UR6UH

GE Multilin Universal Relay 6U Digital I/O Module

Product scope

- Combines six Form-A outputs with four digital contact inputs.
- Uses non-monitored output contacts in the documented 6U configuration.
- Provides configurable contact-input debounce for event and control logic.
- Requires the 6U/H ordering identity to match the relay chassis configuration.

Manufacturer source

GE Grid Solutions Universal Relay family documentation

The exact product record precedes any retained manufacturer manual extracts. Only pages relevant to the current product identity and documented functions are included.

Request a fast quote	Product reference	
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GE Multilin Universal Relay 6U Digital I/O Module

Manufacturer-source product record

This page consolidates only model-specific facts verified in the manufacturer sources listed below. It is included to identify the exact ordering code before the retained manufacturer manual pages.

Module code	6U
Platform	GE Multilin Universal Relay (UR)
Output configuration	Six Form-A contact outputs without current or voltage monitoring
Input configuration	Four digital contact inputs
Input recognition	Less than 1 ms
Input debounce	0 to 16 ms in 0.5 ms steps
Input grouping	Four contact inputs per common return
Ordering suffix	H execution; verify against the installed module label

Official references

- GE Grid Solutions UR family instruction manual and UR I/O module ordering tables.

No adjacent ordering option has been treated as part of this configuration. The complete label and installed-system requirements must be checked before replacement.

Function, operation and application

The following model-specific notes are limited to functions and operating relationships documented by the listed manufacturer sources.

Mixed I/O function

The 6U module provides six non-monitored Form-A contact outputs together with four digital inputs. This combination supports compact breaker-control, annunciation and interlocking schemes within the modular UR platform.

Output operation

FlexLogic or a protection element commands the Form-A relays, which close their normally open contacts to operate the assigned external circuit. Because the 6U outputs are specified without current or voltage monitoring, circuit supervision must be provided elsewhere when the application requires it.

Input operation

The four digital inputs use the UR contact-input threshold and debounce functions before their states are presented to logic, events or control equations. All four inputs share the documented common-return grouping.

Application limits

Output contact duty, trip-coil burden, external fusing and the relay's module-slot assignment must be checked against the host-relay manual. The H execution should be matched to the installed module label rather than inferred from the front-panel function alone.

UR & UR^{Plus} Family

Overview

The Universal Relay (UR) is a family of leading edge protection and control products built on a common modular platform. All UR products feature high-performance protection, expandable I/O options, integrated monitoring and metering, high-speed communications, and extensive programming and configuration capabilities. The UR forms the basis of simplified power management for the protection of critical assets, either as a stand-alone device or within an overall power automation system.

The UR is managed and programmed through EnerVista Launchpad. This powerful software package, which is included with each relay, not only allows the setpoints of the relay to be programmed, but also provides the capability to manage setpoint files, automatically access the latest versions of firmware/documentation and provide a window into the substation automation system.

The UR can be supplied in a variety of configurations and is available as a 19-inch rack horizontal mount unit or a reduced size (¾) vertical mount unit. The UR consists of the following modules: power supply, CPU, CT/VT input, digital input/output, transducer input/output, inter-relay communications, communication switch and IEC 61850 Process Bus. All hardware modules and software options can be specified at the time of ordering.

Protection and Control

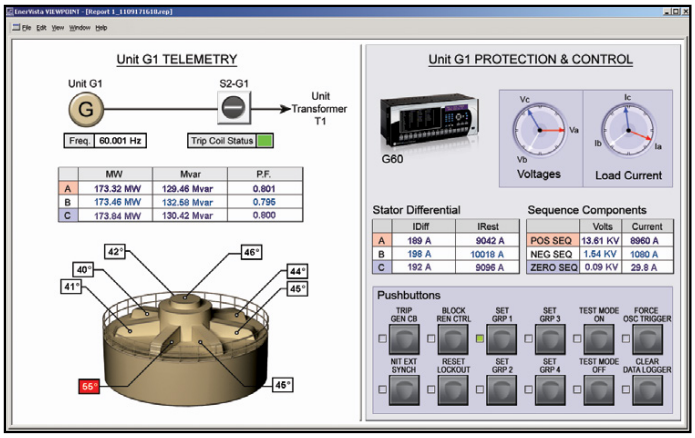
The UR incorporates the most complete and unique protection algorithms to provide unparalleled security and system uptime. The UR selector guide (in the following pages) lists all the protection elements found in each relay.

