UR F60 Feeder Management Relay

An integrated feeder protection and metering solution

Power to Manage your Facility

The first Relay designed from the ground up around the MMS/UCA 2™ Ethernet communications standard.
Giving you the flexibility, connectivity and power to manage your facility.

Connectivity

- ModBus RTU
- MMS/UCA2™ Protocols
- SI Compatibility

Flexibility

- FlexCurves
- FlexLogic
- FlexModules
- Other Features

Presentation Overview

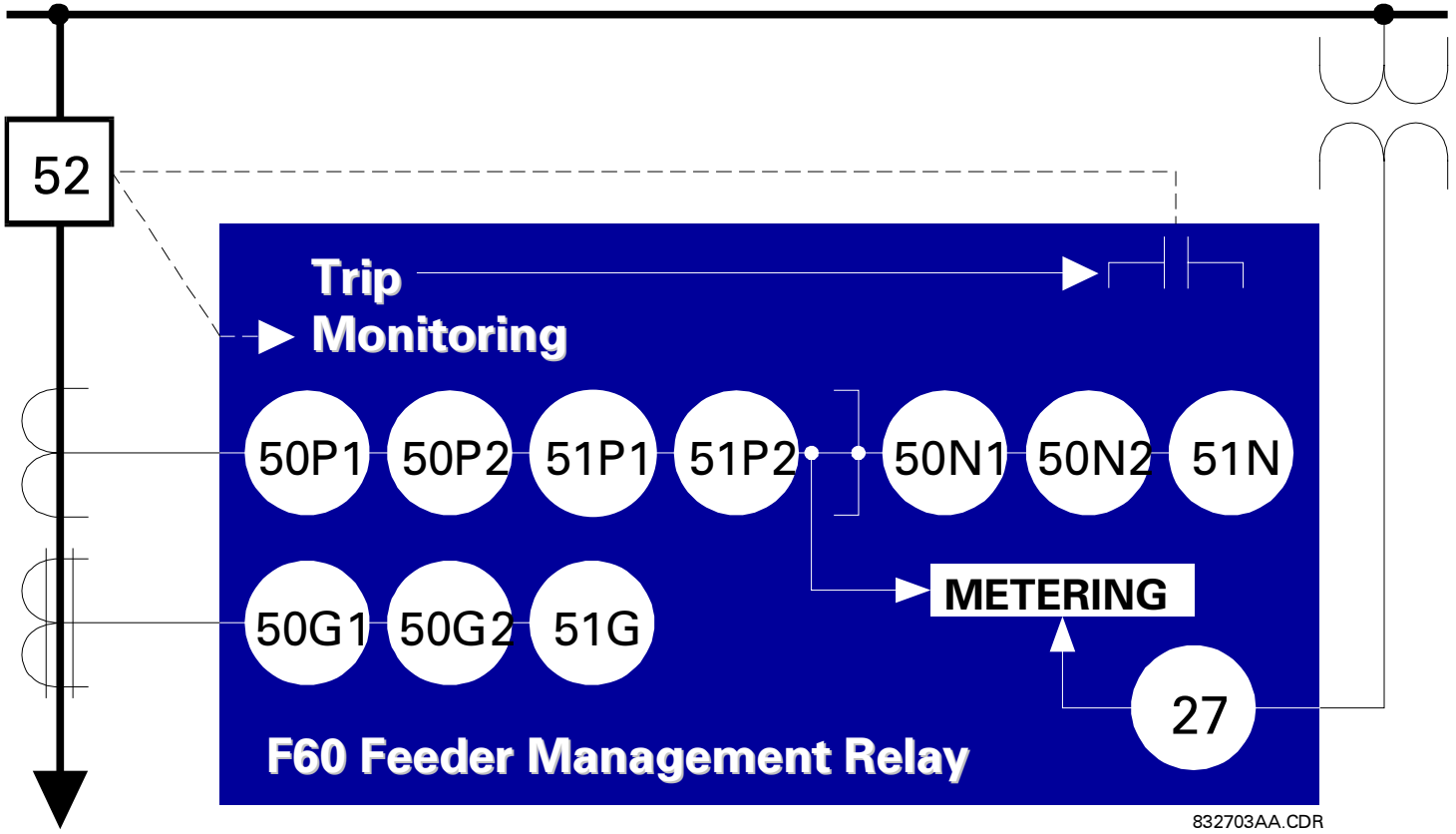
- Applications
- Hardware
- Protection and Control
- Metering and Monitoring
- Communications
- FlexLogic
- Connectivity
- User Interfaces
- F60 PC Software
- Order Codes

Applications

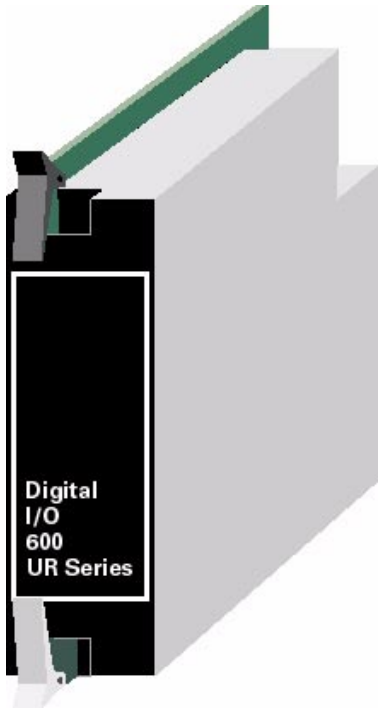
- Feeder Protection and Metering
- Component in Control System

The F60 is a digital relay that provides feeder protection and power metering in one integrated package. It may be used as a stand alone device or as a component of an automated sub-station control system.

