INSTRUCTION MANUAL

ANALOG BACKUP STATION

MODEL **JB2**

BEFORE USE ....

Thank you for choosing M-System. Before use, please check contents of the package you received as outlined below.
If you have any problems or questions with the product, please contact M-System's Sales Office or representatives.

■ PACKAGE INCLUDES:

Analog backup station (body + base socket).....(1)

■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection, hardware setting and basic maintenance procedures.
When you need to change software settings, please refer to the Operation Manual for Model PU-2x (EM-9255), Section A.

POINTS OF CAUTION

■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:
  11 – 35V DC rating: Approx. 120mA at 24V in CAS mode
  Approx. 180mA at 24V in MAN mode

■ GENERAL PRECAUTIONS

- Before you remove the unit from its base socket or mount it, turn off the power supply and input signal for safety.

■ ENVIRONMENT

- Indoor use.
- When heavy dust or metal particles are present in the air, install the unit inside proper housing with sufficient ventilation.
- Do not install the unit where it is subjected to continuous vibration. Do not subject the unit to physical impact.
- Environmental temperature must be within -5 to +55°C (23 to 131°F) with relative humidity within 30 to 90% RH in order to ensure adequate life span and operation.

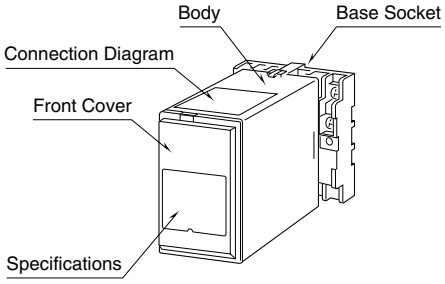
■ WIRING

- Do not install cables close to noise sources (relay drive cable, high frequency line, etc.).
- Do not bind these cables together with those in which noises are present. Do not install them in the same duct.

■ AND ....

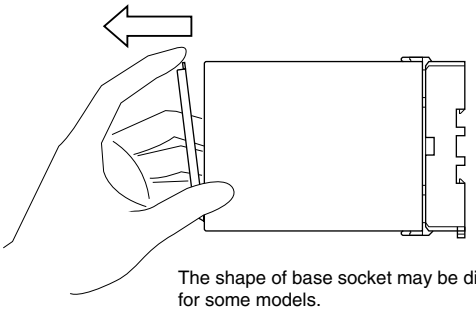
- The unit is designed to function as soon as power is supplied, however, a warm up for 10 minutes is required for satisfying complete performance described in the data sheet.

COMPONENT IDENTIFICATION



■ HOW TO OPEN THE FRONT COVER:

Hang your finger on the hook at the top of the front cover and pull.



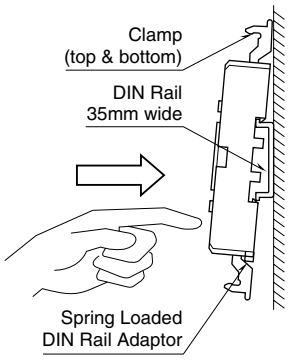
The shape of base socket may be different for some models.

INSTALLATION

Detach the yellow clamps located at the top and bottom of the unit for separate the body from the base socket.

■ DIN RAIL MOUNTING

Set the base socket so that its DIN rail adaptor is at the bottom. Hang the upper hook at the rear side of base socket on the DIN rail and push in the lower. When removing the socket, push down the DIN rail adaptor utilizing a minus screwdriver and pull.



Shape and size of the base socket are slightly different with various socket types.