To support the protection and control functions of the UR, various types and forms of I/O are available (specific capabilities are model dependent). Supported I/Os include:

CTs and VTs

Up to 24 analog current transformer (CT) and voltage transformer (VT) signals can be configured to monitor AC power lines. Both 1 A and 5 A CTs are supported. Special function modules are available including: a CT module with sensitive ground input to provide ground fault protection on high-impedance grounded systems, and a high-impedance fault detection module that provides fast and reliable detection of faults caused by downed conductors.

UR - Protection, Metering, Monitoring and Control



The UR is the single point for protection, control, metering, and monitoring in one integrated device that can easily be connected directly into DCS or SCADA monitoring and control systems like Viewpoint Monitoring as shown.

Digital I/O

Up to 120 contact inputs (with utility voltage rating up to 250V), and up to 72 contact outputs, are available and can be used to monitor and control a wide range of auxiliary equipment found within a substation or other protection application. Types of digital I/O cards include trip-rated Form-A, Form-C, Fast Form-C, latching and Solid State Relay (SSR), with or without DC voltage, current monitoring and isolated inputs (with auto burnish feature). Mechanically latching outputs can be used to develop secure interlocking applications and replace mechanical switches and lockout relays. Form-A digital outputs have activation speeds of less than 4ms and both wet and dry contacts are supported.

Solid state output modules with high current breaking capability, fast tripping and reset time are ideal for direct tripping applications.

Transducer I/O

RTDs and DCmA cards are available to monitor system parameters, such as temperature, vibration, pressure, wind speed, and flow. Analog outputs can be used for hardwired connections from the controller to a SCADA system, to a programmable logic controller (PLC), or to other user interface devices (eg. panel display).

Advanced Automation

The UR incorporates advanced automation features including powerful FlexLogic programmable logic, communication, and SCADA capabilities that far surpass what is found in the average protection relay. Each UR can be seamlessly integrated with other UR relays for complete system protection and control.

FlexLogic

FlexLogic is the powerful UR-platform programming logic engine that provides the ability to create customized protection and control schemes, minimizing the need and associated costs of, auxiliary components and wiring. With 1024 lines of FlexLogic, the UR can be programmed to provide the required tripping logic along with custom scheme logic for breaker control (including interlocking with external synchronizers), transfer tripping schemes for remote breakers and dynamic setting group changes.

Scalable Hardware

The UR is available with a multitude of I/O configurations to suit the most demanding application needs. The expandable modular design allows for easy configuration and future upgrades.

- Multiple CT/VT configurations allow for the implementation of many different schemes, including concurrent split-phase and differential protection
- Flexible, modular high density I/O covering a broad range of input signals and tripping schemes with trip rated Form-A for high density outputs and Trip rated Form A, SSR, Form-C and mechanically latched relays for normal outputs
- Inter-relay communications module that enables the sharing of digital status and analog values between UR relays for control, fast tripping or teleprotection applications

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UR Technical Specifications

MONITORING

PHASOR MEASUREMENT UNIT

Output format:	per IEEE C37.118 standard
Number of channels:	14 synchrophasors, 16 analogs, 16 digitals
TVE (total vector error):	<1%
Triggering:	frequency, voltage, current, power, rate of change of frequency, user-defined
Reporting rate:	1, 2, 5, 10, 12, 15, 20, 25, 30, 50, 60 or 120 times per second
Number of clients:	One over TCP/IP port, two over UDP/IP ports
TAC ranges:	As indicated in appropriate specifications sections
Network reporting format:	16-bit integer or 32-bit IEEE floating point numbers
Network reporting style:	Rectangular (real and imaginary) or polar (magnitude and angle) coordinates
Filtering:	P and M class
Calibration:	Angle ±5°, magnitude +/-5% per phase
Compensation:	-180 to 180° in steps of 30° (current and voltage components)
Mode of operation:	Normal and test
PMU Recording:	46 configurable channels (14 syncrophasor, 16 digital, 16 analogs)

METERING

RMS CURRENT: PHASE, NEUTRAL, AND GROUND

Accuracy at:	
0.1 to 2.0 × CT rating:	±0.25% of reading or ±0.1% of rated (whichever is greater)
> 2.0 × CT rating:	±1.0% of reading

RMS VOLTAGE

Accuracy:	±0.5% of reading from 10 to 208 V

REAL POWER (WATTS)

Accuracy:	±1.0% of reading at -0.8 < PF < -1.0 and 0.8 < PF < 1.0

REACTIVE POWER (VARS)

Accuracy:	±1.0% of reading at -0.2 < PF < 0.2

APPARENT POWER (VA)

Accuracy:	±1.0% of reading

WATT-HOURS (POSITIVE AND NEGATIVE)

Accuracy:	±2.0% of reading
Range:	±0 to 2 × 109 MWh
Parameters:	3-phase only
Update rate:	50 ms

VAR-HOURS (POSITIVE AND NEGATIVE)