Feeder Protection & Metering



Hardware



- Available in 4RU, 19 inch rack chassis configuration
- Modular design allows all modules to be easily inserted or removed for upgrading or repair
- Hinged faceplate allows easy access to modules
- Faceplate can be mounted separately on doors for applications limited in depth
- Extension cable connects faceplate to main unit

Basic Protection Functions

- Phase, neutral, and ground IOC
- Phase, neutral, and ground TOC
- Sensitive ground IOC and TOC
- 13 Standard curve shapes (IEEE/IEC/IAC/I^2t) or FlexCurves™
- Undervoltage

Time Over Current Element Curves

- **IEEE:**
  - Extremely Inverse
  - Very Inverse
  - Moderately Inverse
- **IEC:**
  - Curve A (BS142)
  - Curve B (BS142)
  - Curve C (BS142)
  - Short Inverse
- **I^2t**
- **GE IAC:**
  - Extremely Inverse
  - Very Inverse
  - Inverse
  - Short Inverse
- **Custom:** FlexCurve™ A and B (Programmable)
- **Definite Time**

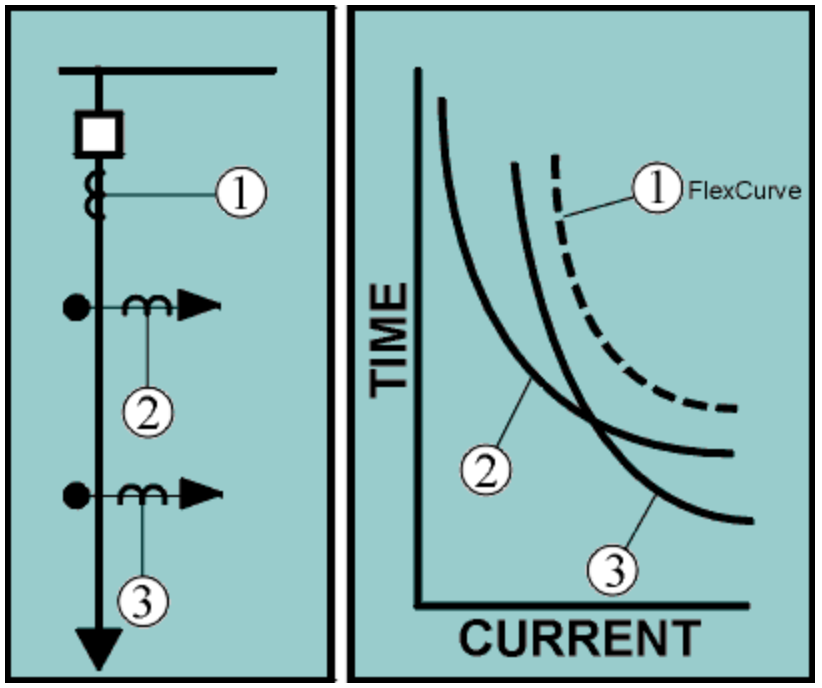
Flexibility

- FlexCurves™
- FlexLogic™
- FlexModules™
- Other Features
- Metering and Monitoring

FlexCurves

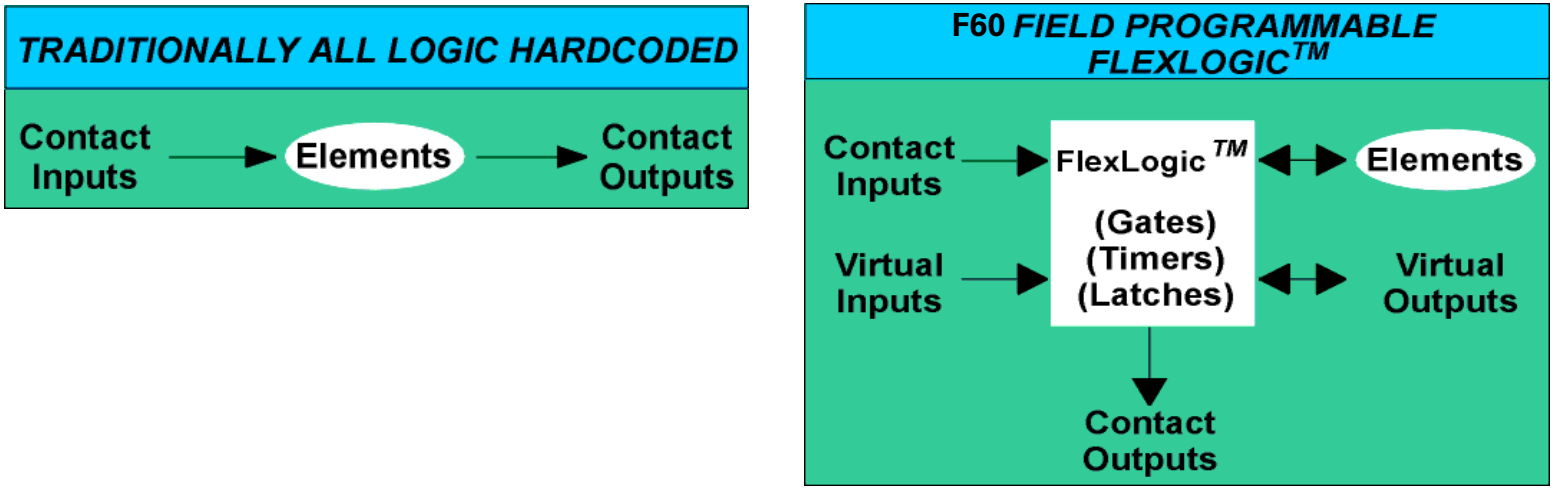
Typical application of FlexCurves:

