Wicket Reader Interfaces
For Carwash, Laundry, Arcade And Other Markets
Rev. 10/2008

General Description

The WR88 Wicket Reader requires 5VDC to operate and has both an output signal and an input signal for connecting it to the system equipment. The WR88 may be configured in the field to use those input and output signals for serial data communication, or it may use them to create an output pulse and to monitor the operational status of the system equipment. These Wicket Reader Interface Modules have been designed to convert local available power to 5VDC and provide the proper interface voltages, currents, and connectors for interfacing to a variety of system equipment.

Interface modules covered in this document include:

- **WK-LV Module: Pulse Output - Low Voltage Interface**
- **WK-HV Module: Pulse Output - High Voltage Interface**
- **WK-CD Module: Serial Port – Card-Display Protocol**
- **WK-MDB Module: Serial Port - MDB Vendor Protocol**

Interface documentation for Turbo Accessories applications, including Wickets Jackpot, Registration & Redemption, and Night Access Door Control, are found within the Turbo Accessories documentation.

Pulse Output - Low Voltage: WK-LV Module

The Model WK-LV Pulse Output - Low Voltage Interface Module was primarily designed for applications powered by either 24VAC or 12-28VDC and requiring a "coin pulse" style interface to activate the service equipment. Such applications include carwash equipment, laundry equipment, low voltage arcade games and other similar equipment.
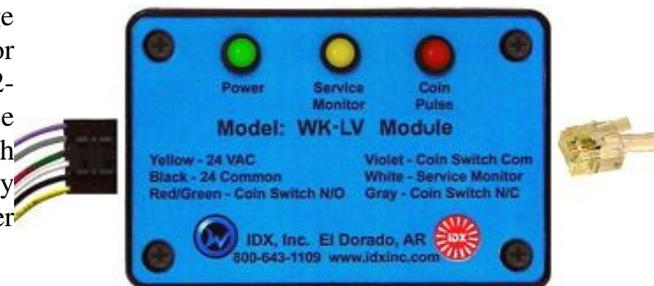
Its three diagnostic LED indicators provide visual operational information that may be helpful during installation and for troubleshooting problems. The enclosure dimensions are 3.3" L x 2.2" W x 1.0" H (84mm x 56mm x 20mm) and comes with adhesive Velcro mounting strips. An RJ-11 telephone style connector on the right side of the enclosure is to plug in the WR88 Wicket Reader. A wiring harness with 16" leads plugs into the field wiring connector on the left hand side of the enclosure. Note: Because there is more than one style of wiring harness (see below) it is a separately ordered item.

The reed relay output provides both N.O. (normally open) and N.C. (normally closed) dry contacts in order to interface as universally as possible. Typically the Relay N.O. and Relay Common terminals will be connected in parallel to those of other "coin pulse" generating devices. The Relay Common contact has an automatically resettable fuse to protect the module from wiring errors and other problems. The Service Monitor input is used to sense if power to the equipment has been applied. The Wicket Reader monitors this signal to determine the following; a) whether to charge the Start Up Amount or the Increment Amount, or b) whether to indicate that the equipment is running (Wicket Reader face turns white). Wickets Administrator is used to configure the WR88 Wicket Reader's use of this signal, including enable/disable and whether Service Sense logically corresponds to a high or low voltage sensed at the input.

One of the below wiring harnesses must be ordered with the WK-LV Module for field wiring:

The WK-WR-LV wire harness has 16" leads and is intended for general purpose retrofit interface. IDX can assist you with specific information on connecting to a variety of equipment.

Wire Harness:
WK-WR-LV

Wire	Name	Description / Specification
1- Yellow	Power Hot	Power supply: 12-28VAC or 12-35VDC
2- Black	Power Common	Power Common - Ground
3- White	Service Monitor	Input threshold: 1.4VDC, 2K Ohms internal pull down. 28VAC/DC maximum.
4- Red/Grn	Switch N.O.	SPDT reed relay switch contacts: 0.30Amps @ 60VDC maximum. - with automatic resettable fuse.
5- Grey	Switch N.C.	
6- Violet	Switch Com.	

The WK-WR-LV-MT wire harness is 16" in length and is terminated with a connector for the Maytag Gen 1 Debit Specification for laundry equipment.

