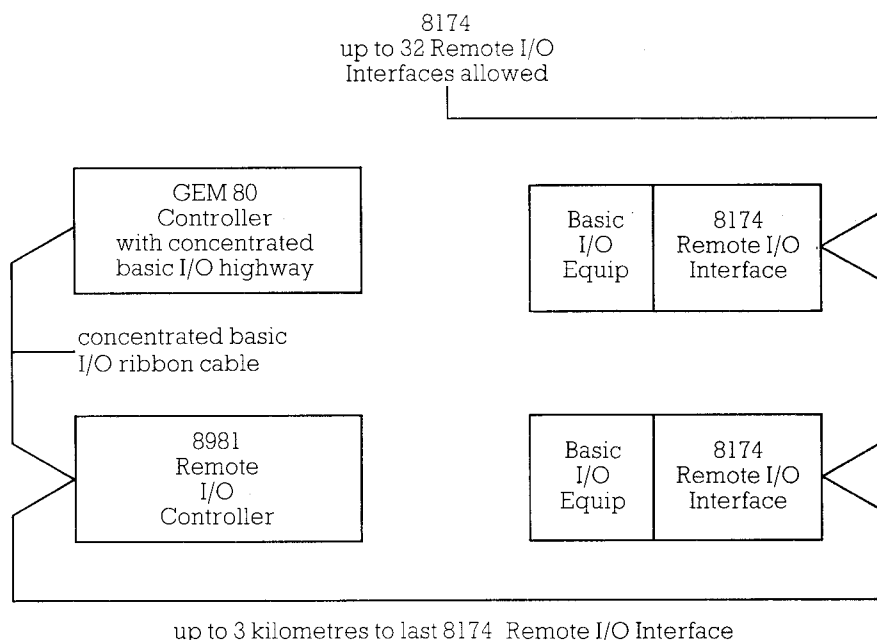
Up to 32 Remote I/O Interface Modules can be connected to each Remote I/O Controller, and the Remote I/O Controller itself will handle up to 2048 I/O points. Each Remote I/O Interface Module will at your discretion accommodate between 64 and 512 I/O points.

A special facility of this system is the programming port on the Remote I/O Interface Module which enables remote programming and monitoring of the host controller.

FEATURES

- A mixture of local and remote I/O can be configured.
- Automatic self-test on all controllers.
- Watchdog contacts hard wired through to each Remote I/O Interface Module.
- Remote station a.c. or d.c. powered.

OPERATION OF SYSTEM



1. Use with I/O Expanders

Not all the I/O on a system need to be remote from the host GEM 80 Programmable Controller. If I/O local to the host controller is required then this must be connected via an I/O Expander. For each I/O Expander employed the remote I/O capability is reduced by 512 I/O points.

The Concentrated Basic I/O Ribbon Cable can be freely 'daisy-chained' between a mixture of Remote I/O Controllers and I/O Expanders.

The possible combination of I/O Expanders and Remote I/O Controllers is limited to a total of 4 units per Concentrated Basic I/O Highway.

2. Operating Times

The overall time for the transition of data to a Remote I/O Interface is built up as follows:-

time = Host Controller scan time
+ I/O Data Link time (worst case)
+ Remote I/O Interface scan time

The Host Controller scan time is fixed by the program size/total I/O connected.

The Remote I/O Interface scan time is fixed by the quantity of I/O connected to it.

This leaves the I/O Data link time as the only possible variable in the overall scan time.

For applications where the overall scan time is critical it is possible to optimize this time by using more than one Remote I/O Controller and distributing the Remote I/O Interfaces between them. Each I/O Data link in such a configuration can be considered as being in parallel with all other I/O Data links.

3. Remote I/O Controller 8981

The unit performs the function of extending the Basic I/O Highway up to 3km by converting it from the Concentrated Highway format into a high speed serial link. An 8174 Remote Interface unit converts this serial link into Standard Basic I/O highway format.

The unit is sited adjacent to a GEM 80 Programmable Controller. The Concentrated Basic I/O ribbon cable is brought from the Controller's I/O Processor and is fitted into a 26 way ribbon cable socket mounted on the top of the unit.

start up : performs comprehensive self test
: starts operating cycle

operating cycle : as the Controller sets output data the Remote I/O Controller writes it to memory.
: transmits output data contained in the memory to each Remote I/O Interface in turn.
: instructs each Remote I/O Interface to transmit input data in turn.
: reads inputs of Remote I/O Interfaces into memory.
: outputs input information from memory to Controller when next the address location is scanned.