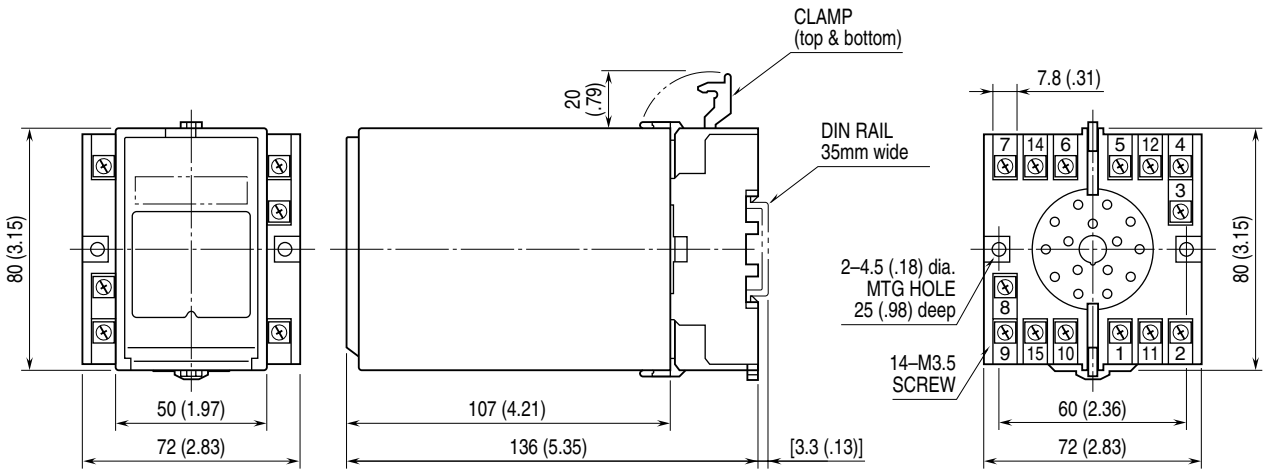
■ WALL MOUNTING

Refer to "EXTERNAL DIMENSIONS."

TERMINAL CONNECTIONS

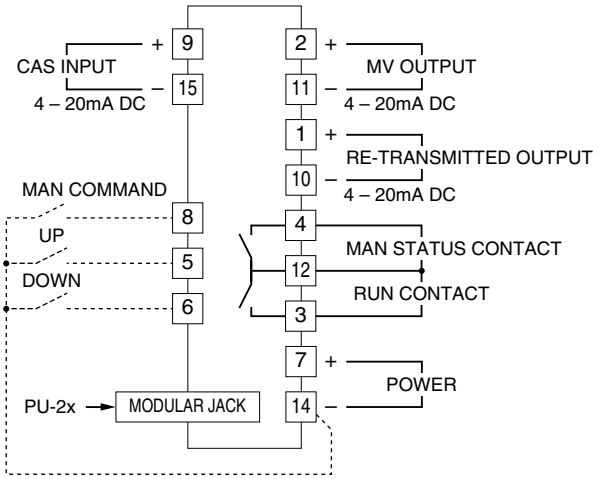
Connect the unit as in the diagram below or refer to the connection diagram on the top of the unit.

■ EXTERNAL DIMENSIONS unit: mm (inch)



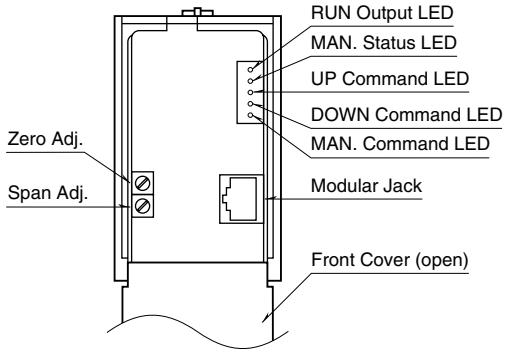
• When mounting, no extra space is needed between units.

■ CONNECTION DIAGRAM

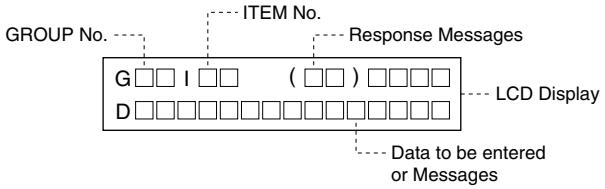


FRONT VIEW & PROGRAMMING

Please refer to the Operation Manual for Model PU-2x (EM-9255), Section A: (A-1) Introduction, (A-2) General Operation Description, (A-3) General Operation Flow Chart for general information.