When the protection curves used for lateral taps 2 and 3 differ; custom FlexCurves can be constructed to coordinate with both.



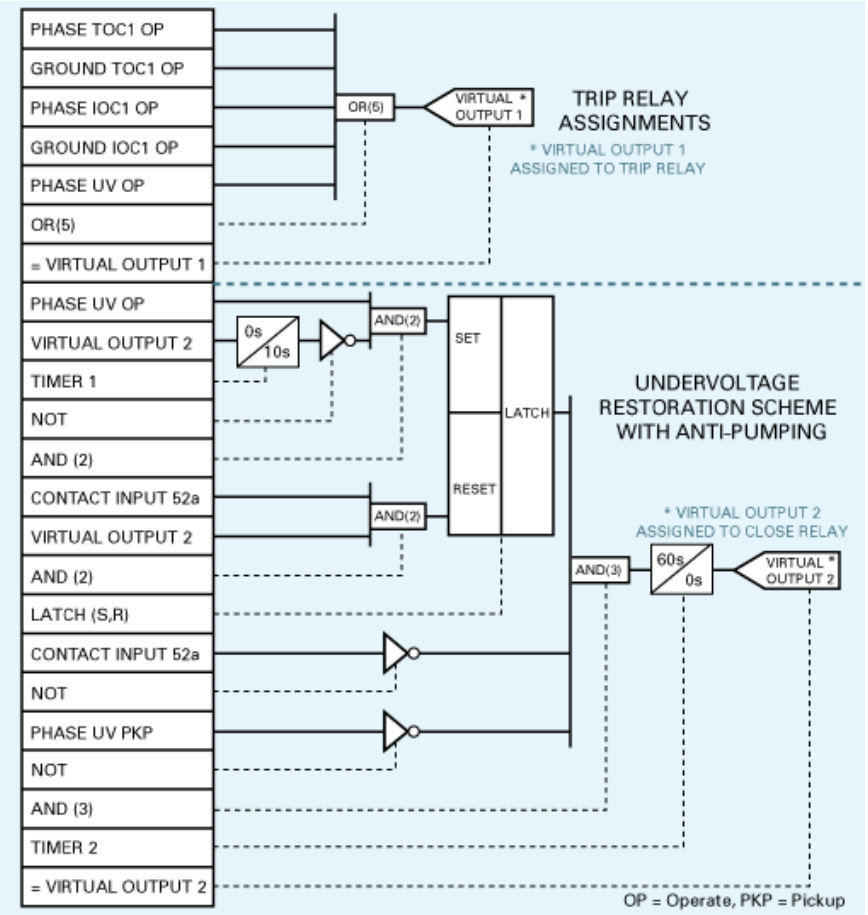
FlexLogic

FlexLogic minimizes the requirement for auxiliary components and wiring while making more complex schemes possible.



Virtual Inputs

Virtual Inputs allow the user to create specific logic unique to a customer's requirement.



FlexLogic

- Expandable I/O
- Flash memory
- Draw-out modules:
  - For serviceability
  - Field Upgradable

Monitoring

- **Current** (Ia Ib Ic In Ig)
  accuracy: ±0.25% from .1 to 2 pick up
- **Voltage** (Vab Vbc Vca Van Vbn Vcn)
  accuracy: ±0.25% from 10 to 208V
- **Apparent Power** (VA)
  accuracy: ±1% of reading
- **Real Power** (W)
  accuracy: ±1%
- **Reactive** (Var)
  accuracy: ±1%
- **Power Factor**
  accuracy: ±0.02

Monitoring

- Oscillography

  64 samples/power frequency cycle

- Event Recorder

  1024 events, all events are date and time stamped to nearest millisecond

Connectivity

- Communications
  - Protocols
  - Peer to Peer Communications
- URPC™
- Integration

Communications Protocols

ModBus® RTU protocol

CPU: standard

Front Port: RS232

Rear Port: RS485

Baud Rate: **115kbps** (6 times faster than 19200 bps)