Accuracy:	±2.0% of reading
Range:	±0 to 2 × 109 Mvarh
Parameters:	3-phase only
Update rate:	50 ms

CURRENT HARMONICS

Harmonics:	2nd to 25th harmonic: per phase, displayed as a % of f1 (fundamental frequency phasor) THD: per phase, displayed as a % of f1
Accuracy:	
Harmonics:	1. f1 > 0.4pu: (0.20% + 0.035% / harmonic) of reading or 0.15% of 100%, whichever is greater 2. f1 < 0.4pu: as above plus %error of f1
THD:	1. f1 > 0.4pu: (0.25% + 0.035% / harmonic) of reading or 0.20% of 100%, whichever is greater 2. f1 < 0.4pu: as above plus %error of f1

DEMAND

Measurements:	Phases A, B, and C present and maximum measured currents 3-Phase Power (P, Q, and S) present and maximum measured currents
Accuracy:	±2.0%

FREQUENCY

Accuracy at	±0.01 Hz (when voltage signal is used for frequency measurement)
V = 0.8 to 1.2 pu:	±0.05 Hz
I = 0.1 to 0.25 pu:	±0.02 Hz (when current signal is used for frequency measurement)
I > 0.25 pu:	

VOLTAGE HARMONICS

Harmonics:	2nd to 25th harmonic: per phase, displayed as a % of f1 (fundamental frequency phasor) THD: per phase, displayed as a % of f1
Accuracy:	
Harmonics:	1. f1 > 0.4pu: (0.20% + 0.035% / harmonic) of reading or 0.15% of 100%, whichever is greater 2. f1 < 0.4pu: as above plus %error of f1
THD:	1. f1 > 0.4pu: (0.25% + 0.035% / harmonic) of reading or 0.20% of 100%, whichever is greater 2. f1 < 0.4pu: as above plus %error of f1

USER-PROGRAMMABLE ELEMENTS

CONTROL PUSHBUTTONS

Number of pushbuttons:	3 (standard), 16 (UR Enhanced HMI) or 8 plus 10 soft pushbuttons (UR color HMI)
Operation:	drive FlexLogic. operands

FLEXCURVES

Number:	4 (A through D)
Reset points:	40 (0 through 1 of pickup)
Operate points:	80 (1 through 20 of pickup)
Time delay:	0 to 65535 ms in steps of 1

FLEXLOGIC

Programming language:	Reverse Polish Notation with graphical visualization (keypad programmable)
Lines of code:	1024
Internal variables:	128
Supported operations:	NOT, XOR, OR (2 to 16 inputs), AND (2 to 16 inputs), NOR (2 to 16 inputs), NAND (2 to 16 inputs), Latch (Reset Dominant), Edge Detectors, Timers
Inputs:	any logical variable, contact, or virtual input
Number of timers:	64
Pickup delay:	0 to 60000 (ms, sec., min.) in steps of 1
Dropout delay:	0 to 60000 (ms, sec., min.) in steps of 1

FLEXELEMENTS

Number of elements:	16
Operating signal:	any analog actual value, or two values in Differential mode
Operating signal mode:	Signed or Absolute Value
Operating mode:	Level, Delta
Comparator direction:	Over, Under
Pickup Level:	-30.000 to 30.000 pu in steps of 0.001
Hysteresis:	0.1 to 50.0% in steps of 0.1
Delta dt:	20 ms to 60 days
Pickup & dropout delay:	0.000 to 65.535 s in steps of 0.001

FLEXSTATES

Number:	up to 256 logical variables grouped under 16 Modbus addresses
Programmability:	any logical variable, contact, or virtual input

LED TEST

Initiation:	from any digital input or user-programmable condition
Number of tests:	3, interruptible at any time
Duration of full test:	approximately 3 minutes
Test sequence 1:	all LEDs on
Test sequence 2:	all LEDs off, one LED at a time on for 1 s
Test sequence 3:	all LEDs on, one LED at a time off for 1 s

NON-VOLATILE LATCHES

Type:	Set-dominant or Reset-dominant
Number:	16 (individually programmed)
Output:	Stored in non-volatile memory
Execution sequence:	As input prior to protection, control, and FlexLogic.