Wire Harness:
WK-WR-LV-MT

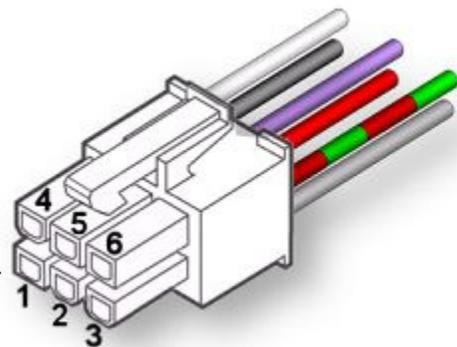| Wire	IDX Name	Maytag Name - Function Description / Specification
1	ServiceMonitor	Avail2 - Optocoupler emitter output for machine available signal.
2	--	Avail1 - Optocoupler collector for machine available signal: = PWR+
3	--	Enable1 - Optocoupler LED anode for debit pulse enable: = PWR+
4	Relay N.C.	Enable2 - Optocoupler LED cathode for debit pulse enable signal.
5	Power Hot	PWR+ - 26VDC @ 100mA max. for debit reader.
6	Power Common	PWR- - Power common for debit reader.

Note: Wickets Administrator must be used to program the WR88 Wicket Reader to enable it to generate the correct pulses and debit a Customer Wicket by the proper amount. See below for information about setting the configuration parameters for the WR88. A separate PDF document for Maytag-specific setup instructions is available on the Web.

Pulse Output - High Voltage: WK-HV Module

The WK-HV Pulse Output - High Voltage Interface Module was primarily designed for applications powered by 120VAC or 240VAC and requiring a "coin pulse" style interface to activate the service equipment. Such applications include laundry equipment, air vendors, carwash vacuums, and other similar equipment. Its three diagnostic LED indicators provide visual operational information that may be helpful during installation and for troubleshooting problems. The enclosure dimensions are 4.4" L x 2.4" W x 1.2" H (112mm x 61mm x 30.5mm) and comes with adhesive Velcro mounting strips.

The relay output provides both N.O. (normally open) and N.C. (normally closed) dry contacts in order to interface as universally as possible. Typically the Relay N.O. and Relay Common terminals will be connected in parallel to those of other "coin pulse" generating devices. The Service Monitor input is used to sense if power to the equipment has been applied. The Wicket Reader monitors this signal to determine the following; a) whether to charge the Start Up Amount or the Increment Amount, or b) whether to indicate that the equipment is running (Wicket Reader face turns white). Wickets Administrator is used to configure the WR88 Wicket Reader's use of this signal, including enable/disable and whether Service Sense logically corresponds to a high or low voltage sensed at the input.

There is an RJ-11 telephone style connector on the right side of the enclosure to plug in the WR88 Wicket Reader. A pre-wired connector with 16" leads plugs into the field wiring connector on the left hand side of the enclosure and is included as part of the WK-HV Module. The table below identifies the color and function of each of these wires.

Wire	Name	Description - Specification
1- Black	Power Hot	Power supply: 95-270VAC
2- Red	Service Monitor	Input threshold: 10VDC, 250VAC maximum.
4- White	Power Common	Power Common
3- Grey	Switch N.C.	SPDT relay switch contacts: 8.0Amps @ 250VAC maximum. - not internally fused
5- Violet	Switch Common	
6- Red/Grn	Switch N.O.	

Note: Wickets Administrator must be used to program the WR88 Wicket Reader to enable it to generate the correct pulses and debit a Customer Wicket by the proper amount. See below for information about setting the configuration parameters for the WR88.

Serial Port - MDB Vendor Protocol: WK-MDB Module

The MDB (multi-drop bus) serial port protocol evolved to become the standard protocol between the control components in vending machines in the mid 1990's. The protocol specifies how the vending machine controller talks to the coin changer, the bill validator, the display, and installed card readers.

The WK-MDB Module is designed to provide the electrical and protocol interface between a vending machine controller (VMC) and a WR88 Wicket Reader. Its three diagnostic LED indicators provide visual operational information that may be helpful during installation and for troubleshooting problems. The enclosure dimensions are 3.0" L x 2.5" W x 1.0" H (76mm x 63mm x 25mm) and has integral mounting ears.

There is an RJ-11 telephone style connector on the right side of the enclosure to plug in the WR88 Wicket Reader. There is an attached 16" cable assembly on the left hand side of the enclosure with two connectors: one to connect to the vending machine controller, and the other which is just a daisy-chain pass-through connector for connecting other devices to the multi-drop bus.

Connector Pin-out:

1 - 34 VDC
2 - DC Power Return
3 - N/C
4 - Master Receive
5 - Master Transmit
6 - Communications Common
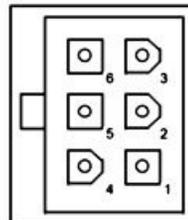
Peripheral Connector
Receptacle (Sockets)
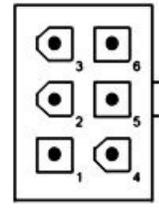
VMC / Bus Connector
Header (Pins)

The MDB Spec V3.0 supports two cashless devices. The address select switch located on the left side of the enclosure configures the WK-MDB Module as one device or the other. The valid cashless addresses are 0x10 (address 1) and 0x60 (address 2). This provides a means for compatibility in a system already having a credit card device installed. Any change made to the address select switch will not take effect until the next module reset through a power cycle or if the vending machine controller commands a bus reset.