UCA2™ protocol

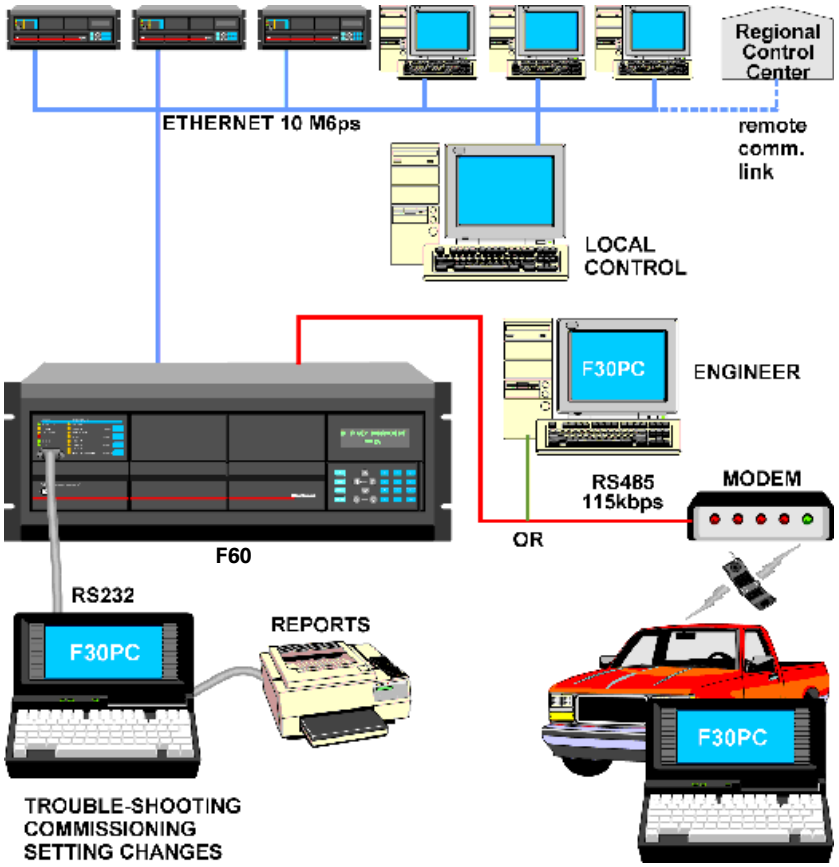
Application: MMS

Physical: 10BaseT (Ethernet) or 10BaseF (Fiber Optic)

Transport layer ISO-OSI and TCP/IP

(Dual Media optionally available)

Peer to Peer Communications



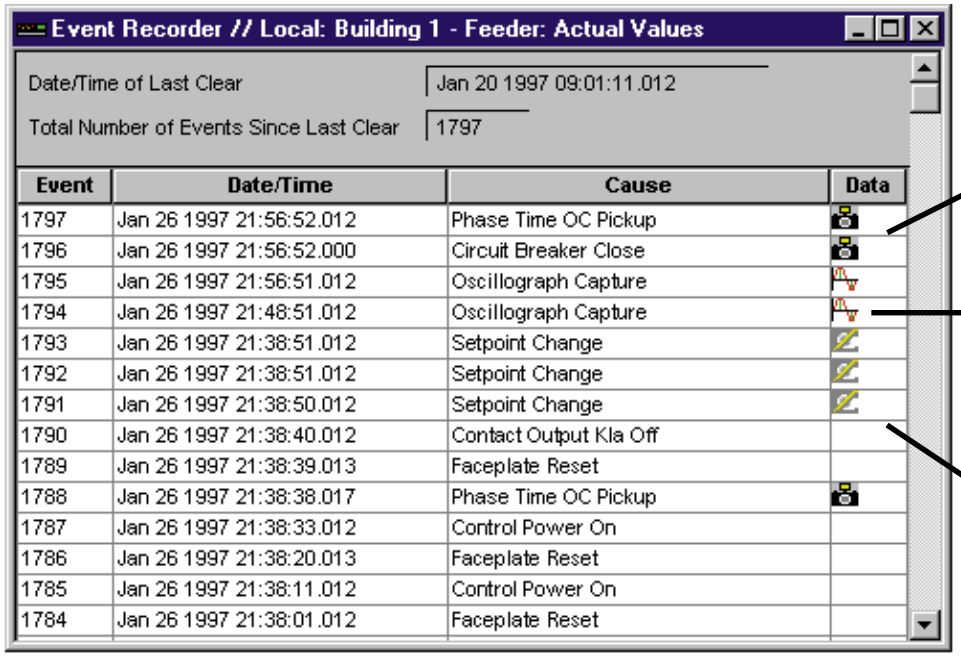
- Peer to peer communications
- Networkable
- Self-defining data
- External data access via corporate WAN

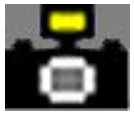
URPC Program Features

Windows 95/ NT Based Software

- View actual values
- View/edit setting on-line
- View Event Recorder for troubleshooting
- Relay firmware programming for upgrades
- View F60 Status
- View/edit setting off-line with setting file manager
- On-line instruction manual
- View F60 Status
- Download & View Oscillography & Comtrade Format

Event Recorder Capture Screen





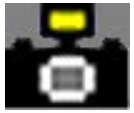
Snapshot Data

Oscillographic Data

Settings Change Data

The three main types of data – Snapshot data, Oscillographic data, and Settings data – can be accessed from this screen, the Event recorder.