• PROGRAMMING WITH PU-2x



• Response Messages

OK: OK
NG: No good. Check modular jack connection.
ER: Communication error

[GROUP 01]

ITEM	MDFY.	DATA INPUT	DISPLAY	CONTENTS
01	S			MAINTENANCE SWITCH
		0	MTSW : MON.MODE	0: Data indication only.
		1	MTSW : PRG.MODE	1: All 'P' marked parameters are modifiable. *1
02	P	Alphabets & No.	TG : XXXXXXXXXX	Tag name entry (10 characters max.)
03	D	No input	OUTPER : XXX.XX	Output in %
04	D	No input	OUTVAL : XX.XXX	Output value in mA
05	D	No input	INPPER : XXX.XX	Input in %
06	D	No input	INPVAL : XX.XXX	Input value in mA
10	P		WRITE DEFAULT	Initializing all setting values to the factory standard ones.
		ENTR	COMPLETED	Initialization complete
21	P			Manual control mode (factory set value: 1) Specifies the initial MV output value when starting MAN control
		1	1 : DIRECT	CAS control signal value
		2	2 : TRACE BACK	CAS control signal value going back for ITEM 28 set time period
		3	3 : FIXED VALUE	Fixed value set in ITEM 29
22	P	Numeric	SLDBAK : XXX.XX	MAN/CAS transition response (%/second) Selectable range: 0.00 to 200.00 No sliding-back function with 0.00
23	P			UP/DOWN response mode (factory set value: 0)
		0	0 : UNIFORM	Constant ramp rate while the key is held down.
		1	1 : ONE+UNIFORM	Normal response rate for once when the key is pressed. Constant ramp rate if it is continuously held down.
		2	2 : ACCELERATED	Accelerated response when the key is pressed until it reaches the constant ramp rate.
24	P	Numeric	KEYRES : XXX.XX	UP/DOWN response time (ramp rate) (%/second) Selectable range: 0.00 to 200.00 (factory set value: 10.00)
25	P			High/Low alarm mode at CAS control (factory set value: 0)
		0	0 : NO ALARM	No alarm trip
		1	1 : LOW ALARM	Low alarm trip only
		2	2 : HIG ALARM	High alarm trip only
		3	3 : ALL ALARM	High/Low alarm trip
26	P	Numeric	ALMLOW : XXX.XX	CAS input Low alarm setpoint (%) Selectable range: -25.00 to 125.00 (factory set value: -25.00)
27	P	Numeric	ALMHIG : XXX.XX	CAS input High alarm setpoint (%) Selectable range: -25.00 to 125.00 (factory set value: 125.00)
28	P	Numeric	TRACEBACK : XX.X	Retroactive time period (seconds) Selectable range: 0.0 to 10.0 (factory set value: 0.0)
29	P	Numeric	MANFIX : XXX.XX	Initial manual control value (%) Selectable range: -25.00 to 125.00 (factory set value: 0.00)
30	P	Numeric	PWRFIX : XXX.XX	Output in % after power on in manual control mode Selectable range: -25.00 to 125.00 (factory set value: -25.00)
31	P			Output value after power on (see "JB2 Actions when the Power Supply is Recovered after Failure.")
		0	0: HOLD VALUE	The value stored at the moment of power failure
		1	1: FIXED VALUE	The value preset in the ITEM 30
32	D	No input	NVRWRCNT: XXX	Number of rewriting E^2PROM (32-bit) Count when changing program or power off

Modification Code
D: No modification (writing) possible. Used only for monitoring (reading).
S: Modifiable at any time.
P: Modifiable only when the MAINTENANCE SWITCH is in the 'PRG' mode.

*1. RUN contact is open (coil de-energized) while in the programming mode.

■ CAS INPUT HIGH/LOW ALARM

• Alarm Trip

The High/Low alarm trips when the CAS input signal reaches or goes beyond the respective setpoints specified with ITEM 26/27.
[Example] Low setpoint at 0.00%
The alarm trips when the input goes below 4.00mA.

• Alarm Reset

The High/Low alarm is reset when the CAS input signal goes out of the alarm zone by 1% deadband.
[Example] Lo setpoint at 0.00%
The alarm is reset when the input goes above 4.160mA, at 4.161mA or more.

OPERATING MODES

■ CASCADE CONTROL MODE

The JB2 allows the CAS input (cascade control signal) from the PID controller to pass through at the MV output terminals.

■ MANUAL CONTROL MODE

When the external MAN command contact is closed, the JB2 turns on to manual control mode.
Actual output signal is determined by following three operation modes:

MODE 1: Holds the CAS control signal at the moment of the MAN command.
MODE 2: Goes back the preset time period and hold the CAS control signal at that moment.
MODE 3: Holds a specific value preset by the Programming Unit (PU-2x).

In this mode, the output can be manipulated with external UP or DOWN commands.
When the MAN command contact is opened, the CAS control signal is recovered with smooth transition.