Note: Wickets Administrator must be used to program the WR88 Wicket Reader to enable the MDB Vendor Protocol to properly communicate with the WK-MDB-Module. See below for information about setting the configuration parameters for the WR88.

A typical vending transaction for a customer would proceed something like this:

1.) A customer walks up to the vending machine to buy something using his Wicket.

2.) As in other transactions where money is first deposited, the Wicket is first read to start the sequence.

3.) The machine controller determines if the customer has enough to buy the lowest price item.

4.) The customer is prompted to make an item selection for vending.

5.) The customer is prompted to read his Wicket again to debit it and complete the transaction.

6.) The machine controller tells the Wicket Reader how much to debit the next presented Wicket.

7.) The Wicket Reader blinks white to indicate a Wicket debit transaction is pending for the amount.

8.) The customer reads his Wicket again, the amount is debited and the reader blinks green.

9.) The completed debit transaction is communicated back to the vending machine controller.

10.) The vending machine controller vends the item to the customer.

11.) If the item fails to vend, the vending machine controller sends a refund to the Wicket Reader.

12.) The Wicket Reader blinks white to indicate a pending refund transaction for the amount.

13.) The customer reads his Wicket again, the amount is refunded, and the Wicket Reader blinks green.

14.) If the same Wicket is not presented to take the refund within 30 seconds, the Wicket Reader goes back to the idle blue color and saves the refund information for some future time when the Wicket is again presented and completes the transaction then.

Note: The MDB Specification does not guarantee that you can just plug the WK-MDB Module and a WR88 Wicket Reader into just any vending machine and expect it to work. The vending machine controller may not be capable of communicating with a second cashless payment device, or it may have an incompatible implementation of the communication sequence details. Please contact IDX sales for compatibility information.

Serial Port - Card-Display Protocol: WK-CD Module

The Card-Display Protocol was developed by IDX at the request of various card acceptor manufacturers to provide interoperability of credit and debit card systems with the installed display-timers in self-service carwash bays. Payment, display message, and status information are communicated between the units via RS-232.

The WK-CD Module is designed to provide the electrical and protocol interface between a WR88 Wicket Reader and an Card-Display compatible display-timer, such as the IDX BigTime, Little Two Timer, or GigaTime. Its three diagnostic LED indicators provide visual operational information that may be helpful during installation and for troubleshooting problems. The enclosure dimensions are 3.3" L x 2.2" W x 1.0" H (84mm x 56mm x 20mm) and comes with adhesive Velcro mounting strips.

There is an RJ-11 telephone style connector on the right side of the enclosure to plug in the WR88 Wicket Reader. There is also an attached 16" RJ-11 telephone style cable assembly on the left hand side of the enclosure to plug directly into the Card-Display Protocol compatible display-timer.

Note: Wickets Administrator must be used to program the WR88 Wicket Reader to enable the Card-Display Protocol so it will properly communicate through the WK-CD Module to the display timer. See below for information about setting the configuration parameters for the WR88.

Wicket Reader Configuration Steps

The **Wickets Administrator** software is used to configure the WR88 Wicket Reader so that it knows how to communicate with the equipment and what to do with customer Wickets when presented. The screen shot to the right shows an example of the setup parameters you will need to program into your Wicket Reader. Below are the setup steps:
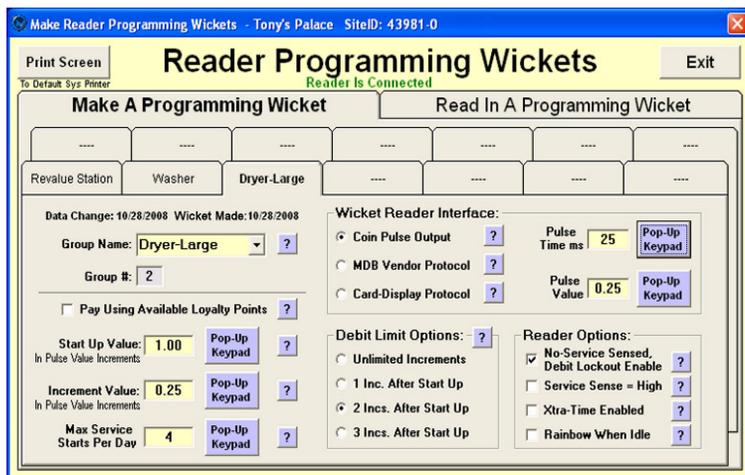
1.) Click the **Make A Programming Wicket** tab, then click a **Group Tab** for a group of equipment that will all operate with the same prices and parameters.