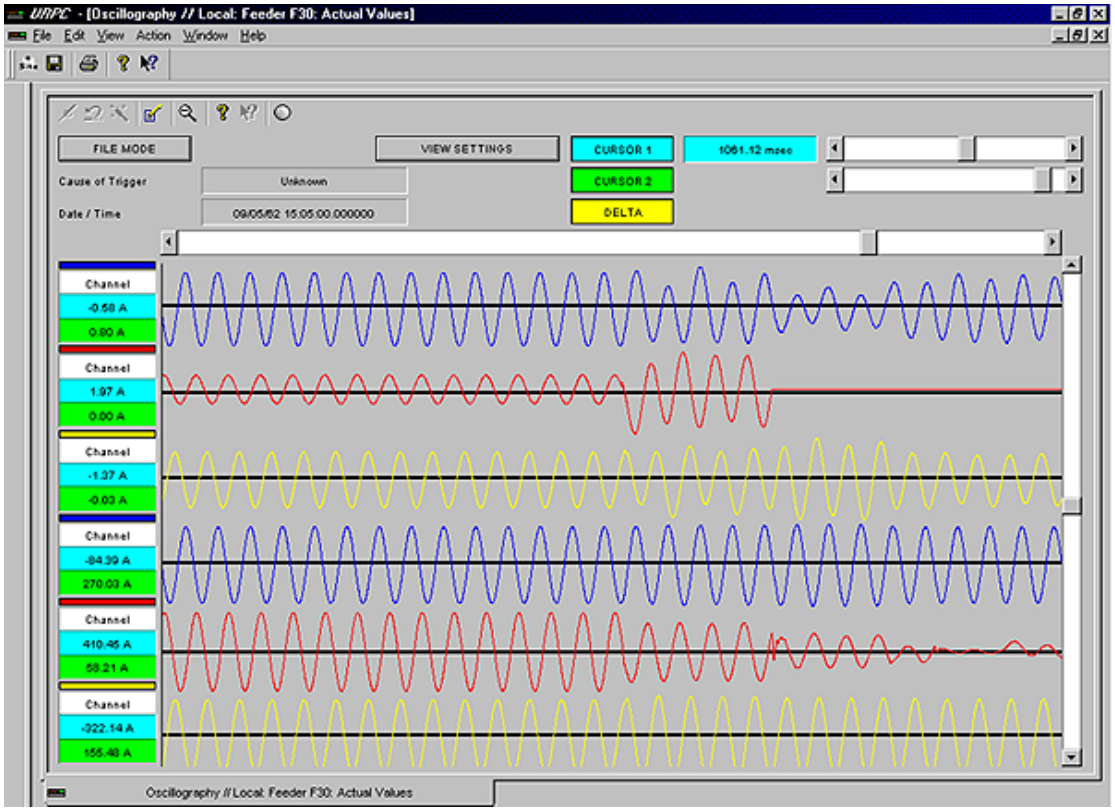
Snapshot Data



Snapshot // Event Recorder // Local:...

Event	1791
Date/Time	Jan 26 1997 21:38:20.012
Cause	Phase Time OC Operate
Frequency	59.998 Hz
Ia	2567.6 A at 11.5
Ib	100.2 A at 131.3
Ic	100.1 A at 251.2
Van	69.4 kV at 0.0
Vbn	69.3 kV at 120.1
Vcn	69.1 kV at 239.8
Metered Value 1	n/a
Metered Value 2	n/a
Metered Value 3	n/a
Metered Value 4	n/a
Metered Value 5	n/a
Metered Value 6	n/a
Metered Value 7	n/a