Cycle time : as GEM 80 Controller
: Serial I/O Data read/write time is 1ms per 64 I/O allocated

repetition : free running
interval

fault : causes Basic I/O fault.
shutdown

4. Remote I/O Interface Operation

The 8174 Remote I/O Interface Module performs a repetitive cycle; it scans its Inputs and sets its Outputs. The Input data is transmitted to the Remote I/O Controller and Outputs are set according to data received from the Remote I/O Controller.

- start up : performs comprehensive self test
: starts operating cycle
: closes watchdog interlock
- operating cycle : scans inputs into data tables scans
: outputs from data tables.
: services watchdog at regular intervals.
- repetition interval : free running
- fault shutdown : opens watchdog contact and
: ceases scanning I/O
- restart after shutdown : initiates power off/on externally or
: by operating power module switch
: shutdown/run.
: I/O data tables cleared to zero on
: power up.

User program

The Remote I/O Interface is not programmable; the user program is held in the host GEM 80 Programmable Controller.

A programming port is available on the Remote I/O Interface to enable the user to examine the user program at a point remote from the host controller. The connection of the programming lead to a Remote I/O Interface inhibits all other programming ports on other Remote I/O Interface units within that system. The programming port supports GEM 80 System Programmer types 8922 and 8940.

Self Test and Watchdog

The Remote I/O Interface performs self tests when power is switched on and also tests on data received from the Remote I/O Controller.

The watchdog relays automatically pick up on satisfactory completion of start up tests. Any failure indicated related to gross maloperation of the equipment results in automatic watchdog trip.

- faults which immediately trip watchdog : power supply break
: power module failure
: Remote I/O Interface module failure
: fault interfering with data transfer on basic I/O highway.
- faults which trip watchdog when detected by running tests : failure to store or recall data
: host GEM 80 Programmable Controller watchdog to trip.

- faults from which recovery is automatic : power supply reapplied after break
: host GEM 80 Programmable Controller watchdog reset.

Watchdog Contacts (for plant):-

- circuit for user : volt free contact
: closed when controller healthy and status running with normal inputs.
- resistive rating : a.c. 200VA 1A 259V make/break
: d.c. 100W 1A 250V make/break
- connections : 6.3mm (1/4") push-on tabs on the backplane (remove power module for access)

SPECIFICATION

8981 Remote I/O Controller

- I/O capacity : up to 2048
- No of remote stations : up to 32
- Maximum distance of remote station : up to 3 kilometres
- Power supply : 2.7A at 15V dc(derived from GEM 80 controller through the concentrated basic I/O highway)
- Self test & watchdog : the controller includes built in self test and trips watchdog on self test failure
- Dimensions : 272 x 238.5 x 67.1mm
- Weight : 1.5kg

8174 Remote I/O Interface Module in Subrack with 8132 Power Module

- I/O capacity : from 64 to 512 points
- Self test & watchdog : includes self test and trips watchdog on self test failure
- Power supply : ac: 88 to 132V or 176 to 264V ac
: 45 to 63Hz
: 40 to 100W
: peak inrush 25A at 250V (decay time constant 4ms)
: peak inrush 50A at 110V (decay time constant 4ms)
: dc: 22 to 85V
: 40 to 100W
: peak inrush 1.8A per volt decay time constant 4ms.
: suitable for operation from current limited source
- Dimension of subrack : 267 x 483 x 300mm
: 19" (483mm) rack mounting
- Weight of subrack : 20kg excluding compact I/O modules

ORDERING CODES

Remote I/O Controller comprising Remote I/O Controller module housed in metal case complete with cable harness and terminal rail 8891-4001

Remote I/O Interface comprising space for 8 compact I/O modules, subrack, power module Remote I/O Interface Module 8174, cable harness and terminal rail 8863-4001

ADDITIONAL INFORMATION

If you require any further information or wish to discuss an application in detail, do not hesitate to contact our GEM 80 Representative.

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