2.) Set the **Group Name** by clicking the drop-down box arrow and selecting a name from the list, which include names for carwash, laundry, arcade, and vending applications, or you may directly enter any name you like in the box. This name will then be shown on the tab.

3.) Set the **Wicket Reader Interface** according to the hardware interface the machine requires. Select the Coin Pulse Output if the equipment requires coin pulses to activate it and you are using the WK-LV or the WK-HV Module to interface to the machine. Select the MDB Vendor Protocol if the equipment is a vending machine or a revalue station and you are using the WK-MDB Module to interface to the machine. Select the Card-Display Protocol if the equipment is an IDX display-timer with that has the Card-Display option and you are using the WK-CD Module to interface to it.

4.) If you have selected the MDB Vendor Protocol in the last step you will see most of the other controls on the screen become unavailable as they are irrelevant to vending machine or revalue station applications. Skip directly to step 10 to write this data to your Reader Programming Wicket.

5.) Set your operating prices (so the Wicket Reader will know how much to debit from a Customer Wicket) by setting the **Start Up Value** and the **Increment Value** using the Pup-Up Keypad. The Start Up Value is the minimum amount to debit to get the machine started and the Increment Amount is usually some smaller amount to debit for additional time or services once the start amount has been satisfied. If the Wicket Reader finds that the presented Wicket does not have sufficient funds to start a machine, it won't debit any funds at all from it and will blink yellow to warn of insufficient funds.

6.) Set the **Debit Limit Options** according to the number of incremental debits the machine can handle.

7.) Set the **Pulse Time** (in milliseconds) according to what your equipment expects to receive from coin operated equipment as a valid coin pulse. Generally this value will be between 15ms and 100ms. If you cannot find this information about your equipment, IDX recommends 50ms be used in the carwash market and 25ms be used in the laundry, arcade, and other markets as your default choice.

8.) Set the **Pulse Value**. In most North American sites, coin pulses are based on a $.25 coin. However you can set the coin pulse value to be pretty much anything you like. For example, in Europe and Australia there are no 0.25 coins, so 0.20, or 0.50 or 1.00 may be what is required.

9.) In the **Reader Options** section:
   a. Check the **No Service - Debit Lockout Enable** box to lockout further debits to customer Wickets if there is no Service Sense signal (machine did not start) for 10 minutes following a debit from the Wicket. When a lockout occurs, the Wicket Reader will continuously blink red to indicate the problem. The debit lockout condition can be cleared by starting the machine or cycling power. During debit lockout a customer can get his money refunded to his Wicket simply by reading his Wicket on the same Wicket Reader one more time. The Wicket Reader will blink green to indicate that the money has been refunded to the Wicket.
   b. Check the **Service Sense = High** box if the voltage sensed by the Service Sense Input to the Wicket Reader goes high when the machine is activated. This is case with most equipment. However, in cases the opposite is true, such as in Maytag laundry machines that produce a "machine available" signal which does the logical opposite and thus requires you to leave the box unchecked.
   c. Check the **Xtra-Time Enabled** box only if the Wicket Reader is tied into an IDX carwash timer with Xtra-Time enabled (or a competitor's timer with a Grace Time feature enabled). This will cause the Wicket Reader to debit only the Increment Value for the first 20 seconds after the Service Sense input indicates the machine has turned off... and then only after that 20 seconds expires (without the machine being turned back on) will the Wicket Reader thereafter debit the full Start Up Value from a customer's Wicket to initiate a new service cycle. Leave this box unchecked if your equipment does not have an Xtra-Time or Grace Time feature.
   d. Check the **Rainbow When Idle** box you would like the Wicket Reader face to occasionally depart from its normal blue idle color and quickly cycle through the colors of the rainbow. This feature can help attract attention to the Wicket Reader, but some may be concerned that it may confuse the customer if it occurs about the time the customer is reading his Wicket. Your choice.

10.) When you are done, tap your Reader Programming Wicket on the Wicket Reader Programming Module to have it write this configuration information to the Wicket.

11.) Take the Reader Programming Wicket around to all of the machines that will operate with these particular configuration parameters and tap the Wicket on the machine's Wicket Reader to have it read in and program itself with these parameters. The Wicket Reader will blink green to indicate that it has successfully read the parameters from the Reader Programming Wicket.