Oscillographic Data

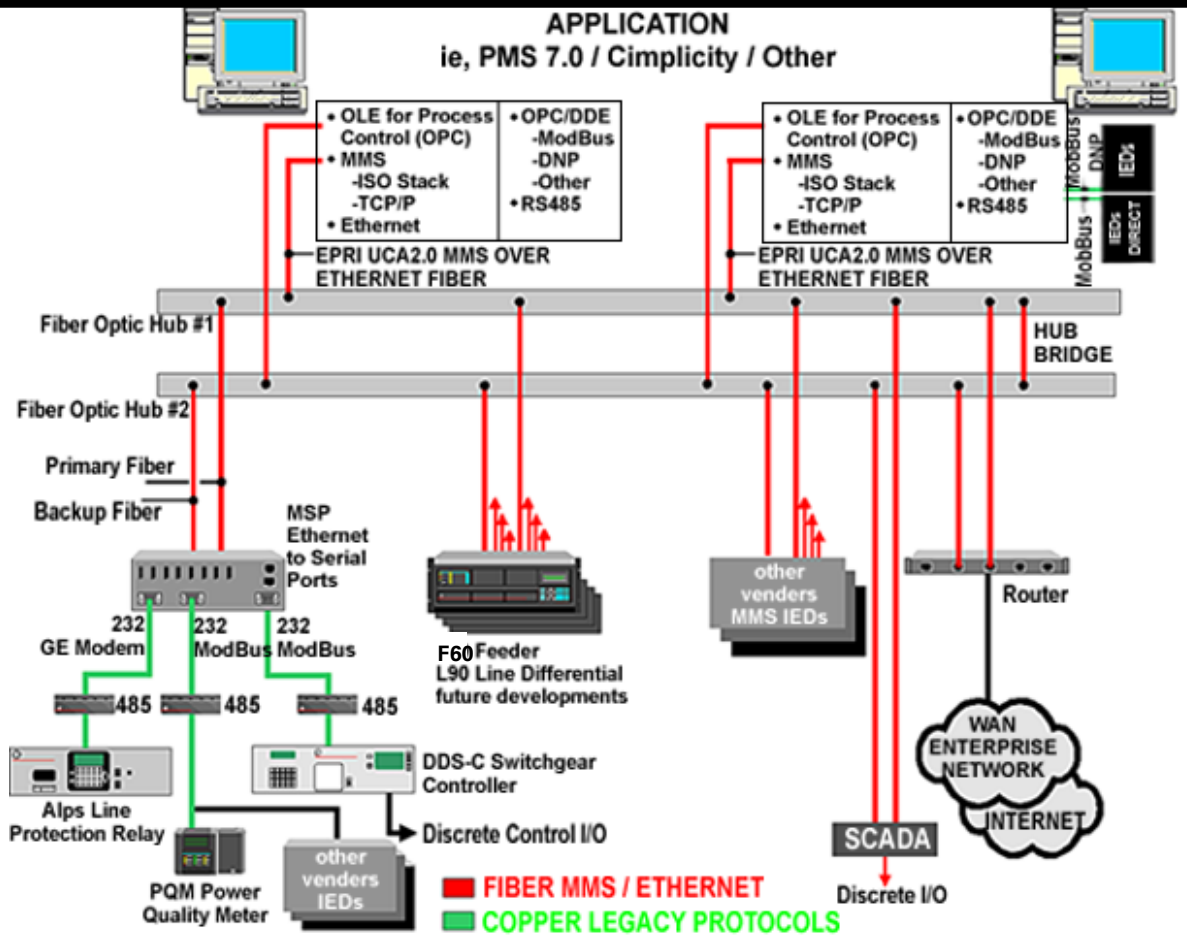


Settings Change Data

Setpoint Change // Event Recorder // Local: Building 1 - Feeder: Actual...

Event	1793	1992
Date/Time	Jan 26 1997 21:38:20.012	Jan 25 1997 20:38:20.455
Setpoint Name	Phase Time OC Pickup	System Frequency
Old Value	200.0 A	60.0 Hz
New Value	2000.0 A	50.0 Hz

Substation Automation



SUBSTATION AUTOMATION USING EPRI MMS/ETHERNET & GEPM IEDs

User Interfaces

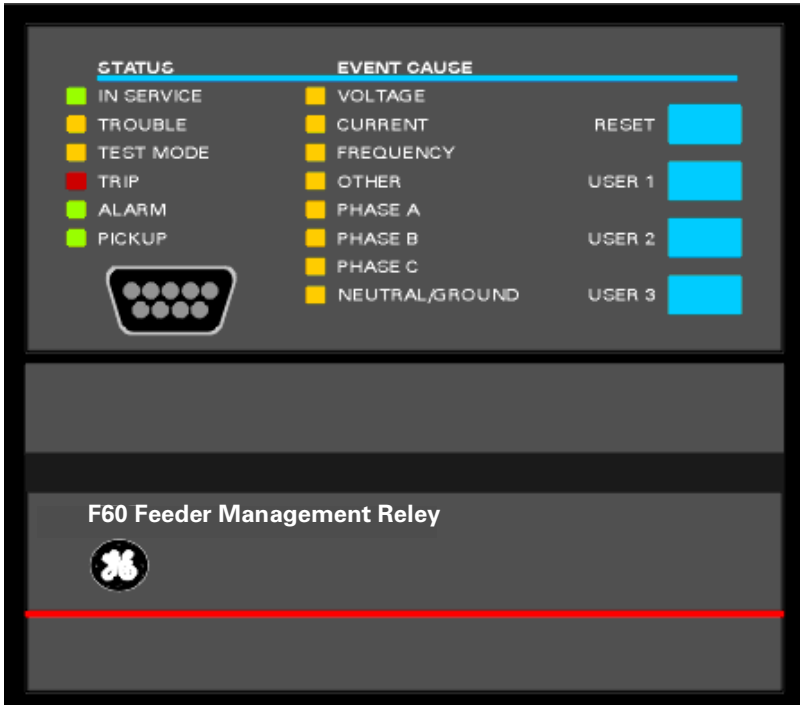
- PC Software for setting, monitoring
- RS232 port, faceplate accessible
- RS485 port (115kbps, Modbus RTU)
- Second RS485 or Ethernet Port: 10BaseF, redundant 10BaseF supporting MMS/UCA 2.0 protocol
- 2x20 character display and keypad
- Target LED indicators