SELECTOR SWITCH

Number of elements:	2
Upper position limit:	1 to 7 in steps of 1
Selecting mode:	Time-out or Acknowledge
Time-out timer:	3.0 to 60.0 s in steps of 0.1
Control inputs:	step-up and 3-bit
Power-up mode:	restore from non-volatile memory or synchronize to a 3-bit control input

USER-DEFINABLE DISPLAYS

Number of displays:	16
Lines of display:	2 × 20 alphanumeric characters
Parameters:	up to 5, any Modbus register addresses
Invoking and scrolling:	keypad, or any user-programmable condition, including pushbuttons

USER-PROGRAMMABLE LEDS

Number:	48 plus Trip and Alarm (UR Enhanced HMI), 8 plus Trip and Alarm (UR Color HMI)
Programmability:	from any logical variable, contact, or virtual input
Reset mode:	Self-reset or Latched

USER-PROGRAMMABLE PUSHBUTTONS (OPTIONAL)

Number of pushbuttons:	13 (standard), 16 (UR Enhanced HMI) or 8 plus 10 soft pushbuttons (UR color HMI)
Mode:	Self-Reset, Latched
Display message:	2 lines of 20 characters each

8-BIT SWITCH

Number of elements:	6
Input signals:	two 8-bit integers via FlexLogic operands
Control:	any FlexLogic operand
Response time:	< 8 ms at 60 Hz, < 10 ms at 50 Hz

INPUTS

AC CURRENT

CT rated primary:	1 to 50000 A
CT rated secondary:	1 A or 5 A by connection
Nominal frequency:	20 to 65 Hz
Relay burden:	< 0.2 VA at rated secondary
Conversion range:	
Standard CT:	0.02 to 46 × CT rating RMS symmetrical
Sensitive Ground/HI-Z CT module:	0.002 to 4.6 × CT rating RMS symmetrical
Current withstand:	20 ms at 250 times rated 1 sec. at 100 times rated continuous at 3 times rated continuous 4xInom; URs equipped with 24 CT inputs have a maximum operating temp. of 50°C

AC VOLTAGE

VT rated secondary:	50.0 to 240.0 V
VT ratio:	1.00 to 24000.00
Nominal frequency:	20 to 65 Hz For the L90, the nominal system frequency should be chosen as 50 Hz or 60 Hz only.
Relay burden:	< 0.25 VA at 120 V
Conversion range:	1 to 275 V
Voltage withstand:	continuous at 260 V to neutral 1 min./hr at 420 V to neutral

CONTACT INPUTS

Dry contacts:	1000 Ω maximum
Wet contacts:	300 V DC maximum
Selectable thresholds:	17 V, 33 V, 84 V, 166 V
Tolerance:	±10%
Contacts Per Common Return:	4
Recognition time:	< 1 ms
Debounce timer:	0.0 to 16.0 ms in steps of 0.5
Continuous Current Draw:	3mA (when energized)

CONTACT INPUTS WITH AUTO-BURNISHING

Dry contacts:	1000 Ω maximum
Wet contacts:	300 V DC maximum
Selectable thresholds:	17 V, 33 V, 84 V, 166 V
Tolerance:	±10%
Contacts Per Common Return:	2
Recognition time:	< 1 ms
Debounce timer:	0.0 to 16.0 ms in steps of 0.5
Continuous Current Draw:	3mA (when energized)
Auto-Burnish Impulse Current:	50 to 70 mA
Duration of Auto-Burnish Impulse:	25 to 50 ms

DCMA INPUTS

Current input (mA DC):	0 to -1, 0 to +1, -1 to +1, 0 to 5, 0 to 10, 0 to 20, 4 to 20 (programmable)
Input impedance:	379 ±10%
Conversion range:	-1 to + 20 mA DC
Accuracy:	±0.2% of full scale
Type:	Passive

DIRECT INPUTS

Number of input points:	32
No. of remote devices:	16
Default states on loss of comms.:	On, Off, Latest/Off, Latest/On
Ring configuration:	Yes, No
Data rate:	64 or 128 kbps
CRC:	32-bit
CRC alarm:	
Responding to:	Rate of messages failing the CRC
Monitoring message count:	10 to 10000 in steps of 1
Alarm threshold:	1 to 1000 in steps of 1
Unreturned message alarm:	
Responding to:	Rate of unreturned messages in the ring configuration
Monitoring message count:	10 to 10000 in steps of 1
Alarm threshold:	1 to 1000 in steps of 1

IRIG-B INPUT

Amplitude modulation:	1 to 10 V pk-pk
DC shift:	TTL
Input impedance:	22 kW
Isolation:	2 kV

REMOTE INPUTS (IEC 61850 GSSE)

Number of input points:	32, configured from 64 incoming bit pairs
Number of remote devices:	16
Default states on loss of comms.:	On, Off, Latest/Off, Latest/On

RTD INPUTS

Types (3-wire):	100 Ω Platinum, 100 Ω & 120 Ω Nickel, 10 Ω Copper
Sensing current:	5 mA
Range:	-50 to +250°C
Accuracy:	±2°C
Isolation:	36 V pk-pk

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