■ TRANSITION FROM MAN TO CAS CONTROL MODE

The JB2 increases/decreases the MV output until it reaches to the same value as the CAS control signal, and turns on to CAS control mode. The response time constant can be set/changed with the PU-2x.
If the external command contact is closed during the transition, the JB2 output holds the signal of this moment and turns on to MAN control mode.

■ JB2 ACTIONS WHEN THE POWER SUPPLY IS RECOVERED AFTER FAILURE

OPERATING MODE BEFORE FAILURE	MAN COMMAND STATUS AT RECOVERY	ITEM 31: 0	ITEM 31: 1
CASCADE	OFF (CAS mode)	Cascade control action	Cascade control action
	ON (MAN mode) *1	Manual control starting with the CAS control signal at the moment of failure	Manual control starting with a specific value preset in ITEM 30
MANUAL	OFF (CAS mode)	Cascade control action	Cascade control action
	ON (MAN mode) *1	Manual control holding the MAN control signal at the moment of failure	Manual control starting with a specific value preset in ITEM 30
SLIDING-BACK	OFF (CAS mode)	Cascade control action	Cascade control action
	ON (MAN mode) *1	Manual control holding the transition signal at the moment of failure	Manual control starting with a specific value preset in ITEM 30

*1. Approx. 0.3 seconds is required to switch from CAS to MAN when the power supply is recovered.

■ DIFFERENCES BETWEEN JB AND JB2/A

Means to back up the output value is different.
JB: STATIC RAM (A large capacitance capacitor holds the value until the capacitor is discharged)
JB2/A: E^2PROM (Output value is stored at E^2PROM and held until the next rewrite)
JB: When power recovers during MAN control mode, the output value is different depending on the power fail period.
JB2/A: The output value at power recovery is selectable with ITEM 31. Refer to the following table.

OUTPUT VALUE AT POWER RECOVERY DURING "MAN" CONTROL MODE

JB	Output value at the moment of power failure (recovery within the memory time)	Fixed value (recovery after the memory time)
JB2/A	ITEM 31 : 0	ITEM 31 : 1

■ COMPATIBILITY BETWEEN JB2 AND JB2/A

For JB2/A, the operation at power recovery is selectable (ITEM 30, 31).
When JB2 (without "/A") is replaced with JB2/A compatibly, set JB2/A according to the ITEM 21 value of JB2 as following.
- When JB2 is set ITEM 21 as 1 (DIRECT) or as 2 (TRACE BACK)
  Set JB2/A ITEM 30 as -25% and ITEM 31 as 0 (HOLD VALUE)
- When JB2 is set ITEM 21 as 3 (FIXED VALUE)
  Set JB2/A ITEM 30 as -25%, and ITEM 31 as 1 (FIXED VALUE)

CHECKING

1) Terminal wiring: Check that all cables are correctly connected according to the connection diagram.
2) Power input voltage: Check voltage across the terminal 7 – 14 with a multimeter.
3) Input: Check that the input signal is within 0 – 100% of the full-scale.
4) Output: Check current across the terminal 2 (+) – 11 (–) for MV output, 1 (+) – 10 (–) for the re-transmitted output.

ADJUSTMENT PROCEDURE

This unit is calibrated at the factory to meet the ordered specifications, therefore you usually do not need any calibration.
For matching the signal to a receiving instrument or in case of regular calibration, adjust the output as explained in the following.

■ HOW TO CALIBRATE THE OUTPUT SIGNAL

Use a signal source and measuring instruments of sufficient accuracy level. Turn the power supply on and warm up for more than 10 minutes.
1) ZERO: Apply 0% CAS input and adjust the re-transmitted output to 0%.
2) SPAN: Apply 100% CAS input and adjust the re-transmitted output to 100%.
3) Check ZERO adjustment again with 0% CAS input.
4) When ZERO value is changed, repeat the above procedure 1) – 3).

The MAN/CAS transition response time, UP/DOWN response time (ramp rate), retroactive time period, CAS input High/Low alarm setpoints are programmable using the PU-2x Programming Unit. Refer to "FRONT VIEW & PROGRAMMING."

LIGHTNING SURGE PROTECTION

M-System offers a series of lightning surge protector for protection against induced lightning surges. Please contact M-System to choose appropriate models.