User Interfaces

PROTECTIVE COVER
- Protects keypad when not in use
- Can be fitted with a seal

RESET KEY
- Clears event, EVENT CAUSE LED
- indicators, and latched alarms

User Interfaces



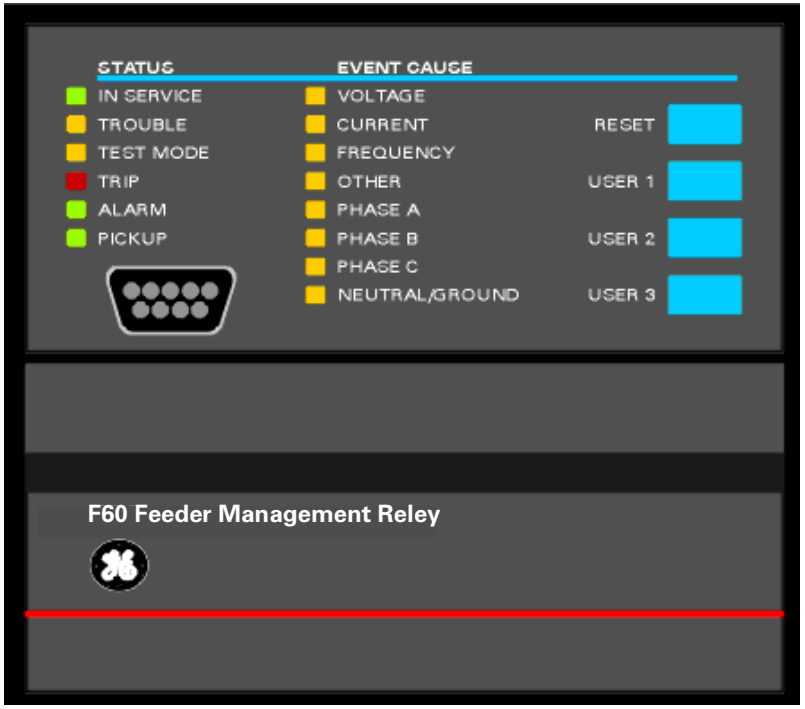
STATUS INDICATORS

IN SERVICE: The relay is operating normally
TROUBLE: Self-test detected a problem
TEST MODE: The relay is in test mode
TRIP: A trip command had been issued
ALARM: An alarm condition is present
PICKUP: Pickup condition detected

RS232 SERIAL PORT

- Connect to a PC to run URPC
- Use for downloading settings, monitoring data, sequence of events reports, Oscillography

User Interfaces



EVENT CAUSE LED INDICATORS

VOLTAGE: Event caused by voltage
CURRENT: Event caused by current
FREQUENCY: Not applicable
OTHER: Not applicable
PHASE A Indicates which
PHASE B phase was
PHASE C involved
NEUTRAL/GROUND

RS232 SERIAL PORT

- Connect to a PC to run URPC
- Use for downloading settings, monitoring data, sequence of events reports, Oscillography

User Interfaces

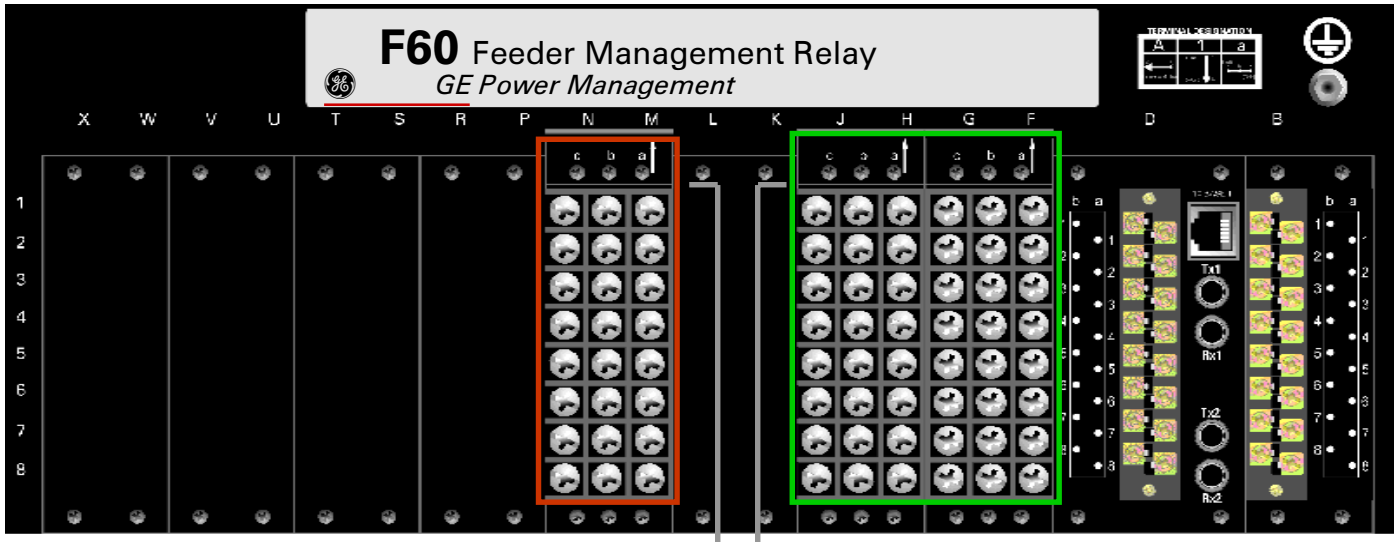
DISPLAY

- 40 character vacuum fluorescent display
- Visible in dim lighting or at any angle
- Used for programming, monitoring, status, fault diagnosis, user programmable messages and settings

KEYPAD

- Numerical keypad and command keys allow full access to the relay
- Rubber keypad is dust tight and splash-proof with door
- Website address via HELP for technical support

User Interfaces



CONTACT INPUTS (Expandable)

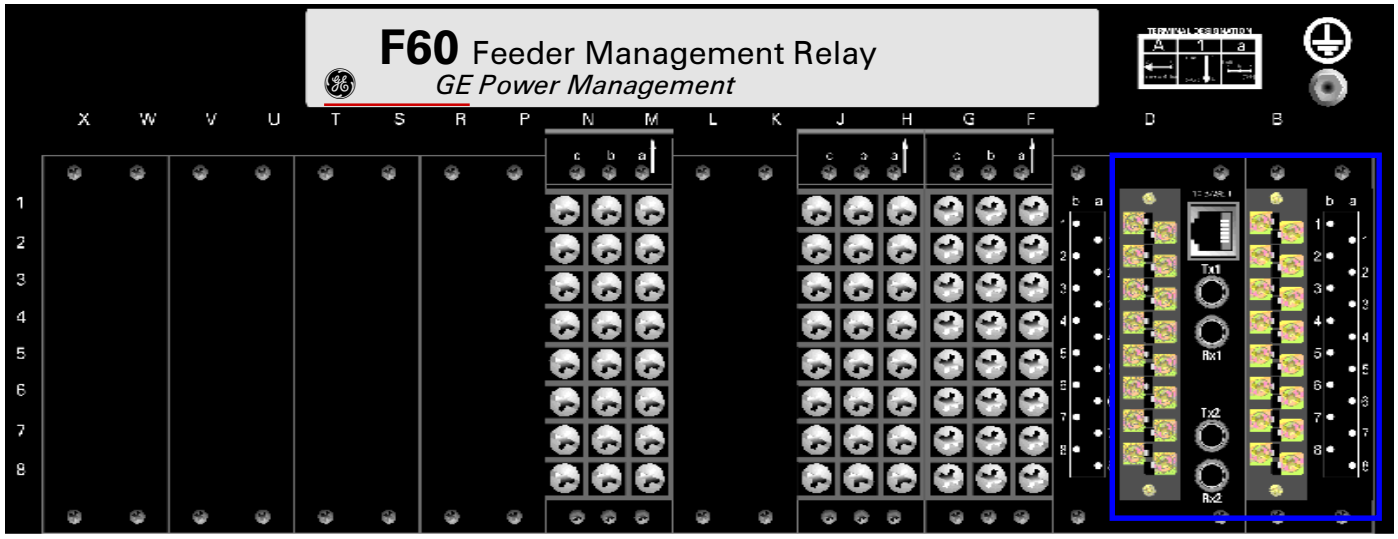
Configurable inputs may be used for:

- Breaker status
- Oscillography trigger
- Control inputs

CONTACT OUTPUTS (Expandable)

- Trip rated Form-A relays
- Form-C relays that may be programmed for
- auxiliary functions

User Interfaces



PROGRAM UPDATING

Flash memory storage of firmware for field updating via communications port. Enables product updating on-site for latest features.

POWERFUL PROCESSORS

Numerical data processing using a 32 bit CPU and DSP for high speed complex task processing

COMMUNICATIONS

- ModBus® RTU on RS485 @ 115 kbps
- MMS/UCA 2.0 on Redundant 10BaseF

Order Code

F30 - * 00 - H C * - F ** - H * * - M * *

Base Unit	F30								Base Unit
CPU		A							RS485 + RS485
		B							RS485 + 10BaseT
		C							RS485 + 10BaseF
		D							RS485 + Redundant 10BaseF
Software Options			00						No software options
Mounting				H					Horizontal
Faceplate					C				Faceplate with keypad and display
Power Supply						L			24/48 V (Low); 19-60 VDC, 19-81 VAC
						H			125/250 V (High); 88-300 VDC, 70-265
VAC CT/VT							8A		Standard 4CT/4VT
							8B		Sensitive ground 4CT/4VT
Digital I/O								6A	2 Form-A, 2 Form-C, 8 inputs
								6B	2 Form-A, 2 Form-C, 4 inputs
								6C	8 Form-C outputs
Custom I/O configuration available								6D	16 inputs
Consult factory with requirements								6E	4 Form-C, 8 inputs
								XX	No module

Accessories: Demo Sturdy carrying case

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